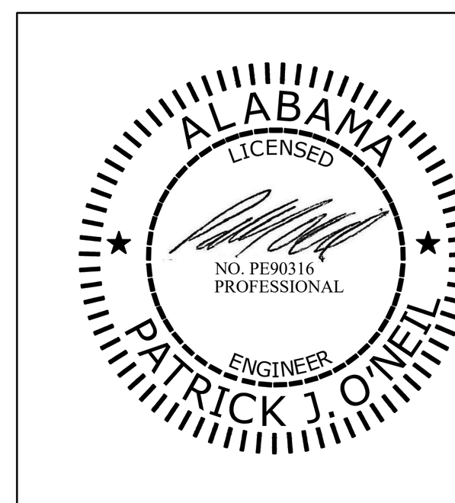


MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED. MECHANICAL EQUIPMENT LOCATED ON ROOFTOP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S INSTALLATION INSTRUCTIONS TO MAINTAIN CLEARANCES TO ACCESS FOR SERVICE AND MAINTENANCE.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON-SITE OR OFF-SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
   - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
   - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
   - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
   - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
   - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON-COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
   - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE-POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA-255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER-PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL- SKRIM-KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK	
ABOVE CEILINGS	1-1/2" BLANKET TYPE
GRILLE BOOTS	1-1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:	
ALL	LINER WHERE NOTED, OTHERWISE:
GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:	
ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:	
EXHAUST	NONE
PIPING:	
INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
OUTDOOR REF PIPING	1-1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R-410A. PROVIDE WITH 5-YEAR LIMITED PARTS WARRANTY AND 5-YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE-PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON-PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1-1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1-HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2-BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2-12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI-BLADE DAMPERS PER SMACNA FIGURE 2-13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON-OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED (REFER TO PARAGRAPH 2), RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G-90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DUCT BOARD IS ACCEPTABLE WITH WRITTEN APPROVAL BY OWNER DUCT BOARD, IF ALLOWED, SHALL HAVE A MINIMUM R-VALUE OF 6 AND BE COMPOSED OF RESIN BONDED GLASS FIBERS. DUCT BOARD SHALL HAVE AN FSK VAPOR JACKET AND COMPLY WITH ASTM C1290.
3. DRYER VENT SHALL BE 26 GA. MINIMUM.
4. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G-90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: <15" DIA. = 24 GAUGE, 15"-26" DIA. = 22 GAUGE.
5. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY-IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
6. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
7. FABRICATE AND SUPPORT METAL DUCT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
8. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
9. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
10. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
11. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
SUPPLY	NOTE 1	2"	A
RETURN-RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

NOTES:

1. REFER TO PARAGRAPH 2 WHERE DUCT BOARD IS ALLOWED.

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45-60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R-2
USE GROUP: VB
OCCUPANCY: 203

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START-UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON-COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

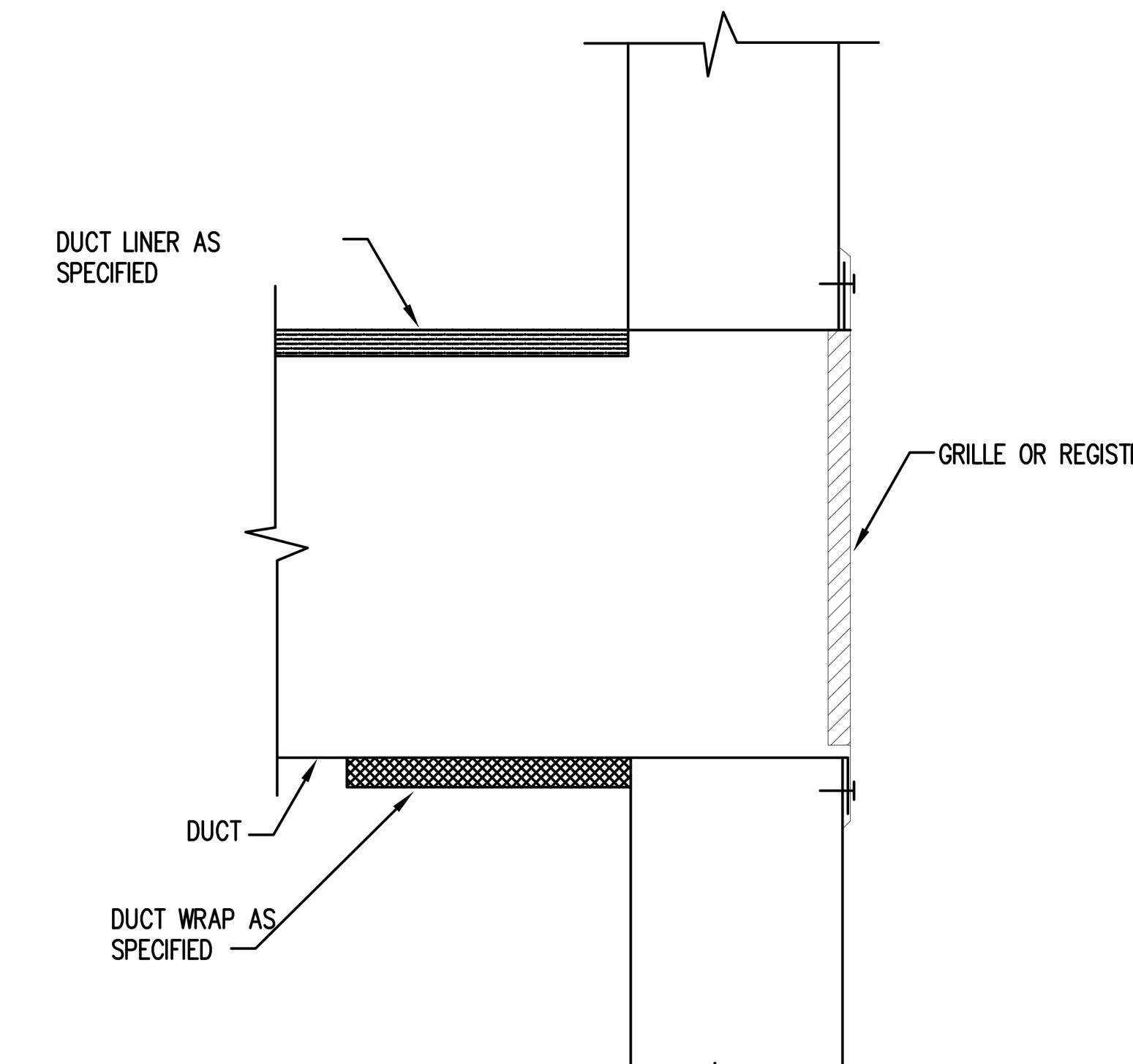
MECHANICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)	24x12, R-X 100 CFM	SIDEWAYS RETURN
	FLEXIBLE CONNECTION	24x12, S-X 100 CFM	SIDEWAYS SUPPLY
20x20 12x12	TRANSITION	RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
	FIRE DAMPER W/ ACCESS DOOR	8"ø, S-1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	AIR TIGHT CONNECTION OFF DUCT MAIN		DOOR UNDERCUT
	4-WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION	T	THERMOSTAT (48"AFF)
	RETURN DIFFUSER	SD	SMOKE DETECTOR
24" 24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.	OCC	OCCUPANCY SENSOR
		AD	ACCESS DOOR IN SIDE OF WALL OR DUCT
		AHU-1	EQUIPMENT NUMBER
			1-HOUR RATED WALL
			2-HOUR RATED WALL
			MATCH LINE
		ZD	ZONE DAMPER
		M	MOTORIZED DAMPER; USED FOR BYPASS AIR

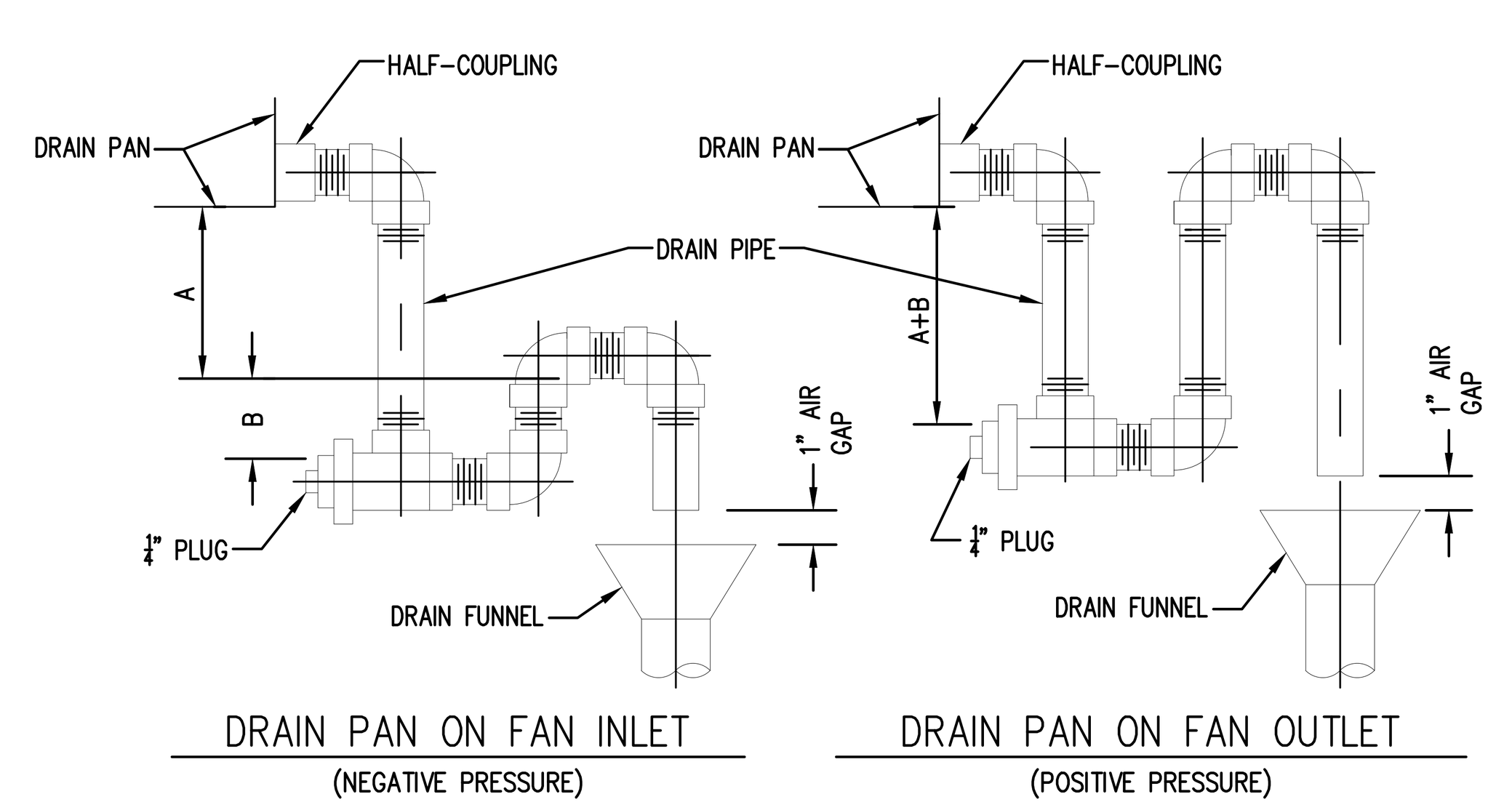
MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

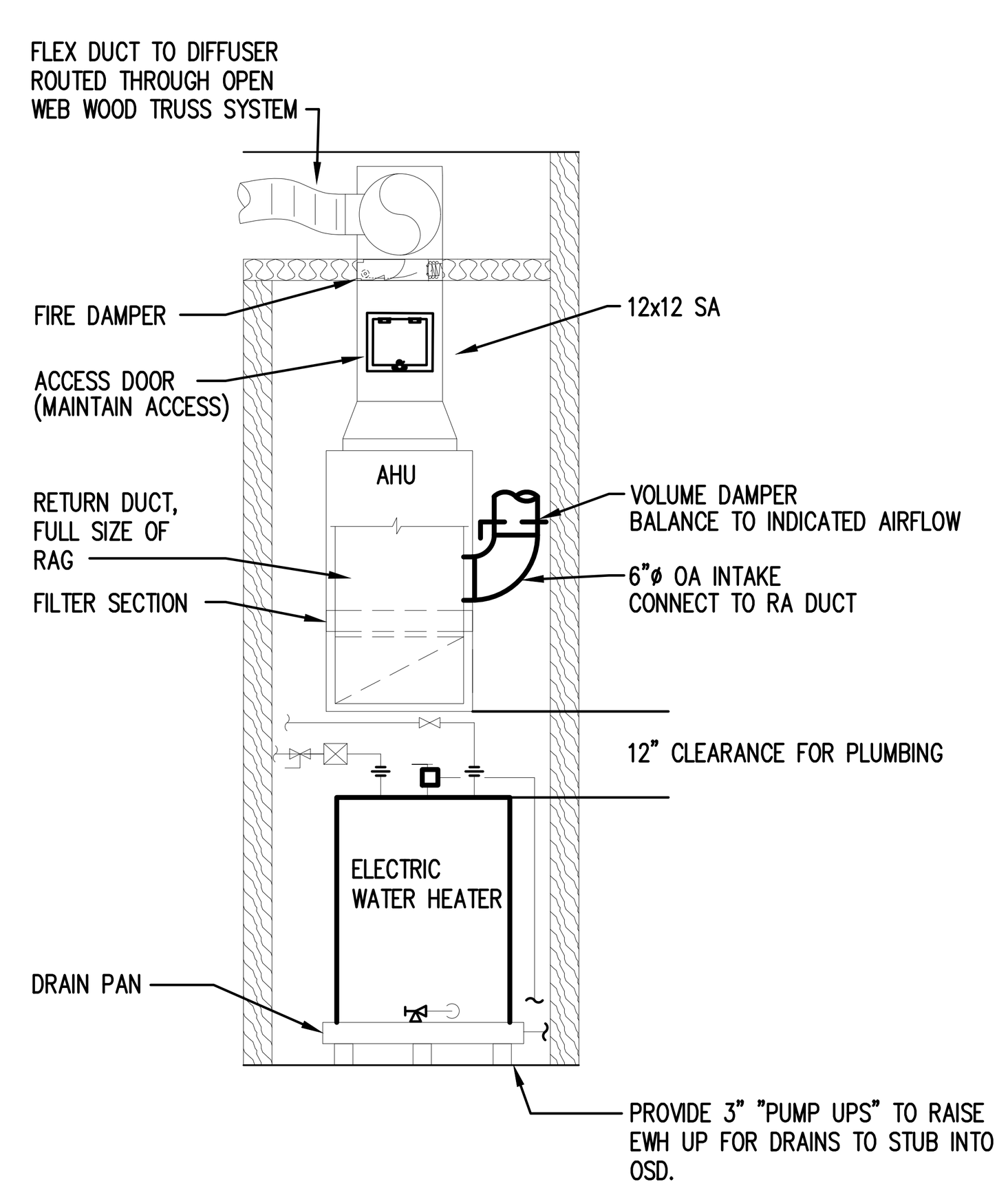


5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE

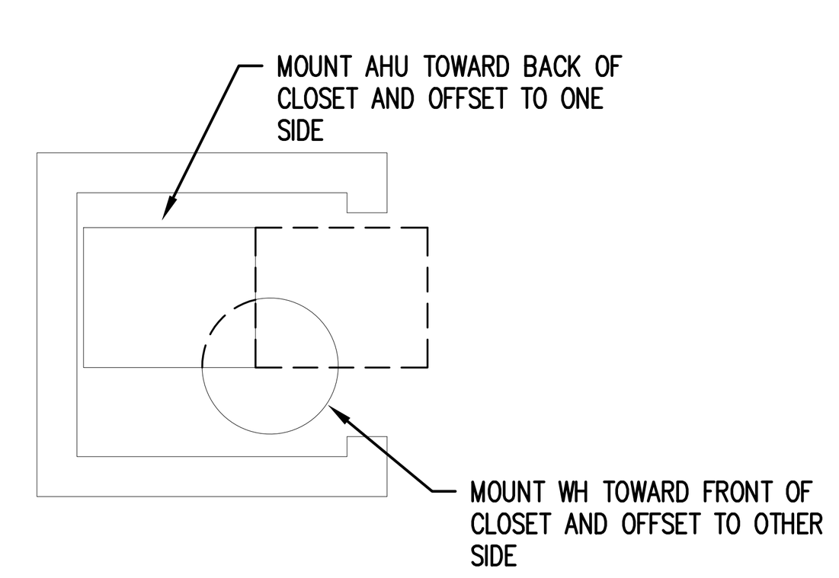


NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

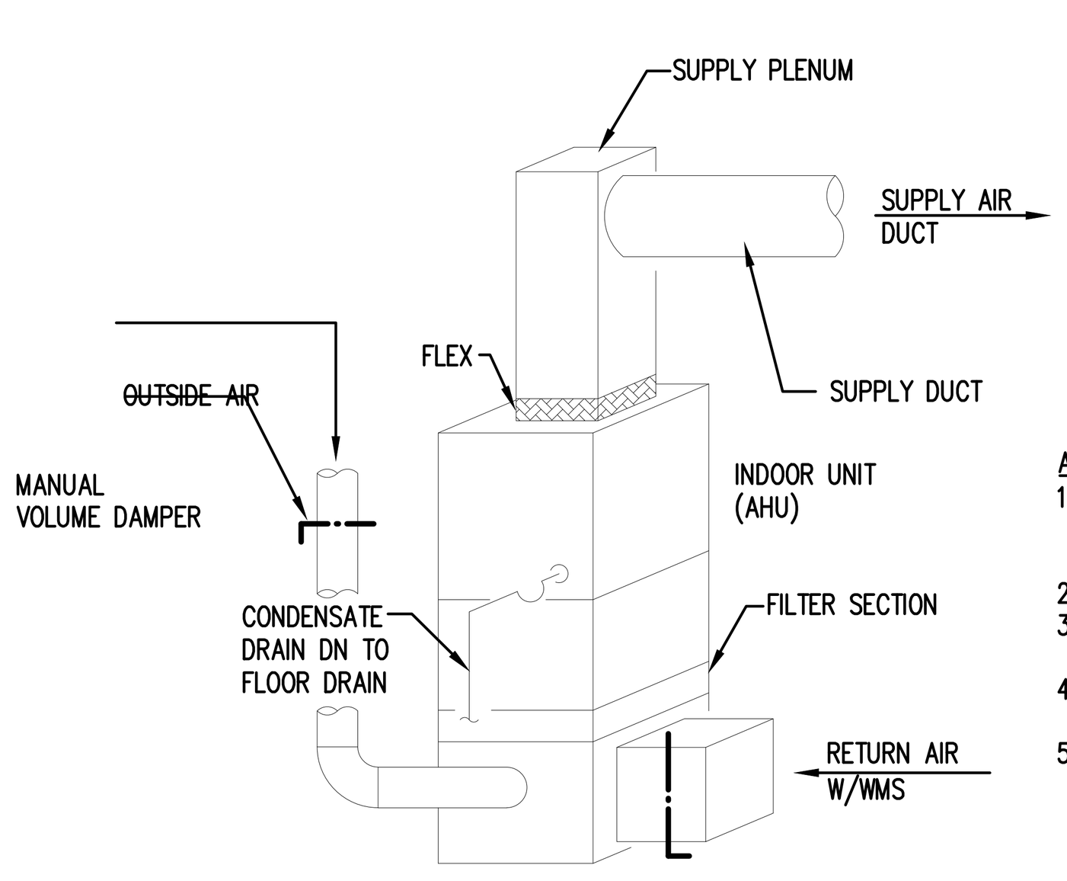
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

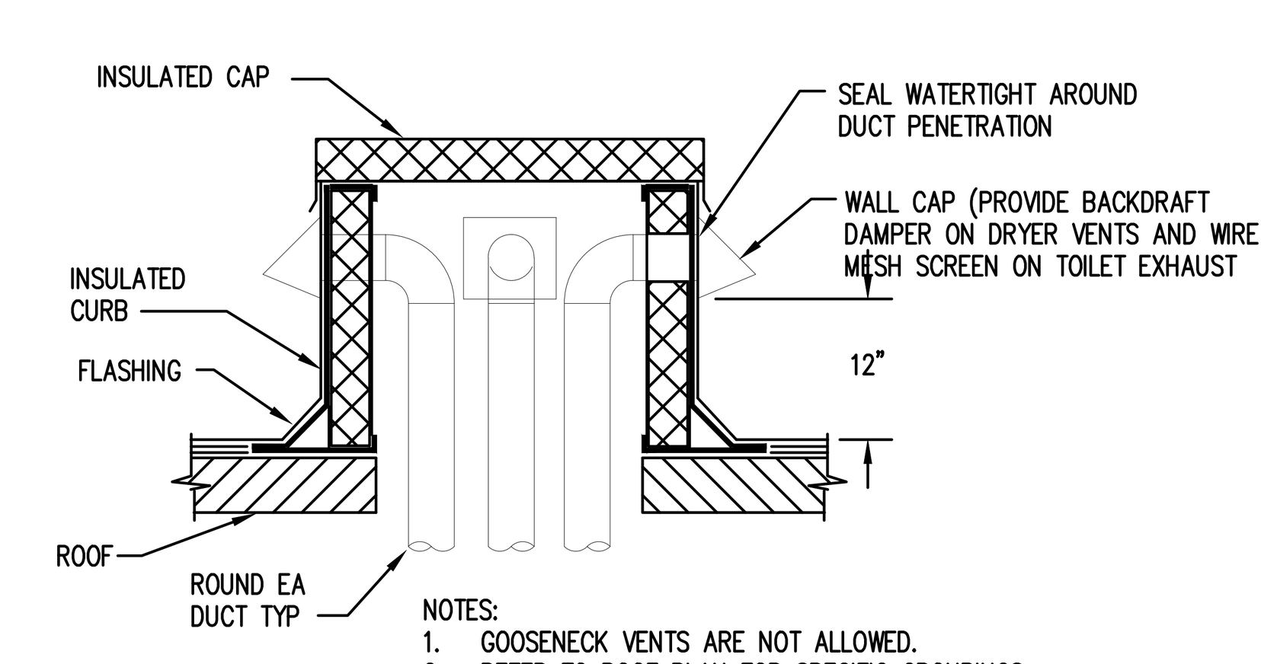


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE



AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

TERRACES AT HIGH MOUNTAIN - A1

SHEET:
M1.001

ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA										SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R		
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X					USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X	KRUEGER	S80

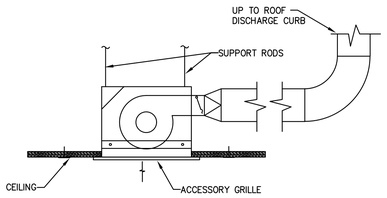
SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

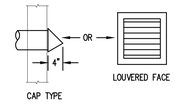
SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

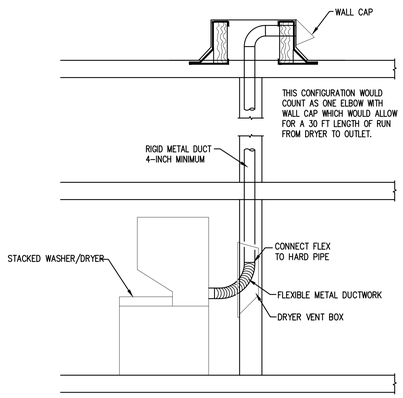
HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
1001	45	A	A	1101	60	A	A	1201	60	A	A	1301	45	A	A
1002	30	B	B	1102	30	B	B	1202	30	B	B	1302	45	B	B
1003	45	A	A	1103	30	A	A	1203	30	A	A	1303	45	A	A
1004	30	A	A	1104	45	A	A	1204	45	A	A	1304	45	A	A
1005	45	A	A	1105	45	A	A	1205	45	A	A	1305	45	A	A
1006	30	A	A	1106	30	A	A	1206	30	A	A	1306	45	A	A
1007	30	A	A	1107	30	A	A	1207	30	A	A				
				1108	45	A	A	1208	45	A	A				
				1109	45	A	A	1209	45	A	A				
				1110	30	A	A	1210	30	A	A				
				1111	30	A	A	1211	30	A	A				
				1112	60	A	A	1212	60	A	A				



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

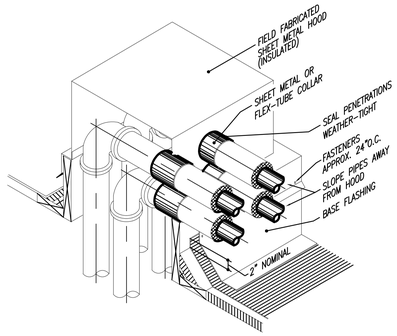


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

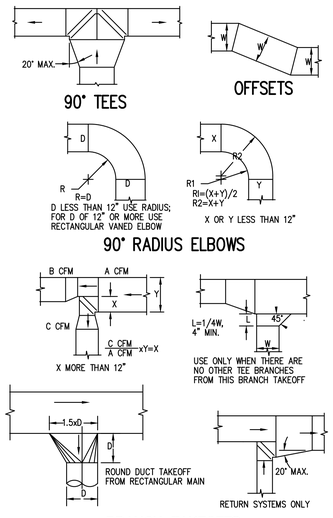
NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

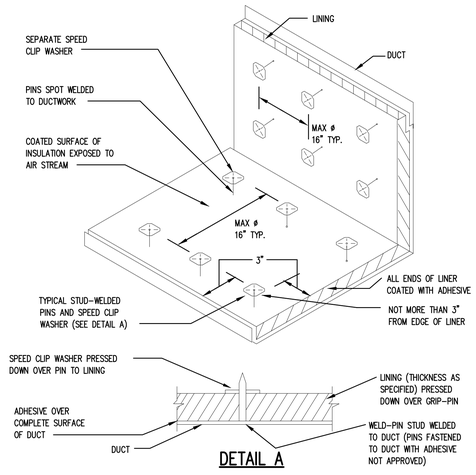
3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



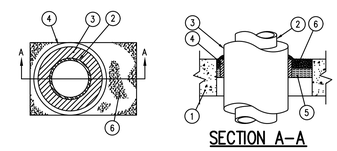
5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE



1. Floor orWall Assembly – Min 4–1/2 in. thick lightweight or normal weight (100–150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2–1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics* – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr.When max 2 in. diam insulated steel or copper pipe is used,T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94–5VA may be used.

4. Fill,Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

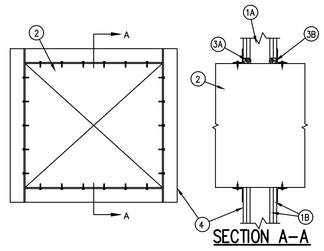
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill,Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant.
(The W Rating applies only when FB–3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3–1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3–1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction–fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

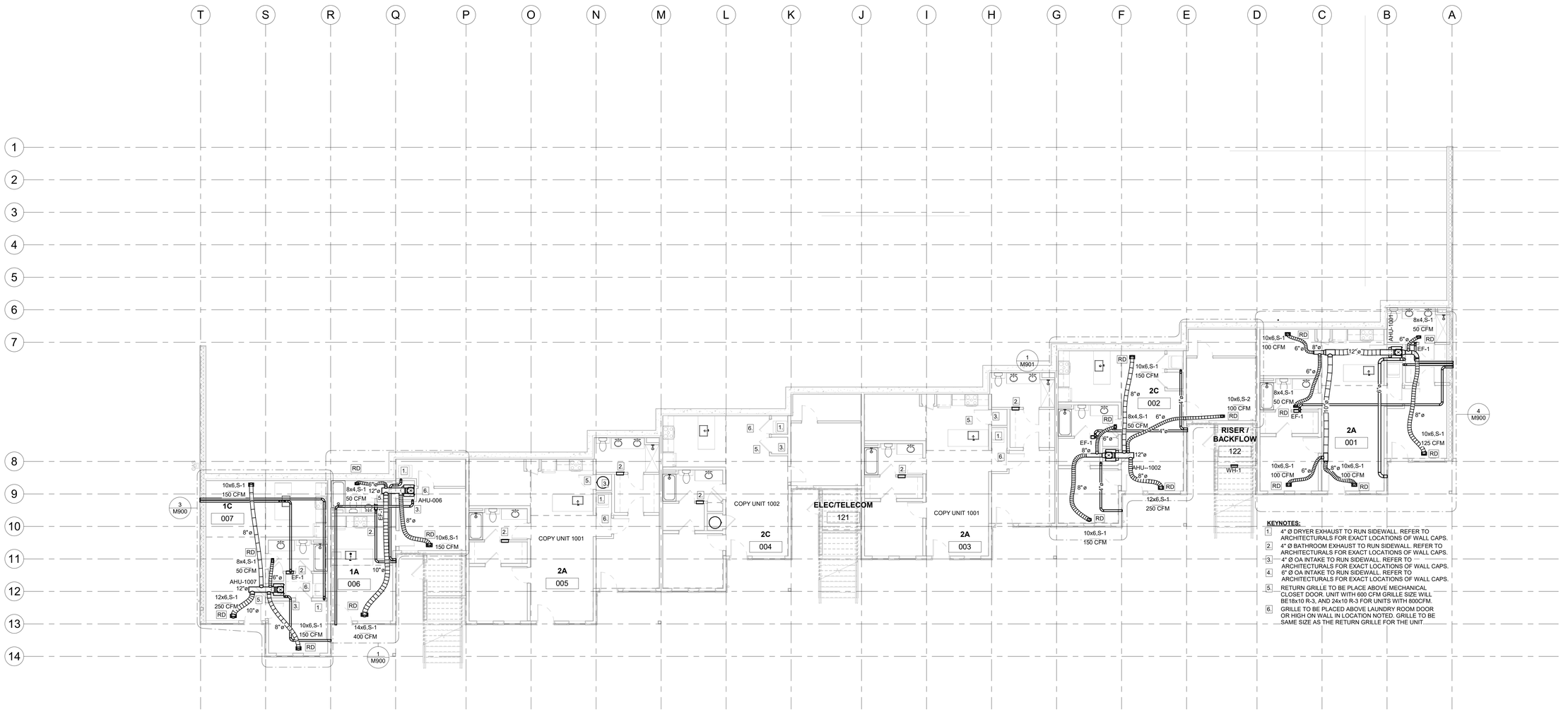
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:
M1.002

TERRACES AT HIGH MOUNTAIN - A1



KEYNOTES:

1. 4" Ø DRYER EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
5. RETURN GRILLE TO BE PLACE ABOVE MECHANICAL CLOSET DOOR. UNIT WITH 600 CFM GRILLE SIZE WILL BE18x10 R-3, AND 24x10 R-3 FOR UNITS WITH 800CFM.
6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:

M1.100

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1

1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

KEYNOTES:

1. 4" Ø DRYER EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
5. RETURN GRILLE TO BE PLACE ABOVE MECHANICAL CLOSET DOOR. UNIT WITH 600 CFM GRILLE SIZE WILL BE 18x10 R-3, AND 24x10 R-3 FOR UNITS WITH 800CFM.
6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

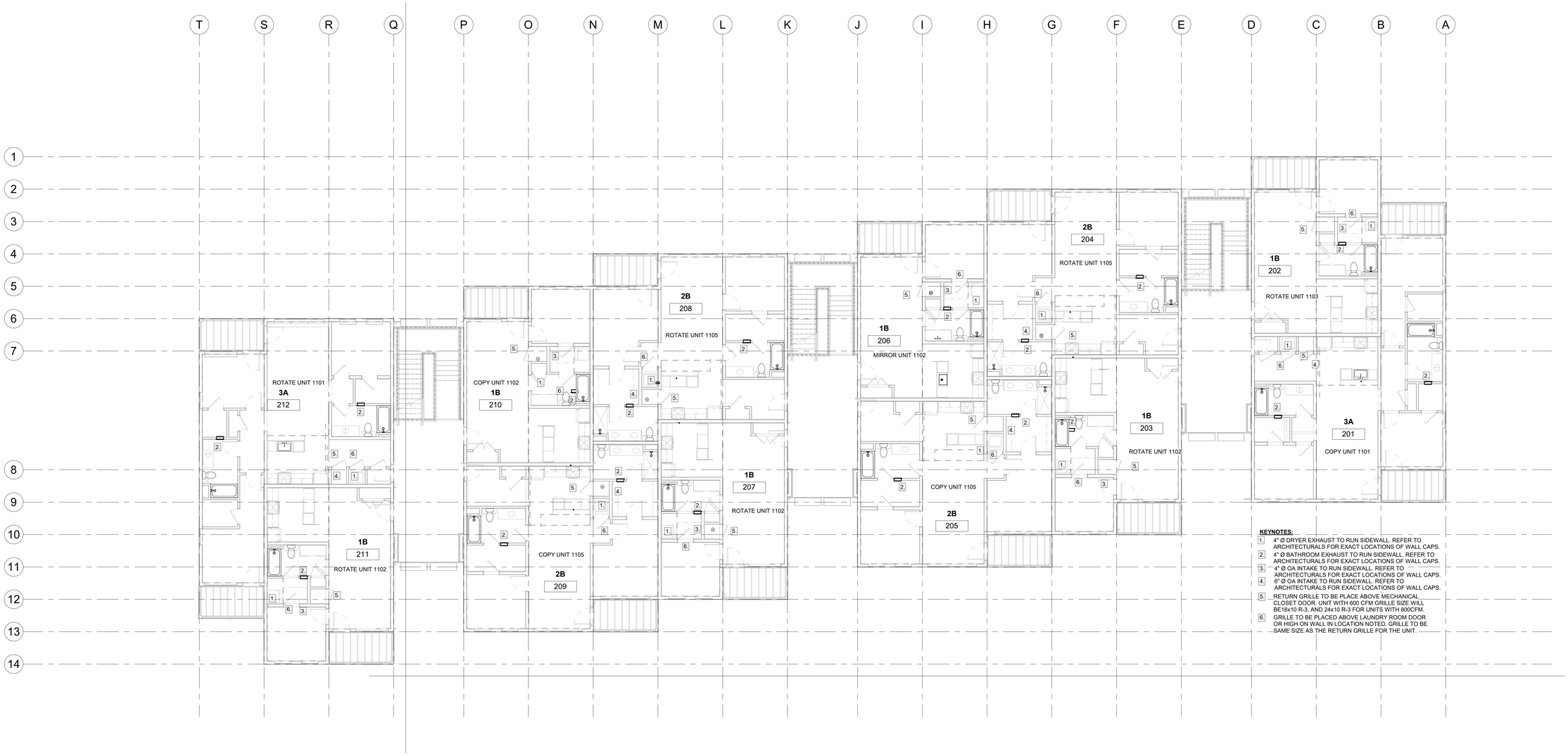
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:

M1.101

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1



1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

KEYNOTES:

1. 4" Ø DRYER EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
5. RETURN GRILLE TO BE PLACE ABOVE MECHANICAL CLOSET DOOR. UNIT WITH 600 CFM GRILLE SIZE WILL BE18x10 R-3, AND 24x10 R-3 FOR UNITS WITH 800CFM.
6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:

M1.102

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1

KEYNOTES:

1. 4" Ø DRYER EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
5. RETURN GRILLE TO BE PLACE ABOVE MECHANICAL CLOSET DOOR. UNIT WITH 600 CFM GRILLE SIZE WILL BE18x10 R-3, AND 24x10 R-3 FOR UNITS WITH 800CFM.
6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

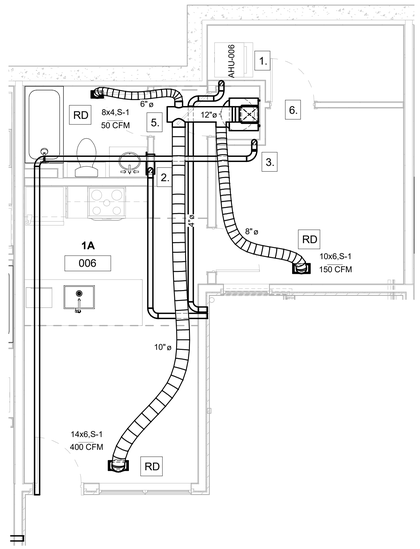
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

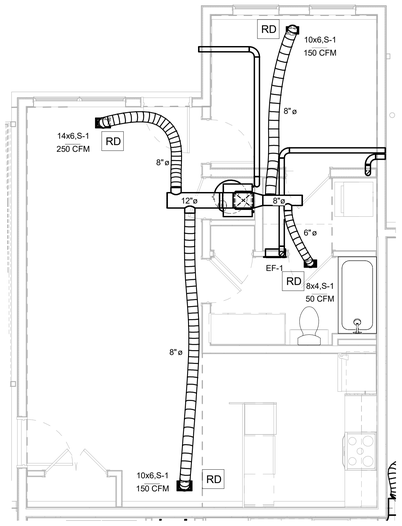
SHEET:

M1.103

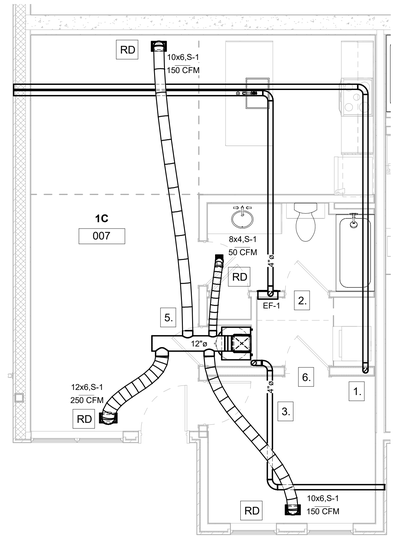
TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1



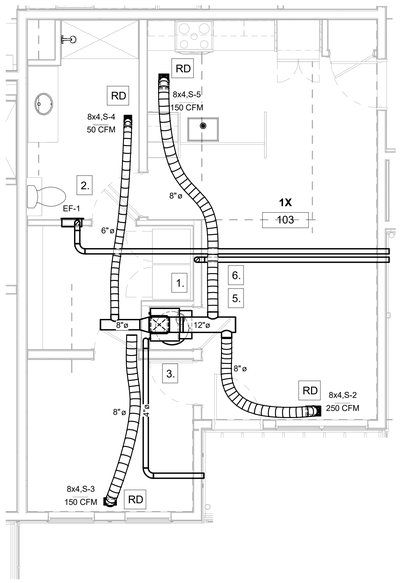
1 MECHANICAL TYPICAL UNIT TYPE 1A
1/4" = 1'-0"



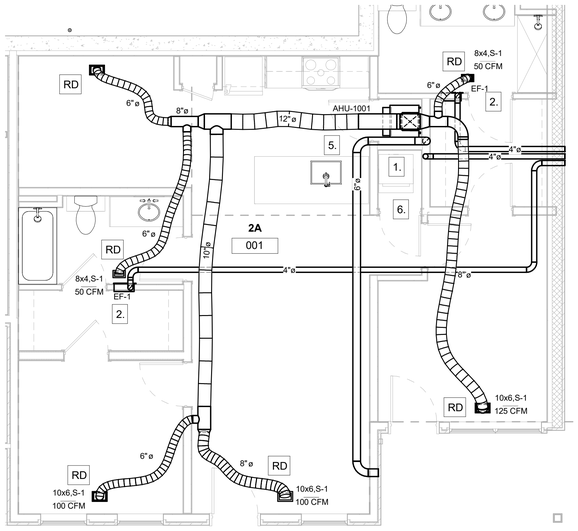
6 MECHANICAL TYPICAL UNIT TYPE 1B
1/4" = 1'-0"



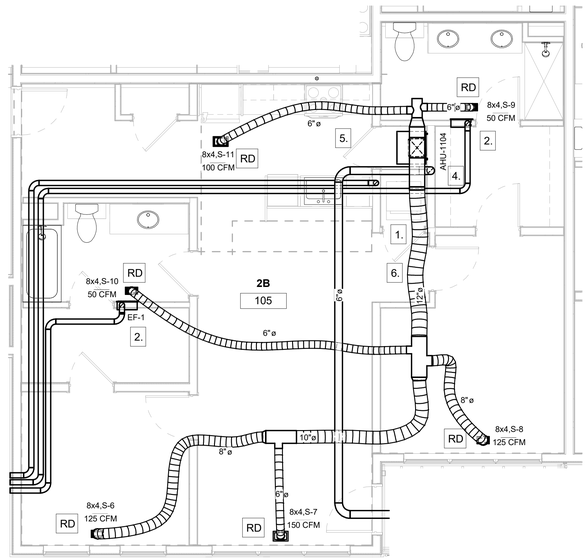
3 MECHANICAL TYPICAL UNIT TYPE 1C
1/4" = 1'-0"



2 MECHANICAL TYPICAL UNIT TYPE 1X
1/4" = 1'-0"



4 MECHANICAL TYPICAL UNIT TYPE 2A
1/4" = 1'-0"



5 MECHANICAL TYPICAL UNIT TYPE 2B
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

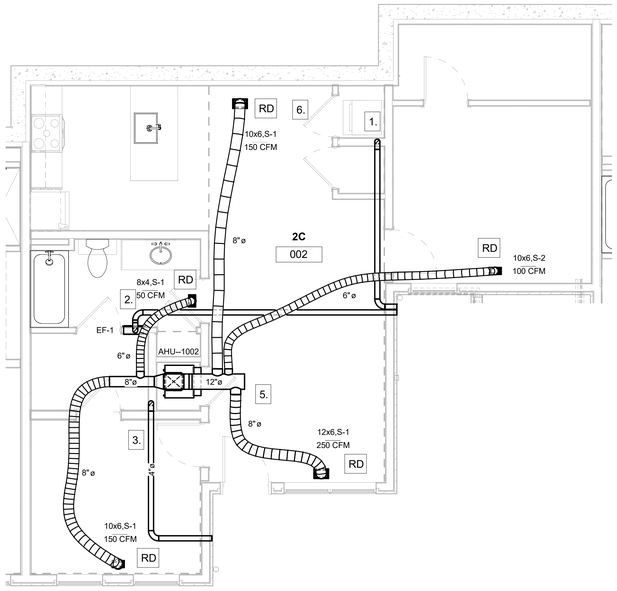
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

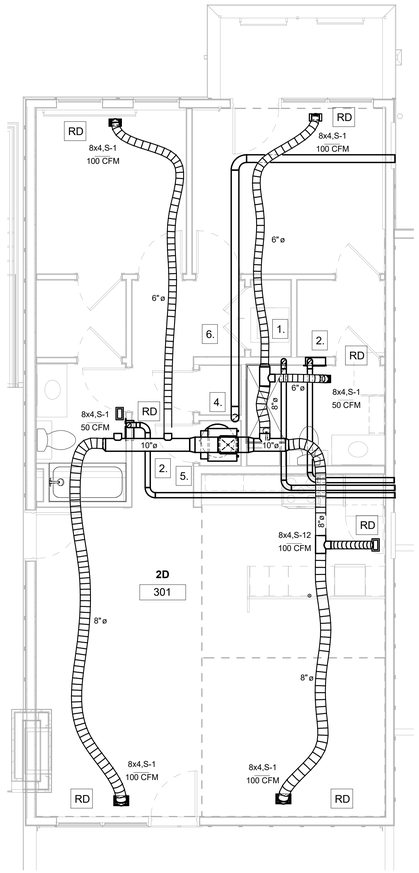
MECHANICAL
ENLARGED PLANS

SHEET:
M1.900

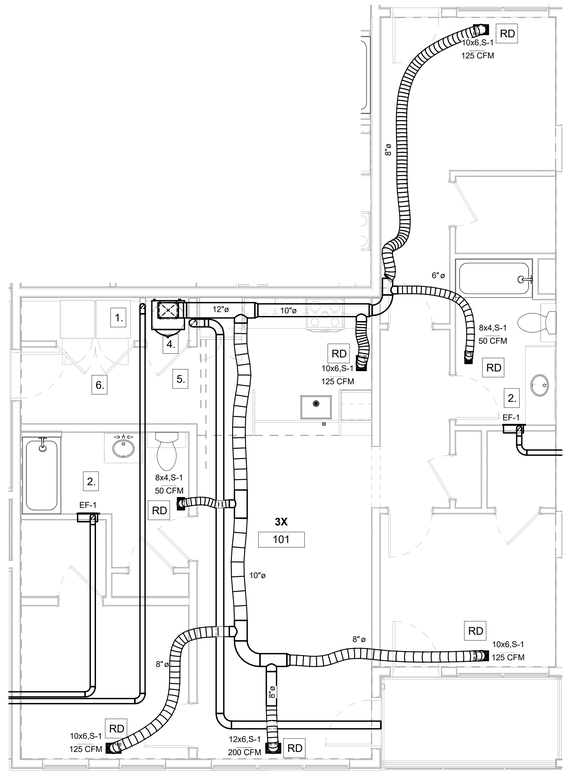
TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1



1 MECHANICAL TYPICAL UNIT TYPE 2C
1/4" = 1'-0"



2 MECHANICAL TYPICAL UNIT TYPE 2D
1/4" = 1'-0"



3 MECHANICAL TYPICAL UNIT TYPE 3A
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
ENLARGED PLANS

SHEET:

M1.901

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A1

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON-SITE OR OFF-SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON-COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE-POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA-255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER-PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL- SKRIM-KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK:		
	ABOVE CEILINGS	1-1/2" BLANKET TYPE
	GRILLE BOOTS	1-1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
	ALL	LINER WHERE NOTED, OTHERWISE:
	GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:		
	ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:		
	EXHAUST	NONE
PIPING:		
	INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
	OUTDOOR REF PIPING	1-1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R-410A. PROVIDE WITH 5-YEAR LIMITED PARTS WARRANTY AND 5-YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE-PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON-PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1-1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1-HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2-BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2-12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI-BLADE DAMPERS PER SMACNA FIGURE 2-13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON-OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED, RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G-90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DRYER VENT SHALL BE 26 GA. MINIMUM.
3. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G-90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: <15" DIA. = 24 GAUGE, 15"-26" DIA. = 22 GAUGE.
4. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY-IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
5. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
6. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
7. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
8. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY, RETURN, AND EXHAUST DUCTS. TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
9. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
10. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
LP SUPPLY	NOTE 1	2"	A
RETURN-RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45-60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R-2
USE GROUP: VB
OCCUPANCY: 138

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START-UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON-COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

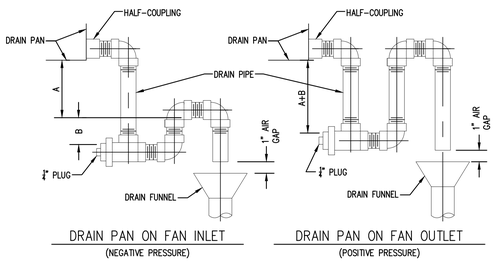
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4-WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
24" 24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R-X 100 CFM	SIDEWAYS RETURN
24x12, S-X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S-1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD__	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU-1	EQUIPMENT NUMBER
	1-HOUR RATED WALL
	2-HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

MECHANICAL ABBREVIATIONS

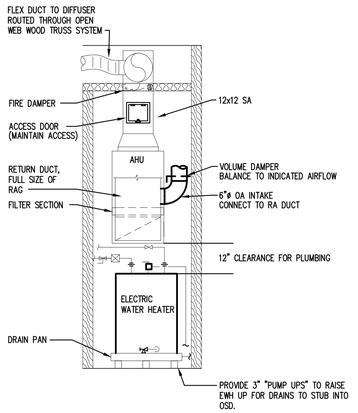
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

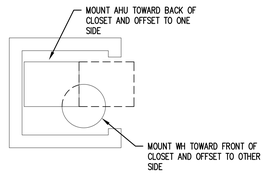


NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

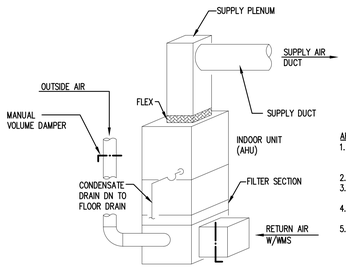
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

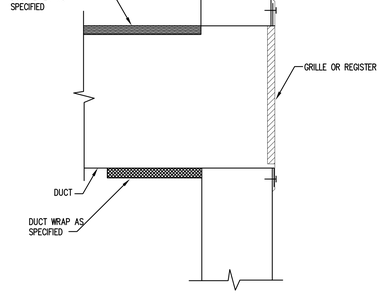


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE

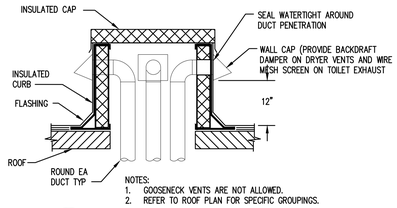


AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE99316 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A2
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
	11-JUN-2021	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118B
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M2.001

TERRACES AT HIGH MOUNTAIN - A2

ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA										SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R		
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X					USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X		KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X		KRUEGER	S80

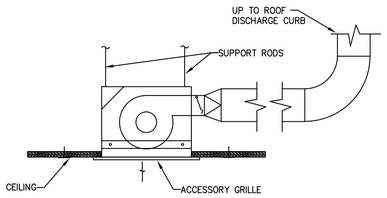
SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

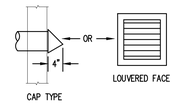
SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

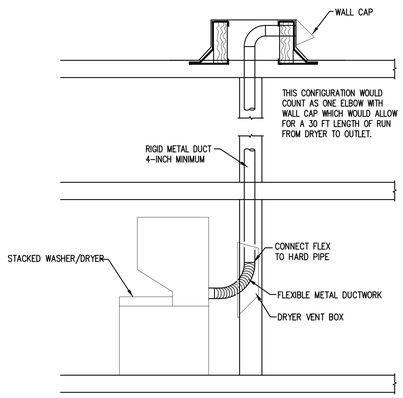
HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
2001	45	A	A	2101	60	A	A	2201	60	A	A	2301	45	A	A
2002	30	B	B	2102	30	B	B	2202	30	B	B	2302	45	B	B
2003	45	A	A	2103	30	A	A	2203	30	A	A	2303	45	A	A
2004	30	A	A	2104	45	A	A	2204	45	A	A	2304	45	A	A
2005	45	A	A	2105	45	A	A	2205	45	A	A	2305	45	A	A
2006	30	A	A	2106	30	A	A	2206	30	A	A	2306	45	A	A
2007	30	A	A	2107	30	A	A	2207	30	A	A				
				2108	45	A	A	2208	45	A	A				
				2109	45	A	A	2209	45	A	A				
				2110	30	A	A	2210	30	A	A				
				2111	30	A	A	2211	30	A	A				
				2112	60	A	A	2212	60	A	A				



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

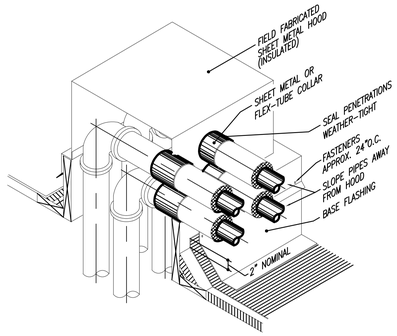


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

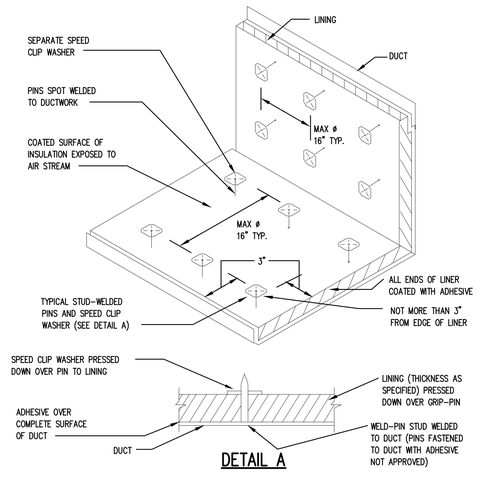
NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

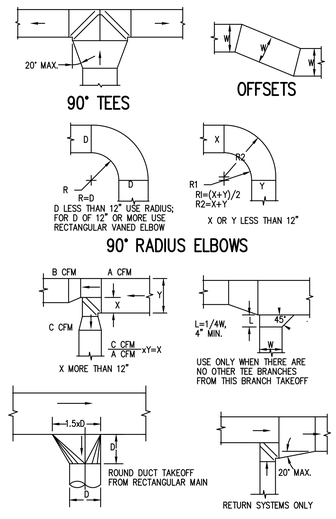
3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



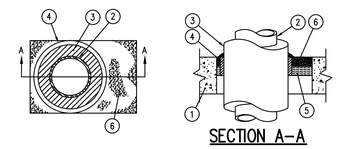
5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



1. Floor or Wall Assembly – Min 4-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2-1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics# – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr. When max 2 in. diam insulated steel or copper pipe is used, T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94-5VA may be used.

4. Fill, Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

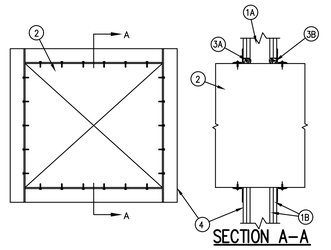
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill, Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant.
(The W Rating applies only when FB-3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill, Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE30516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-2021	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

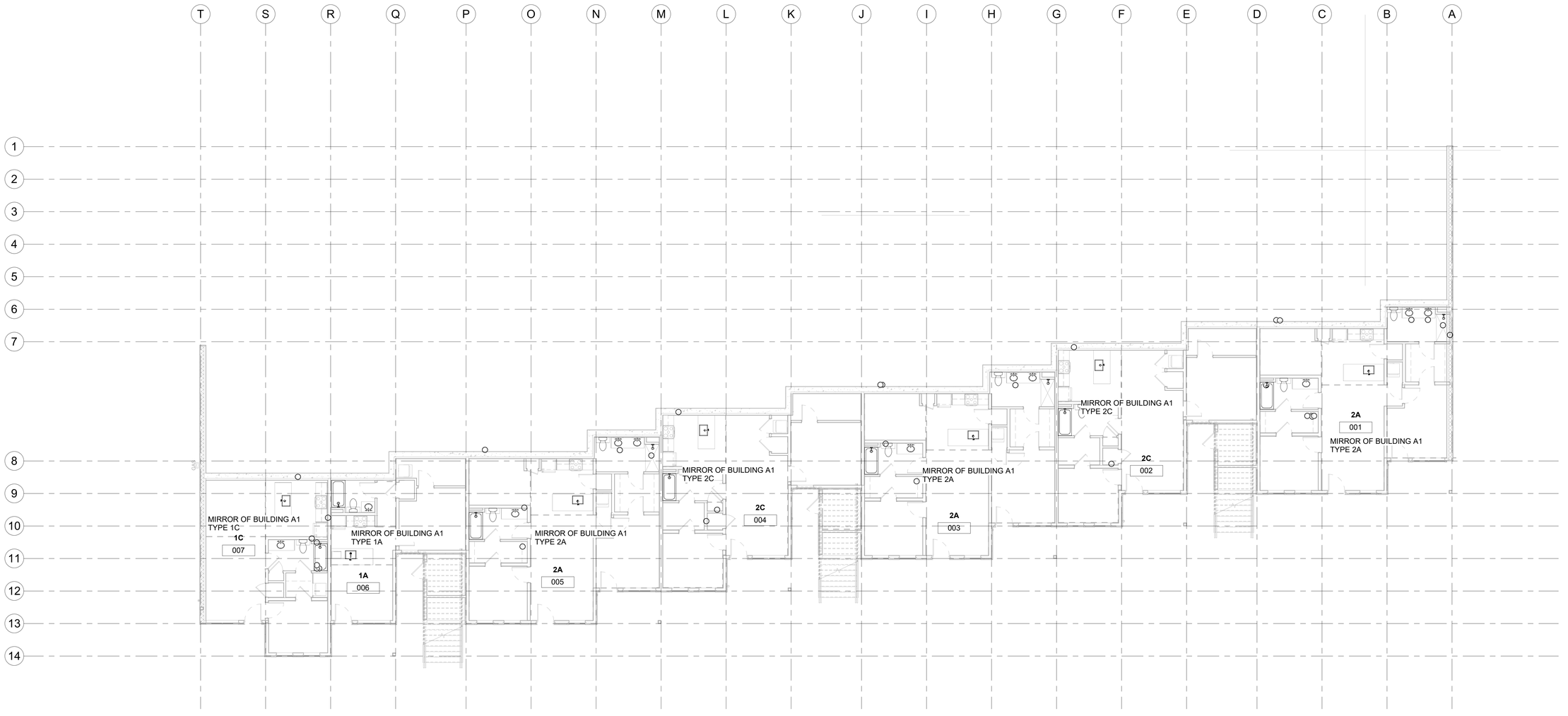
PROJECT #:	K118B
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:

M2.002

TERRACES AT HIGH MOUNTAIN - A2



1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

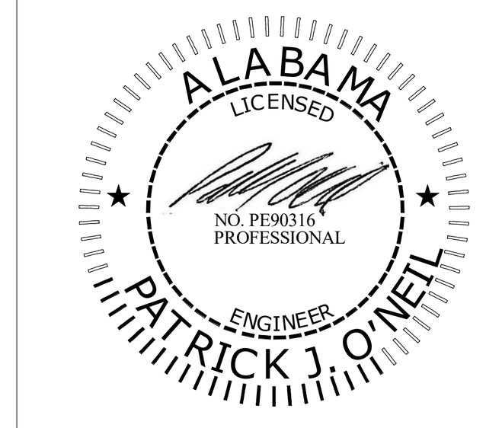
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:
M2.100

TERRACE AT HIGH MOUNTAIN - A2



1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

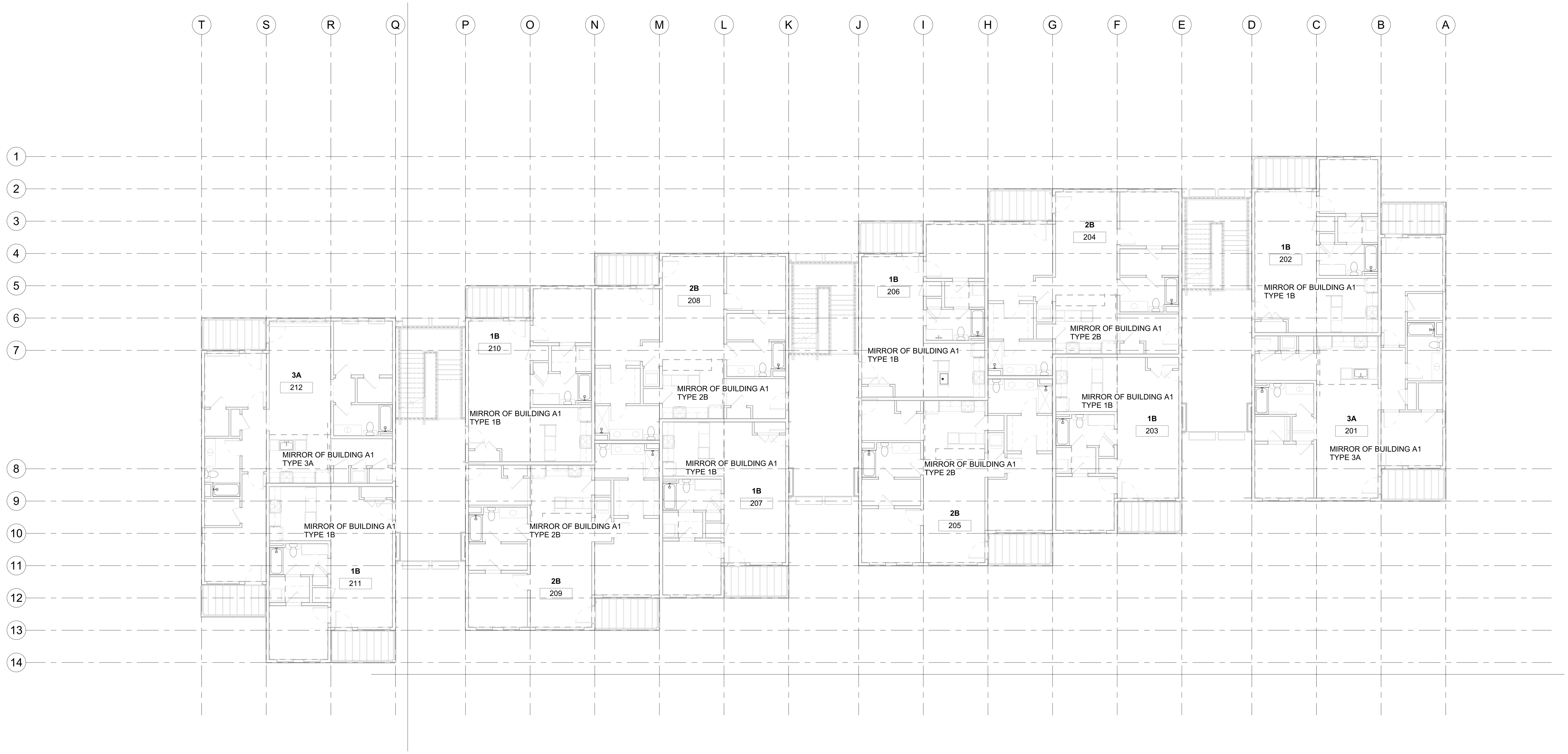
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

TERRACE AT HIGH MOUNTAIN - A2

SHEET:

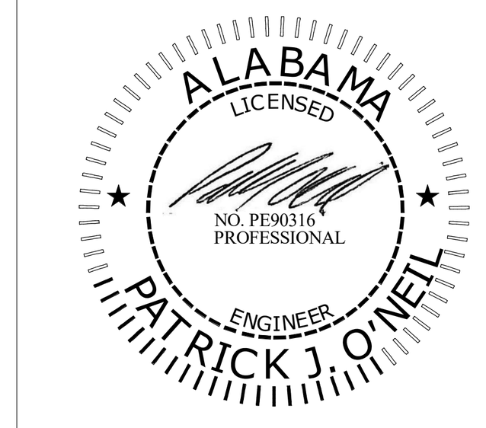
M2.101



1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.



TERRACE AT HIGH MOUNTAIN - A2
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

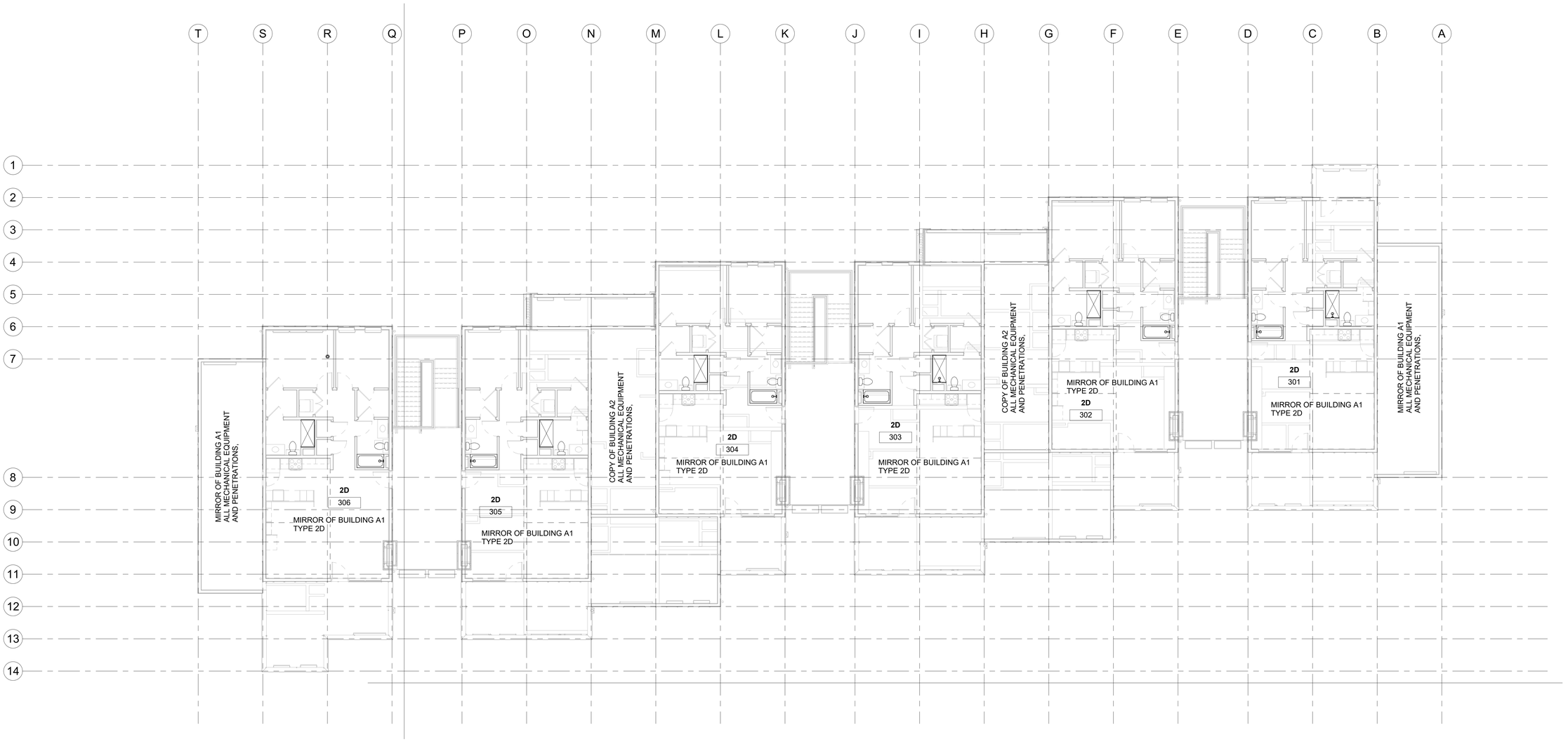
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:
M2.102

TERRACE AT HIGH MOUNTAIN - A2



1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

SHEET:
M2.103

TERRACE AT HIGH MOUNTAIN - A2

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED. MECHANICAL EQUIPMENT LOCATED ON ROOFTOP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S INSTALLATION INSTRUCTIONS TO MAINTAIN CLEARANCES TO ACCESS FOR SERVICE AND MAINTENANCE.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON–SITE OR OFF–SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON–COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE–POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA–255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER–PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL– SKRIM–KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK:		
	ABOVE CEILINGS	1–1/2" BLANKET TYPE
	GRILLE BOOTS	1–1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
	ALL	LINER WHERE NOTED, OTHERWISE:
	GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:		
	ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:		
	EXHAUST	NONE
PIPING:		
	INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
	OUTDOOR REF PIPING	1–1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R–410A. PROVIDE WITH 5–YEAR LIMITED PARTS WARRANTY AND 5–YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE–PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON–PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1–1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1–HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2–BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2–12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI–BLADE DAMPERS PER SMACNA FIGURE 2–13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON–OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED (REFER TO PARAGRAPH 2), RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G–90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DUCT BOARD IS ACCEPTABLE WITH WRITTEN APPROVAL BY OWNER DUCT BOARD, IF ALLOWED, SHALL HAVE A MINIMUM R–VALUE OF 6 AND BE COMPOSED OF RESIN BONDED GLASS FIBERS. DUCT BOARD SHALL HAVE AN FSK VAPOR JACKET AND COMPLY WITH ASTM C1290.
3. DRYER VENT SHALL BE 26 GA. MINIMUM.
4. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G–90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: ≤15" DIA. = 24 GAUGE, 15"–26" DIA. = 22 GAUGE.
5. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY–IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
6. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
7. FABRICATE AND SUPPORT METAL DUCT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
8. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
9. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
10. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
11. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
SUPPLY	NOTE 1	2"	A
RETURN–RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

NOTES:

1. REFER TO PARAGRAPH 2 WHERE DUCT BOARD IS ALLOWED.

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45–60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R–2
USE GROUP: VB
OCCUPANCY: 138

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START–UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON–COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

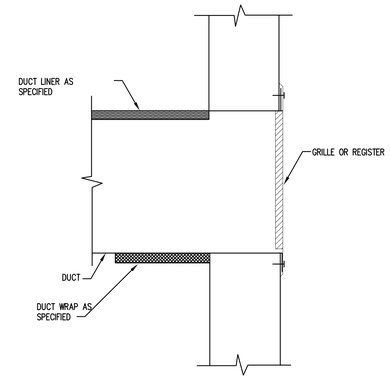
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4–WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
24" 24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R–X 100 CFM	SIDEWAYS RETURN
24x12, S–X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S–1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD__	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU–1	EQUIPMENT NUMBER
	1–HOUR RATED WALL
	2–HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

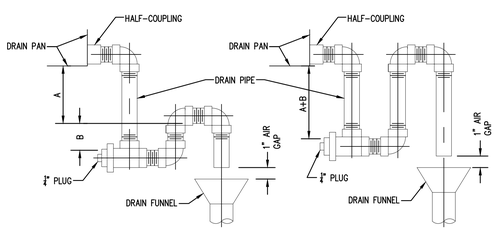
MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

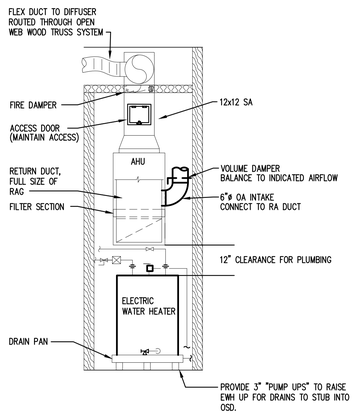


5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE

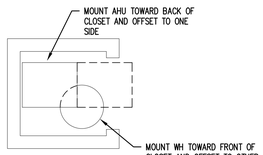


NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT.
   "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

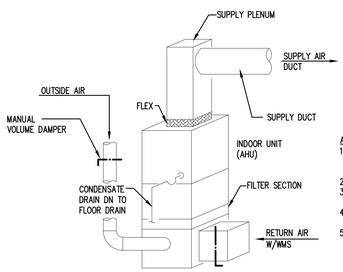
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

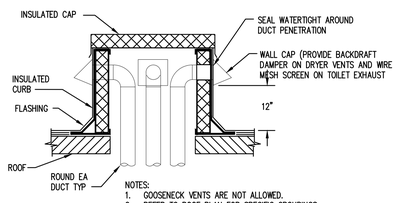


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE



AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE30516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A3
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-2021	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118B
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M3.001

TERRACES AT HIGH MOUNTAIN - A3

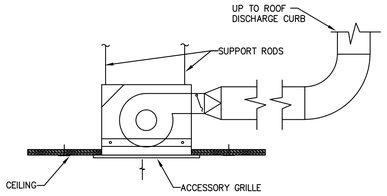
ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

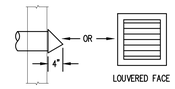
FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

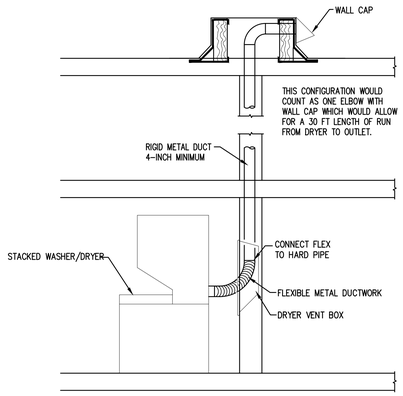
UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA											SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R	
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X				USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X	KRUEGER	S80



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

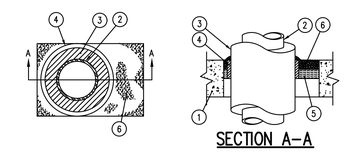


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



SECTION A-A

1. Floor or Wall Assembly – Min 4-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2-1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics* – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr. When max 2 in. diam insulated steel or copper pipe is used, T rating is 1 hr.**
See **Plastics*** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94-5VA may be used.

4. Fill, Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gouge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill, Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant.
(The W Rating applies only when FB-3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE

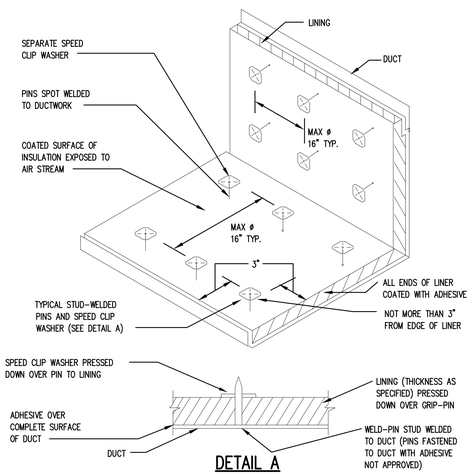
SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

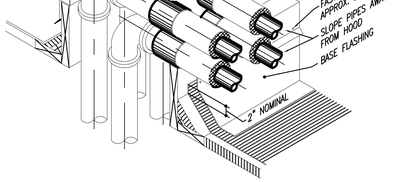
SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

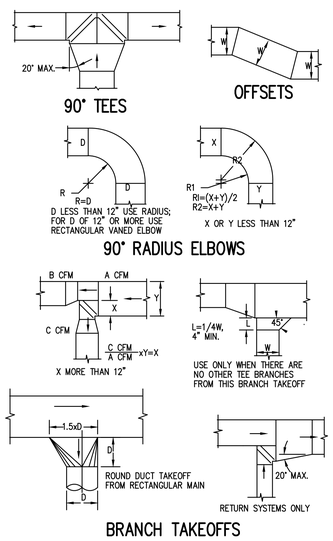
HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
3001	45	A	A	3101	60	A	A	3201	60	A	A	3301	45	A	A
3002	30	B	B	3102	30	B	B	3202	30	B	B	3302	45	B	B
3003	45	A	A	3103	30	A	A	3203	30	A	A	3303	45	A	A
3004	30	A	A	3104	45	A	A	3204	45	A	A	3304	45	A	A
3005	45	A	A	3105	45	A	A	3205	45	A	A	3305	45	A	A
3006	30	A	A	3106	30	A	A	3206	30	A	A	3306	45	A	A
3007	30	A	A	3107	30	A	A	3207	30	A	A				
				3108	45	A	A	3208	45	A	A				
				3109	45	A	A	3209	45	A	A				
				3110	30	A	A	3210	30	A	A				
				3111	30	A	A	3211	30	A	A				
				3112	60	A	A	3212	60	A	A				



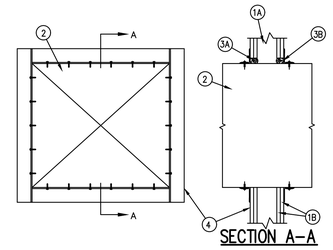
6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE



5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



SECTION A-A

1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill, Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE9516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-2021	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

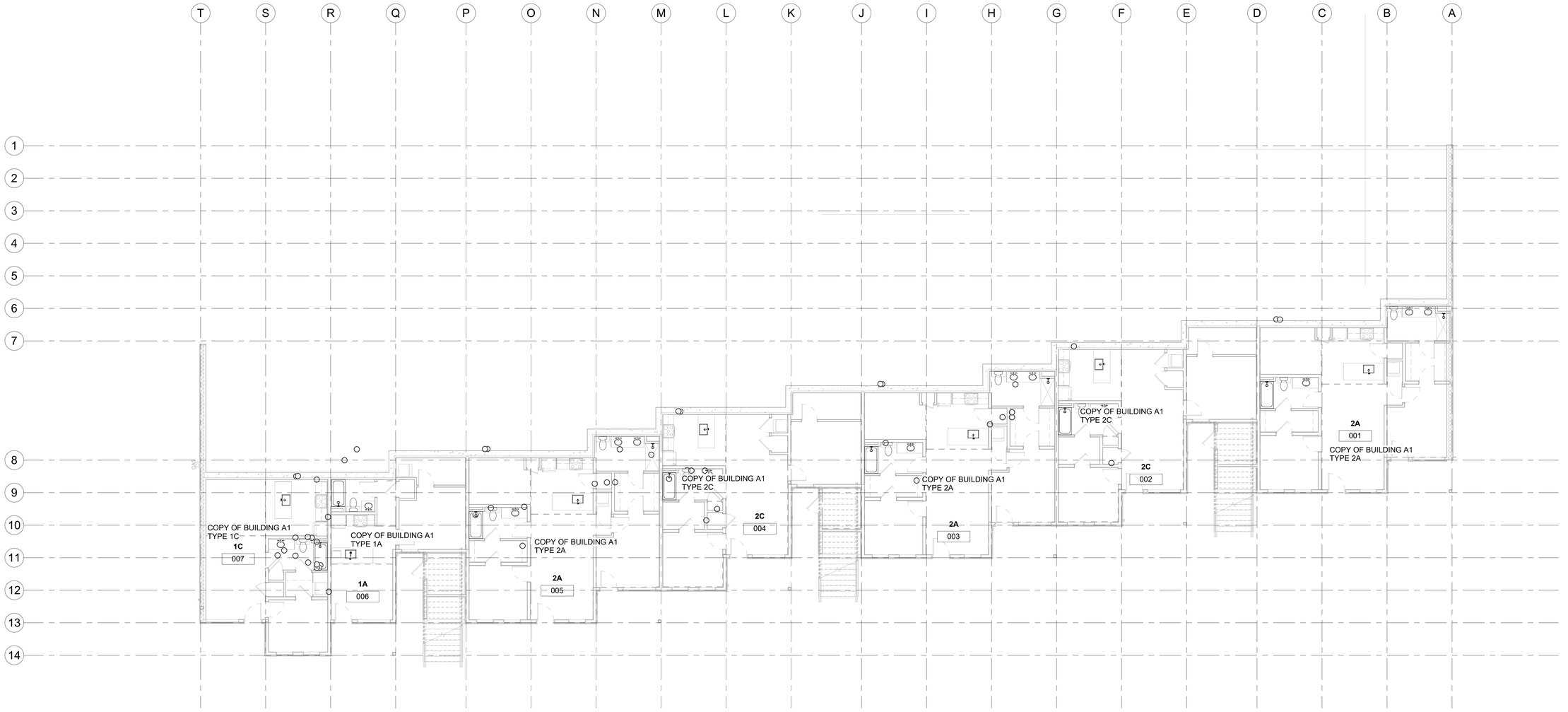
PROJECT #:	K118B
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:

M3.002

TERRACES AT HIGH MOUNTAIN - A3



1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30317 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:

M3.100

TERRACE AT HIGH MOUNTAIN - A3

1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

TERRACE AT HIGH MOUNTAIN - A3
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

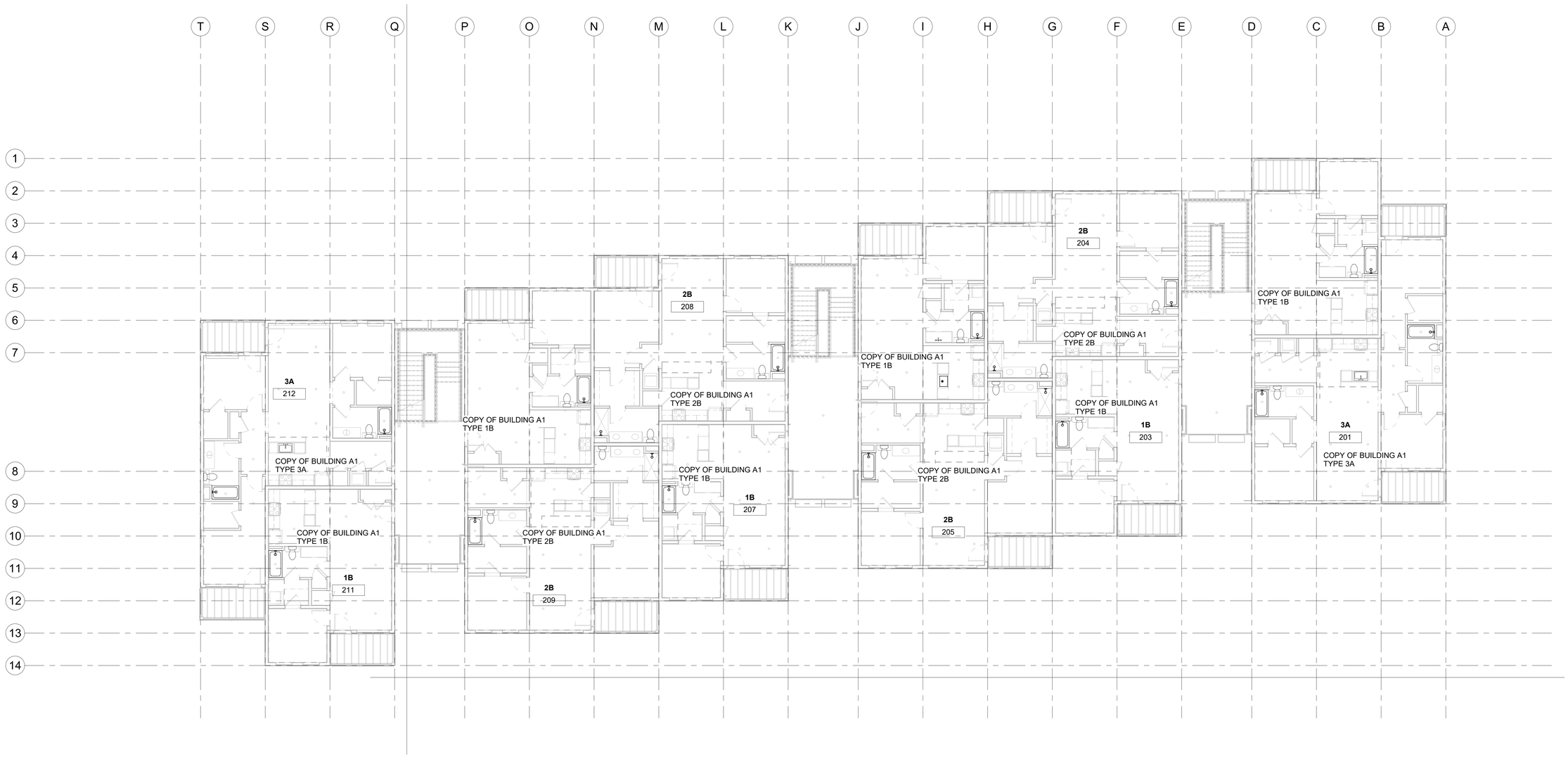
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:
M3.101

TERRACE AT HIGH MOUNTAIN - A3



1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE59317 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

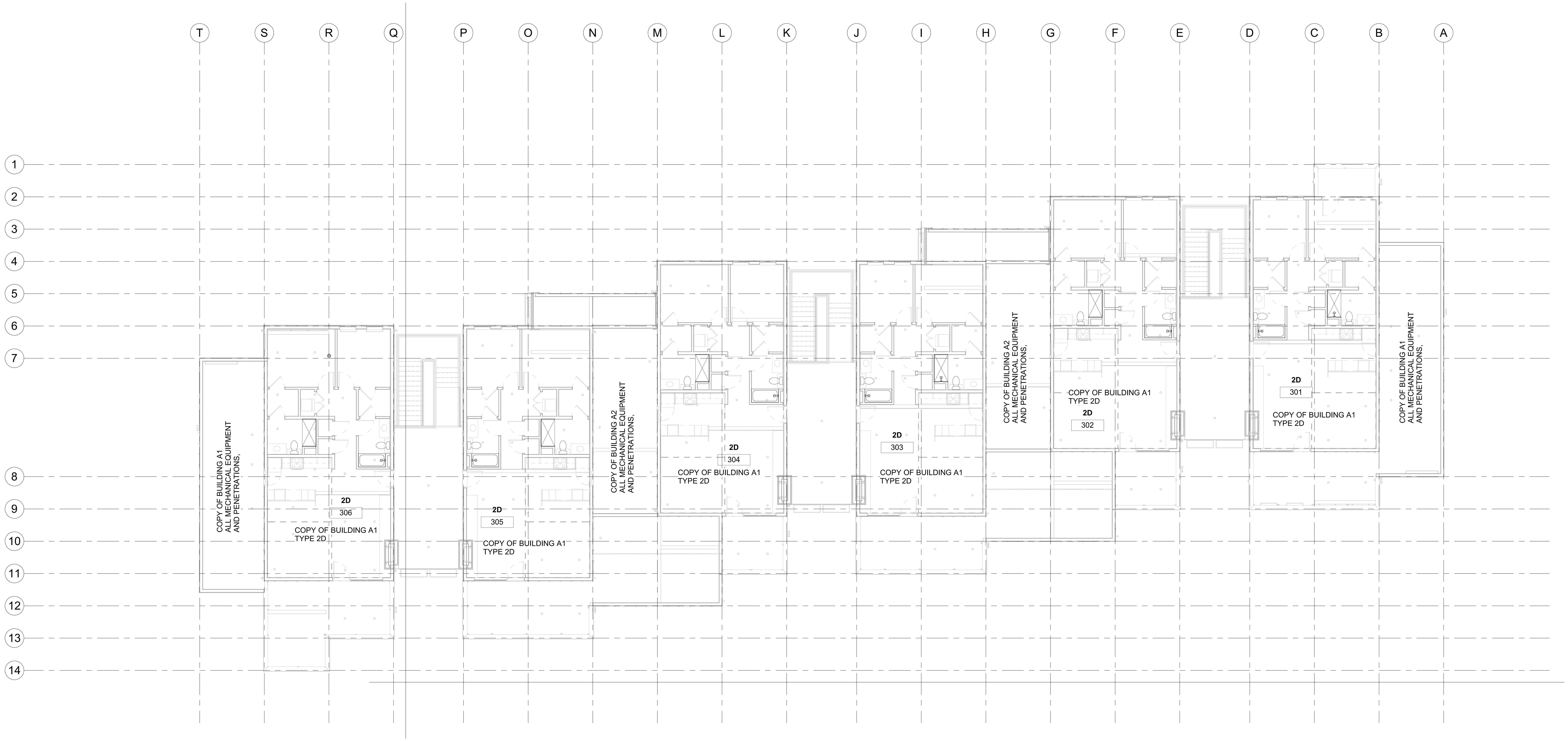
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:

M3.102

TERRACE AT HIGH MOUNTAIN - A3



1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE00116 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A3
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

SHEET:
M3.103

TERRACE AT HIGH MOUNTAIN - A3

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED. MECHANICAL EQUIPMENT LOCATED ON ROOFTOP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S INSTALLATION INSTRUCTIONS TO MAINTAIN CLEARANCES TO ACCESS FOR SERVICE AND MAINTENANCE.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON–SITE OR OFF–SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON–COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE–POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA–255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER–PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL– SKRIM–KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK		
	ABOVE CEILINGS	1–1/2" BLANKET TYPE
	GRILLE BOOTS	1–1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
	ALL	LINER WHERE NOTED, OTHERWISE:
	GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:		
	ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:		
	EXHAUST	NONE
PIPING:		
	INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
	OUTDOOR REF PIPING	1–1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R–410A. PROVIDE WITH 5–YEAR LIMITED PARTS WARRANTY AND 5–YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE–PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON–PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1–1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1–HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2–BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2–12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI–BLADE DAMPERS PER SMACNA FIGURE 2–13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON–OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED (REFER TO PARAGRAPH 2), RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G–90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DUCT BOARD IS ACCEPTABLE WITH WRITTEN APPROVAL BY OWNER DUCT BOARD, IF ALLOWED, SHALL HAVE A MINIMUM R–VALUE OF 6 AND BE COMPOSED OF RESIN BONDED GLASS FIBERS. DUCT BOARD SHALL HAVE AN FSK VAPOR JACKET AND COMPLY WITH ASTM C1290.
3. DRYER VENT SHALL BE 26 GA. MINIMUM.
4. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G–90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: ≤15" DIA. = 24 GAUGE, 15"–26" DIA. = 22 GAUGE.
5. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY–IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
6. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
7. FABRICATE AND SUPPORT METAL DUCT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
8. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
9. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
10. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
11. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
SUPPLY	NOTE 1	2"	A
RETURN–RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

NOTES:

1. REFER TO PARAGRAPH 2 WHERE DUCT BOARD IS ALLOWED.

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45–60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R–2
USE GROUP: VB
OCCUPANCY: 138

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START–UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON–COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

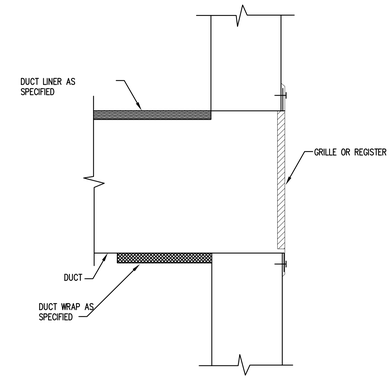
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4–WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R–X 100 CFM	SIDEWAYS RETURN
24x12, S–X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S–1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD__	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU–1	EQUIPMENT NUMBER
	1–HOUR RATED WALL
	2–HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

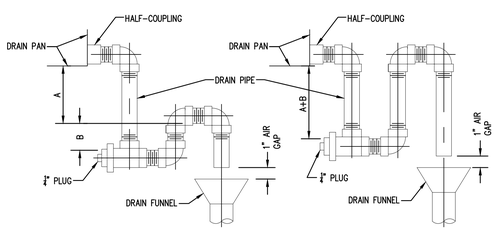
MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

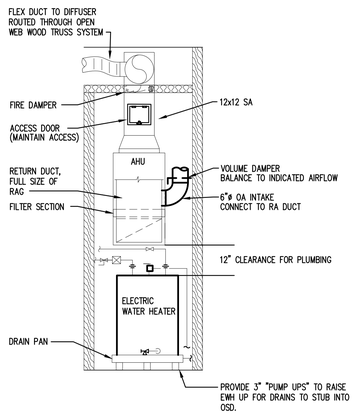


5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE

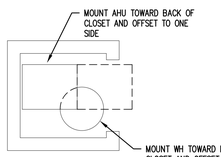


NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

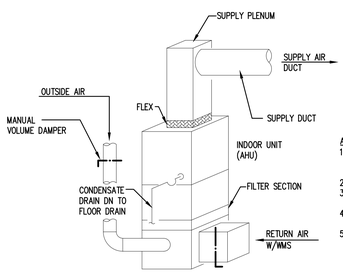
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

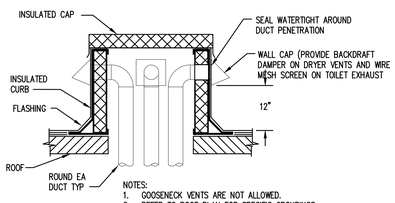


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE



AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39316 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M4.001

TERRACES AT HIGH MOUNTAIN - A4

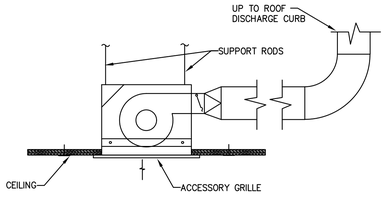
ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

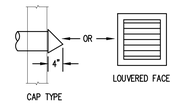
FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA											SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R	
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X				USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X	KRUEGER	S80



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

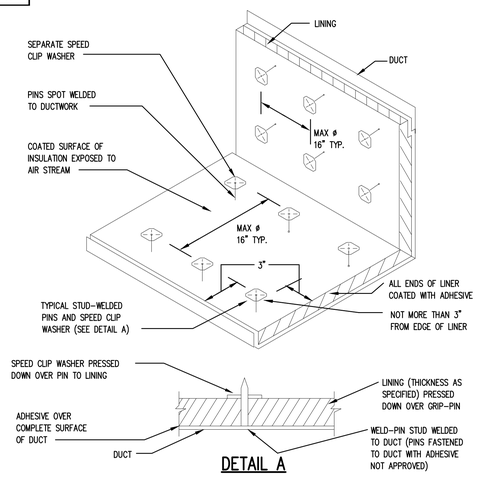
UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
4001	45	A	A
4002	30	B	B
4003	45	A	A
4004	30	A	A
4005	45	A	A
4006	30	A	A
4007	30	A	A

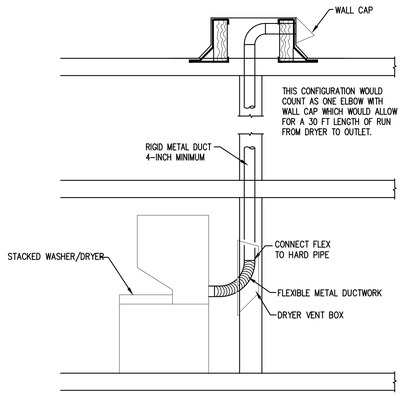
HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
4101	60	A	A
4102	30	B	B
4103	30	A	A
4104	45	A	A
4105	45	A	A
4106	30	A	A
4107	30	A	A
4108	45	A	A
4109	45	A	A
4110	30	A	A
4111	30	A	A
4112	60	A	A

HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
4201	60	A	A
4202	30	B	B
4203	30	A	A
4204	45	A	A
4205	45	A	A
4206	30	A	A
4207	30	A	A
4208	45	A	A
4209	45	A	A
4210	30	A	A
4211	30	A	A
4212	60	A	A

HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
4301	45	A	A
4302	45	B	B
4303	45	A	A
4304	45	A	A
4305	45	A	A
4306	45	A	A



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE

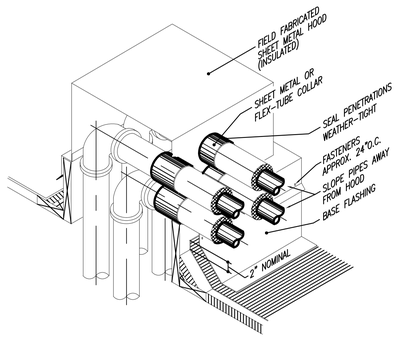


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

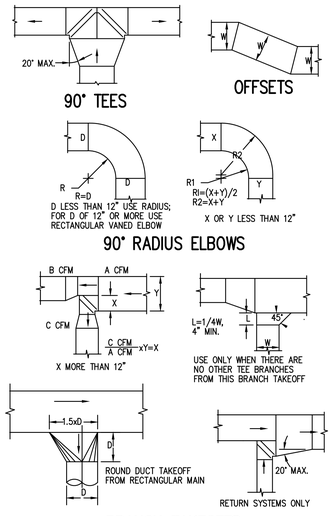
NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

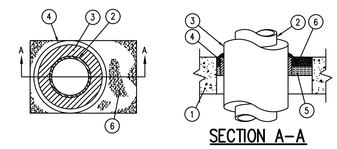
3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



1. Floor orWall Assembly – Min 4-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2-1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics# – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr.When max 2 in. diam insulated steel or copper pipe is used,T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94-5VA may be used.

4. Fill,Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

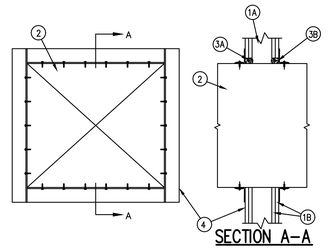
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill,Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant.
(The W Rating applies only when FB-3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

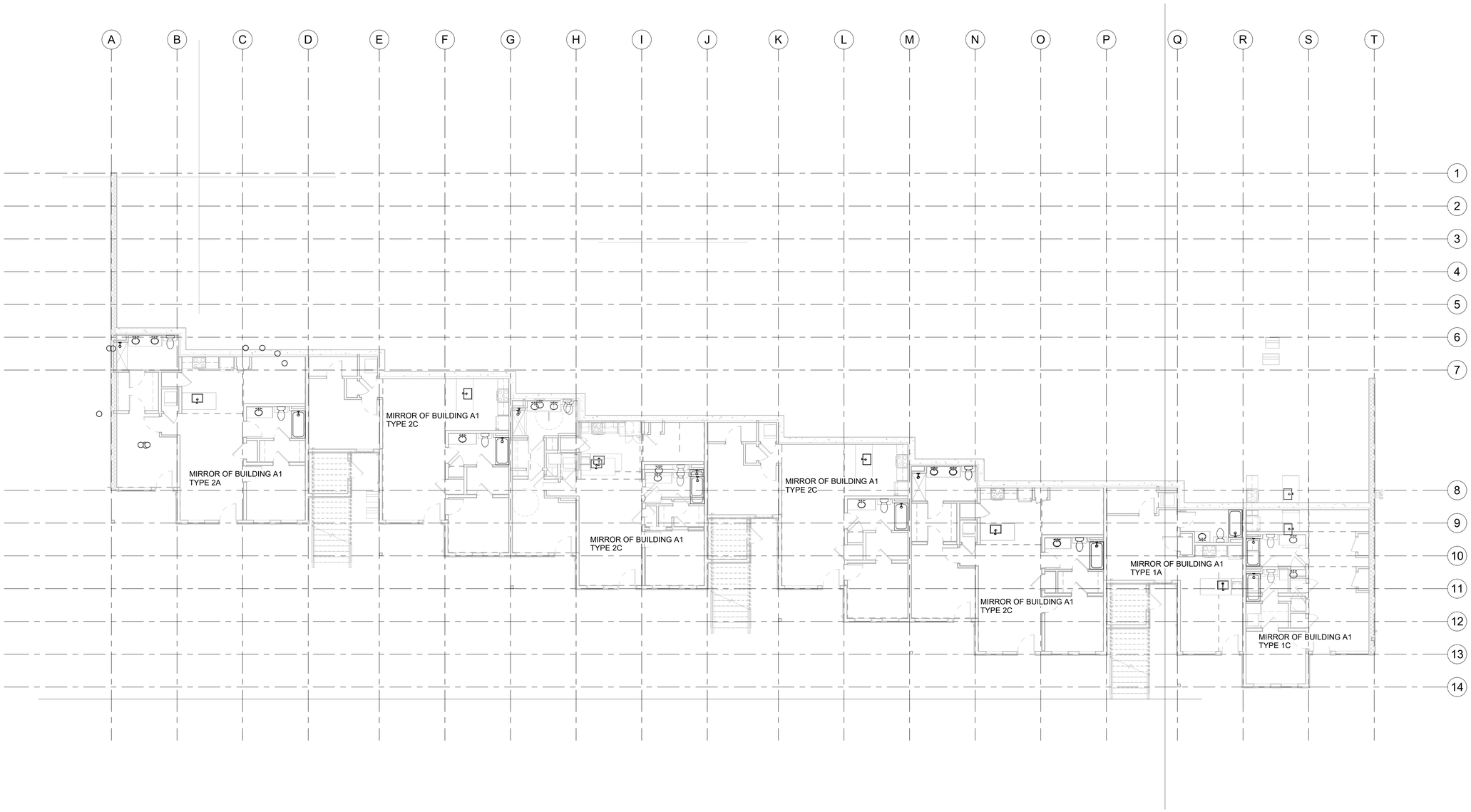
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:
M4.002

TERRACES AT HIGH MOUNTAIN - A4



1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED
NO. PE30574 PROFESSIONAL
ENGINEER
PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:

M4.100

TERRACE AT HIGH MOUNTAIN - A4

1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

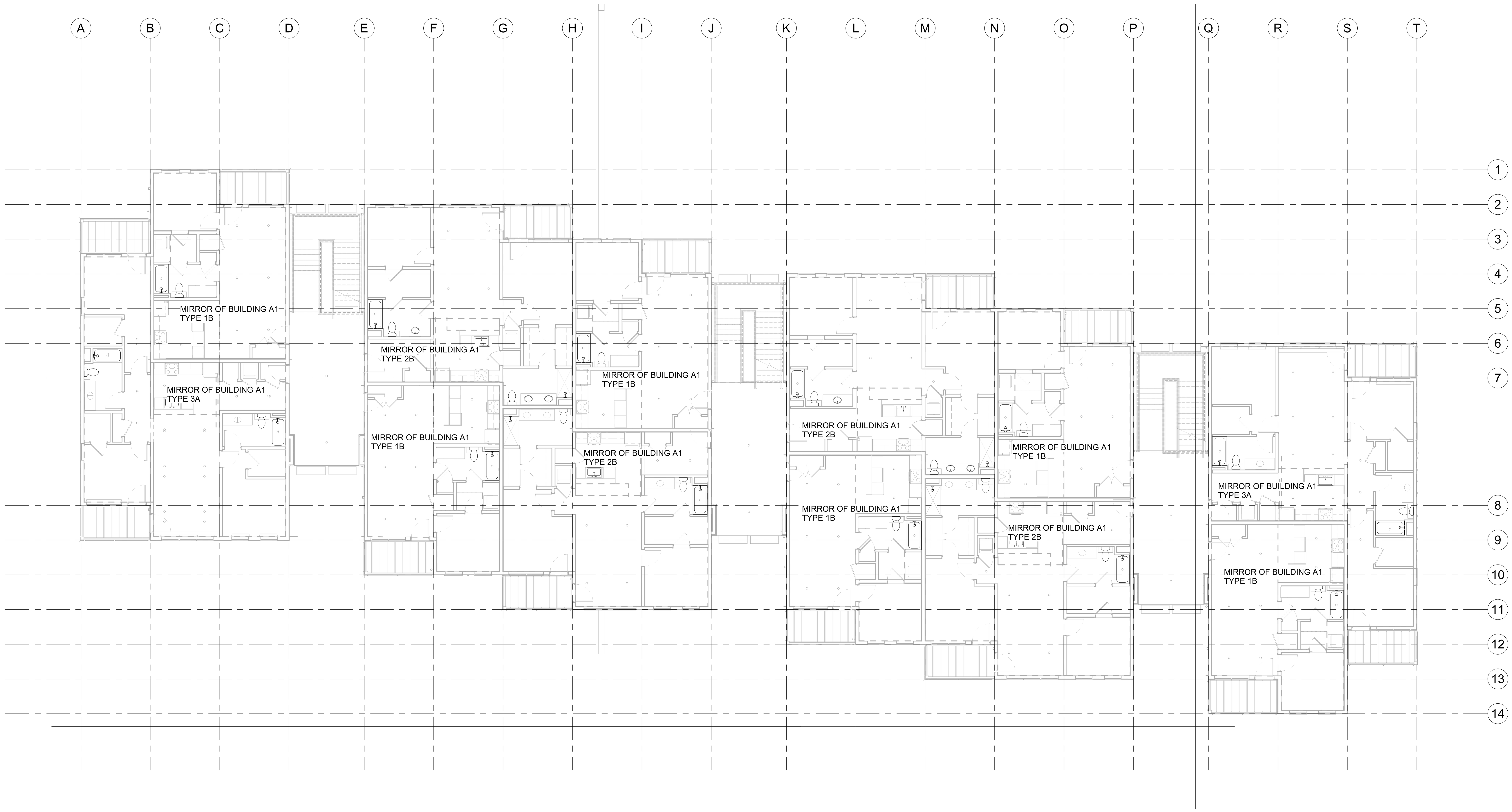
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:

M4.101

TERRACE AT HIGH MOUNTAIN - A4



1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

TERRACE AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

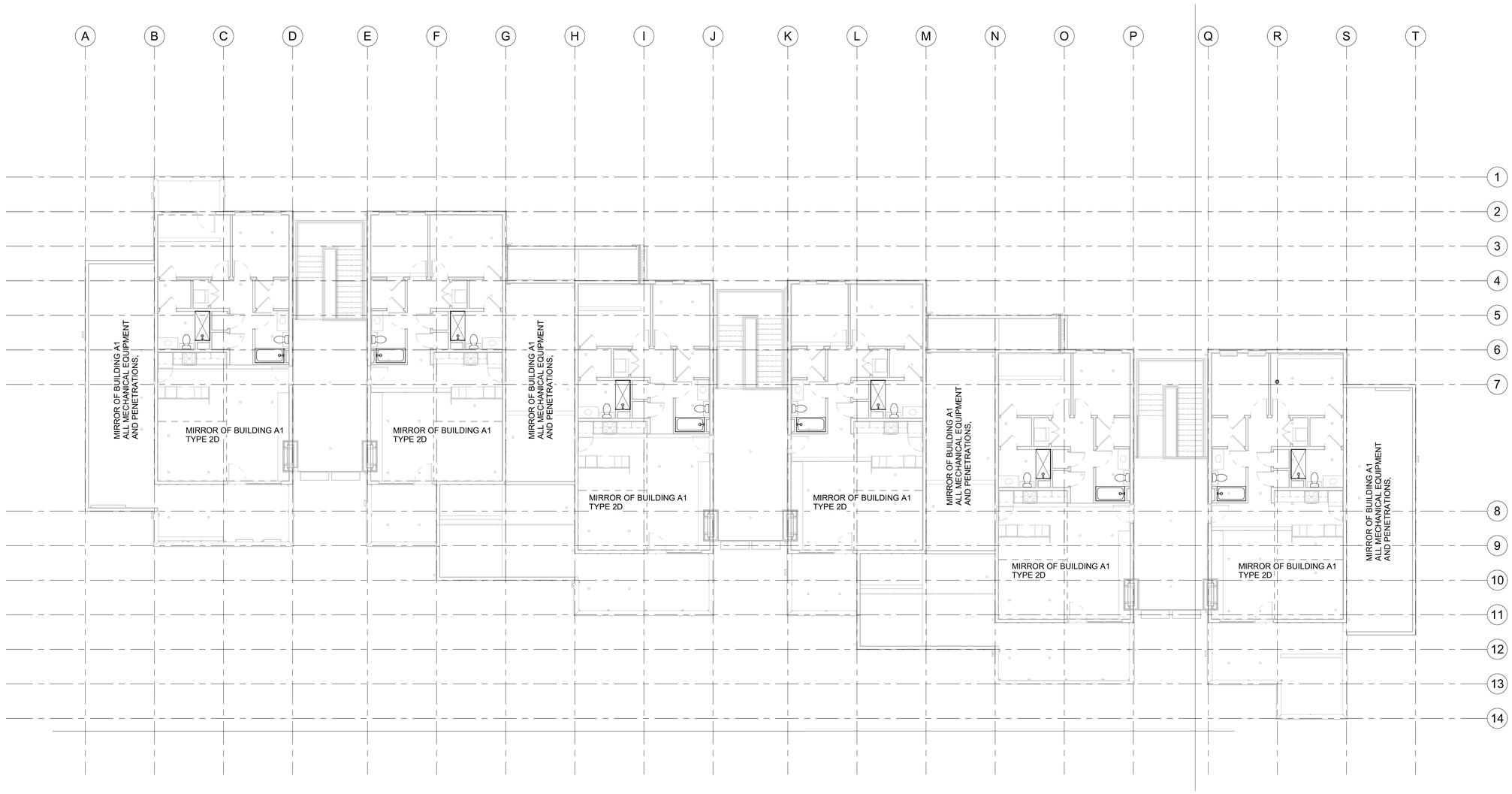
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:

M1.102

TERRACE AT HIGH MOUNTAIN - A4



1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

SHEET:

M1.103

TERRACE AT HIGH MOUNTAIN - A4

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED. MECHANICAL EQUIPMENT LOCATED ON ROOFTOP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S INSTALLATION INSTRUCTIONS TO MAINTAIN CLEARANCES TO ACCESS FOR SERVICE AND MAINTENANCE.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON–SITE OR OFF–SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON–COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE–POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA–255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER–PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL– SKRIM–KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75ºF MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK:		
	ABOVE CEILINGS	1–1/2" BLANKET TYPE
	GRILLE BOOTS	1–1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
	ALL	LINER WHERE NOTED, OTHERWISE:
	GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:		
	ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:		
	EXHAUST	NONE
PIPING:		
	INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
	OUTDOOR REF PIPING	1–1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R–410A. PROVIDE WITH 5–YEAR LIMITED PARTS WARRANTY AND 5–YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE–PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON–PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1–1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1–HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2–BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212ºF FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2–12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI–BLADE DAMPERS PER SMACNA FIGURE 2–13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON–OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED (REFER TO PARAGRAPH 2), RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G–90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DUCT BOARD IS ACCEPTABLE WITH WRITTEN APPROVAL BY OWNER DUCT BOARD, IF ALLOWED, SHALL HAVE A MINIMUM R–VALUE OF 6 AND BE COMPOSED OF RESIN BONDED GLASS FIBERS. DUCT BOARD SHALL HAVE AN FSK VAPOR JACKET AND COMPLY WITH ASTM C1290.
3. DRYER VENT SHALL BE 26 GA. MINIMUM.
4. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G–90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: <15" DIA. = 24 GAUGE, 15"–26" DIA. = 22 GAUGE.
5. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY–IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
6. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
7. FABRICATE AND SUPPORT METAL DUCT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
8. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
9. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
10. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
11. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
SUPPLY	NOTE 1	2"	A
RETURN–RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

NOTES:

1. REFER TO PARAGRAPH 2 WHERE DUCT BOARD IS ALLOWED.

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95ºF DB, 75ºF WB
	WINTER:	17ºF DB
INDOOR TEMPERATURE	SUMMER:	75ºF DB, 45–60% R.H.
	WINTER:	70ºF DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R–2
USE GROUP: VB
OCCUPANCY: 138

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START–UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON–COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

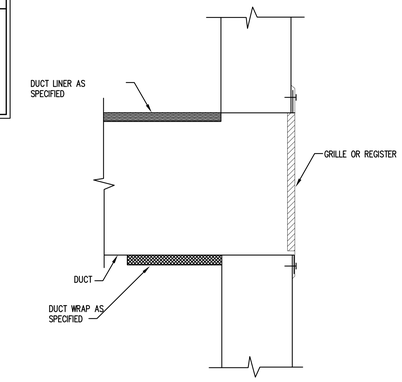
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4–WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
24" 24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R–X 100 CFM	SIDEWAYS RETURN
24x12, S–X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S–1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD__	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU–1	EQUIPMENT NUMBER
	1–HOUR RATED WALL
	2–HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

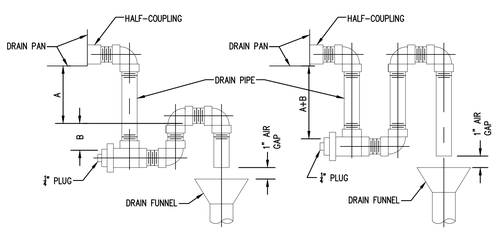
MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST



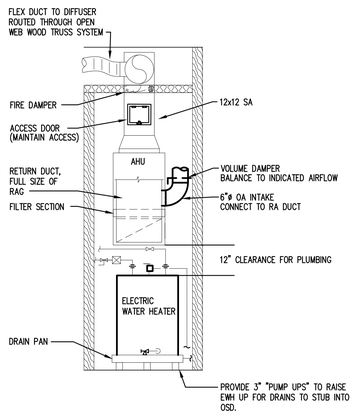
5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE



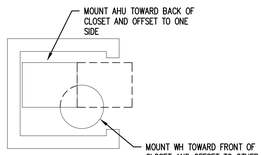
DRAIN PAN ON FAN INLET (NEGATIVE PRESSURE)
DRAIN PAN ON FAN OUTLET (POSITIVE PRESSURE)

NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT.
   "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

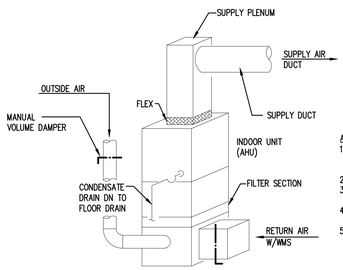
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

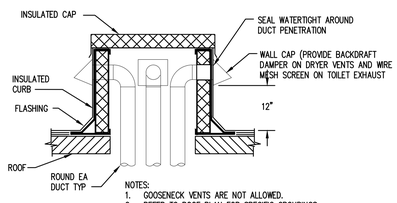


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE



AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39316 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A5
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M5.001

TERRACES AT HIGH MOUNTAIN - A5

ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA											SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R	
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X				USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X	KRUEGER	S80

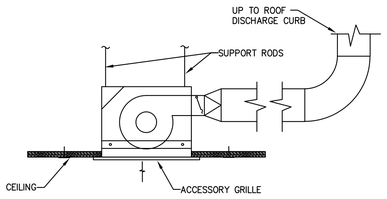
SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

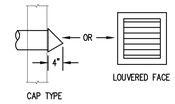
SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

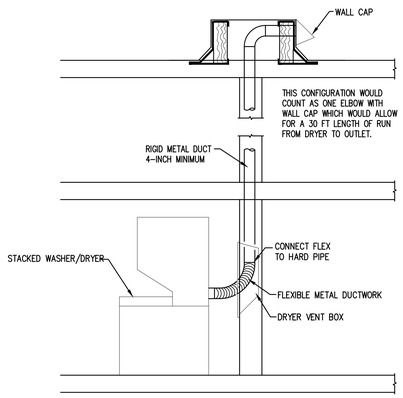
HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
5001	45	A	A	5101	60	A	A	5201	60	A	A	5301	45	A	A
5002	30	B	B	5102	30	B	B	5202	30	B	B	5302	45	B	B
5003	45	A	A	5103	30	A	A	5203	30	A	A	5303	45	A	A
5004	30	A	A	5104	45	A	A	5204	45	A	A	5304	45	A	A
5005	45	A	A	5105	45	A	A	5205	45	A	A				
				5106	30	A	A	5206	30	A	A				
				5107	30	A	A	5207	30	A	A				
				5108	45	A	A	5208	45	A	A				



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

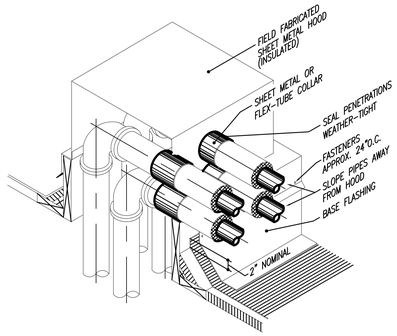


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

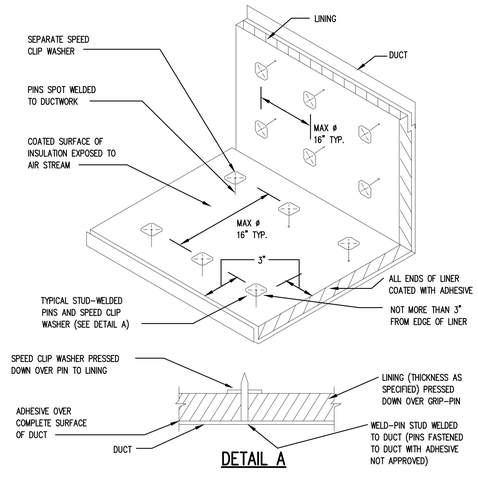
NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

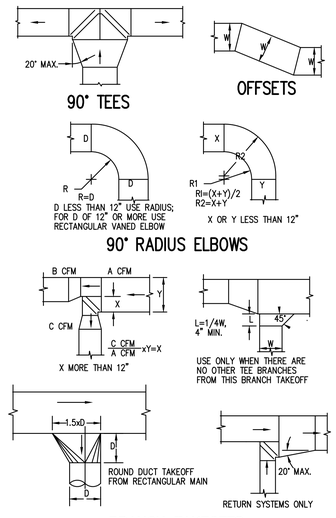
3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



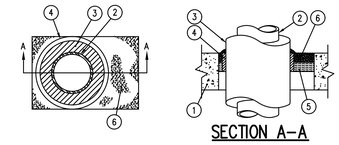
5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



1. Floor orWall Assembly – Min 4–1/2 in. thick lightweight or normal weight (100–150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2–1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics# – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr.When max 2 in. diam insulated steel or copper pipe is used,T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94–5VA may be used.

4. Fill,Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

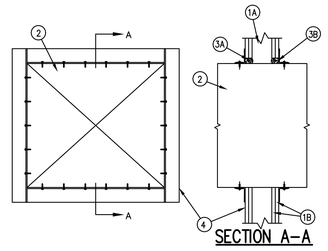
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill,Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant.
(The W Rating applies only when FB–3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3–1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3–1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction–fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A5
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

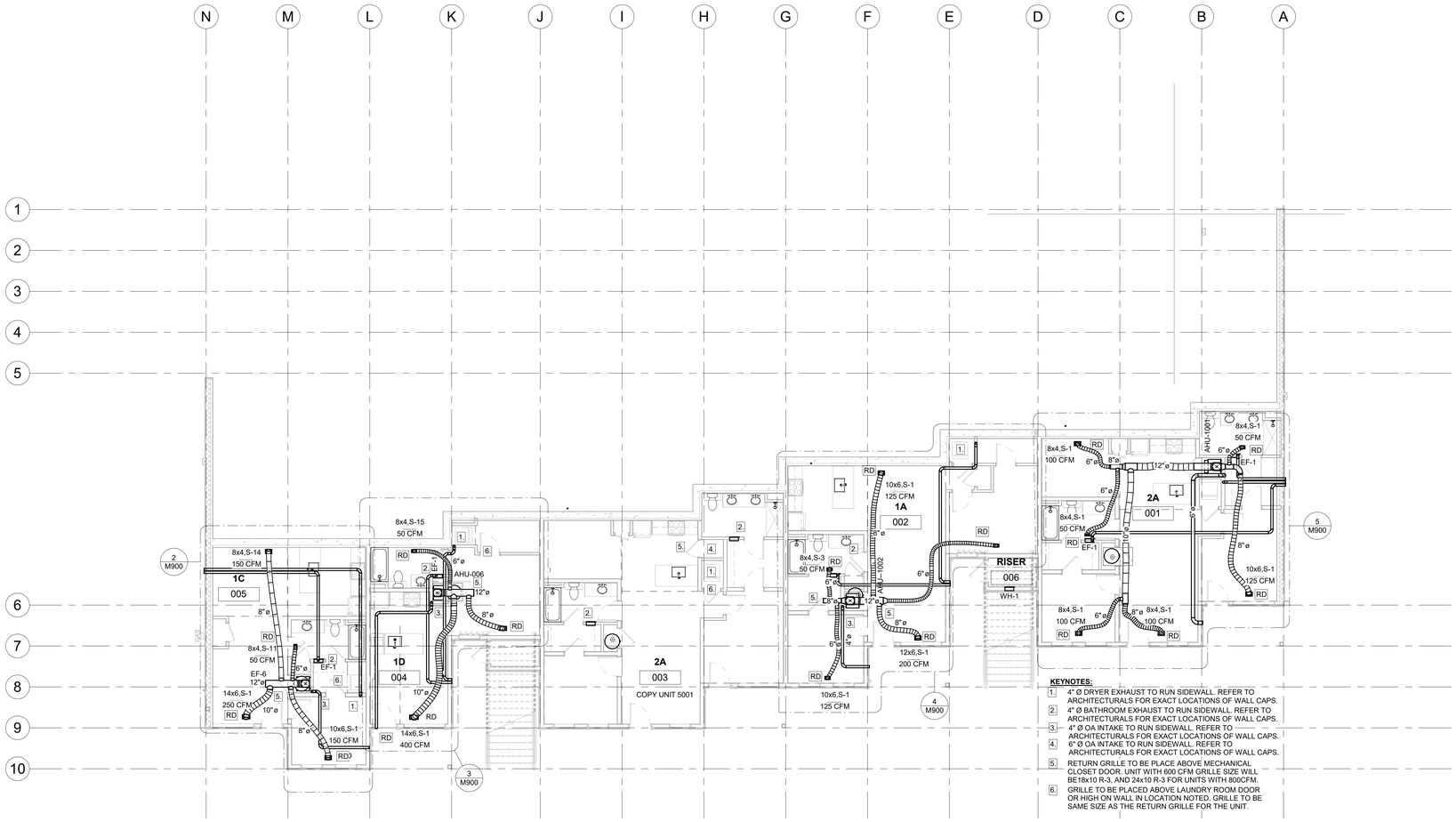
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:
M5.002

TERRACES AT HIGH MOUNTAIN - A5



KEYNOTES:

1. 4" Ø DRYER EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
5. RETURN GRILLE TO BE PLACE ABOVE MECHANICAL CLOSET DOOR. UNIT WITH 600 CFM GRILLE SIZE WILL BE18x10 R-3, AND 24x10 R-3 FOR UNITS WITH 800CFM.
6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
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4		XX
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

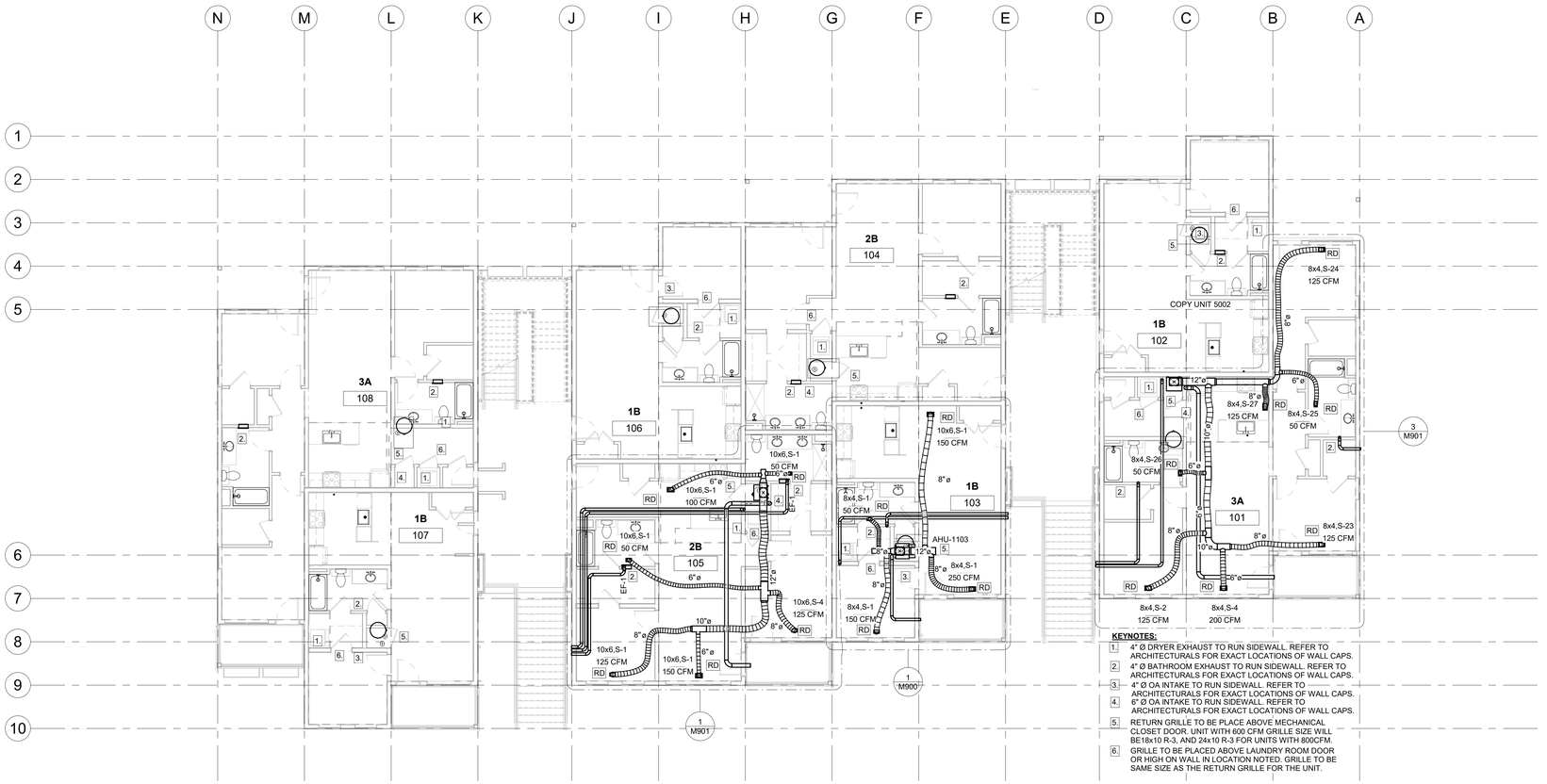
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:

M5.100

TERRACES AT HIGH MOUNTAIN - A5



KEYNOTES:

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2. 4" Ø BATHROOM EXHAUST TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
3. 4" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
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6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

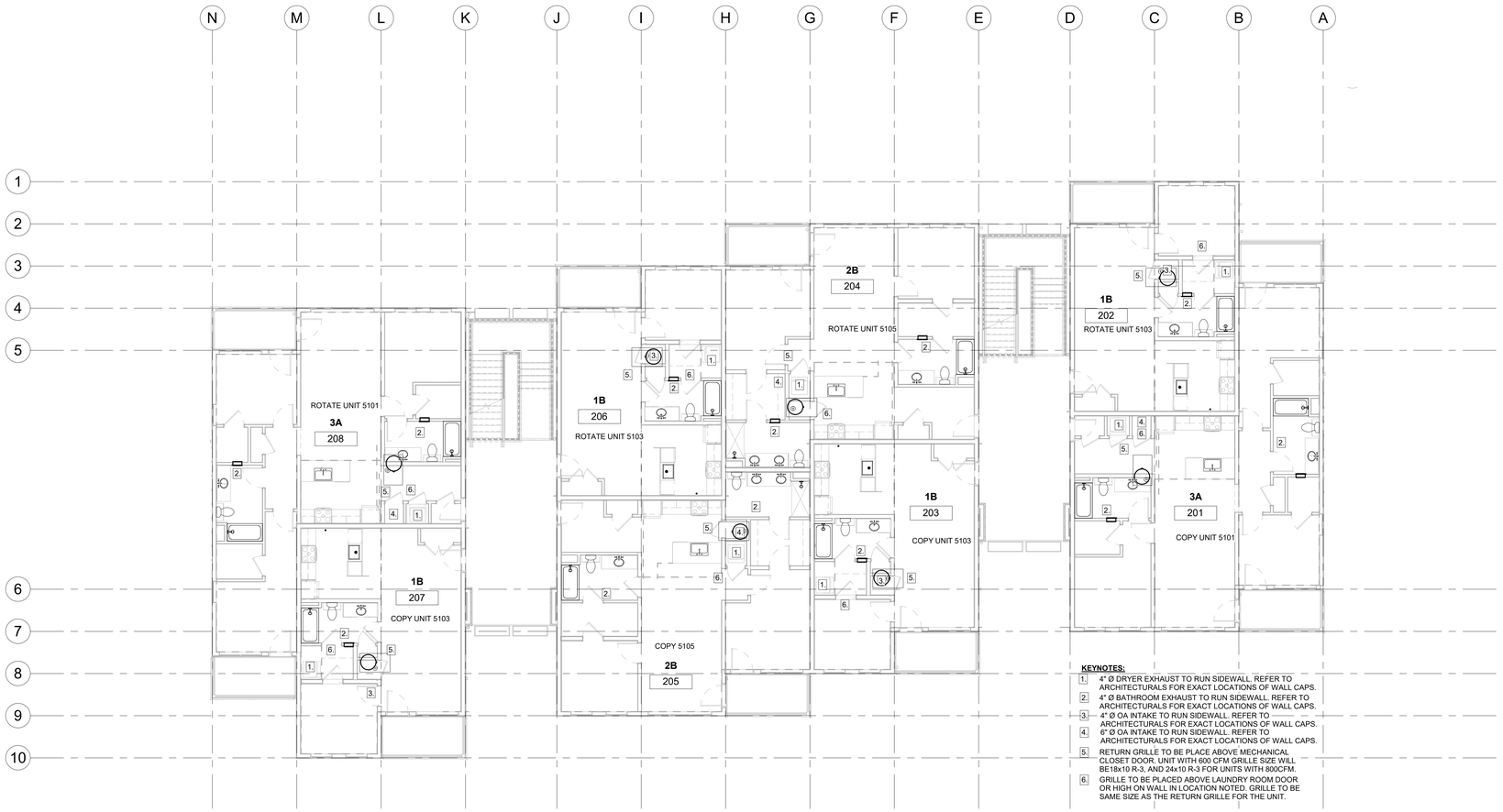
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:

M5.101

TERRACES AT HIGH MOUNTAIN - A5



KEYNOTES:

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6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

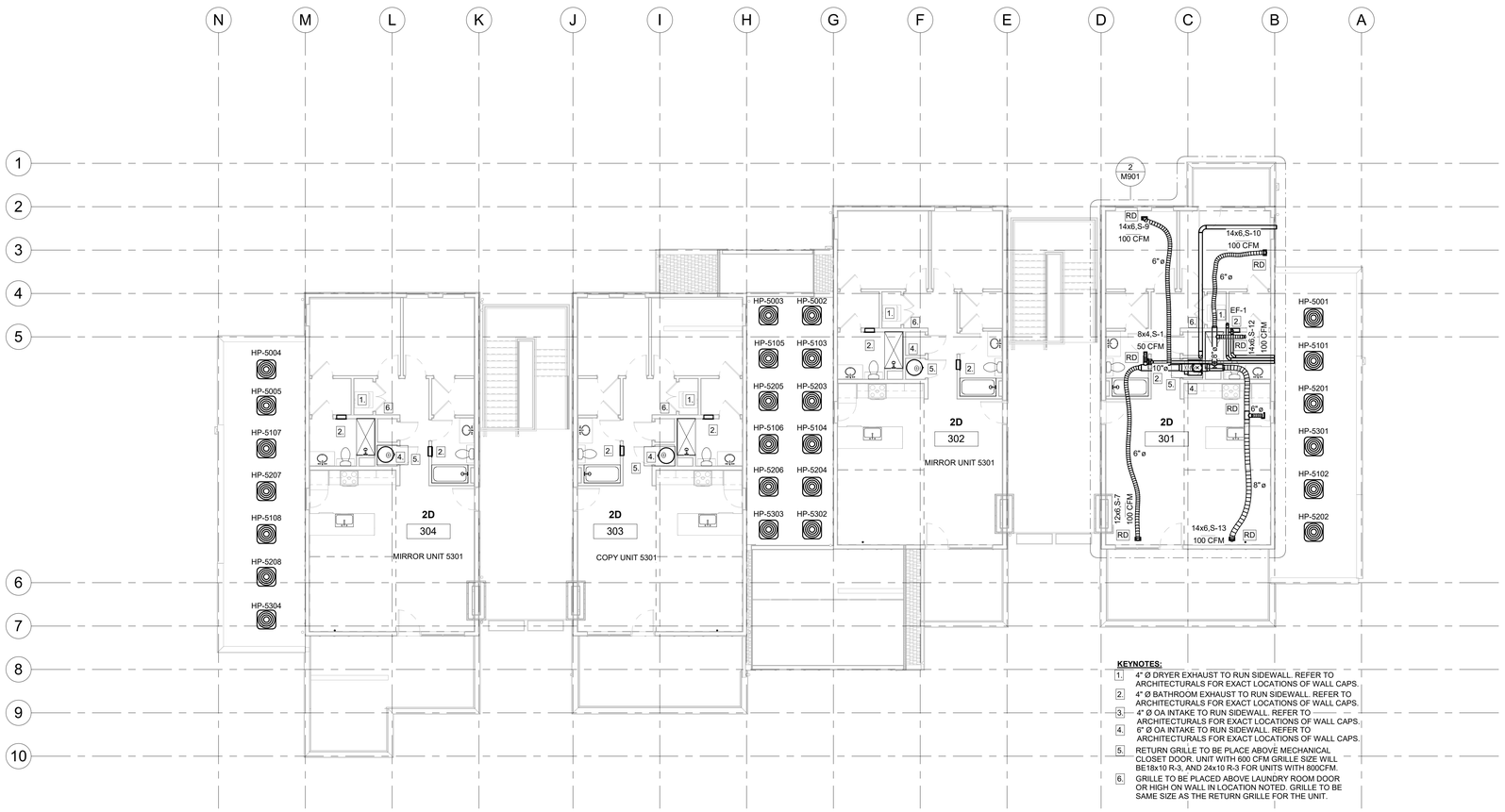
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:

M5.102

TERRACES AT HIGH MOUNTAIN - A5



KEYNOTES:

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4. 6" Ø OA INTAKE TO RUN SIDEWALL. REFER TO ARCHITECTURALS FOR EXACT LOCATIONS OF WALL CAPS.
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6. GRILLE TO BE PLACED ABOVE LAUNDRY ROOM DOOR OR HIGH ON WALL IN LOCATION NOTED. GRILLE TO BE SAME SIZE AS THE RETURN GRILLE FOR THE UNIT.

1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
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4		XX
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6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

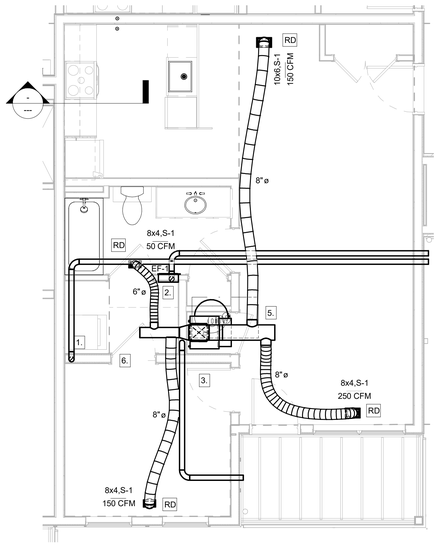
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

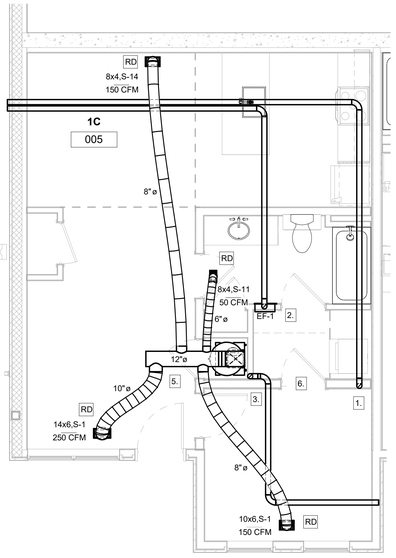
SHEET:

M5.103

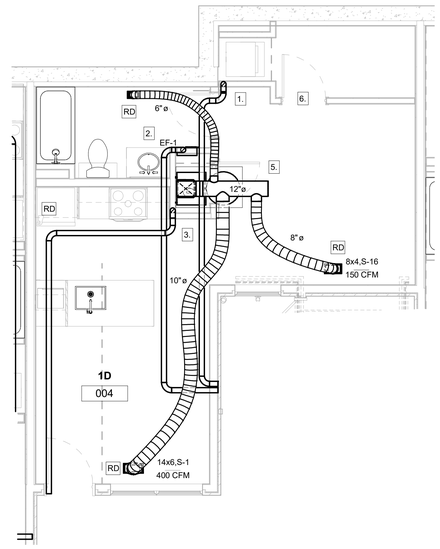
TERRACES AT HIGH MOUNTAIN - A5



1 MECHANICAL TYPICAL UNIT TYPE 1B
1/4" = 1'-0"



2 MECHANICAL TYPICAL UNIT TYPE 1C
1/4" = 1'-0"



3 MECHANICAL TYPICAL UNIT TYPE 1D
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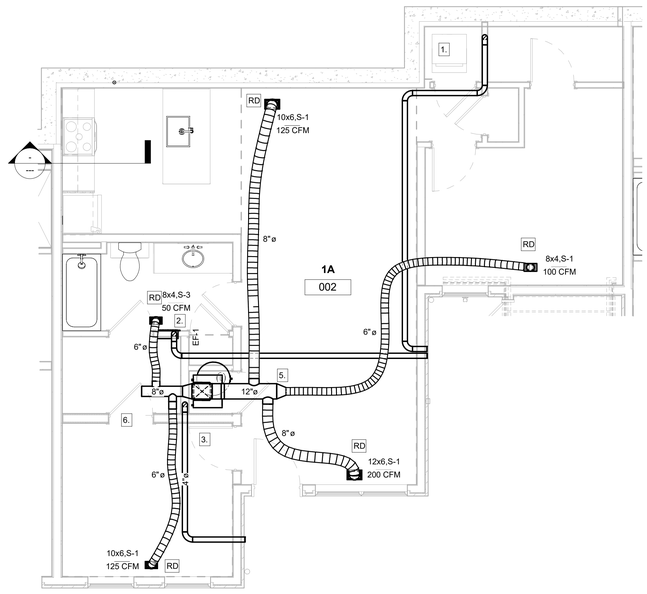
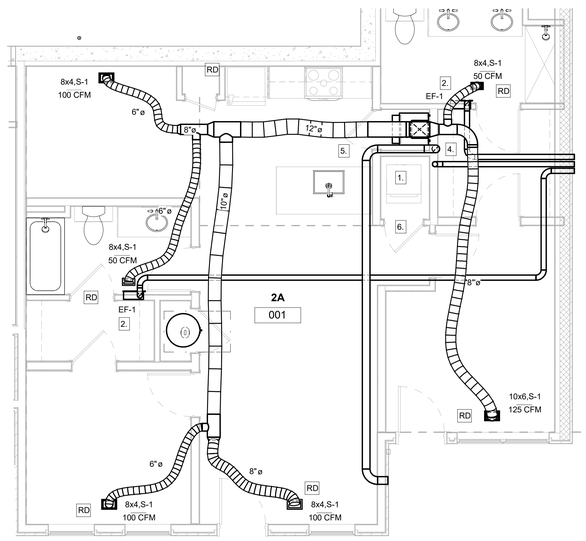


4 MECHANICAL TYPICAL UNIT TYPE 2
1/4" = 1'-0"



5 MECHANICAL TYPICAL UNIT TYPE 2A
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

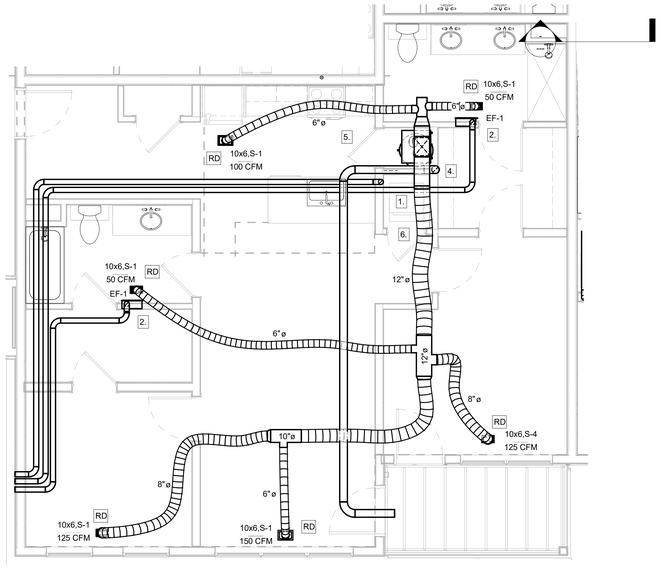
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
ENLARGED PLANS

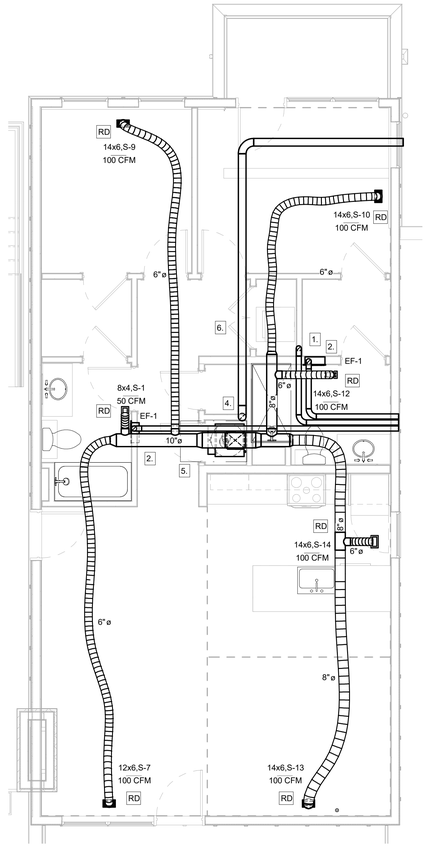
SHEET:

M5.900

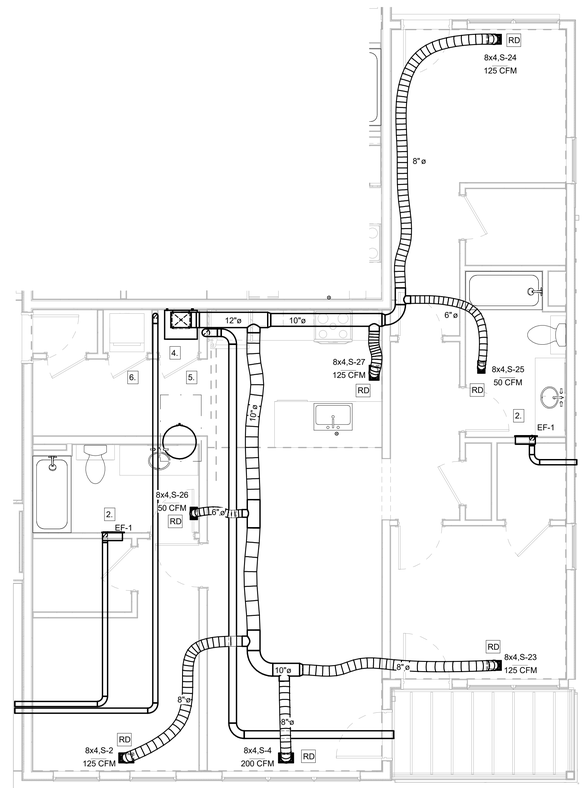
TERRACES AT HIGH MOUNTAIN - A5



1 MECHANICAL TYPICAL UNIT TYPE 2B
1/4" = 1'-0"



2 MECHANICAL TYPICAL UNIT TYPE 2D
1/4" = 1'-0"



3 MECHANICAL TYPICAL UNIT TYPE 3A
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A5

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
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ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

SHEET:
M5.901

TERRACES AT HIGH MOUNTAIN - A5

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED. MECHANICAL EQUIPMENT LOCATED ON ROOFTOP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S INSTALLATION INSTRUCTIONS TO MAINTAIN CLEARANCES TO ACCESS FOR SERVICE AND MAINTENANCE.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON–SITE OR OFF–SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON–COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE–POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA–255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER–PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL– SKRIM–KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK:		
	ABOVE CEILINGS	1–1/2" BLANKET TYPE
	GRILLE BOOTS	1–1/2" BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
	ALL	LINER WHERE NOTED, OTHERWISE:
	GRILLE BOOTS	1" LINER
OUTSIDE AIR DUCTWORK:		
	ALL	2" 1LB DENSITY BLANKET
EXHAUST DUCTWORK:		
	EXHAUST	NONE
PIPING:		
	INDOOR REF PIPING	1" CLOSED CELL ELASTOMERIC
	OUTDOOR REF PIPING	1–1/2" CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R–410A. PROVIDE WITH 5–YEAR LIMITED PARTS WARRANTY AND 5–YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE–PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON–PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1–1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1–HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2–BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2–12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI–BLADE DAMPERS PER SMACNA FIGURE 2–13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON–OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED (REFER TO PARAGRAPH 2), RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G–90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DUCT BOARD IS ACCEPTABLE WITH WRITTEN APPROVAL BY OWNER DUCT BOARD, IF ALLOWED, SHALL HAVE A MINIMUM R–VALUE OF 6 AND BE COMPOSED OF RESIN BONDED GLASS FIBERS. DUCT BOARD SHALL HAVE AN FSK VAPOR JACKET AND COMPLY WITH ASTM C1290.
3. DRYER VENT SHALL BE 26 GA. MINIMUM.
4. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G–90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: <15" DIA. = 24 GAUGE, 15"–26" DIA. = 22 GAUGE.
5. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY–IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
6. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
7. FABRICATE AND SUPPORT METAL DUCT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
8. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
9. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
10. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
11. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
SUPPLY	NOTE 1	2"	A
RETURN–RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

NOTES:

1. REFER TO PARAGRAPH 2 WHERE DUCT BOARD IS ALLOWED.

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45–60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: R–2
USE GROUP: VB
OCCUPANCY: 138

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START–UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON–COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

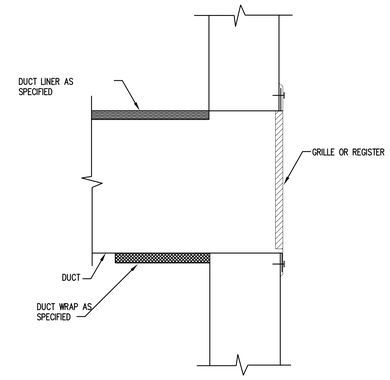
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4–WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
24" 24"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R–X 100 CFM	SIDEWAYS RETURN
24x12, S–X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S–1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD__	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU–1	EQUIPMENT NUMBER
	1–HOUR RATED WALL
	2–HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

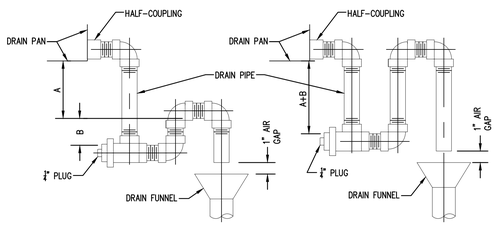
MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANLDING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

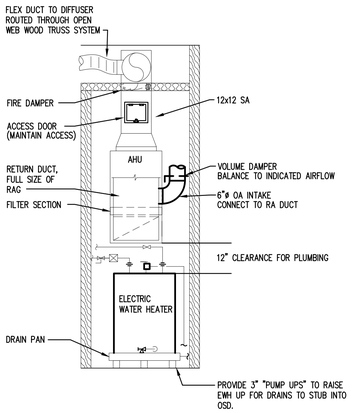


5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE

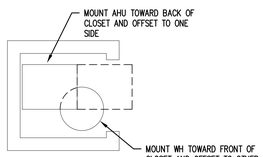


NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

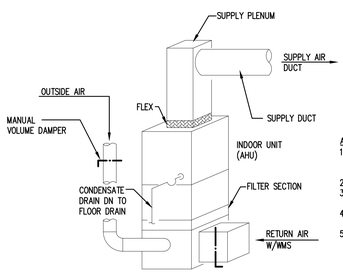
1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

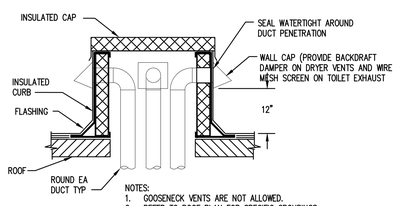


2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE



AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE39318 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M6.001

TERRACES AT HIGH MOUNTAIN - A6

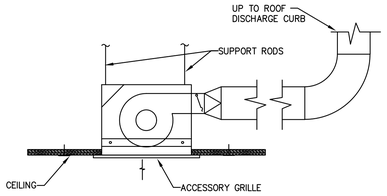
ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

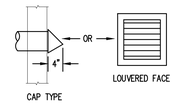
FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA											SELECTION BASED ON	
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R	
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X				USAIRE	102M
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80
E-1	X					X				X	RECT	STEEL	TBD									X	KRUEGER	S80



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

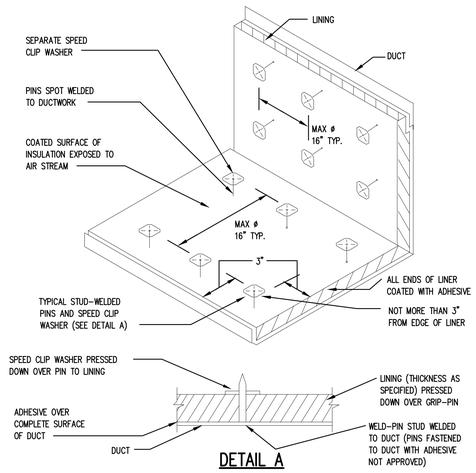
SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-A	AHU-A	18.0	95	45	14.0	R-410A	1	1/12	1100	-	1	1	48	9	11.8	20	208	1	CARRIER	CH14NB18-A	CARRIER	FMA4P1800AL	
HP-B	AHU-B	24.0	95	45	14.0	R-410A	1	1/10	1100	-	1	1	62.9	10.9	14.2	25	208	1	CARRIER	CH14NB24-A	CARRIER	FMA4P2400AL	

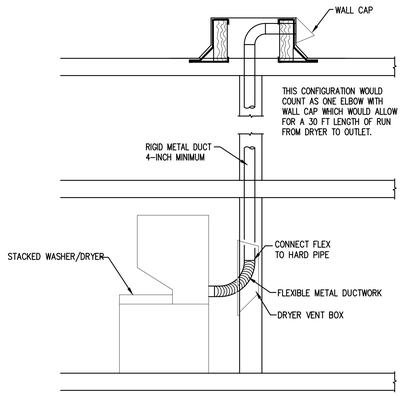
SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-A	APARTMENT TYPE A	600	0.5	SEE UNIT SCHED	1/6	1075	18.0	13.2	80	67	14.0	12.3	70	17	5	240	1	1	208	1	23.6	25	CARRIER	FMA4P1800AL	
AHU-B	APARTMENT TYPE B	800	0.5	SEE UNIT SCHED	1/4	1075	24	18.01	80	67	14	12.3	70	17	5	240	1	1	208	1	23.9	30	CARRIER	FMA4P2400AL	

HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE				HVAC APT UNIT SCHEDULE			
UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE	UNIT NUMBER	OA TYPE	AHU TYPE	HP TYPE
6001	45	A	A	6101	60	A	A	6201	60	A	A	6301	45	A	A
6002	30	B	B	6102	30	B	B	6202	30	B	B	6302	45	B	B
6003	45	A	A	6103	30	A	A	6203	30	A	A	6303	45	A	A
6004	30	A	A	6104	45	A	A	6204	45	A	A	6304	45	A	A
6005	45	A	A	6105	45	A	A	6205	45	A	A				
				6106	30	A	A	6206	30	A	A				
				6107	30	A	A	6207	30	A	A				
				6108	45	A	A	6208	45	A	A				



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE

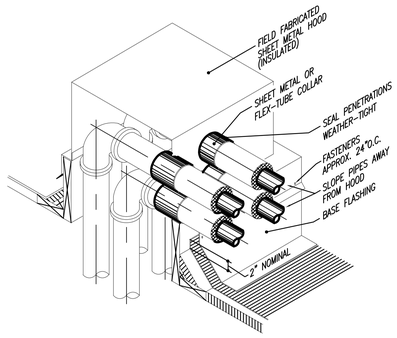


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

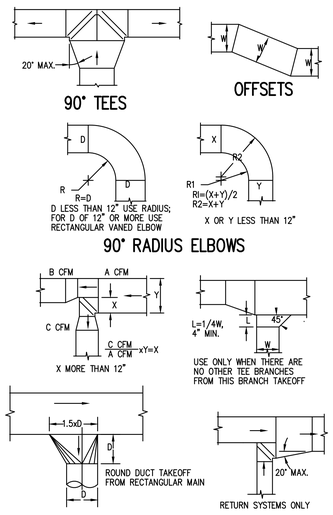
NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

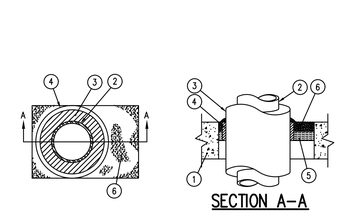
3 M002 DRYER DETAIL (STANDARD)
NOT TO SCALE



5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE



1. Floor orWall Assembly – Min 4-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2-1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics# – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr.When max 2 in. diam insulated steel or copper pipe is used,T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94-5VA may be used.

4. Fill,Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly-wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure-sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS-195+

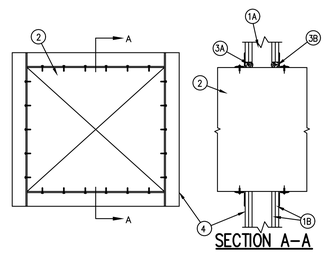
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill,Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant.
(The W Rating applies only when FB-3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3-1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB-3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE9516 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

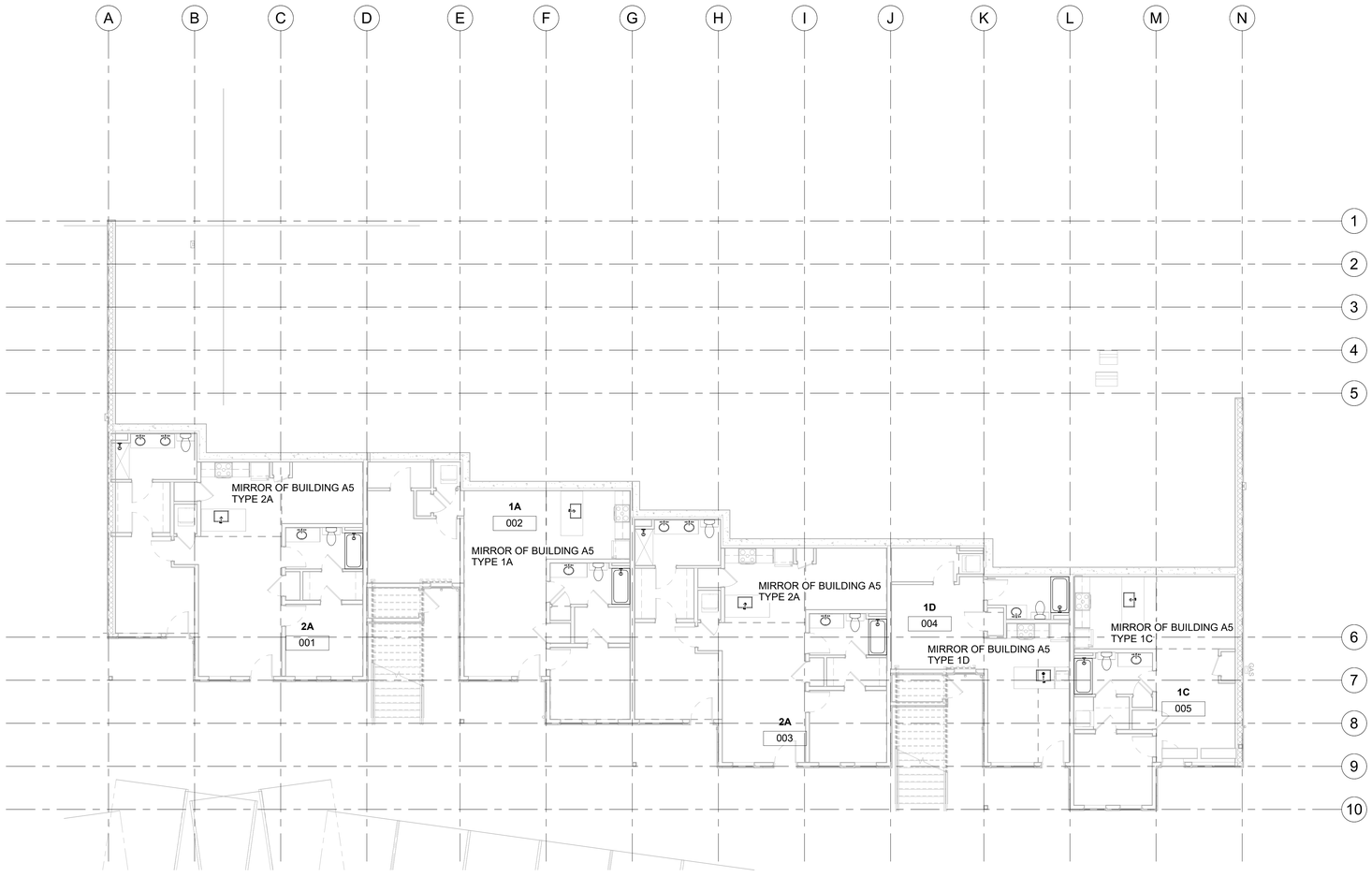
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:

M6.002

TERRACES AT HIGH MOUNTAIN - A6



1 MECHANICAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30137 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
BASEMENT FLOOR PLAN

SHEET:
M6.100

TERRACES AT HIGH MOUNTAIN - A6

1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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ALABAMA LICENSED
NO. PE30137 PROFESSIONAL
ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

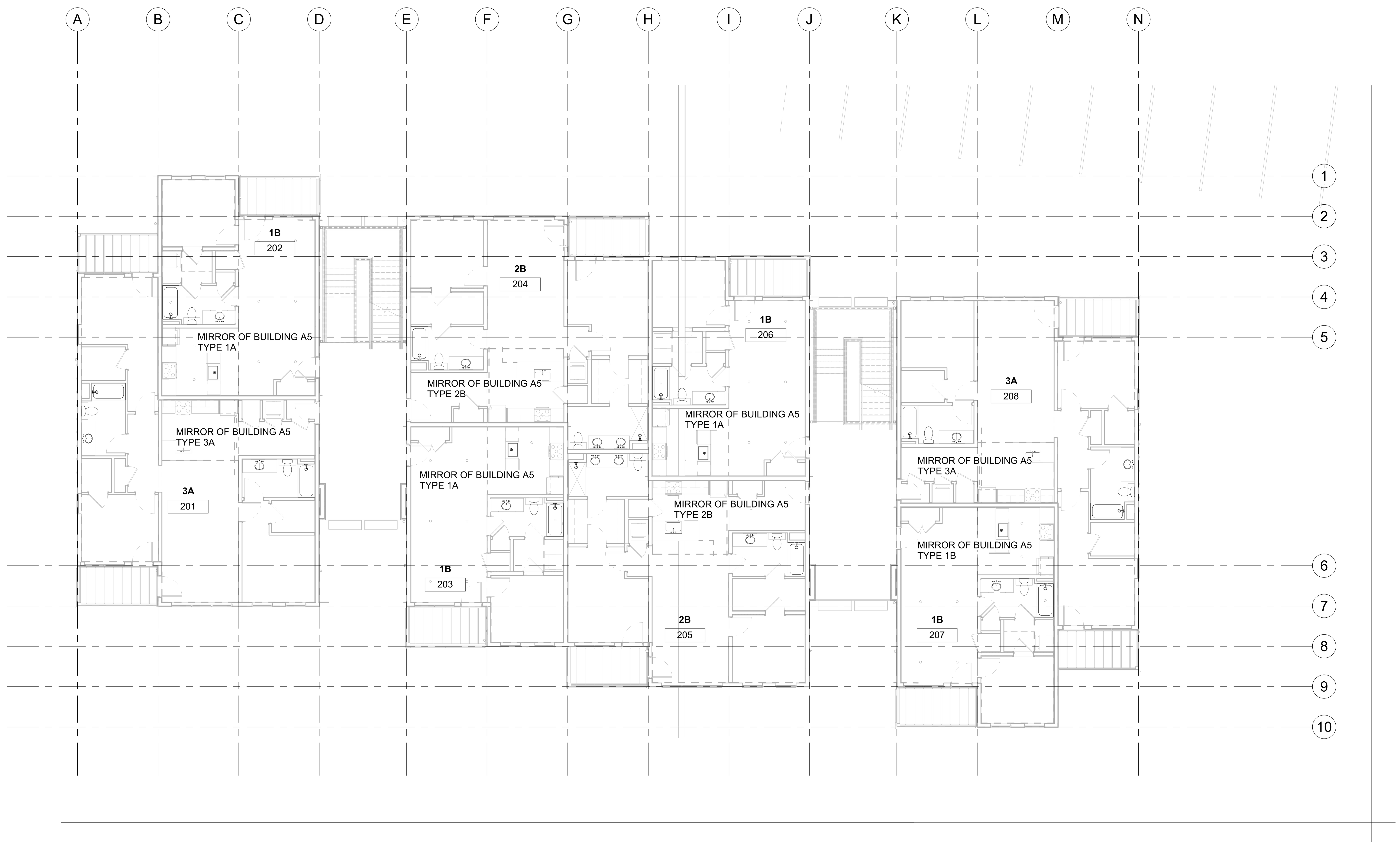
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:

M6.101

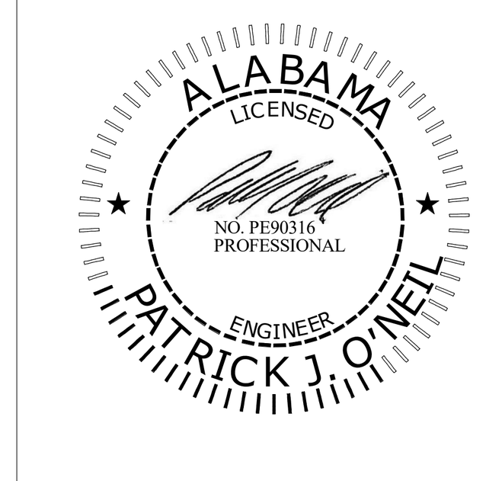
TERRACES AT HIGH MOUNTAIN - A6



1 MECHANICAL SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.



TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

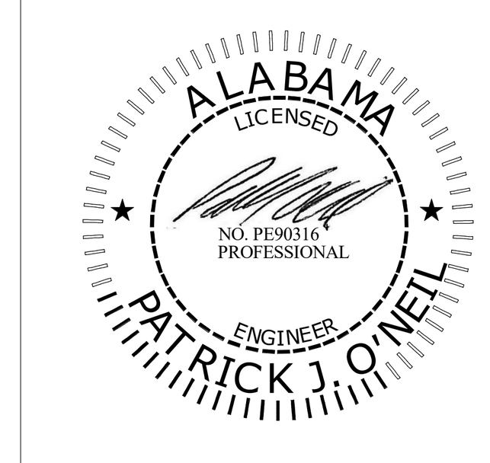
MECHANICAL
SECOND FLOOR PLAN

SHEET:
M6.102

1 MECHANICAL THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.



TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
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2		XX
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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
THIRD FLOOR PLAN

SHEET:
M6.103

TERRACES AT HIGH MOUNTAIN - A6

MECHANICAL SPECIFICATIONS

SECTION 15010 – MECHANICAL GENERAL PROVISIONS:

1. THE WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE REFERENCED CODES AND STANDARDS:
   - 1.1. LOCAL AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS
   - 1.2. ALABAMA BUILDING CODE – 2015, INCLUDING:
     - IBC/2015 – INTERNATIONAL BUILDING CODE
     - 1.2.1. NFPA 70/2014 – NATIONAL ELECTRICAL CODE
     - 1.2.2. NFPA 72/2013 – NATIONAL FIRE ALARM CODE
     - 1.2.3. 2015 INTERNATIONAL MECHANICAL CODE
   - 1.3. ADAAG – AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
   - 1.4. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   - 1.5. ASHRAE – AMER. SOC. OF HEATING. REFRIG. AND AIR COND. ENGINEERS
   - 1.6. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 1.7. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
   - 1.8. OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
   - 1.9. SMACNA – SHEET METAL AND AIR COND. CONTRACTORS NAT'L ASSOCIATION
   - 1.10. UL – UNDERWRITERS LABORATORIES, INC.
2. CONFORM TO THE BUILDING CODE AND LOCAL AUTHORITIES HAVING JURISDICTION (AHJ). OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND FEES REQUIRED.
3. CONFORM TO DIV 0, DIV 1 AND THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT.
4. COORDINATE SCHEDULE FOR ALL WORK WITH AND FOR APPROVAL BY THE OWNER.
5. COORDINATE WORK FROM OTHER TRADES AND BUILDING STRUCTURE PRIOR TO INSTALLATION. MAKE MINOR ADJUSTMENTS AS REQUIRED FACILITATING THE WORK.
6. ALL EQUIPMENT, MATERIALS AND SYSTEMS SHALL BE LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. (UL), AS SUITABLE FOR USE INTENDED.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE "MEANS AND METHODS" OF THE WORK. WORK SHALL CONFORM TO THE NECA 1 – "STANDARD OF INSTALLATION" AND SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
8. INSTALL AND APPLY ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROVIDE SUBMITTALS WHERE INDICATED.
9. INSTALL AND PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE, DIRT, AND DEBRIS AND CLEAN AND REPAIR AS REQUIRED. DO NOT USE COMPRESSED AIR FOR CLEANING.
10. WARRANTY: PROVIDE WARRANTY ON WORKMANSHIP AND MATERIALS. WARRANTY SHALL COVER ALL COSTS FOR PARTS, LABOR, ASSOCIATED TRAVEL, AND EXPENSES FOR A PERIOD OF ONE YEAR FROM COMPLETION OF SYSTEM ACCEPTANCE. WARRANTY SHALL APPLY EQUALLY TO BOTH HARDWARE AND SOFTWARE. PERSONNEL SUPPORTING THIS WARRANTY AGREEMENT SHALL PROVIDE ON-SITE OR OFF-SITE SERVICE IN A TIMELY MANNER AFTER FAILURE NOTIFICATION TO THE VENDOR. THE MAXIMUM ACCEPTABLE RESPONSE TIME TO PROVIDE THIS SERVICE AT THE SITE SHALL BE 24 HOURS, MONDAY THROUGH FRIDAY AND 48 HOURS ON SATURDAY AND SUNDAY.
11. SUBMITTALS:
    - 11.1. PROVIDE SUBMITTALS ON EQUIPMENT AND MATERIALS.
    - 11.2. SUBMITTAL REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE PLANS AND SPECIFICATIONS.
    - 11.3. OPERATION OF THE SYSTEMS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
    - 11.4. REVIEW OF A SPECIFIC ITEM DOES NOT INCLUDE OR IMPLY APPROVAL OF AN ASSEMBLY (OF WHICH THE ITEM IS A COMPONENT).
    - 11.5. ALL DEVIATIONS FROM THE PROJECT ENGINEERING DRAWINGS AND SPECIFICATIONS SHALL BE EXPLICITLY NOTED IN SUBMITTALS BY COVER LETTER OR WILL BE CONSIDERED NON-COMPLIANT AND REJECTED, REGARDLESS OF SUBMITTAL REVIEW STATUS. DEVIATIONS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS UNLESS SEPARATELY NEGOTIATED WITH THE OWNER.
    - 11.6. THE CONTRACTOR, BY SUBMITTING A PROPOSED SUBSTITUTION, ACCEPTS ALL RESPONSIBILITY FOR COORDINATING ALL CHANGES AND ABSORBING ALL COSTS DUE TO PROPOSED SUBSTITUTED EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO: COORDINATION WITH AND CHANGES AFFECTING OTHER TRADES, ADDITIONAL CIRCUITS, IMPACT OF ADDITIONAL LOADS, CIRCUIT CHARACTERISTICS, AND SINGLE-POINT CONNECTION KITS.

SECTION 15080–INSULATION:

1. ALL PRODUCTS IN THE CONDITIONED AIRSTREAM (INCLUDING PLENUMS) SHALL BE NONCOMBUSTIBLE AND SHALL COMPLY WITH NFPA 90A FLAME/SMOKE/FUEL CONTRIBUTION RATING OF 25/50/0 AND COMPLY WITH UL181 EROSION LIMITATIONS. FIRE HAZARD RATINGS SHALL BE DETERMINED BY NFPA-255 "METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS", ASTM E84, OR UL723.
2. INSTALL INSULATION PER MANUFACTURERS INSTRUCTIONS.
3. ON SUPPLY AIR AND OUTSIDE AIR DUCTS ENSURE THAT THE VAPOR BARRIER IS CONTINUOUS AND SEALED AT ALL PENETRATIONS.
4. PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH A WEATHER-PROOF MEMBRANE.
5. BLANKET FIBERGLASS: FLEXIBLE FIBROUS GLASS, FLAME RETARDANT FACTORY LAMINATED FOIL- SKRM-KRAFT (FSK) VAPOR BARRIER, 2" STAPLING FLANGE. MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN., MINIMUM DENSITY OF 1.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .28 AT 75°F MEAN TEMPERATURE. BASED ON KNAUF DUCT WRAP.
6. SCHEDULE (INSULATION BASED ON KNAUF):

SUPPLY DUCTWORK:		
ABOVE CEILINGS	1-1/2"	BLANKET TYPE
GRILLE BOOTS	1-1/2"	BLANKET TYPE
RETURN/TRANSFER DUCTWORK:		
ALL	LINER WHERE NOTED, OTHERWISE:	
GRILLE BOOTS	1"	LINER
OUTSIDE AIR DUCTWORK:		
ALL	2"	TLB DENSITY BLANKET
EXHAUST DUCTWORK:		
EXHAUST	NONE	
PIPING:		
INDOOR REF PIPING	1"	CLOSED CELL ELASTOMERIC
OUTDOOR REF PIPING	1-1/2"	CLOSED CELL ELASTOMERIC W/ WEATHERPROOF JACKET

SECTION 15767–HEATERS:

ELECTRIC UNIT HEATERS:

1. WALL ELECTRIC HEATERS (WH) – RECESSED WALL MOUNTED ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, LOUVERED FRONT COVER, DISCONNECT SWITCH, AND HEATING ELEMENT.

SECTION 15770–SPLIT SYSTEM AIR CONDITIONERS:

OUTDOOR STANDARD SPLIT SYSTEM HEAT PUMP (HP):

1. STANDARD EFFICIENCY, SPLIT SYSTEM HEAT PUMP. COMPRESSOR TO BE INTERNALLY PROTECTED AGAINST HIGH PRESSURE, TEMPERATURE, AND EXTERNALLY BY A FACTORY INSTALLED HIGH PRESSURE SWITCH. PROVIDE REMOVABLE ACCESS PANEL TO ELECTRICAL BOX. FURNISH FULLY CHARGED AND FACTORY WIRED. UNIT SHALL OPERATE WITH R-410A. PROVIDE WITH 5-YEAR LIMITED PARTS WARRANTY AND 5-YEAR LIMITED COMPRESSOR WARRANTY.
2. CONSTRUCTED OF PRE-PAINTED STEEL, INTERNALLY PROTECTED HERMETIC COMPRESSOR WITH INTERNAL DISCHARGE LINE SOLID CORE FILTER DRIER, CRANKCASE HEATER, AND HARD START KITS (FOR UNITS WITH REFRIGERANT LINE LENGTHS OVER 100 FT). CONDENSER COILS CONSTRUCTED OF COPPER TUBING AND ENHANCED ALUMINUM COILS.
3. INSTALL UNIT ON PLASTIC HOUSEKEEPING PAD (WITH NEOPRENE BETWEEN PAD AND ROOF) OR 4x4 WEATHER TREATED LUMBER WITH NEOPRENE PADS BETWEEN UNIT AND LUMBER.

INDOOR STANDARD SPLIT SYSTEM AIR HANDLING UNIT (AHU):

1. COMPACT AND STURDY CABINET IS PROTECTED WITH A DURABLE FINISH AND INSULATED TO PREVENT SWEATING. PROVIDE WITH ALUMINUM FIN COILS AND ELECTRIC HEATERS.
2. FOR UNITS MOUNTED VERTICALLY, PROVIDE FLOAT SWITCH ON CONDENSATE OVERFLOW CONNECTION. FOR UNITS MOUNTED HORIZONTALLY PROVIDE CONDENSATE DRAIN PAN UNDER UNIT WITH FLOAT OR WATER DETECTOR WITHIN THE PAN. UPON A DETECTION OF WATER IN THE PAN OR CONDENSATE OVERFLOW CONNECTION, UNIT SHALL BE SHUT DOWN.
3. PROVIDE NON-PROGRAMMABLE DIGITAL THERMOSTAT FOR ALL RESIDENTIAL UNITS.
4. PROVIDE DUCTED INDOOR UNIT WITH SUPPLY AND RETURN PLENUMS AS INDICATED. PLENUMS TO BE SIZED AS SMALL AS POSSIBLE FOR CONNECTIONS. LINE WITH 1" INSULATION FOR SOUND DAMPENING.
5. PROVIDE WITH INTERNAL FILTER RACK AND 1"THICK FILTER.

SECTION 15820–DUCTWORK ACCESSORIES:

1. WALL CAPS (EXTERIOR WALL): PROVIDE WALL CAPS FOR ALL DRYER AND BATHROOM EXHAUST DUCTS AND OUTSIDE AIR DUCTS AT EXTERIOR WALL PENETRATIONS. WALL CAPS SHALL BE ALUMINUM CONSTRUCTION. PROVIDE DRYER AND EXHAUST DUCTS WITH BUILT IN DAMPER. BASED ON SEIHO MODEL SFZC. COLOR TO BE DETERMINED BY THE ARCHITECT.
2. FIRE DAMPERS: CURTAIN TYPE WITH BLADES OUT OF THE AIR STREAM (HIGH HAT TYPE) WITH 1-1/2" HOUR UL RATINGS APPROVED FOR USE IN 2 HOUR RATED WALLS AND 1-HOUR RATED FLOOR ASSEMBLIES. PROVIDE WITH FUSIBLE LINK AND CLOSURE SPRING FOR USE IN VERTICAL DUCTWORK (HORIZONTALLY MOUNTED).
3. CEILING MOUNTED RADIATION DAMPER: INSULATED, 2-BLADE, 22 GA GALVANIZED STEEL FRAME AND BLADES, SPRING OPERATED WITH 212°F FUSIBLE LINK. BASED ON ARROW MODEL A91 (RECTANGULAR) AND A97 (ROUND).
4. VOLUME DAMPERS (MANUAL): BLADES AND FRAME SHALL BE OF EXTRUDED ALUMINUM OR GALVANIZED STEEL CONSTRUCTION. PROVIDE SINGLE BLADE DAMPERS PER SMACNA FIG 2-12, FIGURE B ON RECTANGULAR DUCTS LESS THAN 30" IN WIDTH AND 12" OR LESS IN DEPTH AND MULTI-BLADE DAMPERS PER SMACNA FIGURE 2-13, FIGURE A ON LARGER RECTANGULAR DUCTS. ROUND DUCT VOLUME DAMPERS SHALL BE SINGLE BLADE MOUNTED ON A CONTINUOUS SHAFT. EQUIP WITH LOCKING QUADRANT AND END BEARINGS. PROVIDE HANDLE EXTENSION ON EXTERNALLY INSULATED DUCTWORK.

SECTION 15830–FANS:

1. FANS SHALL BE UL LISTED AND AMCA CERTIFIED. ELECTRICAL DEVICES SHALL CONFORM TO NEMA STANDARDS. WIRING SHALL CONFORM TO NEC.
2. MOTORS SHALL BE NON–OVERLOADING, HIGH EFFICIENCY TYPE. MOTORS DESIGNED FOR VARIABLE SPEED SHALL BE DESIGNED AND RATED FOR USE WITH VFDs.
3. CEILING MOUNTED (WITHIN RATED DROPPED CEILING): FORWARD CURVED INJECTION MOLDED POLYPROPYLENE FAN WHEEL, 22 GAUGE GALVANIZED STEEL INLET BOX, ISOLATED MOUNTED DIRECT MOTOR, MOUNTED TO ONE PIECE GALVANIZED STAMPED STEEL INTEGRAL MOTOR MOUNT/INLET, BACKDRAFT DAMPER, AND WHITE HIGH IMPACT STYRENE INJECTED MOLDED GRILLE. PROVIDE WITH INTEGRAL RADIATION DAMPER. BASIS OF DESIGN: COOK MODEL GC.

SECTION 15850–GRILLES, REGISTERS, AND DIFFUSERS:

1. PROVIDE AS INDICATED IN THE GRD SCHEDULE. PROVIDE ALL GRDs WITH INTEGRAL VOLUME DAMPERS OR WITH VOLUME EXTRACTORS AS INDICATED. COLOR OF THE GRILLES TO BE DETERMINED BY ARCHITECT. PERFORMANCE OF THE GRILLES IS A MAXIMUM OF 700 FPM OR A NC LEVEL OF 30 OR LESS FOR SIZE AND CFM INDICATED.
2. INSTALL WITH AIR TIGHT CONNECTION TO DUCTWORK. COORDINATE MOUNTING CONDITIONS WITH ARCHITECTURAL.
3. CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.

SECTION 15890–METAL DUCTWORK:

1. UNLESS OTHERWISE NOTED, RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF HOT ROLLED STEEL CONTINUOUSLY ANNEALED AND HOT DIPPED GALVANIZED SHEET OR COIL, MINIMUM G-90, 0.90 OZ/SF COATING SUITABLE FOR FORMING WITHOUT FLAKING OR PEELING, SUITABLE FOR WELDING OR SOLDERING. ZINC COATING SHALL NOT BE IMPAIRED FROM DOUBLE SEAMING, BREAKING OR ROLL FORMING. 14 GA. AND LIGHTER CONFORMING TO ASTM A 527; 13 GA AND HEAVIER CONFORMING TO ASTM A 526.
2. DRYER VENT SHALL BE 26 GA. MINIMUM.
3. UNLESS OTHERWISE NOTED, ROUND DUCTWORK SHALL BE CONSTRUCTED OF G-90 GALVANIZED STEEL WITH THE FOLLOWING MINIMUM GAUGES: <15" DIA. = 24 GAUGE, 15"-26" DIA. = 22 GAUGE.
4. INSULATED ROUND FLEXIBLE DUCT (MAX LENGTH 8') IS ALLOWED FOR BRANCH CONNECTIONS TO DIFFUSERS AND GRILLES ABOVE LAY-IN CEILINGS. INSULATED ROUND FLEXIBLE DUCTWORK SHALL BE UL181, CLASS 1 AND SUITABLE FOR LOW PRESSURE APPLICATIONS OF NOT LESS THAN 3" W.C. CONNECT TO METAL DUCT WITH STAINLESS STEEL DRAW BANDS.
5. ALL DUCT SIZES SHOWN ON PLANS ARE INSIDE CLEAR (AIRFLOW) DIMENSIONS. NO ALLOWANCE HAS BEEN MADE FOR DUCT LINER OR DOUBLE WALL DUCTWORK WHERE REQUIRED.
6. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
7. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED.
8. PROVIDE DOUBLE WALL TURNING VANES IN ALL LOW PRESSURE SUPPLY , RETURN, AND EXHAUST DUCTS . TURNING VANES ARE NOT REQUIRED WHERE RADIUS ELBOW FITTINGS WITH R=1.5 OR GREATER ARE USED.
9. SEAL DUCT JOINTS AIR TIGHT. PROVIDE AIR TIGHT SEAL WITH VOLUME DAMPERS AT ALL TAPS OFF MAIN DUCT TO DIFFUSERS.
10. SCHEDULE:

SYSTEM	SECTION	PRESSURE CLASS	SEAL CLASS
LP SUPPLY	NOTE 1	2"	A
RETURN–RELIEF	ALL	2"	C
GEN. EXHAUST	ALL	2"	C
DRYER VENT	ALL	2"	SPOT WELD

MECHANICAL GENERAL NOTES:

SCOPE:
PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, AND OTHER SERVICES NECESSARY TO SATISFACTORILY COMPLETE ALL MECHANICAL WORK INDICATED ON THE CONTRACT DOCUMENTS. ALL SPECIFICATIONS, NOTES, OR SYMBOLS MAY NOT BE APPLICABLE FOR THIS TENANT. CONTRACTOR SHALL CAREFULLY REVIEW PLANS AND DETAILS FOR ACCURATE EXTENT OF WORK REQUIRED.

PERMITS:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT OF ALL APPLICABLE BUILDING PERMITS, INSPECTIONS, AND OTHER REQUIRED ADMINISTRATIVE DUTIES TO COMPLETE ALL INDICATED WORK REQUIREMENTS.

DESIGN CONSIDERATIONS:

OUTDOOR TEMPERATURE:	SUMMER:	95°F DB, 75°F WB
	WINTER:	17°F DB
INDOOR TEMPERATURE	SUMMER:	75°F DB, 45–60% R.H.
	WINTER:	70°F DB

*HUMIDITY WILL VARY WITH OUTDOOR CONDITION

VENTILATION AND DISTRIBUTION:
MECHANICAL VENTILATION WILL BE PROVIDED PER IMC SECTION 403 AND TABLE 403.3.

CODES:
ALL WORK SHALL BE DONE IN ACCORDANCE WITH IBC 2015, IMC 2015 AND ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

STANDARDS:
ALL MATERIALS WITH ELECTRICAL REQUIREMENTS SHALL BE UL LISTED FOR THE INTENDED APPLICATION.

PHASING AND WORK PERFORMANCE:
THE CONTRACTOR SHALL COORDINATE ALL PHASING AND STAGING/STORAGE OF MATERIALS AND WORK WITH THE GENERAL CONTRACTOR. A WRITTEN GUARANTEE FOR THE PERIOD OF AT LEAST ONE YEAR AFTER SUBSTANTIAL COMPLETION SHALL BE TURNED OVER TO THE OWNER ON ALL MATERIALS AND WORK DONE BY THE CONTRACTOR. ALL MATERIALS INSTALLED SHALL ALSO BE PROVIDED WITH THE MAXIMUM AVAILABLE GUARANTEE FROM THE MANUFACTURER.

CLEAN UP AND PROTECTION OF AREA:
THE CONTRACTOR SHALL CLAIM ALL RESPONSIBILITY FOR PROTECTION OF THE AREAS INVOLVED, INCLUDING ANY AREAS INVOLVED IN THE TRANSPORTATION AND STORAGE OF EQUIPMENT DURING CONSTRUCTION. THE CONTRACTOR SHALL CONSISTENTLY MAINTAIN A WORK ENVIRONMENT THAT IS CLEAN AND PROTECTED FROM UNAUTHORIZED PERSONS AND DAMAGE DUE TO CONSTRUCTION. AFTER COMPLETION OF ALL CONSTRUCTION, THE CONTRACTOR SHALL CLEAN ALL AREAS INVOLVED IN THE CONSTRUCTION PROCESS, TO THE OWNER'S APPROVAL. ALL REFUSE INVOLVED DUE TO CONSTRUCTION SHALL BE PROPERLY AND PROMPTLY DISPOSED OF AT AN ON SITE LOCATION.

CONSTRUCTION TYPE: A–3
USE GROUP: VB
OCCUPANCY: 214

- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND/OR DUCTWORK. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGERS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.
- INSTALL ALL DEVICES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- COORDINATE THE PROPER GRILLE STYLE AND FRAME STYLE WITH THE FINAL APPROVED CEILING CONSTRUCTION AND INSTALL GRILLES, REGISTERS, AND DIFFUSERS.
- DUE TO THE SMALL SCALE OF THE DRAWINGS, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY TO COORDINATE THE AIR OUTLET AND INLET LOCATIONS WITH THE CEILING PLANS, LIGHTING PLANS, SECTIONS AND/OR DETAILS.
- PROVIDE SUBMITTALS ON ALL EQUIPMENT AND CONTROLS FOR APPROVAL.
- PROVIDE OWNER TRAINING ON ALL EQUIPMENT.
- PROVIDE START–UP OF ALL EQUIPMENT.
- WELDING, CUTTING, OR BURNING: THE CONTRACTOR SHALL PROVIDE THE OWNER A MINIMUM OF 72 HOURS ADVANCE NOTICE PRIOR TO PERFORMING ANY WELDING, CUTTING, OR BURNING WITHIN THE BUILDING. NO WELDING, CUTTING, OR BURNING SHALL OCCUR WITHOUT GENERAL CONTRACTOR APPROVAL. WHERE WELDING, CUTTING, OR BURNING ARE NECESSARY, NON–COMBUSTIBLE SHIELDS SHALL BE USED AND SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE MAINTAINED NEARBY.
- FABRICATION OF STEEL SUPPORTS: FABRICATE FROM STEEL ANGLES, CHANNELS OR PLATES IN ACCORDANCE WITH ASTM.
- THERMOSTAT LOCATIONS ARE GENERAL. THERMOSTATS SHALL BE LOCATED ADJACENT TO DOORS OR NEAR RETURN GRILLES. COORDINATE FINAL THERMOSTAT LOCATIONS WITH ARCHITECT AND/OR OWNER.

MECHANICAL LEGEND

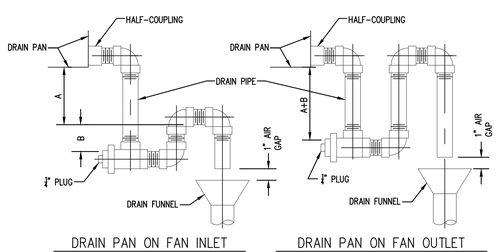
SYMBOL	DESCRIPTION
WxD	DUCT SIZE (FIRST FIGURE IS OF SIDE SHOWN DIMENSION)
	FLEXIBLE CONNECTION
20x20 12x12	TRANSITION
	FIRE DAMPER W/ ACCESS DOOR
	AIR TIGHT CONNECTION OFF DUCT MAIN
	4–WAY THROW SUPPLY DIFFUSER WITH FLEX DUCT CONNECTION
	RETURN DIFFUSER
3" 3"	HEAT PUMP WITH COIL AND MAINTENANCE CLEARANCE BOUNDARY LINE; REFER TO MANUFACTURER'S MANUAL.

SYMBOL	DESCRIPTION
24x12, R–X 100 CFM	SIDEWAYS RETURN
24x12, S–X 100 CFM	SIDEWAYS SUPPLY
RD	DIFFUSER TO BE PROVIDED WITH RADIATION DAMPER
8"ø, S–1 160 CFM	DIFFUSER TAG WITH AIRFLOW
	DOOR UNDERCUT
T	THERMOSTAT (48"AFF)
SD	SMOKE DETECTOR
OCC	OCCUPANCY SENSOR
AD	ACCESS DOOR IN SIDE OF WALL OR DUCT
AHU–1	EQUIPMENT NUMBER
	1–HOUR RATED WALL
	2–HOUR RATED WALL
	MATCH LINE
ZD	ZONE DAMPER
M	MOTORIZED DAMPER; USED FOR BYPASS AIR

MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	GA	GAUGE
AD	ACCESS DOOR	HP	HORSEPOWER
AHU	AIR HANDLING UNIT	HZ	FREQUENCY
BTU	BRITISH THERMAL UNIT	KW	KILOWATT
BTUH	BRITISH THERMAL UNIT PER HOUR	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
DB	DRY BULB	NTS	NOT TO SCALE
DE	DRYER EXHAUST	OA	OUTSIDE AIR
DN	DOWN	PD	PRESSURE DROP
DWG	DRAWING	PH	PHASE
DX	DIRECT EXPANSION	PSI	POUNDS PER SQUARE INCH
EA	EXHAUST AIR	PVC	POLYVINYL CHLORIDE
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EF	EXHAUST FAN	RD	RADIATION DAMPER
ESP	EXTERNAL STATIC PRESSURE	RL	REFRIGERANT LIQUID
°F	DEGREE FAHRENHEIT	RPM	REVOLUTIONS PER MINUTE
FD	FIRE DAMPER	RS	REFRIGERANT SUCTION
FLA	FULL LOAD AMPERES	SA	SUPPLY AIR
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET	WB	WET BULB
		WH	WALL HEATER

MECHANICAL DRAWING LIST

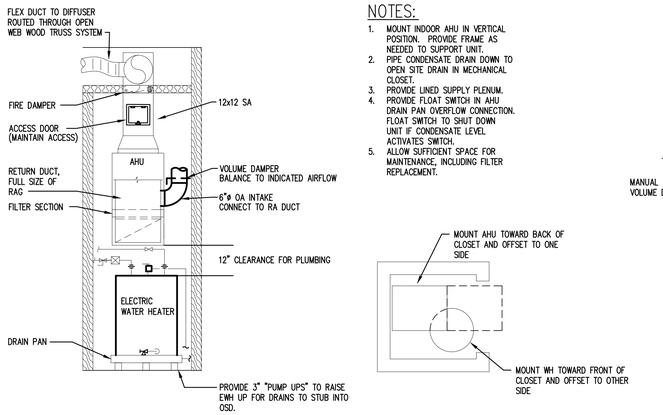


DRAIN PAN ON FAN INLET (NEGATIVE PRESSURE)

DRAIN PAN ON FAN OUTLET (POSITIVE PRESSURE)

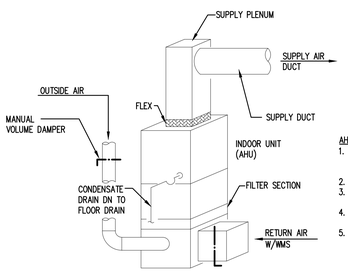
NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

1 M001 CONDENSATE DRAIN DETAIL
NOT TO SCALE



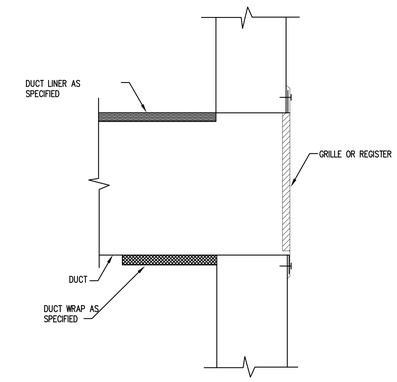
NOTES:
1. MOUNT INDOOR AHU IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PIPE CONDENSATE DRAIN DOWN TO OPEN SITE DRAIN IN MECHANICAL CLOSET.
3. PROVIDE LINED SUPPLY PLENUM.
4. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.
5. ALLOW SUFFICIENT SPACE FOR MAINTENANCE, INCLUDING FILTER REPLACEMENT.

2 M001 INDOOR AHU MOUNTED ABOVE WATER HEATER CLOSET LAYOUT
NOT TO SCALE

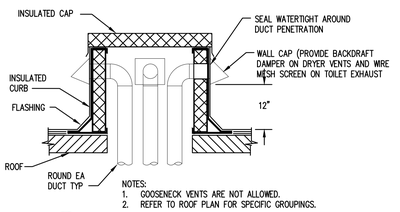


AHU NOTES:
1. MOUNT INDOOR AIR HANDLING UNIT IN VERTICAL POSITION. PROVIDE FRAME AS NEEDED TO SUPPORT UNIT.
2. PROVIDE RETURN AIR PLENUM WITH FILTER.
3. PIPE CONDENSATE DRAIN DOWN TO FLOOR DRAIN IN MECHANICAL CLOSET.
4. PROVIDED LINED RETURN AND SUPPLY PLENUMS.
5. PROVIDE FLOAT SWITCH IN AHU DRAIN PAN OVERFLOW CONNECTION. FLOAT SWITCH TO SHUT DOWN UNIT IF CONDENSATE LEVEL ACTIVATES SWITCH.

3 M001 VERTICALLY MOUNTED AHU DETAIL
NOT TO SCALE



5 M001 SIDEWALL GRILLE OR REGISTER DETAIL
NOT TO SCALE



NOTES:
1. GOOSENECK VENTS ARE NOT ALLOWED.
2. REFER TO ROOF PLAN FOR SPECIFIC GROUPINGS.

4 M001 DV/TE DUCT CURB DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. 19830 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A7
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL NOTES, SPECIFICATIONS, ABBREVIATIONS, LEGEND, AND DETAILS.

SHEET:
M7.001

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A7

ELECTRIC UNIT HEATER SCHEDULE:

UNIT NO.	SERVING	UNIT TYPE	TOTAL CAPACITY (BTUH)	AIR DATA		ELECTRIC DATA				SELECTION BASED ON		REMARKS
				CFM	EAT °F	KW	FLA	VOLT	PH	MANUFACTURER	MODEL	
WH-1	MECHANICAL ROOMS AND STAIRS	WALL MTD	6142	100	64	1.8	15	120	1	BERKO	FRA1812	

FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	TOTAL STATIC H_2O	FAN RPM	MOTOR DATA			SELECTION BASED ON		REMARKS
							HP	VOLTS	PH	MANUFACTURER	MODEL	
EF-1	RESIDENTIAL BATHROOM	CEILING MTD	50	FC	0.35	750	27W	120	1	COOK	GC-128	CONTROLL BY SWITCH

GRILLE, REGISTER AND DIFFUSER SCHEDULE:

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA										SELECTION BASED ON		REMARKS
	G	R	D	SA	RA	EA	CEILING	DUCT	FLOOR	WALL	SHAPE	MATERIAL	COLOR	ACCESSORIES				PATTERN					MANUFACTURER	MODEL	
														VD	RC	VE	P	1-W	2-W	3-W	4-W	E/R			
S-1		X		X			X				RECT	ALUMINUM	TBD	X					X				USAIRE	102M	
S-2			X	X			X				SQUARE	STEEL	TBD	X							X		KRUEGER	1400	24x24 PANEL
S-3			X	X			X				LINEAR	ALUMINUM	TBD	X					X				KRUEGER	DFL	2 SLOT, 1" SLOT WIDTH
R-1	X				X					X	RECT	STEEL	TBD	X								X	KRUEGER	S80	0° DEFLECTION

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - MINI SPLIT

UNIT NO.	SERVING	SUPPLY FAN DATA				COOLING DATA				HEATING DATA			UNIT ELECTRIC DATA			SELECTION BASED ON		OUTDOOR UNIT	REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	NO.	CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	VOLT	PH	MOCP	MANUFACTURER	MODEL		
							DB °F	WB °F											
AHU-DOG SPA	DOG SPA	300	0	0	1	9.0	80	67	23.0	12.0	70	47	208	1	--	FUJITSU	ASU9RLF1	AOU9RLFW1	ELECTRIC FED FROM OUTDOOR UNIT
AHU-MAINT.	MAINTENANCE	300	0	0	1	9.0	80	67	23.0	12.0	70	47	208	1	--	FUJITSU	ASU9RLF1	AOU9RLFW1	ELECTRIC FED FROM OUTDOOR UNIT

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE - MINI SPLIT

UNIT NO.	SERVING	UNIT DATA					FAN MOTOR(S)				COMPRESSOR(S)		UNIT ELECTRIC DATA				SELECTION BASED ON		INDOOR UNIT	REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	MCA	MOCP	VOLT	PH	MANUFACTURER	MODEL		
HP-DOG SPA	AHU-DOG SPA	9	95	45	23.0	R-410A	1	--	--	995	1	1	10	15	208	1	FUJITSU	AOU9RLFW1	ASU9RLF1	SINGLE ZONE ORIENTATION
HP-MAINT.	AHU-MAINT.	9	95	45	23.0	R-410A	1	--	--	995	1	1	10	15	208	1	FUJITSU	AOU9RLFW1	ASU9RLF1	SINGLE ZONE ORIENTATION

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE (14 SEER) - CONVENTIONAL

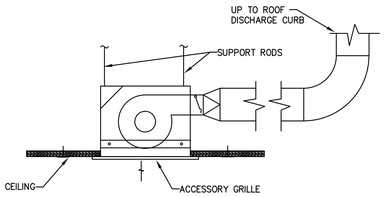
UNIT TAG	SERVING	UNIT DATA					FAN DATA				COMPRESSOR(S)				UNIT ELECTRIC DATA				SELECTION BASED ON		PAIRED WITH		REMARKS
		CAPACITY MBH	COND. EAT °F	S. SUCT. °F	SEER	REFRIG. TYPE	NO.	HP	RPM	TOTAL CFM	NO.	STEPS	LRA	RLA	MCA	MOCP	VOLT	PH	MANUF.	MODEL	MANUF.	MODEL	
HP-LEASING LOBBY	AHU-LEASING LOBBY	18	95	45	15	R-410A	1	1/12	800	-	1	1	48	9	11.8	20	208	1	CARRIER	25HBC518A0030	CARRIER	FX4DF019L008	
HP- UPSTAIRS DINING	AHU-UPSTAIRS DINING	24.0	95	45	15.0	R-410A	1	1/12	800	-	1	1	58.3	12.8	16.5	25	208	1	CARRIER	25HBC524A0030	CARRIER	FX4DF025L008	
HP-FITNESS	AHU-FITNESS	48.0	95	45	15.0	R-410A	1	1/4	800	-	1	1	117	21.8	28.5	40	208	1	CARRIER	25HBC548A0030	CARRIER	FX4DF049L015	
HP-YOGA	AHU-YOGA	36.0	95	45	15.0	R-410A	1	1/5	800	-	1	1	79	16.7	22.1	35	208	1	CARRIER	25HBC536A0030	CARRIER	FX4DF037L015	
HP-OFFICE/ENTRY	AHU-OFFICE/ENTRY	36.0	95	45	15.0	R-410A	1	1/5	800	-	1	1	79	16.7	22.1	35	208	1	CARRIER	25HBC536A0030	CARRIER	FX4DF037L015	

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE - CONVENTIONAL

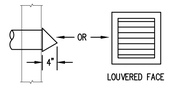
UNIT TAG	SERVING	SUPPLY FAN DATA					COOLING DATA					HEATING DATA			ELEC. HEATING COIL DATA				UNIT ELECTRIC DATA				SELECTION BASED ON		REMARKS
		NOMINAL CFM RANGE	ESP Delta P IN H_2O	OA CFM	HP	RPM	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EAT °F		SEER @ARI	CAPACITY MBH	INDOOR EAT DB °F	OUTDOOR COND. DB °F	KW	VOLT	PH	NO. STEPS	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
									DB °F	WB °F															
AHU-LEASING	LEASING LOBBY	600	0.5		1/3	1050	18.0	17.0	80	67	15.0	15.7	70	17	3.8	208	1	1	208	1	26	30	CARRIER	FX4DF019L008	PAIRED WITH HEATER KFCEH0501N05
AHU-UPSTAIRS DINING	UPSTAIRS DINING	800	0.5		1/3	1050	24.0	22.0	80	67	15.0	15.7	70	17	3.8	208	1	1	208	1	26	30	CARRIER	FX4DF025L008	PAIRED WITH HEATER KFCEH0501N05
AHU-FITNESS	FITNESS	1600	0.5		3/4	1050	48.0	43	80	67	15.0	47.1	70	17	11.3	208	3	1	208	3	47.7	50	CARRIER	FX4DF049L015	PAIRED WITH HEATER KFCEH1601315
AHU-YOGA	YOGA	1200	0.5		1/2	1050	36.0	32.0	80	67	15.0	47.1	70	17	11.3	208	3	1	208	3	47.7	50	CARRIER	FX4DF037L015	PAIRED WITH HEATER KFCEH1601315
AHU-OFFICE/ENTRY	OFFICE/ENTRY	1200	0.5		1/2	1050	36.0	32.0	80	67	15.0	47.1	70	17	11.3	208	3	1	208	3	47.7	50	CARRIER	FX4DF037L015	PAIRED WITH HEATER KFCEH1601315

PACKAGED ROOF TOP UNIT SCHEDULE:

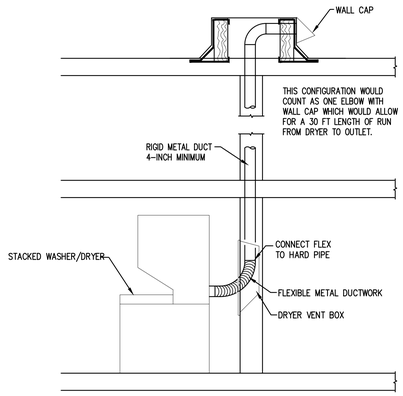
UNIT NO.	SERVING	SA CFM	OA CFM	SUPPLY FAN DATA			COOLING DATA						HEATING DATA					UNIT ELECTRICAL DATA				ACCESSORIES*						SELECTION BASED ON		REMARKS
				ESP Delta P (IN H_2O)	KW	RPM	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	IEER	STAGES	REFRIG.	ENTERING AIR			INPUT CAPACITY (MBH)	GAS TYPE		STAGES	ENTERING AIR		MCA	MOCP	VOLT	PH	EC=ECONOMIZER TS=THERMOSTAT EPTS=PROGRAM. TS RC=ROOF CURB SD=SMOKE DECT EH=EMERG. HEAT						MANUFACTURER	MODEL	
												DB °F	WB °F	COND. DB °F		N	P		DB °F	COND. DB °F					EC	RC	SD	HG	EPTS	EH			
RTU-1	LODGE	2900		1	1.0	1234	91.3	67.81	12.6	2	R410A	80.0	67	95	120	X		2	65	97	42	50	208	3	X	X	X		X		TRANE	YHC092F3RMA	



1 M002 CEILING FAN DETAIL
NOT TO SCALE



2 M002 WALL CAP DETAIL
NOT TO SCALE

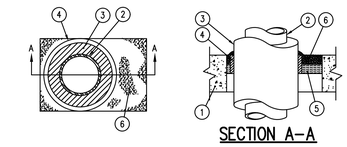


BELOW IS THE CHART ON THE MAXIMUM DRYER LENGTHS PER THE DRYER MANUFACTURER. IT IS UP TO THE HVAC CONTRACTOR TO VERIFY LINE LENGTHS PER THE INSTALLED PRODUCT AND COMPARE TO THE CHART BELOW. NOTE THAT THE LONGEST RUN IS AFFECTED BY THE TYPE OF WALL CAP USED. THE PREFERRED WALL CAP TYPE IS SHOWN UNDER WALL CAP SPECIFICATION. SMALLER OR DIFFERENT CONFIGURATIONS OF THE WALL CAP WILL AFFECT THE LINE LENGTH OF THE DRYER EXHAUST AND NEED TO BE EVALUATED PRIOR TO INSTALLATION.

NUMBER OF 90° ELBOWS	LINE LENGTH ALLOWED
0	35 FT
1	30 FT
2	25 FT

NOTE: (2) 45° ELBOWS = (1) 90° ELBOW

3 M002 DRYER DETAIL (STANDARD)
NOTE TO SCALE



1. Floor orWall Assembly – Min 4–1/2 in. thick lightweight or normal weight (100–150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*** Max area of square, rectangular or circular opening is 45 sq in. with max dimension of 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Pipe – Nom 3 in. diam (or smaller) Type L (or heavier) copper pipe or nom 2–1/2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe. One or more insulated pipes may be installed with a min clearance of 1/2 in. maintained between insulated pipes and with a min clearance of 1/4 in. maintained between insulated pipe and sides of through opening. Pipes to be rigidly supported on both sides of floor or wall assembly.

3. Pipe Insulation – Plastics# – Nom 3/4 in. thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin. **When nom 2-1/2 or 3 in. diam insulated steel or copper pipe is used, T Rating is 1/2 hr.When max 2 in. diam insulated steel or copper pipe is used,T rating is 1 hr.**
See **Plastics#** (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94–5VA may be used.

4. Fill,Void or Cavity Materials* - Wrap Strip – Nom 1/4 in. thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 2 in. wide strips. One nom 2 in. wide strip tightly–wrapped around pipe insulation (Item 3) with the foil side exposed and slid into through opening such that the top edge is flush with top surface of floor. When a single insulated pipe is installed in a circular through opening and when the max annular space between the insulated pipe and the sides of the through opening is 3/8 in., the wrap strip layer may be secured in place with pressure–sensitive tape. In all other situations, the wrap strip layer shall be secured in place with min No. 18 gauge galv steel tie wire. In wall assemblies, the wrap strip layer is to be installed on the insulated pipe in the same manner used for floor assemblies but shall be installed symmetrically on both sides of the wall.

3M COMPANY – Type FS–195+

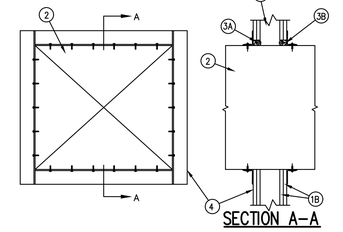
5. Packing Material – Min 1 in. thick mineral wool batt insulation firmly packed into opening with its top surface recessed min 1 in. from top surface of the floor. In wall assemblies, packing material to be firmly packed into opening on both sides of wall and recessed min 1 in. from wall surface. When a single insulated pipe (with wrap strip layer) is installed in a circular through opening and when the max annular space between the wrap strip layer and the sides of the through opening is 1/8 in., no forming material is required.

6. Fill,Void or Cavity Materials* – Caulk or Sealant – Applied to fill through opening to a min depth of 1 in. In floor assemblies, fill material to be installed flush with top surface of floor. In wall assemblies, fill material to be installed flush with wall surface on both sides of wall.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant.
(The W Rating applies only when FB–3000 WT sealant is used.)

*Bearing the UL Classification Marking

4 M002 PIPE THROUGH CONCRETE FIRESTOP DETAIL
NOT TO SCALE



1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3–1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3–1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

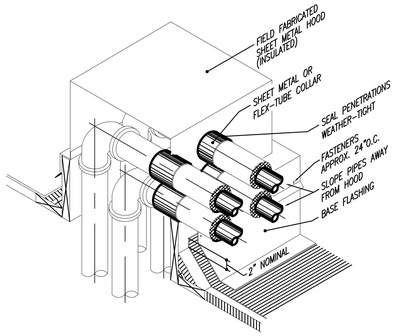
A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction–fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant

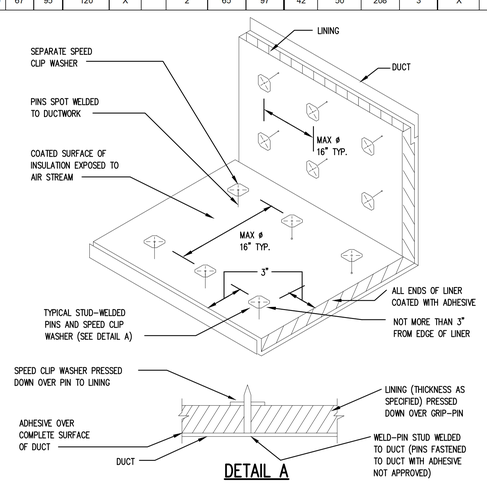
C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

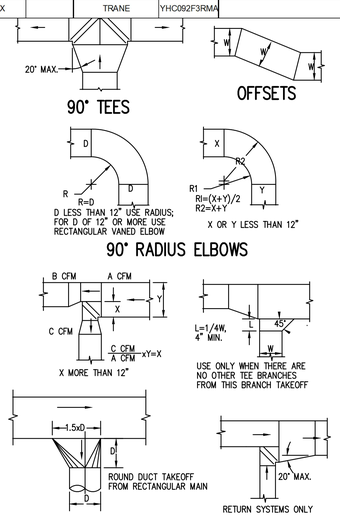
8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE



5 M002 REFRIGERANT PIPING ROOF DETAIL
NOT TO SCALE



6 M002 SOUND LINING INSTALLATION DETAIL
NOT TO SCALE



7 M002 DUCT DETAILS
NOT TO SCALE

1. Wall Assembly – The 1 and 2 hr fire rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing shall consist of steel channel studs to be min 3–1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Additional 3–1/2 in. (89 mm) wide steel studs shall be used to completely frame opening.
B. Gypsum Board* – Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max size of opening to be 1216 sq in. (188.5 cm2) with a max dimension of 38 in. (965 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – Nom 36 by 30 in. (914 by 762 mm) (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm) (point contact) to max 2 in. (51 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System – The details of the firestop system shall be as follows:

A. Packing Material (Optional) – Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction–fit into annular space for 2 hr rated wall assemblies only. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
B. Fill,Void or Cavity Material* - Caulk or Sealant – Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/4 in. (6 mm) diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant

C. Retaining Angles – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap wall surfaces of a min of 1 in. (25 mm). Angles attached to duct on both sides of wall with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Marking

8 M002 DUCT THROUGH GYPSUM FIRESTOP DETAIL
NOT TO SCALE

ALABAMA LICENSED NO. PE30316 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
	11-JUN-21	PERMIT SET

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

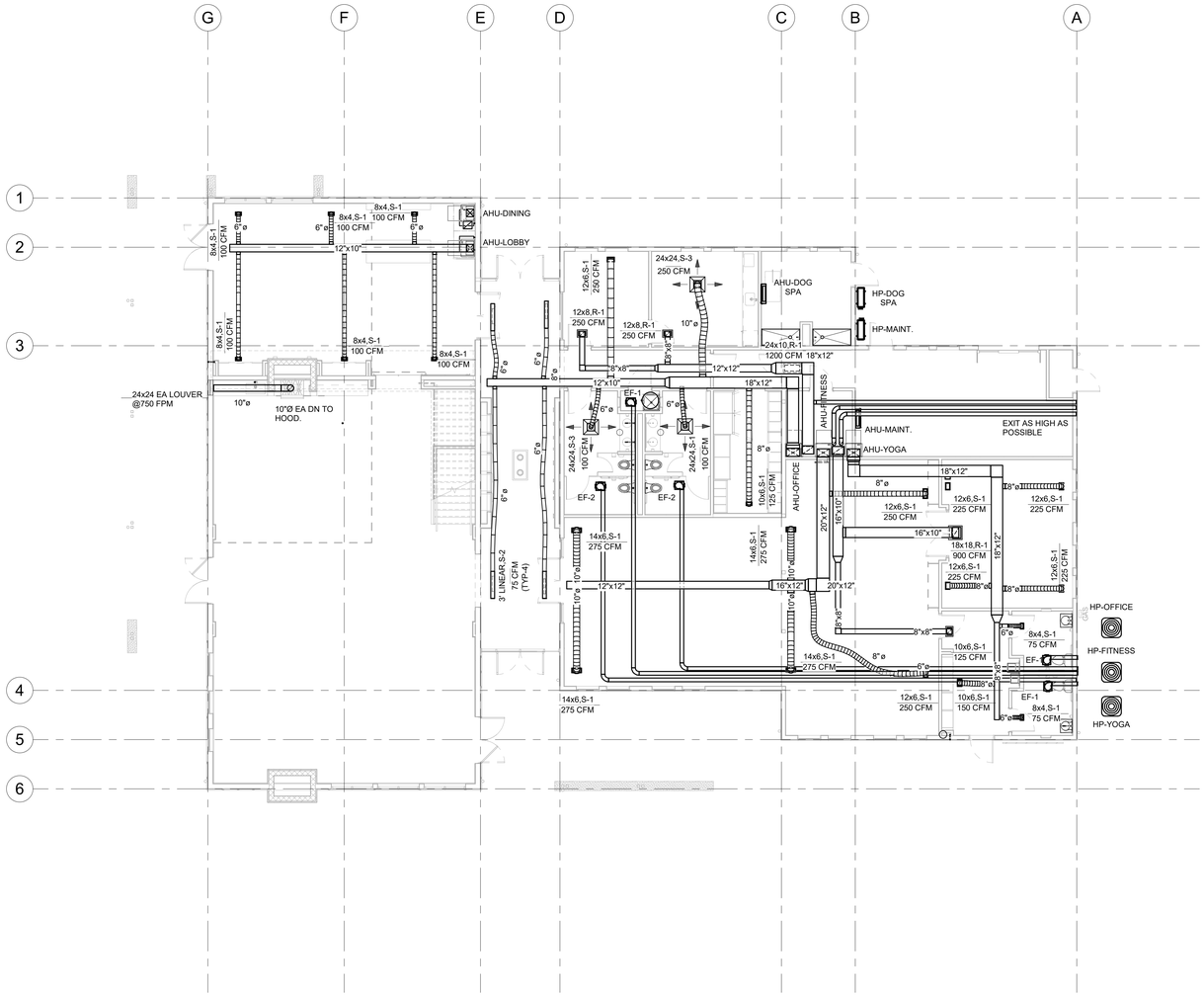
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	AS NOTED
DRAWN BY:	JCW
APPROVED BY:	JCW

MECHANICAL SCHEDULES AND DETAILS.

SHEET:

M7.002

TERRACES AT HIGH MOUNTAIN DEVELOPMENT - A7



1 MECHANICAL FIRST FLOOR PLAN
1/8" = 1'-0"

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

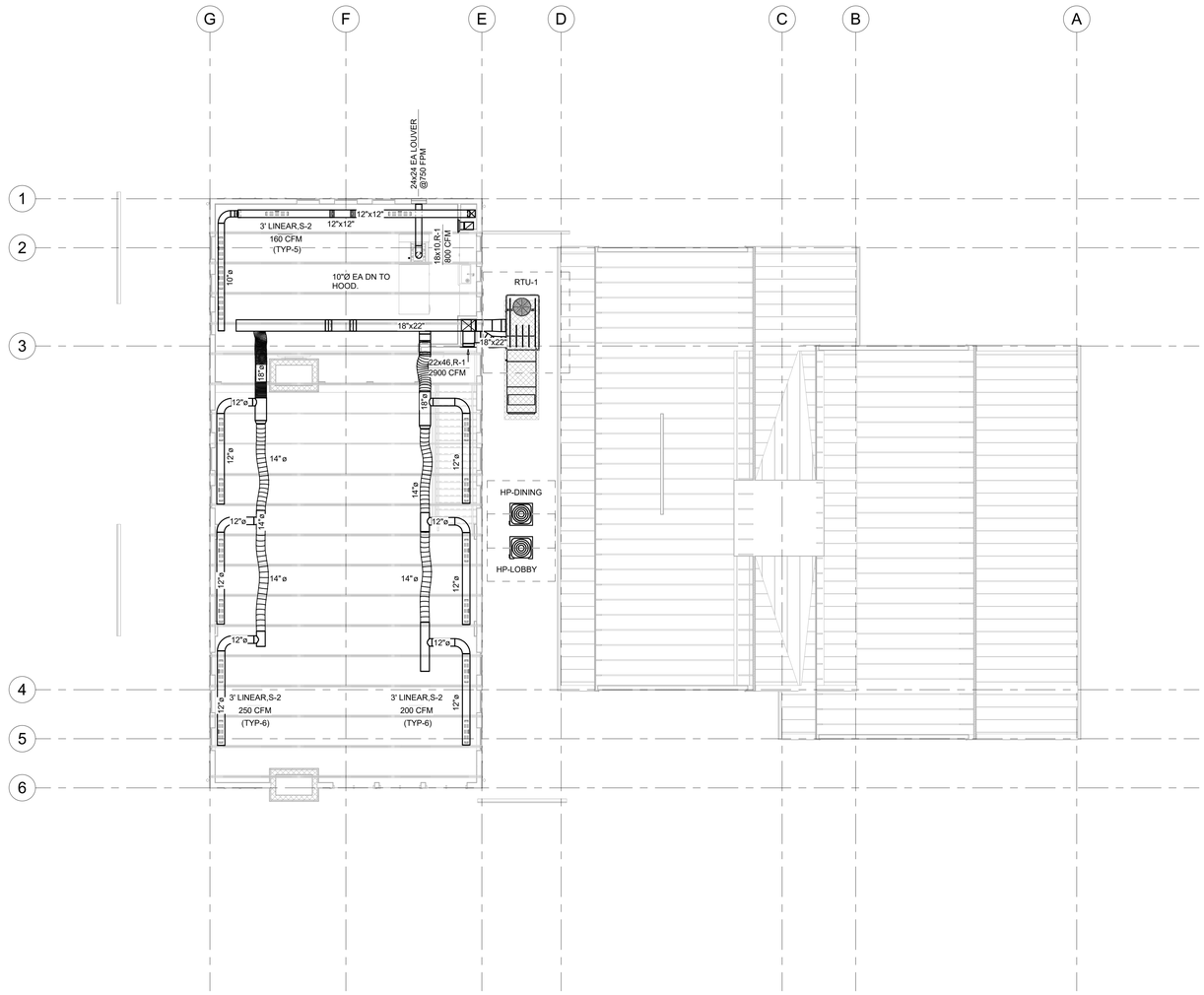
PROJECT #:	K118-C
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
FIRST FLOOR PLAN

SHEET:

M7.100

TERRACES AT HIGH MOUNTAIN - A7



1 MECHANICAL SECOND FLOOR
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118-C
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RAC
APPROVED BY:	PJO

MECHANICAL
SECOND FLOOR PLAN

SHEET:

M7.101

TERRACES AT HIGH MOUNTAIN - A7