

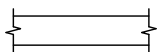
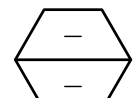
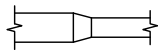
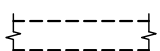
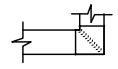
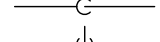
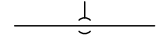
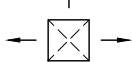
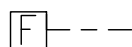
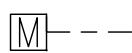
AIR CONDITIONING AND VENTILATION SPECIFICATIONS											
1.	DUCT DIMENSIONS SHOWN ON PLANS ARE INSIDE CLEAR DIMENSIONS. FIT OF DUCTWORK SHALL BE VERIFIED PRIOR TO FABRICATION.	16. EQUIPMENT AND CONDENSATE DRAINS SHALL BE SCHEDULE 80 PVC PIPE WITH SOLVENT WELDED JOINTS AND DRAINAGE PATTERN FITTINGS. PROVIDE CLEANOUTS AT EVERY CHANGE IN DIRECTION. ALL INTERIOR CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH MINIMUM 1" ARMAFLEX. PROVIDE PVC OR ALUMINUM JACKET FOR EXTERIOR PIPING. DRAINS SHALL BE ROUTED SO AS NOT TO CREATE A TRIPPING HAZARD. SLOPE LINES AT 1/4-INCH PER FOOT UNLESS OTHERWISE DIRECTED. PROVIDE A WATER SEAL WITH WATER COLUMN 1-INCH GREATER THAN THE TOTAL STATIC PRESSURE OF THE FAN IN INCHES OF WATER. TERMINATE AS INDICATED ON DRAWING.									
2.	INSULATED, FACTORY FABRICATED, FLEXIBLE DUCTWORK MAY BE UTILIZED AT RUNOUTS TO AIR DIFFUSERS. FLEXIBLE DUCTWORK SHALL CONSIST OF AN EXTERIOR REINFORCED LAMINATED VAPOR BARRIER, 1.5" FIBERGLASS INSULATION AND INTERIOR VINYL LINER (NON-PERFORATED) WITH SPRING STEEL WIRE HELIX. FIBERGLASS INSULATION SHALL HAVE A MAXIMUM CONDUCTIVITY OF 0.25 AT 75°F. FLEXIBLE DUCT ASSEMBLY SHALL HAVE A FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 OR LESS. FLEXIBLE DUCT TO FLEXIBLE DUCT CONNECTIONS SHALL BE MADE WITH FACTORY FABRICATED STEEL COLLARS. SECURE TO RIGID DUCTWORK AND AIR DEVICES WITH SCREWS AND DRAWBANDS. LENGTH OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO 5' AND SHALL NOT BE COMPRESSED. FLEXIBLE DUCTWORK SHALL NOT BE USED FOR ELBOWS AND SHALL NOT PASS THROUGH WALLS.	17. REFRIGERANT PIPING: DIMENSIONS AND MATERIAL REQUIREMENTS FOR PIPE, PIPE FITTINGS AND COMPONENTS SHALL CONFORM TO ASHRAE 15 AND ANSI B31.5 AND SHALL BE COMPATIBLE WITH FLUIDS USED AND CAPABLE OF WITHSTANDING THE PRESSURES AND TEMPERATURES OF THE SERVICE. PIPE, TUBING AND COMPONENTS USED FOR REFRIGERANT SERVICE SHALL BE CLEANED, SEALED, CAPPED OR PLUGGED PRIOR TO SHIPMENT FROM THE MANUFACTURER'S PLANT. TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS BRAZED WITH SILVER OR COPPER PHOSPHORUS ALLOYS. SUCTION LINES SHALL BE INSULATED WITH 1" FLEXIBLE ELASTOMERIC THERMAL INSULATION, ARMAFLEX OR APPROVED EQUAL. ALL EXTERIOR INSULATION SHALL BE WRAPPED WITH AN ALUMINUM JACKET. ALL UNDERGROUND INSULATION SHALL BE 1" CELLULAR GLASS WITH PIT WRAP. PROVIDE PROSET SYSTEMS U.L. FIRE RATED SLEEVE/COUPLING PENETRATORS FOR EACH PIPE PENETRATION PASSING THROUGH FIRE RATED FLOORS, WALLS, PARTITION OR FLOOR CEILING ASSEMBLIES. ALL PENETRATORS SHALL COMPLY WITH ASTM E-814 OR U.L. 1479 FIRE TEST STANDARDS. SLEEVE PENETRATORS SHALL HAVE A BUILT IN ANCHOR RING FOR WATER PROOFING AND ANCHORING INTO CONCRETE POURS OR USE THE SPECIAL FIT CORED HOLE PENETRATOR FOR CORED HOLES. INSTALL PIPING SYSTEM IN ACCORDANCE WITH ANSI STANDARD B9.1 AND B31.5 AND WITH ASHRAE RECOMMENDATIONS. AFTER COMPLETION OF PIPING INSTALLATION AND PRIOR TO INITIAL OPERATION, CONDUCT TESTS ON PIPING SYSTEM. FURNISH MATERIALS AND EQUIPMENT REQUIRED FOR TESTS. TEST SYSTEMS FOR TIGHTNESS AND IF NECESSARY, CORRECT BY REMAKING OR RE-WELDING JOINTS. REFRIGERANT SYSTEM TEST PRESSURES FOR TIGHTNESS SHALL NOT BE LESS THAN TEST PRESSURES SPECIFIED IN ANSI/ASHRAE 15 OR ASME/ANSI B31.5. AFTER COMPLETION OF LEAK TESTING OF REFRIGERANT SYSTEM, REMOVE ALL AIR AND MOISTURE FROM SYSTEM WITH A HIGH VACUUM PUMP. PROVIDE INITIAL CHARGE OF R-410A REFRIGERANT.									
3.	DUCT HANGERS SHALL BE CONSTRUCTED OF GALVANIZED STEEL (UNLESS OTHERWISE STATED). DUCTS SHALL BE SUPPORTED AND CONNECTED TO THE STRUCTURE PER SMACNA DUCT CONSTRUCTION STANDARDS. HANGERS AND SUPPORTS FOR GREASE DUCT SHALL BE OF NONCOMBUSTIBLE MATERIALS. FLEXIBLE DUCTS SHALL BE SUPPORTED WITH GALVANIZED STRAPS (UNLESS OTHERWISE STATED).	18. PIPE HANGERS FOR INSULATED PIPE SIZES 1/2" TO 1-1/2" SHALL BE ADJUSTABLE, STEEL, BAND TYPE. PIPE HANGERS FOR INSULATED PIPE SIZES 2" AND OVER SHALL BE ADJUSTABLE, STEEL CLEVIS TYPE. SHIELDS SHALL BE USED WHERE HANGER SUPPORTS INSULATED PIPE. SHIELDS SHALL BE 18 GAGE GALVANIZED STEEL OVER INSULATION 180 DEGREES AND A MINIMUM OF 12 INCHES LONG. PIPE HANGERS FOR BARE PIPE SHALL BE ADJUSTABLE, MALLEABLE STEEL, SPLIT RING TYPE. BARE COPPER PIPE SHALL BE PROTECTED FROM CORROSION BY TRISOLATOR OR SIMILAR PRODUCT. HANGERS SHALL BE LOCATED 12" MAXIMUM FROM ANY CHANGE IN DIRECTION AND SPACED AS FOLLOWS FOR STRAIGHT RUNS.									
4.	HEAVY FLEXIBLE CONNECTIONS SHALL BE FURNISHED AND INSTALLED AT DUCT CONNECTIONS TO FANS AND WHERE INDICATED. FLEXIBLE CONNECTIONS SHALL BE 6" MINIMUM AND 10" MAXIMUM IN LENGTH. MATERIAL SHALL BE VENTFAB MANUFACTURED BY VENTFABRICS, METAL-FAB MANUFACTURED BY DURO-DYNE OR APPROVED EQUAL.	<table><tr><th>PIPE SIZE MAX.</th><th>HANGER SPACING</th><th>HANGER ROD DIAMETER</th></tr><tr><td>1/2" TO 1-1/4"</td><td>6'</td><td>1/4"</td></tr><tr><td>1-1/2" TO 2"</td><td>8'</td><td>1/4"</td></tr></table>	PIPE SIZE MAX.	HANGER SPACING	HANGER ROD DIAMETER	1/2" TO 1-1/4"	6'	1/4"	1-1/2" TO 2"	8'	1/4"
PIPE SIZE MAX.	HANGER SPACING	HANGER ROD DIAMETER									
1/2" TO 1-1/4"	6'	1/4"									
1-1/2" TO 2"	8'	1/4"									
5.	MANUAL VOLUME DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE INDICATED AT SUPPLY AIR DUCT RUNOUTS TO AIR DIFFUSERS AND GRILLES AS NEAR AS POSSIBLE TO THE TRUNK DUCT. MANUAL VOLUME DAMPERS FOR RECTANGULAR DUCT SHALL BE CONSTRUCTED OF ALUMINUM AND BE THE OPPOSED BLADE TYPE. STAND-OFFS TO OUTSIDE OF INSULATION SHALL BE PROVIDED FOR MANUAL VOLUME DAMPERS IN INSULATED DUCTS. LOCKING AND INDICATING QUADRANTS SHALL BE PROVIDED WHERE DAMPER IS ACCESSIBLE. REMOTE CEILING OPERATORS SHALL BE FURNISHED AND INSTALLED FOR DAMPERS ABOVE INACCESSIBLE CEILINGS. OPERATORS SHALL BE GEAR AND LINKAGE TYPE EQUAL TO YOUNG REGULATOR WITH CHROME PLATED CEILING ESCUTCHEON AND COVER PLATE. PROVIDE RUSKIN OR APPROVED EQUAL.	29. ALL PIPE PENETRATIONS THRU EXISTING OR NEW EXTERIOR WALLS SHALL BE SLEEVED AND WEATHER PROOFED TO PREVENT LEAKING INTO THE BUILDING.									
6.	ROOF CURB ASSEMBLIES SHALL CONSIST OF HEAVY GAUGE GALVANIZED STEEL(UNLESS OTHERWISE STATED) ROOF CURB, UTILIZED CONSTRUCTION, WITH INTEGRAL BASE PLATE, 3 LB DENSITY INSULATION AND 2 X 2 NAILER. ROOF CURB SHALL BE AS MANUFACTURED BY PATE OR EQUAL.										
7.	SUPPLY AND RETURN AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL (UNLESS OTHERWISE STATED) PER SMACNA DUCT CONSTRUCTION STANDARDS AND CHAPTER 1, AIR DUCT DESIGN, 2012 EQUIPMENT VOLUME ASHRAE HANDBOOK. DUCTWORK SHALL BE CONSTRUCTED FOR THE PRESSURE CLASS REQUIRED TO MEET SYSTEM STATIC PRESSURE INDICATED ON THESE DRAWINGS. SPIRAL LOCK-FORMED ROUND DUCT MAY BE UTILIZED. TRANSVERSE JOINTS AND LONGITUDINAL SEAMS SHALL BE SEALED AIR-TIGHT WITH MASTIC OR APPROVED SEALANT COMPOUND AROUND ALL JOINTS. RADIUSED ELBOWS OR MITERED ELBOWS WITH SINGLE THICKNESS TURNING VANES SHALL BE UTILIZED. TURNING VANES SHALL BE SUPPORTED AT INTERVALS OF 36" MAXIMUM. TURNING VANE RUNNERS SHALL HAVE A VANE IN EVERY SLOT AND SHALL CONFORM TO SMACNA DUCT CONSTRUCTION STANDARDS.										
8.	ALL SUPPLY AIR AND RETURN DUCT WORK SHALL BE WRAPPED WITH 1-1/2" INCH THICK DUCT WRAP WITH VAPOR BARRIER – OWENS CORNING FIBERGLASS DUCT WRAP WITH FOIL-SCRIM-KRAFT FACING. INSULATION SHALL BE SECURED WITH WIRE TIES AT 12" ON CENTER OR WITH SELF-SEALING LAP AND TAPE JOINTS 3" ON CENTER AT FITTINGS. JOINTS SHALL BE COVERED WITH 3" WIDE FOIL REINFORCED KRAFT TAPE. ADHESIVE OR MECHANICAL FASTENERS SHALL BE USED WHERE NECESSARY TO PREVENT SAGGING. VAPOR BARRIER PENETRATIONS BY MECHANICAL FASTENERS SHALL BE SEALED WITH VAPOR BARRIER ADHESIVE. INSULATION SHALL STOP AND POINT AROUND ACCESS DOORS AND DAMPER OPERATORS TO ALLOW OPERATION WITHOUT DISTURBING WRAPPING.										
9.	AIR DISTRIBUTION DEVICES: STORMPROOF LOUVER: STATIONARY DRAINABLE BLADE TYPE CONSTRUCTED OF EXTRUDED ALUMINUM. LOUVERS SHALL BE COMPATIBLE WITH THE ADJACENT SUBSTRATE AND INSTALLED WITH INSECT SCREEN. RUSKIN OR APPROVED EQUAL. PAINT EXPOSED PORTIONS OF LOUVER TO MATCH THE SURROUNDING SURFACES. ROOF CAP: GREENHECK OR EQUAL, LOW PROFILE ROOF CAP, ALL ALUMINUM CONSTRUCTION, PAINT TO MATCH ROOF, PROVIDE WITH INSECT SCREEN. SIZING SHALL BE AS RECOMMENDED BY THE MANUFACTURER BASED ON SUPPLY OR EXHAUST AIR AND THE VOLUME OF AIR MOVING THROUGH THE DEVICE.										
10.	ALL CEILING DIFFUSERS AND REGISTERS IN FIRE RATED CEILINGS SHALL BE CONSTRUCTED OF STEEL. WHERE FIRE SMOKE DAMPERS ARE REQUIRED, PROVIDE RUSKIN FSD FIRE DAMPER OR APPROVED EQUAL. CEILING RADIATION DAMPERS SHALL BE RUSKIN CFD OR APPROVED EQUAL. PROVIDE DIFFUSERS AND REGISTERS WITH THERMAL BLANKETS BETWEEN DAMPERS AND FIRE RATED CEILING. INSTALLATION SHALL BE PER MANUFACTURER'S UL LISTED INSTALLATION INSTRUCTIONS.										
11.	DUCT SMOKE DETECTORS SHALL BE PROVIDED FOR UNITS PROVIDING MORE 2000 CFM. DUCT SMOKE DETECTORS SHALL BE LOCATED ON THE SUPPLY DUCT PRIOR TO ANY BRANCHES AND AIR TERMINALS.										
12.	CONTROLS: PROVIDE THERMOSTAT IN RETURN AIR DUCT WITH SUBBASE MOUNTED ON THE WALL AS INDICATED ON DRAWINGS. EACH DUCTLESS SPLIT INDOOR UNIT SHALL BE PROVIDED WITH A WIRED REMOTE CONTROLLER AS INDICATED ON DRAWINGS. PROVIDE CONTROL WIRING PER MANUFACTURER'S WRITTEN INSTRUCTION, RUN CONCEALED IN FINISHED SPACE.										
13.	VIBRATION ISOLATORS: SPRING ISOLATORS WITH A MINIMUM STATIC DEFLECTION OF 1.0 INCHES OR AS REQUIRED BY THE MANUFACTURER. KORFUND VIBRO-ISOLATOR, SERIES VX OR EQUAL. KORFUND NEOPRENE PAD "KORPAD" OR EQUAL.										
14.	AFTER THE SYSTEM IS ENERGIZED, OPERATE THE EQUIPMENT TO TEST FOR PROPER OPERATION AND TO ADJUST THE DAMPERS. CLEAN UP EQUIPMENT AS NECESSARY. FURNISH WRITTEN INSTRUCTIONS FOR NORMAL USAGE OF THE WALL THERMOSTAT CONTROLLER AND OWNER'S RESPONSIBILITIES CONCERNING NORMAL SERVICING OF THE INSTALLED EQUIPMENT.										
15.	BALANCE, ADJUST, AND TEST: AN INDEPENDENT TEST AND BALANCE FIRM WHICH IS AABC OR NEBB CERTIFIED SHALL BE RETAINED FOR CHECK/TEST-START-UP AND TESTING AND BALANCING OF AIR AND WATER SYSTEMS. THE TEST REPORT SHALL BE IN A FORMAT APPROVED FOR SYSTEMS OF THIS TYPE AND COMPLEXITY. QUALIFICATIONS OF INDEPENDENT TEST AND BALANCE FIRM SHALL BE SUBMITTED FOR REVIEW. TAB WORK SHALL COMPLY WITH THE LATEST PROCEDURAL STANDARDS AND SMACNA'S TAB PROCEDURAL GUIDE.										
16.	TEST MECHANICAL SYSTEMS TO DETERMINE QUANTITATIVE PERFORMANCE. COMPARE OBSERVED QUANTITIES WITH DESIGN QUANTITIES. ADJUST SYSTEMS TO PRODUCE OBSERVED QUANTITIES THAT WILL CONFORM TO DESIGN QUANTITIES WITHIN TOLERANCES SPECIFIED.										

GENERAL MECHANICAL SPECIFICATIONS	
1.	PROVIDE COMPLETE AND OPERATING SYSTEMS AS SPECIFIED AND INDICATED ON DRAWINGS. "PROVIDE" SHALL MEAN "FURNISH AND INSTALL" WHEN USED HEREIN.
2.	WORK SHALL COMPLY WITH ALL LOCAL CODES AND ORDINANCES INCLUDING: ANSI B9.1/ASHRAE 15 – SAFETY CODE FOR MECHANICAL REFRIGERATION; HAWAII DOH CHAPTER 39, TITLE 11 – AIR CONDITIONING AND VENTILATION; HAWAII COUNTY BUILDING CODE; ASHRAE 62–2016 – VENTILATION STANDARD;SMACNA HVAC DUCT CONSTRUCTION STANDARDS; 2018 INTERNATIONAL ENERGY CONSERVATION CODE.
3.	CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS AND FEES.
4.	MATERIALS AND EQUIPMENT SHALL BE NEW AND GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE. MATERIALS AND EQUIPMENT SHALL BE AS SCHEDULED OR EQUAL, MEETING THE REQUIREMENTS OF THE SPECIFICATION. MATERIALS AND EQUIPMENT SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO ORDER RELEASE. WORK SHALL BE GUARANTEED AGAINST DEFECTIVE WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT. WARRANTY WORK SHALL BE COMPLETED AT NO EXTRA CHARGE TO THE OWNER. FURNISH MANUFACTURER'S PRODUCT WARRANTY CERTIFICATES IN A BINDER.
5.	PRIOR TO COMMENCEMENT OF WORK AND ORDERING OF EQUIPMENT, CONTRACTOR SHALL SUBMIT 6 BOUND SETS OF PROPOSED MATERIALS AND EQUIPMENT. RECORD DRAWINGS, OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE SUBMITTED AS REQUIRED BY OWNER'S REPRESENTATIVE UPON COMPLETION.
6.	DRAWINGS SHALL NOT BE SCALED.
7.	PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. PROVIDE FIRE DAMPERS ON ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
8.	MECHANICAL EQUIPMENT SHALL BE SECURED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND APPLICABLE SECTIONS OF THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
9.	ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS PRIOR TO ORDER RELEASE. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
10.	DUCTWORK, PIPING AND EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE SMACNA SEISMIC RESTRAINT MANUAL – GUIDELINES FOR MECHANICAL SYSTEMS.
11.	ELECTRICAL: CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. OBTAIN EQUIPMENT MANUFACTURER'S CONTROL WIRING DIAGRAMS FOR THE EQUIPMENT FURNISHED. ELECTRICAL EQUIPMENT SHALL BE FURNISHED WITH WEATHER PROOF (NEMA 4X WHEN POSSIBLE) ENCLOSURES FOR OUTDOOR INSTALLATIONS AND OTHERWISE AS INDICATED ON PLANS.
12.	FIELD INVESTIGATIONS: VISIT THE WORK-SITE AND BECOME FULLY AWARE OF ALL EXISTING CONDITIONS. INVESTIGATE THE CONTRACT DOCUMENTS AND MAKE PROPER PROVISIONS TO AVOID INTERFERENCES OR CONSTRUCTION DELAYS. DETERMINE THE EXACT ROUTE OF EACH DUCT AND PIPE. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.
13.	WORK CONDITIONS: FIELD VERIFY CONDITIONS AND DIMENSIONS FOR INTERFERENCES. INSTALLED WORK SHALL BE PROTECTED DURING CONSTRUCTION AND CLEANED FOR FINAL INSPECTION. TOUCH-UP PAINT ALL RAW EDGES OF METAL EXPOSED TO WEATHER. COORDINATE WITH OTHER TRADES FOR PIPE SLEEVES AND INSTALLATION OF EQUIPMENT SUPPORTS.
14.	REQUIREMENTS: PERFORM WORK USING PERSONNEL SKILLED IN THE TRADE INVOLVED. PROVIDE COMPETENT SUPERVISION. FURNISH NEW EQUIPMENT, MATERIALS AND ACCESSORIES BEARING THE MANUFACTURER'S IDENTIFICATION AND CONFORMING TO THE RECOGNIZED COMMERCIAL STANDARDS.
15.	EQUIPMENT INSTALLATION: INSTALL EQUIPMENT IN THE SPACE ALLOTTED WITH SUFFICIENT CLEARANCE FOR PROPER OPERATION AND MAINTENANCE AND WITH SUFFICIENT HEAD CLEARANCE ACCORDING TO THE BUILDING CODE. WHERE EQUIPMENT DIFFERS IN ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, PROVIDE ALL REQUIRED CHANGES IN PIPING, SUPPORTS AND APPURTENANCES. PROVIDE ACCESS PANELS WHERE REQUIRED FOR MAINTENANCE ACCESS TO EQUIPMENT.

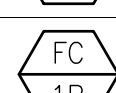
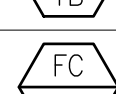
MECHANICAL ABBREVIATIONS			
(E)	EXISTING	FPM	FEET PER MINUTE
(D)	DEMOLISH	FT	FEET
(N)	NEW	HTR	HEATER
(R)	RELOCATED	HZ	HERTZ
A	AMPERE	KW	KILOWATT
A/C	AIR CONDITIONING	LAT	LEAVING AIR TEMPERATURE
ABV	ABOVE	LBS	POUNDS
ADJ	ADJUSTABLE	MAN	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
ACCU	AIR COOLED CONDENSING UNIT	MCA	MINIMUM CIRCUIT AMPS
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
APPROX	APPROXIMATELY	MIN	MINIMUM
ARCH	ARCHITECT	MOCP	MAXIMUM OVERCURRENT PROTECTION
BLDG	BUILDING	MTD	MOUNTED
BHP	BRAKE HORSEPOWER	NOM	NOMINAL
BV	BALL VALVE	OA	OUTSIDE AIR
CAP	CAPACITY	PH	PHASE
CD	CEILING DIFFUSER	PLMB	PLUMBING
CLG	CEILING	QTY	QUANTITY
CFM	CUBIC FEET PER MINUTE	REQ'D	REQ'D
CONC	CONCRETE	RM	ROOM
CONN	CONNECT	RA	RETURN AIR
CONT	CONTINUATION	RAR	RETURN AIR REGISTER
DB	DRY BULB	RLA	RUNNING LOAD AMPS
DBA	DECIBELS (A-WEIGHTED)	SA	SUPPLY AIR
DN	DOWN	SQ	SQUARE
EA	EXHAUST AIR	SS	STAINLESS STEEL
EAT	ENTERING AIR TEMPERATURE	TDH	TOTAL DISCHARGE HEAD
EF	EXHAUST FAN	TEMP	TEMPERATURE
ELEC	ELECTRICAL	TYP	TYPICAL
ER	EXHAUST REGISTER	V	VOLT
ESP	EXTERNAL STATIC PRESSURE	VAV	VARIABLE AIR VOLUME
EXH	EXHAUST	VD	MANUAL VOLUME DAMPER
EXIST	EXISTING	VTR	VENT TO ROOF
FC	FAN COIL	W	WATT
FD	FIRE DAMPER	W/	WITH
FLA	FULL LOAD AMPS	WB	WET BULB
FLEX	FLEXIBLE	ZD	ZONE DAMPER
FLR	FLOOR		

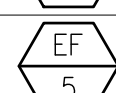
HAWAII COUNTY ENERGY CODE		
2018 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES HAR 3-181.1		
RESIDENTIAL BUILDING ENERGY EFFICIENCY STANDARDS		
I CERTIFY THAT THE DESIGN IS IN CONFORMANCE WITH THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE RESIDENTIAL PROVISIONS OF THE 2018 IECC WITH AMENDMENTS PER HAR CHAPTER 3-181.1:		
COMPLIANCE METHOD		
	TROPICAL ZONE. R401.2.1	
	POINTS OPTION. R407	
X	PREScriptive. R402	
	POINTS OPTION. R407	
	SIMULATED PERFORMANCE ALTERNATIVE. R405	
	ENERGY RATING INDEX COMPLIANCE ALTERNATIVE. R406	
INFORMATION IN CONSTRUCTION DOCUMENTS		YES N/A
ENVELOPE		X
ROOF INSULATION R-VALUE		X
ROOF INSULATION TYPE AND LOCATION		X
ROOF MEMBRANE SOLAR REFLECTANCE AND THERMAL EMITTANCE		X
WALL INSULATION R-VALUE		X
WALL INSULATION TYPE AND LOCATION		X
WINDOW AND SKYLIGHT SHGC		X
AIR LEAKAGE TESTING REQUIREMENT		X
AIR CONDITIONING		
AIR CONDITIONING EQUIPMENT CAPACITY AND EFFICIENCY		X
PROGRAMMABLE THERMOSTAT		X
DUCT INSULATION R-VALUE		X
DUCT LEAKAGE TESTING REQUIREMENT		X
ELECTRICAL		
LIGHTING FIXTURE LOCATIONS		X
LAMP TYPE		X
CEILING FANS		X
WHOLE-HOUSE FAN		X
NOTES:		
SIGNATURE: 		
DATE: 11/10/2022		
NAME: NIMR Y. TAMIMI		
TITLE: MECHANICAL ENGINEER		
LICENSE NO.:7936-M		

 NIMR Y. TAMIMI LICENSED PROFESSIONAL ENGINEER Exp. 04/30/24 No. 7936-M HAWAII, U.S.A. THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.  SIGNATURE		
GENERAL CONTRACTOR:		
REVISIONS	NO.	DESCRIPTION
	1	FINAL DR SET
DATE		10/12/22
SINGLE FAMILY RESIDENCE LOT 23 NOHEA, PHASE 1		
TMK: 3-6-8-043-023		
NOHEA AT MAUNA LANI, LLC		
16130 VENTURA BLVD, STE 510		
ENCINO, CA 91436 2538		
PH: 805-494-7704 FAX: 805-494-1226		
CRAIG MONAGHAN, ARCHITECT		
4522 LOWER DR, LAKE OSWEGO, OR 97035		
PH: 503-522-9000		
monaghan.craig@gmail.com		
DATE		
10/12/22		
SCALE		
As indicated		
SHEET TITLE:		
MECHANICAL SYMBOLS, & ABBREVIATION		
SHEET NUMBER:		
M1.0		

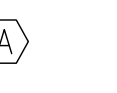
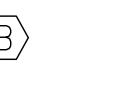
MECHANICAL SYMBOLS			
	SHEET METAL DUCTWORK		EQUIPMENT TAG
	DUCTWORK TRANSITION		CO2 SENSOR MOUNTED IN DUCT
	DEMOLITION		SMOKE DETECTOR MOUNTED IN DUCT
	SUPPLY OR OA DUCT ELBOW DOWN		DETAIL DESIGNATION
	RETURN OR EXHAUST DUCT ELBOW DOWN		CEILING ACCESS PANEL
	45° BOOT BRANCH TAKEOFF		PIPE RISER TO UPPER LEVEL
	DUCT CONTINUATION		PIPE ELBOW UP/DOWN
	ELBOW WITH TURNING VANES		PIPE BRANCH TOP CONNECTION
	SUPPLY OR OA DUCT UP		PIPE BRANCH BOTTOM CONNECTION
	RETURN AIR OR EXHAUST DUCT UP		PIPE UNION
	EXHAUST AIR DUCT UP		POINT OF CONNECTION
	SUPPLY AIR DIFFUSER		POINT OF DISCONNECTION
	RETURN AIR OR EXHAUST REGISTER		
	VOLUME DAMPER		
	FIRE DAMPER OR CEILING RADIATION DAMPER		
	COMBINATION FIRE SMOKE DAMPER		
	MOTORIZED DAMPER		
	BACKDRAFT DAMPER		
	THERMOSTAT MOUNTED AT MAX +48° A.F.F. TO THE TOP OF THE CONTROL DEVICE PLATE		

AIR COOLED CONDENSING UNIT SCHEDULE										
UNIT NO.	AREA SERVED	NOMINAL CAPACITY (TONS)	COMPRESSOR QTY/TYPE	CONDENSER EAT (°F)	ELECTRICAL			WEIGHT (LBS)	SYSTEM SEER	REMARKS
					V/HZ/PH	MCA	MOP			
 1	FC-1A, FC-1B	4.0	1/INVERTER DRIVEN SCROLL	100	208-230V/60/1	29	44	271	16.5	mitsubishi pumy OR APPROVED EQUAL.
 2	FC-2A,2B,2C	3.0	1/INVERTER DRIVEN SCROLL	100	208-230V/60/1	29	30	271	18.3	mitsubishi pumy OR APPROVED EQUAL.

FAN COIL UNIT SCHEDULE																	
UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE				ELECTRICAL DATA			UNIT WEIGHT (LB)	MAX UNIT HEIGHT (IN)	REMARKS
								ENT. °F		LVG. °F		MCA	MOP	V/HZ/PH			
								DB	WB	DB	WB						
 1A	GREAT ROOM	735	100	24,000	21,300	16,300	0.6	74.8	64.5	57.0	56.1	3.0	15	208-230V/60/1	113	17"	MITSUBISHI MULTI-POSITION OR APPROVED EQUAL. PROVIDE WITH BUILT IN CONDENSATE LIFT.
 1B	MASTER BED/BATH	875	200	30,000	23,000	14,500	0.6	79.4	68.4	56.8	55.9	4.13	15	208-230V/60/1	141	21"	MITSUBISHI MULTI-POSITION OR APPROVED EQUAL. PROVIDE WITH BUILT IN CONDENSATE LIFT.
 2A	LAUNDRY/KITCHEN	585	50	18,000	12,100	9,900	0.6	74.6	63.8	56.7	55.7	3.0	15	208-230V/60/1	113	17"	MITSUBISHI MULTI-POSITION OR APPROVED EQUAL. PROVIDE WITH BUILT IN CONDENSATE LIFT.
 2B	GUEST 1 & MULTI-PURPOSE	585	75	18,000	14,700	11,600	0.6	75.0	64.4	57.1	56.1	3.0	15	208-230V/60/1	113	17"	MITSUBISHI MULTI-POSITION OR APPROVED EQUAL. PROVIDE WITH BUILT IN CONDENSATE LIFT.
 2C	GUEST SUITE 2	400	50	12,000	7,900	6,100	0.6	75.5	64.8	57.1	56.2	3.0	15	208-230V/60/1	113	17"	MITSUBISHI MULTI-POSITION OR APPROVED EQUAL. PROVIDE WITH BUILT IN CONDENSATE LIFT.

EXHAUST FAN SCHEDULE												
UNIT NO.	AREA SERVED	CFM	STATIC PRESSURE (IN. W.G.)	MOTOR DATA		DRIVE	RPM	TYPE	WEIGHT (LBS.)	SOUND LEVEL (SONES)	OPERATION	REMARKS
				HP/W	V/HZ/PH							
 1	LAUNDRY/PANTRY	50	0.375	7.2W	120/60/1	ECM DIRECT	1093	CEILING CENTRIFUGAL	11	0.4	SWITCH	PANASONIC WHSIPERCEILING DC SMARTFLOW OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER.
 2	MASTER BATH	130	0.375	25.4W	115/60/1	DIRECT	1105	CEILING MOUNTED	13	<1.5	SWITCH	PANASONIC WHISPERGREEN OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER.
 3	MASTER WC	50	0.375	7.2W	120/60/1	ECM DIRECT	1093	CEILING CENTRIFUGAL	11	0.4	SWITCH	PANASONIC WHSIPERCEILING DC SMARTFLOW OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER.
 4	BATH 1	50	0.375	7.2W	120/60/1	ECM DIRECT	1093	CEILING CENTRIFUGAL	11	0.4	SWITCH	PANASONIC WHSIPERCEILING DC SMARTFLOW OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER.
 5	BATH 2	50	0.375	7.2W	120/60/1	ECM DIRECT	1093	CEILING CENTRIFUGAL	11	0.4	SWITCH	PANASONIC WHSIPERCEILING DC SMARTFLOW OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER.

BOOSTER FAN SCHEDULE												
UNIT NO.	AREA SERVED	CFM	STATIC PRESSURE (IN. W.G.)	MOTOR DATA		DRIVE	RPM	TYPE	WEIGHT (LBS.)	SOUND LEVEL (SONES)	OPERATION	REMARKS
				HP/W	V/HZ/PH							
B 1	DRYER	188 (ADJ.)	VARIES	65 W	120/1/60	DIRECT	2175	CENTRIFUGAL INLINE	9	—	FAN MOTOR AND PRESSURE SWITCH	FANTECH DBF OR APPROVED EQUAL

AIR TERMINAL SCHEDULE	
SUPPLY AIR	DESCRIPTION
 A	ALL ALUMINUM CONSTRUCTION, SURFACE MOUNTED, ALUMINUM OPPOSED BLADE VOLUME DAMPER. TITUS TDC-AA OR APPROVED EQUAL.
 B	ALL ALUMINUM CONSTRUCTION, SURFACE MOUNTED, OFF-WHITE BAKED ENAMEL FINISH. TITUS 300FL-AA OR APPROVED EQUAL. PROVIDE WITH 45 DEGREE DEFLECTION.
RETURN/EXHAUST AIR	DESCRIPTION
①	ALL ALUMINUM CONSTRUCTION, SURFACE MOUNTED, ALUMINUM OPPOSED BLADE VOLUME DAMPER, TITUS 350FL OR APPROVED EQUAL.
②	ALL ALUMINUM CONSTRUCTION, SURFACE MOUNTED, ALUMINUM OPPOSED BLADE VOLUME DAMPER, TITUS 350FL OR APPROVED EQUAL.
X/X XX X-W AIR TERMINAL SIZE (IN.) DIRECTIONAL THROW (SUPPLY ONLY) AIR FLOW (CFM) AIR TERMINAL SYMBOL AIR TERMINAL NOTES 1. ALL AIR DEVICES SHALL BE FULLY INSULATED SUCH THAT NO METAL PORTIONS OF THE DIFFUSER ARE EXPOSED IN UNCONDITIONED AREAS. PROVIDE MOLDED FIBERGLASS INSULATION DIFFUSER BLANKET FOR 24"X24"LAY-IN MODULES. DIFFUSER BLANKET SHALL HAVE FOIL BACK VAPOR BARRIER WITH 6.0 R-VALUE OR GREATER. 2. ALL AIR DEVICES SHALL BE UNIFORM IN COLOR. OWNER'S REPRESENTATIVE TO CONFIRM COLOR OF ALL AIR TERMINALS.	

NOTES

- PROVIDE PSX 700 OR APPROVED EQUAL FOR ALL EXTERNAL FAN BLADES AND OUTDOOR EQUIPMENT HOUSINGS (INTERNAL & EXTERNAL).
- PROVIDE BLYGOLD POLYAL XT OR APPROVED EQUAL FOR ALL EXTERNAL COILS.

DUCT AND PLENUM INSULATION NOTES

- DUCT INSULATION THICKNESS SHALL BE GREATER THAN OR EQUAL TO R-6 FOR DUCTS AND PLENUMS LOCATED IN UNCONDITIONED SPACES.
- DUCT INSULATION THICKNESS SHALL BE GREATER THAN OR EQUAL TO R-8 FOR DUCTS AND PLENUMS LOCATED OUTDOORS.
- DUCTS AND PLENUMS TO BE SEALED PER IMC 2018.

PIPING INSULATION NOTES

- PROVIDE PIPE INSULATION THICKNESSES PER IECC 2018 TABLE C403.11.3
- PIPING REQUIRED INSULATION SHALL BE INSULATED CONTINUOUSLY THROUGH CLAMPING, SUPPORTS, AND SLEEVING WITH THE INSULATION THICKNESS AND SPECIFICATIONS PER IECC 2018.

RESIDENTIAL DUCT LEAKAGE TESTING

PROVIDE DUCT LEAKAGE TESTING BASED ON THE FOLLOWING CRITERIA :
ROUGH-IN TEST : TOTAL LEAKAGE SHALL BE MEASURED WITH A PRESSURE DIFFERENTIAL OF 0.1 INCH W.G. (25 PA) ACROSS THE SYSTEM, INCLUDING THE MANUFACTURER'S AIR HANDLER ENCLOSURE IF INSTALLED AT THE TIME OF THE TEST. REGISTERS SHALL BE TAPED OR OTHERWISE SEALED DURING THE TEST. THE TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 4 CUBIC FEET PER MINUTE (113.3 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA WHERE THE AIR HANDLER IS NOT INSTALLED AT THE TIME OF TEST. WHERE THE AIR HANDLER IS NOT INSTALLED AT THE TIME OF THE TEST, THE TOTAL LEAKAGE SHALL BE LESS THAN OR EQUAL TO 3 CUBIC FEET PER MINUTE (85 L/MIN) PER 100 SQUARE FEET (9.29 M2) OF CONDITIONED FLOOR AREA.

NIMR Y. TAMIMI

LICENSED PROFESSIONAL ENGINEER

Exp. 04/30/24

No. 7996-M

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.



SIGNATURE

GENERAL CONTRACTOR:

REVISIONS

NO.	DESCRIPTION	DATE
	FINAL DR SET	10/12/22

SINGLE FAMILY RESIDENCE

LOT 23 NOHEA, PHASE 1

TMK: 3-6-8-043-023

NOHEA AT MAUNA LANI, LLC

16130 VENTURA BLVD, STE 510

ENCINO, CA 91436 2538

PH: 805-494-7704 FAX: 805-494-1226

CRAIG MONAGHAN, ARCHITECT

4522 LOWER DR. LAKE OSWEGO, OR 97035

PH: 503-522-9000

monaghan.craig@gmail.com

DATE

:

10/12/22

SCALE

:

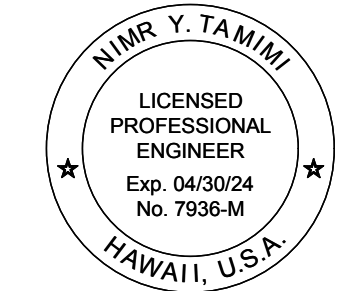
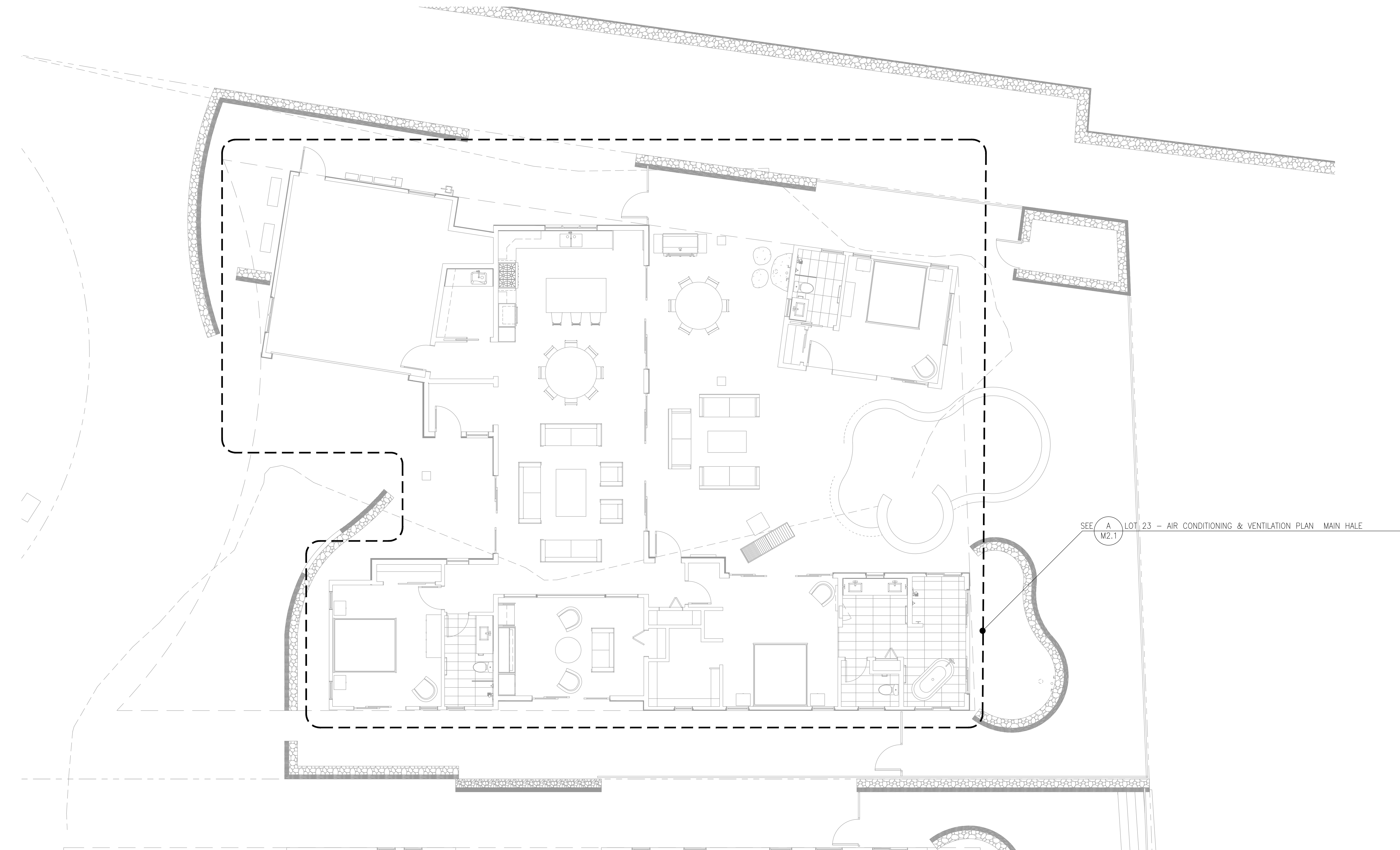
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SHEET TITLE:

MECHANICAL SCHEDULES

SHEET NUMBER:

M1.1



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SIGNATURE

GENERAL CONTRACTOR:

REVISIONS	NO.	DESCRIPTION	DATE
	1	FINAL DR SET	10/12/22

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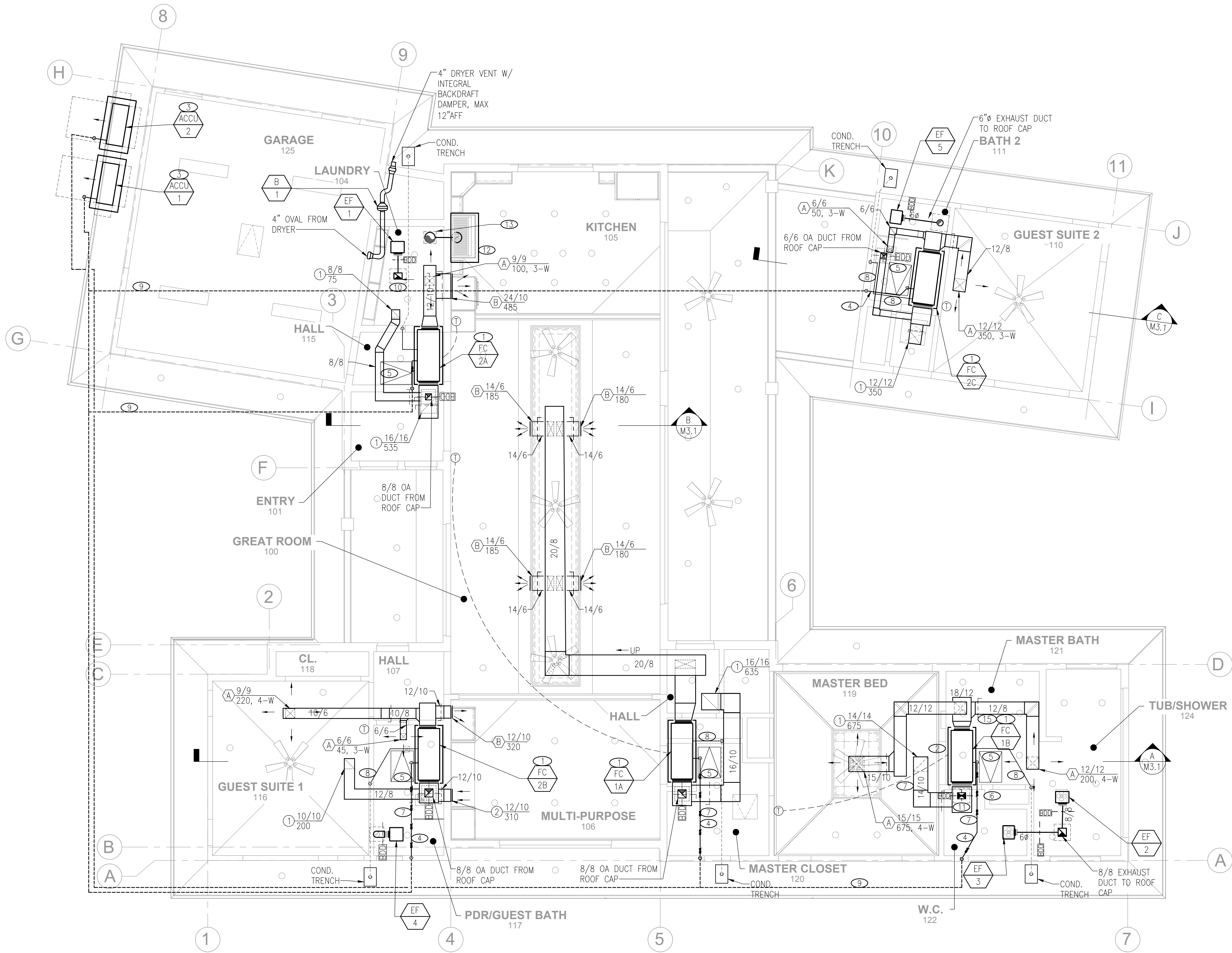
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DATE: 10/12/22

SCALE: As indicated

SHEET
TITLE:
**LOT 23
MECHANICAL
SITE PLAN**

SHEET
NUMBER:
M2.0



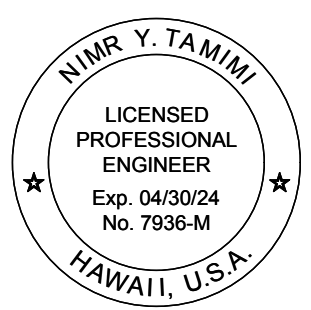
LOT 23 AIR CONDITONING & VENTILATION PLAN
SCALE: 1/4" = 1'-0"

NOTICES

- FAN COIL UNITS SHALL BE CAPABLE OF CONNECTING TO A DOOR SWITCH.
- COORDINATE DUCT AND EQUIPMENT LOCATIONS WITH TRUSS MANUFACTURER. PROVIDE ADEQUATE CLEARANCE FOR MAINTENANCE.
- PROVIDE JACKETING FOR ALL EXPOSED REFRIGERANT PIPING, PAINT TO MATCH FINISH COLOR OF ADJACENT SUBSTRATE.
- ALL THERMOSTATS SHALL BE MOUNTED AT +48" MAXIMUM TO TOP MOST OPERABLE PORTION OF CONTROL.
- EXHAUST OUTLETS SHALL BE A MINIMUM OF 3' AWAY FROM ANY OPENINGS INTO THE BUILDING.
- RETURN AIR TEMPERATURE SENSOR IN DUCT.
- PROVIDE CLEANOUTS FOR EVERY CHANGE IN DIRECTION FOR CONDENSATE PIPING.
- VERIFY TRUSS OPENINGS AVAILABILITY PRIOR TO INSTALLATION. TRUSS ATTIC SPACE LIMITED. COORDINATE WITH OTHER DISCIPLINES TO AVOID CONFLICTS.
- ROTATE DUCTWORK AS REQUIRED TO FIT BETWEEN TRUSSES. DO NOT CUT TRUSSES.
- LIMITED CEILING SPACE CLEARANCE IN AREA. INSTALL DUCTWORK PRIOR TO PLUMBING AND ELECTRICAL DISCIPLINES. COORDINATE WITH OTHER DISCIPLINES TO AVOID CONFLICTS.

NOTES

- SECONDARY DRAIN PAN. PROVIDE SENSOR IN PAN TO SHUT DOWN UNIT UPON DETECTION OF MOISTURE.
- PROVIDE 1" UNDERCUT AT DOOR.
- 6" THICK CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDE, SLOPE TO REPEL WATER.
- REFRIGERANT PIPING ABOVE CEILING, CONSULT MANUFACTURER FOR PROPER SIZING.
- 22/30 ACCESS PANEL, SEE ARCH. DWGS.
- 8/8 EXH DUCT UP TO ROOF CAP.
- ROUTE REFRIG. PIPING AND DUCTWORK AS HIGH AS POSSIBLE TO PROVIDE ACCESS/MAINTENANCE CLEARANCE.
- 1" COND. DRAIN PIPE ABOVE CEILING.
- REFRIGERANT PIPING UNDERGROUND, CONSULT MANUFACTURER FOR PROPER SIZING AND INSTALLATION.
- 8/6 EXH DUCT UP TO ROOF CAP.
- 8/6 OA DUCT UP TO ROOF CAP.
- RANGE HOOD WITH INTEGRAL BLOWER (600 CFM). SEE ARCH. DWGS. FOR DETAILS AND SCHEDULE.
- 10" EXH. DUCT TO ROOF CAP



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SIGNATURE

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REVISIONS	NO.	DESCRIPTION	DATE
	1	BID SET	7/22/19
	1	FINAL SET	10/12/22

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DATE: 10/12/22

SCALE: As indicated

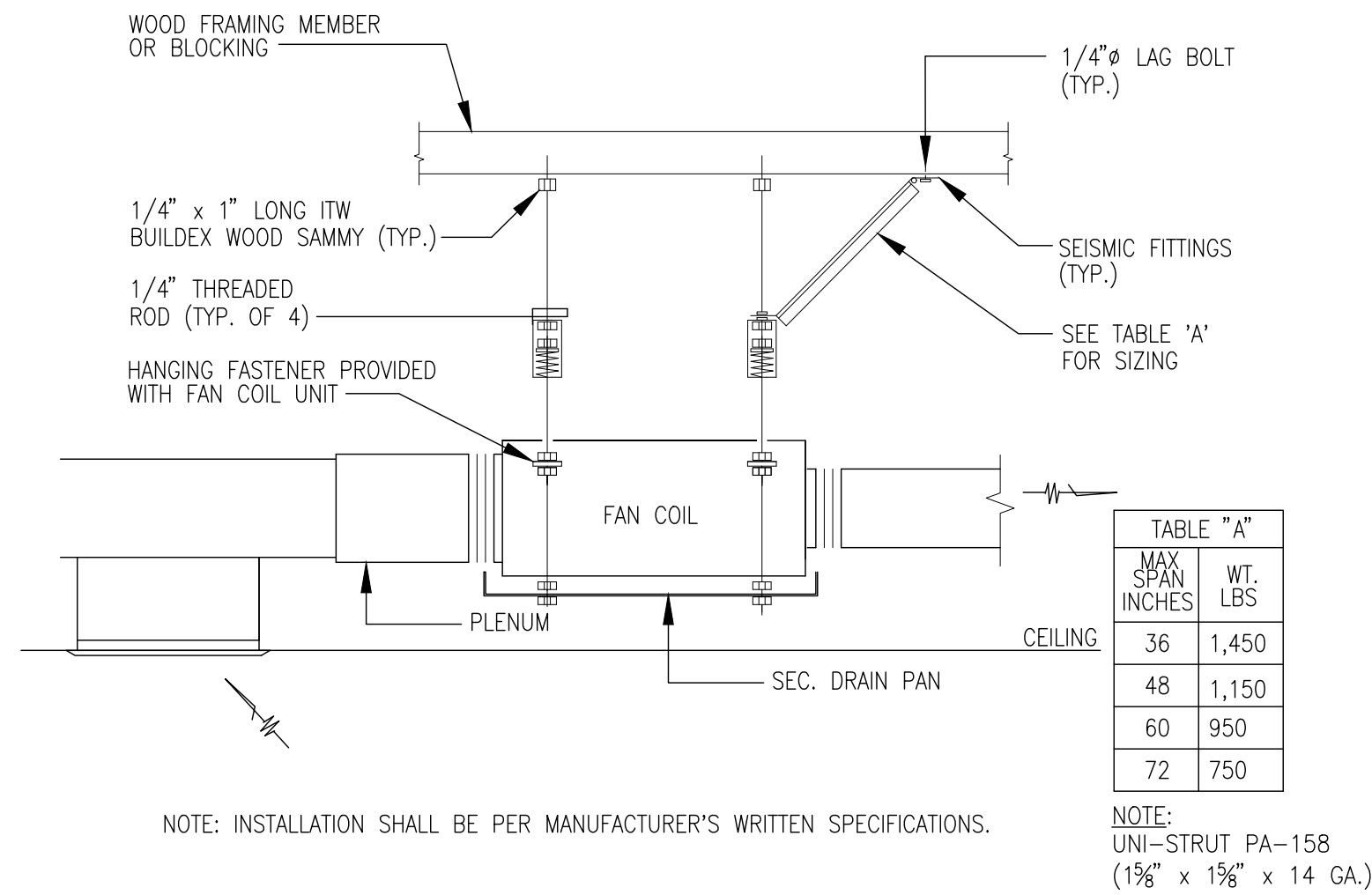
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**LOT 23 AIR
COND. & VENT.
PLAN MAIN
HALE**

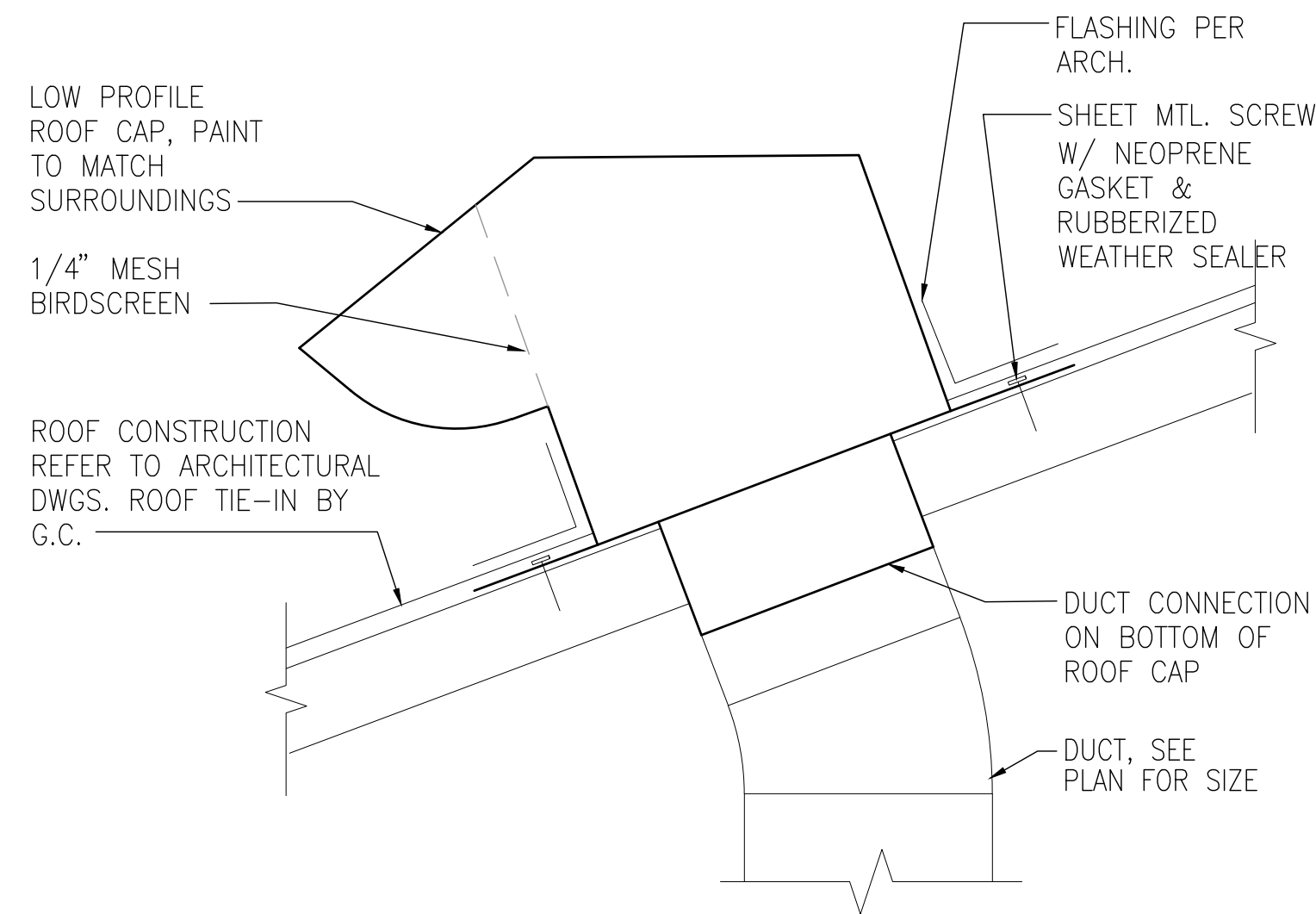
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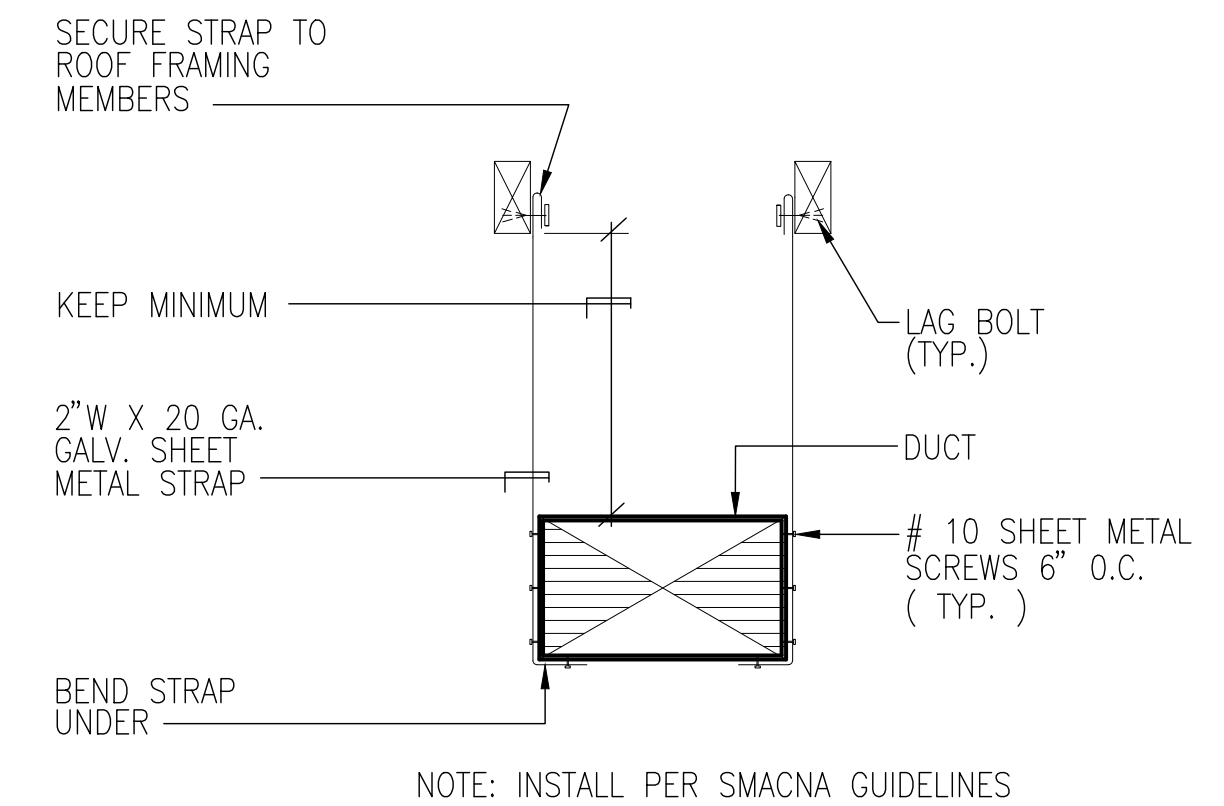
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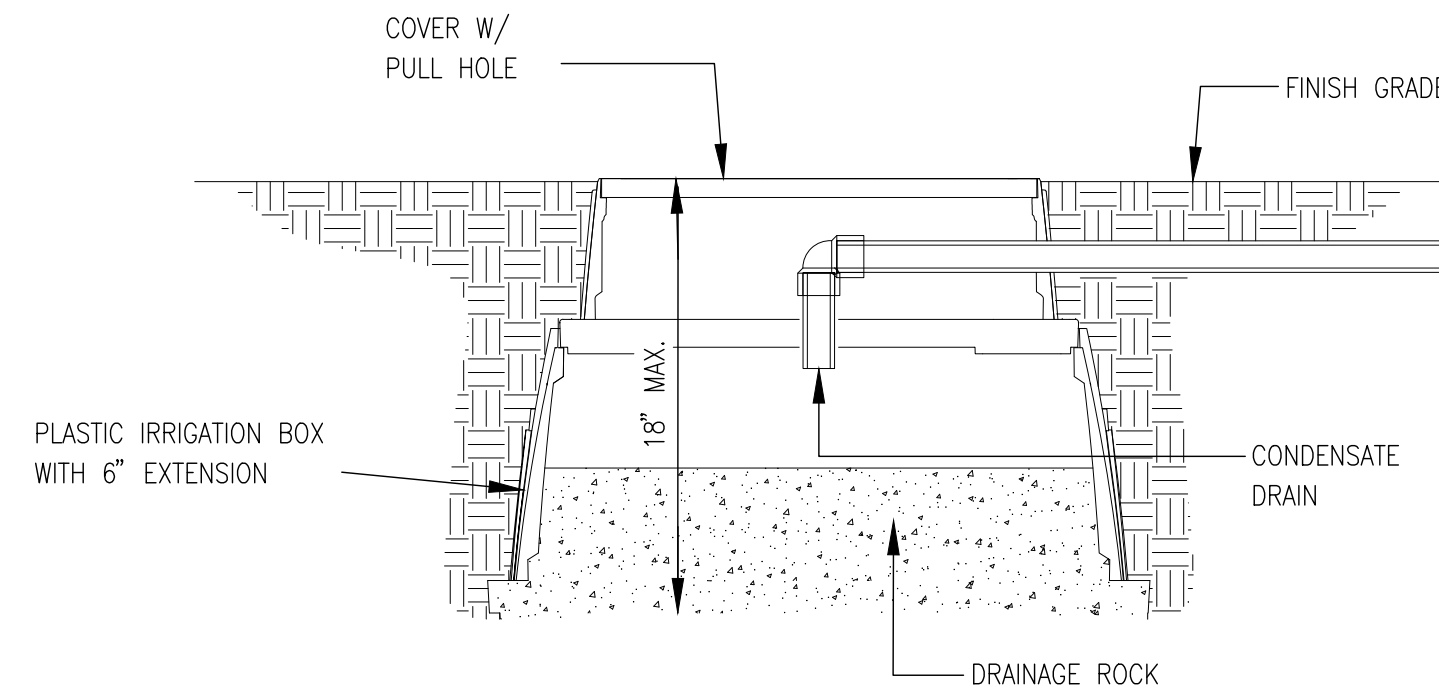
6 TYPICAL FAN COIL HANGING DETAIL
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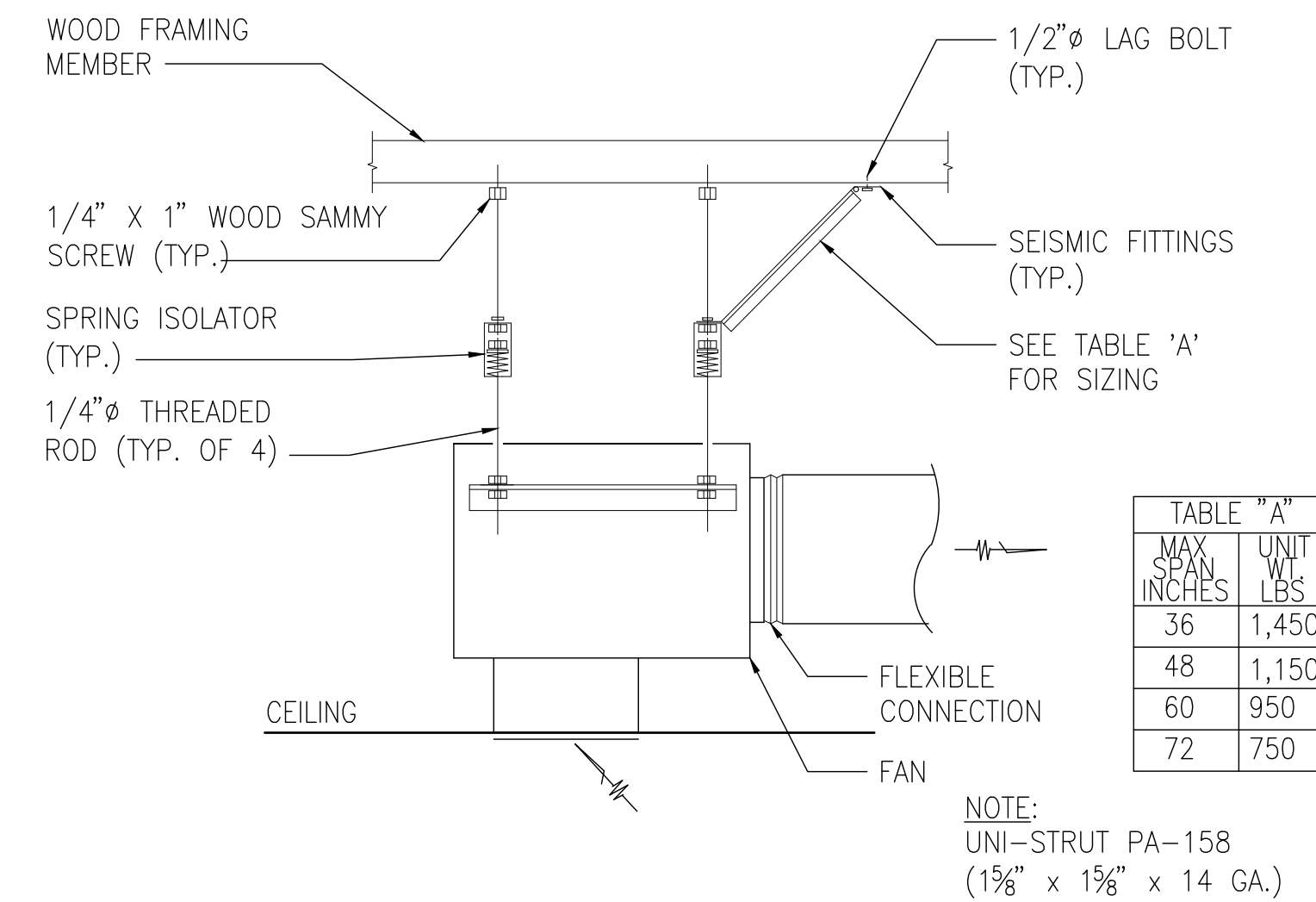
3 TYP. ROOF CAP DETAIL
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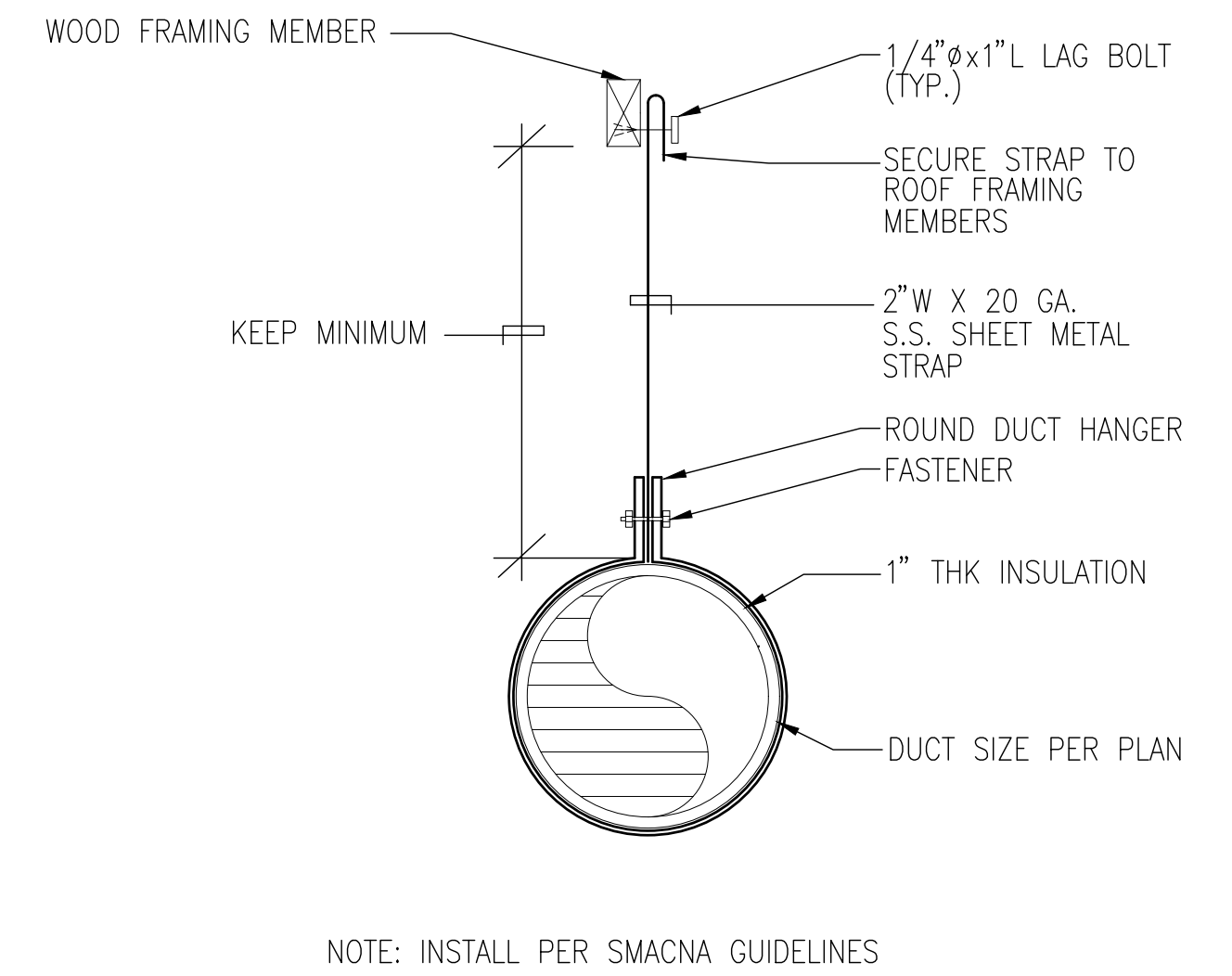
1 DUCT SUPPORT DETAIL
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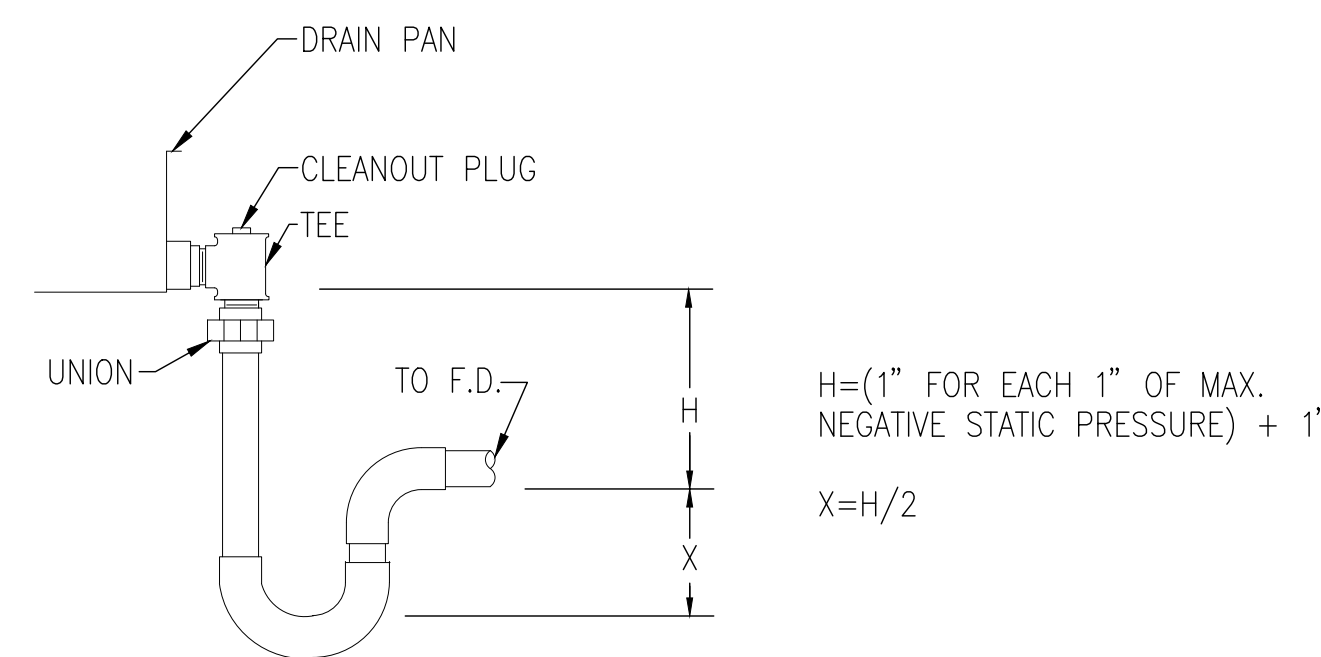
7 CONDENSATE TRENCH DETAIL
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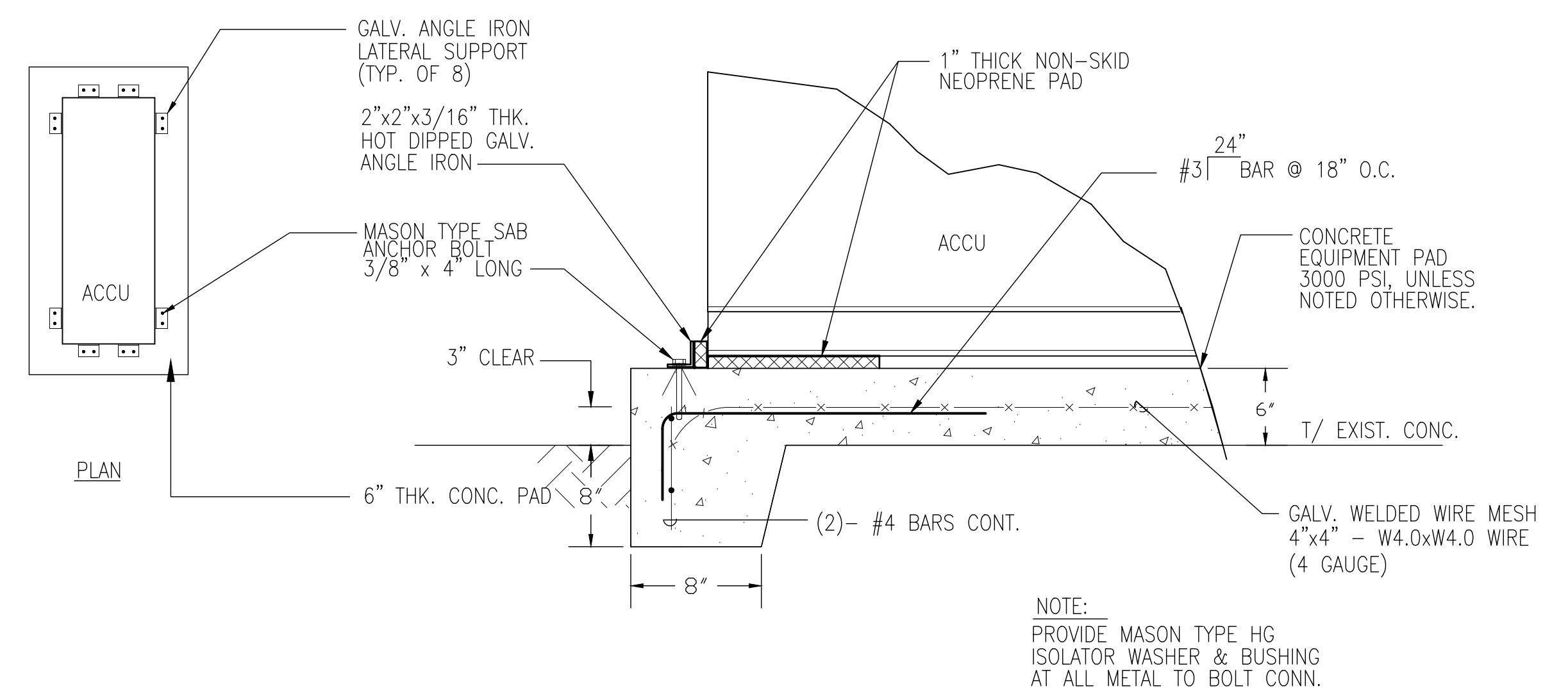
4 TYPICAL CEILING EXHAUST FAN MOUNTING DETAIL
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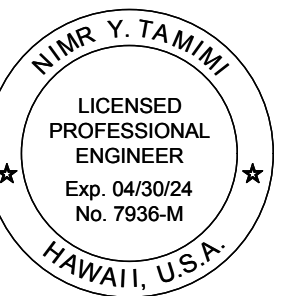
2 ROUND DUCT SUPPORT DETAIL
NO SCALE



8 DRAW THRU DRAIN TRAP DETAIL
NO SCALE



5 ACCU LATERAL SUPPORT DETAIL
NO SCALE



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SIGNATURE

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REVISIONS	NO.	DESCRIPTION	DATE
		FINAL DR SET	10/12/22

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TMK: 3-6-8-043-023
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SHEET TITLE:
MECHANICAL DETAILS

SHEET NUMBER:
M4.1