

HVAC PIPING LEGEND

SYMBOL	ABBR.	DESCRIPTION
	CHWS	CHILLED WATER SUPPLY PIPING
	CHWR	CHILLED WATER RETURN PIPING
	CWS	CONDENSER WATER SUPPLY PIPING
	CWR	CONDENSER WATER RETURN PIPING
	HWS	HEATING WATER SUPPLY PIPING
	HWR	HEATING WATER RETURN PIPING
	C.W.	COLD WATER PIPING
	H.W.	HOT WATER PIPING
	H.W.R.	HOT WATER RETURN PIPING
	G.	NATURAL GAS PIPING
	FW	FILTERED WATER PIPING
	D./C.D.	INDIRECT OR CONDENSATE DRAIN
	-	ISOMETRIC CONTINUATION
	-	PIPE RISE
	-	PIPE DROP
	-	PIPE DROP UNDER A HORIZONTAL PIPE
	-	PIPE CAP
	-	PIPE BREAK
	G.V.	GATE VALVE
	G.B.V.	GLOBE VALVE
	B.V.	BALL VALVE
	C.V.	CHECK VALVE
	P.V.	PLUG VALVE
	S.V.	SOLENOID VALVE
	S.O.V.	SHUTOFF VALVE
	C.N.V.	CONTROL VALVE
	B.V.	BUTTERFLY VALVE
	-	UNION
	-	REDUCER
	C.P.	CENTRIFUGAL PUMP
	P.O.C.	POINT OF CONNECTION BETWEEN NEW AND EXISTING

NOTE: ALL SYMBOLS MAY NOT APPLY

REFERENCE SYMBOLS

	GENERAL REFERENCE DESIGNATES SHEET NUMBER		EQUIPMENT NAME AND NUMBER
	DETAIL REFERENCE TOP DESIGNATES DETAIL NUMBER BOTTOM DESIGNATES SHEET NUMBER		REVISION NUMBER
	SECTION REFERENCE TOP DESIGNATES SECTION NUMBER BOTTOM DESIGNATES SHEET NUMBER		ELEVATION SYMBOL
			NEW CONNECTION TO EXISTING

DUCTWORK SYMBOLS

SINGLE	DOUBLE	ABBR.	DESCRIPTION
		-	RECTANGULAR DUCT (NEW)
		-	ROUND DUCT (NEW)
		-	RECTANGULAR DUCT (EXISTING)
		-	ROUND DUCT (EXISTING)
		-	45 DEG. TAP: USE AT BRANCH DUCTS ONLY
		-	DUCT SPLIT WITH DAMPER: USE AT ELBOWS AND TEES: PROPORTION DUCT AREAS BY CFM'S
		-	CURVED ELBOW - MIN. RADIUS R: 1.5 WIDTH
		-	90 DEG. ELBOW WITH SINGLE RADIUS TURNING VANES
		-	FLEXIBLE DUCT CONNECTION
		SD	SMOKE DETECTOR
		VD	VOLUME DAMPER
		-	SPIN-IN FLEX DUCT TAKEOFF WITH DAMPER
		SA	SUPPLY AIR
		EXH / EA	EXHAUST AIR
		RA	RETURN AIR
		REL	RELIEF AIR
		OSA / OA	OUTSIDE AIR
		POC	POINT OF CONNECTION
		TA	TRANSFER AIR
		FF	FINISHED FLOOR
		AFF	ABOVE FINISHED FLOOR
		BFF	BELOW FINISHED FLOOR
		NTS	NOT TO SCALE
		FSD	FIRE/SMOKE DAMPER
		S	SENSOR
		-	FIRE STAT SET AT 165°
		-	OUTSIDE AIR STAT
		T	THERMOSTAT MOUNTED AT A 48" MAX. OR PER ADA REQUIREMENTS
		-	CO2 SENSOR
		H	HUMIDISTAT
		U.C.	UNDERCUT DOOR 1". COORDINATE WITH GENERAL CONTRACTOR

NOTE: ALL SYMBOLS MAY NOT APPLY

2015 IECC COMPLIANCE NOTES

- ALL SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND A MINIMUM OF R-8 INSULATION WHEN LOCATED OUTSIDE THE BUILDING. WHEN LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION.
 - WHEN LOCATED WITHIN EQUIPMENT.
 - WHEN THE DESIGN TEMPERATURE DIFFERENCE BETWEEN THE INTERIOR AND THE EXTERIOR OF THE DUCT OR PLENUM DOES NOT EXCEED 15 DEG. F.
- PROVIDE AUTOMATIC CHANGEOVER 7-DAY PROGRAMMABLE THERMOSTATS FOR EACH ZONE WITH A 2-HOUR OCCUPANT OVERRIDE, INTELLIGENT RECOVERY, AND 10-HOUR MINIMUM BATTERY BACKUP. PROGRAM SETBACK TEMPERATURES TO 85°F(COOL) AND 55°F(HEAT). THERMOSTATS USED TO CONTROL HEATING AND COOLING, SHALL PROVIDE A SETPOINT OVERLAP RESTRICTION SUCH AS A DEADBAND OF AT LEAST 5°F. ALL TEMPERATURE CONTROLS ARE TO BE TESTED, ADJUSTED, AND CALIBRATED FOR PROPER OPERATION. MOUNT ALL THERMOSTATS AND TEMPERATURE SENSORS AS INDICATED ON THE DRAWINGS. COORDINATE EXACT LOCATION WITH THE ARCHITECT. PROVIDE LOCKING COVER AS REQUIRED BY THE ARCHITECT OR THE OWNER. MOUNT BETWEEN 48"-54" AFF.
- WHERE MECHANICAL VENTILATION IS PROVIDED, THE SYSTEM SHALL PROVIDE THE CAPABILITY TO REDUCE THE OUTDOOR AIR SUPPLY TO THE MINIMUM REQUIRED BY CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE. OUTDOOR AIR SUPPLY AND EXHAUST DUCTS SHALL BE PROVIDED WITH AUTOMATIC MEANS TO REDUCE AND SHUT OFF AIRFLOW.
- SEALING DUCTWORK: ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK MUST BE SECURELY SEALED USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS, GASKETS OR MASTICS, MESH AND MASTIC SEALING SYSTEMS, OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR 181B.
- OUTDOOR AIR SUPPLY AND EXHAUST DUCTS SHALL BE EQUIPPED WITH MOTORIZED DAMPERS THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE. EXCEPTION - GRAVITY DAMPERS SHALL BE PERMITTED IN BUILDINGS LESS THAN 3 STORIES IN HEIGHT.
- PROVIDE OWNER WITH COMPLETE OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND CONTROLS INSTALLED. DOCUMENTATION MUST INCLUDE EQUIPMENT CAPACITY (INPUT & OUTPUT), REQUIRED MAINTENANCE ACTIONS, CONTROLS AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, CONTROL SEQUENCE DESCRIPTIONS, DESIRED OR FIELD-DETERMINED SETPOINTS, AND A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

MECHANICAL SHEET INDEX

M0.1	MECHANICAL SPECS, SYMBOLS, AND SHEET INDEX
M0.2	COMCHECK
M1.0	MECHANICAL FLOOR PLAN
M1.1	MECHANICAL ROOF PLAN
M2.0	MECHANICAL ENLARGED PLAN
M3.0	MECHANICAL SCHEDULES
M4.0	MECHANICAL DETAILS & SECTIONS

MECHANICAL SPECIFICATIONS

- NOTE: NOT ALL SPECIFICATIONS MAY APPLY.
- NOTICE TO OWNERS, ARCHITECTS AND CONTRACTORS REGARDING PRICING ESTIMATES**
- UNDER NO CIRCUMSTANCES SHALL THESE DRAWINGS BE "FINAL" OR "HARD BID" UNTIL THE PROJECT IS FULLY PERMITTED TO THE PROJECT.
 - ALL PRELIMINARY PRICING EFFORTS SHALL BE CONSIDERED AS ESTIMATES ONLY AND SHALL INCLUDE SUCH CONTINGENCIES, ALLOWANCES, ALTERNATIVES, ETC. TO ACCOUNT FOR MODIFICATIONS AND ADDITIONS THAT WILL OCCUR TO THE DRAWINGS DURING FINALIZATION OF THE DESIGN AND PERMITTING PROCESS.
- SCOPE OF WORK**
- THE WORK INCLUDED UNDER THIS SECTION CONSISTS OF FURNISHING ALL MATERIALS, EQUIPMENT AND LABOR, AND THE PERFORMING OF ALL FUNCTIONS, EXCEPT AS OTHERWISE SPECIFIED HEREIN OR SHOWN ON THE DRAWINGS TO BE PERFORMED BY OTHERS, AND FOR THE INSTALLATION OF ALL HEATING AND COOLING EQUIPMENT, PIPING AND ALL DUCTWORK, GRILLES, REGISTERS, ETC., INCLUDING ALL CONNECTIONS TO EACH SYSTEM AS SPECIFIED HEREIN AND SHOWN ON THE DRAWINGS. IT SHALL FURTHER INCLUDE FURNISHING AND INSTALLING ALL MISCELLANEOUS ITEMS REQUIRED FOR THE OPERATION OF THE SYSTEM, WHETHER SPECIFICALLY CALLED OUT OR NOT.
 - SPECIAL INSPECTIONS: WHERE THE PLANS INDICATE SPECIAL INSPECTIONS AND REPORT, OR AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ), THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, HIRE AN INDEPENDENT THIRD PARTY INSPECTOR OR TESTING AGENCY TO PERFORM THE REQUIRED INSPECTIONS FOR THE TYPES OF WORK REQUIRED OR IDENTIFIED ON THE SPECIAL INSPECTION FORM. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT TO THE REGISTERED DESIGN PROFESSIONAL ENGINEER PROVIDING TEST RESULTS AND STATING WHETHER THE ITEMS REQUIRED SPECIAL INSPECTION WERE IN COMPLIANCE WITH THE INSPECTION REQUIREMENTS. PROVIDE ADDITIONAL COST FOR ENGINEER'S SEALED LETTER OF APPROVAL.
- COORDINATION**
- CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW APPROXIMATE LOCATIONS. COORDINATE WORK WITH ALL TRADES TO AVOID INTERFERENCE. INSTALLED HVAC WORK WHICH INTERFERES WITH THE WORK OF OTHER TRADES DUE TO LACK OF COORDINATION SHALL BE RE-INSTALLED AT NO ADDITIONAL COST TO THE OWNER.
 - REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF EQUIPMENT, PARTITIONS, WALLS, AND GENERAL CONSTRUCTION.
 - ALL CONTRACTORS SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH OTHER TRADES AFFECTED BY EACH OTHERS WORK.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL FIELD CONDITIONS WHICH MAY AFFECT HIS WORK BEFORE SUBMITTING BIDS.
 - PERFORMANCE OF ALL WORK SHALL BE SCHEDULED AS APPROVED BY THE OWNER, AVOID INTERFERENCE WITH FUNCTIONS IN OTHER PARTS OF THE FACILITY, AND COORDINATE WITH THE WORK OF OTHER TRADES. SERVICES SHALL NOT BE INTERRUPTED WITHOUT WRITTEN PRIOR APPROVAL OF THE OWNER.
 - NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ARCHITECT AND THE STRUCTURAL ENGINEER.
 - PROTECT EXISTING BUILDING STRUCTURE AND GROUNDS FROM DAMAGE WHICH MAY OCCUR DURING DEMOLITION WORK. ANY DAMAGE TO THE EXISTING FACILITIES SHALL BE REPAIRED, REPLACED, OR RESTORED TO THE ORIGINAL CONDITION AT NO ADDITIONAL COST AND TO THE SATISFACTION OF THE OWNER.
 - SPACE ABOVE CEILINGS IS CRITICAL - THE CONTRACTOR SHALL VERIFY SPACE ABOVE CEILING & COORDINATE WITH PLUMBING, ELECTRICAL, STRUCTURAL, FIRE PROTECTION, ARCHITECTURAL, AND ALL OTHER TRADES INVOLVED BEFORE COMMENCEMENT OF WORK.
- CODES AND PERMITS**
- ALL MATERIALS, EQUIPMENT AND INSTALLATION MUST COMPLY WITH ALL APPLICABLE LAWS, CODES, RULES AND REGULATIONS, REQUIRED BY CITY, COUNTY AND STATE, AS WELL AS FEDERAL REQUIREMENTS.
 - COMBUSTIBLE MATERIALS SHALL NOT BE USED IN A NON-COMBUSTIBLE BUILDING AS DEFINED BY THE BUILDING CODE. COMBUSTIBLE MATERIALS MAY BE PROTECTED AS SPECIFIED BY THE ENGINEER AND ARCHITECT OF RECORD.
 - PERMITS: OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES AND FEES.
 - INSPECTIONS: FURNISH OWNER WITH CERTIFICATE OF INSPECTION AND APPROVAL BY LOCAL AUTHORITIES PRIOR TO FINAL ACCEPTANCE OF THE PROJECT BY THE OWNER. ALL WORK MUST BE INSPECTED.
- EXISTING CONDITIONS**
- PRIOR TO COMMENCING WORK, MECHANICAL CONTRACTOR SHALL CLEAN, TEST AND INSPECT ALL EXISTING MECHANICAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS TO INSURE THAT ALL EQUIPMENT IS IN SATISFACTORY WORKING CONDITION. CONTRACTOR SHALL INCLUDE IN HIS BID THE REPLACEMENT OF FILTERS, CLEANING OF CONDENSATE DRAIN PANS AND DRAIN LINES, EXHAUSTOR AND CONDENSER COILS AND THE REPLACEMENT OF FAN BELTS. CHANGE REFRIGERANT GAS AS REQUIRED. REPORT ANY DEFECTS/DEFICIENCIES TO OWNER/ARCHITECT IMMEDIATELY. SUBMIT ADDENDUM TO CORRECT ANY DEFECTS/DEFICIENCIES AS NOTED ON THE DRAWINGS.
 - VERIFY EXACT SIZE, LOCATION, ROUTING, ETC. OF ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AIR DEVICES, THERMOSTATS, SENSORS, PIPING, ETC., WHICH ARE TO BE REMOVED, REPLACED, ABANDONED, REWORKED, ETC., AS REQUIRED AND SHOWN ON DRAWINGS.
 - MECHANICAL WORK SHOWN AS EXISTING IS FOR REFERENCE ONLY. FIELD VERIFY ALL EXISTING CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY SHOULD THE FIELD CONDITIONS DIFFER FROM THE DRAWINGS IN SUCH A WAY AS TO COMPROMISE THE DESIGN.
 - CONTRACTOR SHALL ENSURE ALL SURFACES (WALLS, FLOORS, CEILING AND ROOF) ARE BROUGHT BACK TO ORIGINAL CONDITION IN ACCORDANCE WITH ARCHITECTS REQUIREMENTS AFTER MODIFICATIONS HAVE BEEN MADE. COORDINATE WITH GENERAL CONTRACTOR.
- PRODUCTS**
- ALL PRODUCTS SHALL BE NEW AND UNUSED OF ESTABLISHED AND REPUTABLE AMERICAN MANUFACTURERS. ITEMS OF EQUIPMENT USED FOR THE SAME PURPOSE SHALL BE OF THE SAME MANUFACTURER.
 - ALL ACCESSORIES SHALL BE COMPLETE AND OPERABLE. ANY ACCESSORIES REQUIRED FOR THE OPERATION OF THE SYSTEM SHALL BE INCLUDED AS THOUGH SPECIFICALLY INDICATED TO BE PROVIDED. SUCH ACCESSORIES WOULD INCLUDE FILTERS, CONDENSATE DRAINS, RELIEF VALVES, SERVICE VALVES, THERMOSTATS, VIBRATION ISOLATORS, ETC. MOTOR STARTERS FOR PREWIRED EQUIPMENT (AND OTHER PROTECTION AND CONTROL DEVICES) ARE ALSO INCLUDED IN THIS SPECIFICATION.
 - SPECIFIC REFERENCE TO A MANUFACTURER'S PRODUCT IS ONLY TO ESTABLISH TYPE, QUALITY, AND PERFORMANCE REQUIRED. THESE QUALIFICATIONS ARE IN ADDITION TO THE REQUIREMENTS SHOWN ON THE DRAWINGS AND WITHIN THESE SPECIFICATIONS. LISTING OF ALTERNATE EQUIPMENT MANUFACTURERS SHALL NOT BE CONSTRUED AS AN UNCONDITIONAL APPROVAL OF THE PRODUCTS OF THOSE MANUFACTURERS.
 - ACCEPTABLE HVAC EQUIPMENT MANUFACTURERS: CARRIER, TRANE, YORK, LENOX, APPROVED EQUAL OR AS SPECIFIED ELSEWHERE IN THESE DOCUMENTS.
 - PROVIDE CLEARANCES AS PER MANUFACTURERS RECOMMENDATIONS.
- SUBSTITUTIONS**
- SUBSTITUTIONS OF MATERIALS OR PRODUCTS SHOWN HEREIN SHALL BE BY OWNER'S, ARCHITECTS, OR ENGINEER'S WRITTEN APPROVAL. ANY DEVIATION FROM THESE DRAWINGS WILL NOT BE ALLOWED.
 - MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ANY SUBSTITUTIONS AND COSTS OF CHANGES INCURRED BY OTHER TRADES DUE TO THE SUBSTITUTIONS. OTHER TRADES INCLUDE ELECTRICAL, PLUMBING, STRUCTURAL, ROOFING, OR ANY TRADE EFFECTED BY THE SUBSTITUTION.
- SHOP DRAWING SUBMITTALS**
- PRIOR TO PROCUREMENT, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW FOR ALL EQUIPMENT, INCLUDING THE FOLLOWING:
 - DIFFUSERS, REGISTERS, LOWERS AND FLEXIBLE DUCTWORK.
 - PACKAGED ROOFTOP UNITS, SPLIT-SYSTEM AIR HANDLING UNITS, CONDENSING UNITS, EVAPORATIVE COOLING UNITS AND EXHAUST FANS.
 - THERMAL INSULATION, ACOUSTICAL LINER AND FIRE DAMPERS.
 - PIPING, SUPPORTS AND VALVES.
 - AUTOMATIC TEMPERATURE CONTROLS.
- THERMOSTATS, CONTROLS AND CONTROL WIRING**
- ALL CONTROL EQUIPMENT, INTEGRAL STARTERS, INTERLOCKING STARTERS, SMOKE

CODE INFORMATION

- 2015 IBC, 2015 IMC, 2015 IECC. ALL SYSTEMS SHALL BE IN COMPLIANCE WITH THE ABOVE CODES AS ADOPTED BY CITY OF CYPRESS.
- OUTDOOR AIR VENTILATION PROVIDED AND BASED ON CHAPTER 4, SECTION 403.2 AND TABLE 403.3.1.1 & ASHRAE 62-2010.
- DUCT SMOKE DETECTORS REQUIRED BY SECTION 606 SHALL BE INSTALLED IN THE RETURN AIR SYSTEM. DETECTORS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 806.3 AND NFPA 72. DUCT SMOKE DETECTORS REQUIRE A REMOTE TEST VISUAL/TEST STATION PER NFPA 72. DETECTORS SHALL BE CONTROLLED PER SECTION 606.4.
- EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL, IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THIS CODE. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE AT THE TIME OF INSPECTION PER SECTION 304.1.
- MATERIALS EXPOSED WITHIN PLENUMS SHALL HAVE A FLAME SPREAD RATING INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE TO ASTM E84.
- ALL MATERIAL INSTALLED WITHIN PLENUMS SHALL CONFORM TO SECTION 602 PLENUMS.
- MECHANICAL DESIGN IS INTENDED THAT THE AIR CONDITIONING SYSTEM WILL OPERATE CONTINUOUSLY TO MAINTAIN CURRENT VENTILATION REQUIREMENTS, IMC 403.2 & 403.3.
- CALL FOR INSPECTION OF ALL MECHANICAL SYSTEMS PRIOR TO BACKFILL AND CONCEALMENT, IMC 107.2

- INSTALLATION FOR VELOCITIES TO 2,000 FPM; FASTENERS SHALL START WITHIN 3" OF THE UPSTREAM TRANSVERSE EDGES OF THE LINER AND 3" FROM THE LONGITUDINAL JOINTS AND SHALL BE SPACED AT A MAXIMUM OF 12" O.C. AROUND THE PERIMETER OF THE DUCT, EXCEPT THAT THEY MAY BE A MAXIMUM OF 12" FROM A CORNER BREAK. ELSEWHERE, THEY SHALL BE MAXIMUM OF 18" O.C. EXCEPT THAT THEY SHALL BE PLACED NOT MORE THAN 8" FROM A LONGITUDINAL JOINT OF THE LINER NOR 12" FROM A CORNER BREAK. COAT ALL EXPOSED JOINTS AND EDGES OF TRANSVERSE JOINTS WITH A FIRE RETARDANT ADHESIVE.
 - OUTDOOR DUCTWORK SHALL BE INSULATED INTERNALLY WITH 2" DUCT LINER. INSTALL PER MANUFACTURER'S INSTRUCTIONS. ALL OUTDOOR DUCTWORK JOINTS SHALL BE SEALED WITH SILICONE SEALANT AND MADE COMPLETELY WATER TIGHT AND LEAK PROOF.
- GRILLES, REGISTERS AND DIFFUSERS**
- FURNISH AND INSTALL ALL GRILLES, REGISTERS, CEILING DIFFUSERS AND DOOR GRILLES WHERE INDICATED. THEY SHALL BE OF SIZE AND MODEL CALLED FOR ON THE DRAWINGS.
 - ALL GRILLES, REGISTERS, AND CEILING DIFFUSERS MUST BE SET FLUSH AND TRUE TO WALL OR CEILING TO PREVENT AIR LEAKAGE AROUND EDGES. ALL UNITS SHALL BE PROVIDED WITH NEOPRENE GASKETING AROUND THE INSIDE OF THE FRAME.
 - ALL UNITS SHALL BE FACTORY FINISHED, OF COLOR SELECTED BY THE ARCHITECT, OR AS OTHERWISE INDICATED.
 - PAINT ALL DUCTWORK, TURNING VANES, INSULATION, ETC. THAT IS VISIBLE THROUGH GRILLES, REGISTERS, OR CEILING DIFFUSERS FLAT BLACK.
- RELIEF VENTS**
- ALL RELIEF VENT EXTERIOR PENETRATIONS SHALL BE PROVIDED WITH COUNTERBALANCED BAROMETRIC BACKDRAFT DAMPERS.
- EQUIPMENT**
- ALL MECHANICAL EQUIPMENT SHALL BE PROPERLY LISTED AND LABELED BY AN APPROVED AGENCY.
 - ALL EQUIPMENT SHALL BE LABELED WITH STEEL TAGS EMBOSSED WITH 1/4" HIGH LETTERS, PERMANENTLY ATTACHED. TAG SHALL CLEARLY INDICATE THE AREA SERVED BY THE EQUIPMENT.
 - MAINTAIN MANUFACTURER'S RECOMMENDATIONS FOR ALL REQUIRED SERVICE CLEARANCES AND INSTALLATION OF EQUIPMENT.
 - REFER TO ARCHITECTURAL DRAWINGS FOR ACCESS TO ROOF INSTALLED MECHANICAL EQUIPMENT. ROOF ACCESS TO COMPLY WITH THE MECHANICAL CODE BY THE LOCAL JURISDICTION.
- AIR CONDITIONING AND REFRIGERATION PIPING**
- COPPER TUBE WITH BRAZE JOINTS
 - TYPE ACR HARD OR ANNEALED TEMPER SEAMLESS COPPER TUBING ASTM B280
 - BRAZE JOINT PRESSURE FITTINGS ASME B16.50 WROUGHT COPPER ALLOY
 - JOINTS: FLARED OR BRAZED: ASTM A5.8 BOPU-SERIES COPPER-PHOSPHORUS ALLOYS
- CONDENSATE DRAIN**
- FOR EACH HVAC UNIT, PROVIDE FULL SIZED 4" DEEP (MINIMUM) TRAPPED CONDENSATE DRAIN OF COPPER TYPE "M" HARD DRAIN, SCHEDULE 40 PVC ALLOWED FOR INDOOR PORTION OF DRAIN WITH DUCTED RETURN AIR HVAC SYSTEMS.
 - CONDENSATE DRAIN SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S EVAPORATIVE COOLING UNITS. FIELD VERIFY ROUTING IS NOT OVER CRITICAL SPACES CONTAINING WATER SENSITIVE EQUIPMENT.
 - ROUTE PIPING TO 6" ABOVE NEAREST FLOOR SINK, MOP SINK OR DRAIN OR AS INDICATED ON THE DRAWINGS. (UNLESS OTHERWISE SPECIFIED AN ACCEPTABLE RECEPTACLE IF ALLOWED BY OWNER AND AUTHORITY HAVING JURISDICTION.)
 - SLOPE ALL CONDENSATE PIPING AT A MINIMUM OF 1/8" PER FOOT.
 - INSTALL CLEAN OUTS AT EVERY 90 DEGREE TURN ON ALL CONDENSATE DRAIN LINES.
 - PROVIDE AN APPROVED SECONDARY DRAIN SYSTEM OR APPROVED WATER LEVEL DETECTION DEVICE CONFORMING TO UL508 WHERE DAMAGE TO ANY BUILDING COMPONENTS WILL OCCUR AS A RESULT OF OVERFLOW OR STOPPAGE OF THE PRIMARY CONDENSATE DRAIN SYSTEM.
 - INSULATE THE FIRST 8 FEET OF CONDENSATE DRAIN PIPING AND ANY ADDITIONAL CONDENSATE DRAIN PIPING WHERE ENVIRONMENTAL CONDITIONS MAY CAUSE CONDENSATION TO DRIP FROM PIPING.
 - PROVIDE MEANS OF PREVENTING DISSIMILAR METAL CONTACT BETWEEN ALL PIPING MATERIALS FROM ANY OTHER METAL OR STRUCTURAL MEMBER TO PREVENT GALVANIC ACTION BETWEEN THE TWO METALS.
- PIPE INSULATION**
- INSULATE THE FIRST 8 FEET OF CONDENSATE DRAIN PIPING AND ANY ADDITIONAL CONDENSATE DRAIN PIPING WHERE ENVIRONMENTAL CONDITIONS MAY CAUSE CONDENSATION TO DRIP FROM PIPING.
 - EXTERIOR INSULATION SHALL BE RATED FOR EXTERIOR USE OR PROVIDED WITH UV RATED PROTECTIVE COATING.
 - ALL HEATING WATER AND CHILLED WATER PIPING SHALL HAVE FIBERGLASS INSULATION WITH ASJ JACKET, ACHIEVING A THERMAL CONDUCTIVITY (K-FACTOR) OF 0.24 AT 75 DEGREES MEAN TEMPERATURE. INSULATION THICKNESS SHALL MEET THE REQUIREMENTS OF THE 2015 IECC CODE.
 - THE MAXIMUM FIRE HAZARD CLASSIFICATION OF THE INSULATION SYSTEM SHALL NOT BE MORE THAN A FLAME SPREAD OF 25, A FUEL CONTRIBUTED RATING OF 50, AND A SMOKE DEVELOPED RATING OF 50 WHEN TESTED IN ACCORDANCE WITH UL REQUIREMENTS. PIPE COVERING SHALL BEAR THE U.L. LABEL.
 - INSULATE ALL FITTINGS, VALVE BODIES ETC. WITH SINGLE OR MULTIPLE LAYERS OF INSULATION WITH PREFABRICATED FITTINGS WITH P.V.C. JACKETS.
 - PROVIDE MANUFACTURER SUBMITTAL FOR ALL INSULATION MATERIALS.
- FINAL TESTS**
- AN INDEPENDENT AABC, NEBB OR TABB LIFE SAFETY LEVEL 2 CERTIFIED CONTRACTOR SHALL BALANCE AIR DISTRIBUTION TO VALUES LISTED ON DRAWINGS. A FINAL COPY OF THE TEST AND BALANCE REPORT SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION OF THE REPORT. A PROJECT SHALL NOT BE CONSIDERED IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS UNTIL SUCH A REPORT HAS BEEN PROVIDED TO THE ENGINEER.
 - BEFORE ACCEPTANCE AND FINAL PAYMENT, IT SHALL BE DEMONSTRATED THAT ALL APPARATUS IS FUNCTIONING PROPERLY AND EFFICIENTLY. THE CONTRACTOR SHALL MAKE A THOROUGH TEST OF EACH SUPPLY, RETURN, AND EXHAUST SYSTEMS TO ASSURE THAT EACH DIFFUSER AND REGISTER HAS THE PROPER QUANTITY OF AIR IN ACCORDANCE WITH AABC OR NEBB. PROVIDE ADDITIONAL COMFORT BALANCE ADJUSTMENTS PER OWNER/TENANT REQUIREMENTS TO ADDRESS ANY NEEDED VARIATIONS IN DESIGN AIR FLOWS.
 - THE TEST AND BALANCE CONTRACTOR HAS THE RIGHT TO COMMUNICATE ANY INFORMATION TO THE MECHANICAL ENGINEER.
- GUARANTEE**
- THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FROM DEFECT OF WORKMANSHIP, AND SHALL REPLACE OR REPAIR WITHOUT ADDITIONAL COST TO THE OWNER ALL DEFECTIVE MATERIAL AND WORKMANSHIP, FOR A PERIOD OF (1) YEAR AFTER COMPLETION AND ACCEPTANCE.
- CLOSEOUT**
- PROVIDE OWNER WITH COMPLETE OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND CONTROLS INSTALLED. DOCUMENTATION MUST INCLUDE EQUIPMENT CAPACITY (INPUT & OUTPUT), REQUIRED MAINTENANCE ACTIONS, CONTROLS AND CALIBRATION INFORMATION INCLUDING DIAGRAMS, CONTROL SEQUENCE DESCRIPTIONS, DESIRED OR FIELD-DETERMINED SETPOINTS, AND A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.
 - PROVIDE A COMPLETE SET OF FULL SIZE AS-BUILT DRAWINGS OF THE COMPLETE INSTALLATION INCLUDING ALL CHANGES MADE DURING CONSTRUCTION.
- ORDER OF PRECEDENCE OF DOCUMENTS**
- SHOULD A CONFLICT ARISE BETWEEN CONSTRUCTION DOCUMENTS, THE ORDER OF PRECEDENCE SHALL BE:
 - SPECIAL PROVISIONS
 - GENERAL PROVISIONS
 - SPECIFICATIONS
 - DETAILS ON DRAWINGS
 - PLAN DRAWINGS
 - THE ENGINEER OF RECORD SHALL BE NOTIFIED BEFORE A DECISION IS MADE.



REV.	DATE	DESCRIPTION
-	04.12.22	50% REVIEW SET
-	05.10.22	90% REVIEW SET

PRELIMINARY NOT FOR PRICING CONSTRUCTION OR RECORDING

PETSUITES - CYPRESS SPRINGS
7510 FRY RD
CYPRESS, TX 77433

MECHANICAL SPECS, SYMBOLS, AND SHEET INDEX

ISSUED FOR:	
PERMIT	-
BID	-
CONSTRUCTION	-
RECORD	-

SITE ID NO. T.B.D.	
PROJECT MANAGER KMW	DESIGNER DGA

JOB NO.
21210-00

M0.1

TEXAS ENGINEER FIRM REGISTRATION #F-15021

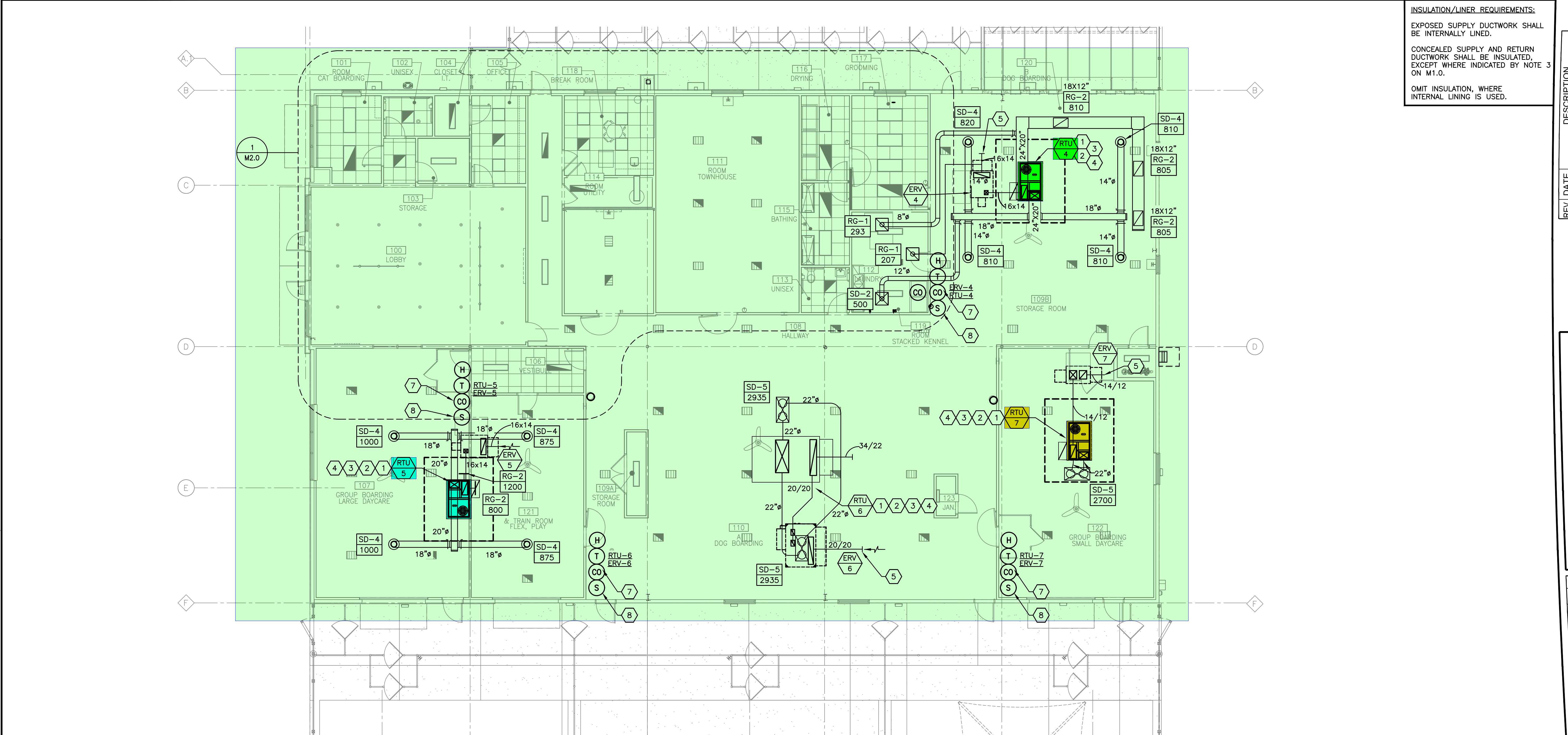
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JOB NO.
220650

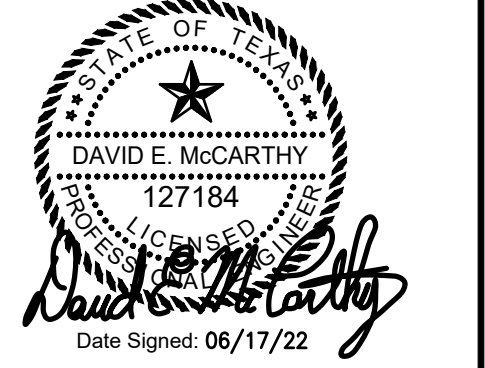
DFT: MG
DSN: MC
CHK: DEM

1 GENERAL NOTES	2 SEQUENCE OF OPERATION	3 VENTILATION SEQUENCE OF OPERATION	4 KEY NOTES
<p>1. THE DRAWINGS ARE DIAGRAMMATIC IN NATURE. EXACT LOCATIONS OF DEVICES AND ROUTING OF DUCTWORK SHALL BE DETERMINED BY CONTRACTOR AFTER COORDINATION WITH ALL OTHER TRADES AND FIELD DETERMINATION OF FINAL CONSTRUCTION DETAILS. MINOR ADJUSTMENTS TO DUCT ROUTING AND CONFIGURATION TO AVOID CONFLICT WITH BUILDING STRUCTURE OR OTHER TRADES SHALL BE INCLUDED IN CONTRACTORS PRICE. CONTRACTOR SHALL OBTAIN ENGINEERS APPROVAL IN WRITING FOR ANY MODIFICATIONS TO SYSTEM DESIGN PRIOR TO INSTALLATION.</p> <p>2. ALL EXPOSED MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND SUPPORTED IN A FIRST-CLASS AND WORKMANLIKE FASHION. CONDUIT SHALL RUN PARALLEL AND/OR PERPENDICULAR TO MAIN BUILDING STRUCTURE. ANY WORK THAT IS NOT DONE IN A FIRST-CLASS OR WORKMANLIKE FASHION, IN THE ARCHITECTS OPINION, SHALL BE REDONE AT THE CONTRACTORS EXPENSE.</p> <p>3. DO NOT SCALE THE DRAWINGS. DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND SYSTEMS. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET, FITTING AND COMPONENT. DO NOT USE THE PLANS FOR EXACT LOCATION OF EQUIPMENT, FIXTURES OR ARCHITECTURAL ITEMS SUCH AS WALLS, WINDOWS, SOFFITS, AND PILASTERS. SPECIFIC LOCATIONS, MOUNTING HEIGHTS AND OVERALL DIMENSIONS OF DEVICES AND FIXTURES ARE TO BE OBTAINED FROM THE ARCHITECTURAL DRAWINGS AND DETAILS WHEN AVAILABLE.</p> <p>4. ALL DUCT JOINTS, SEAMS AND CONNECTIONS SHALL BE SECURELY FASTENED AND SEALED. DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING TEN FEET. DUCT COVERINGS AND LININGS SHALL HAVE A FLAME-SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX NOT MORE THAN 50.</p> <p>5. PROVIDE VOLUME DAMPERS AT ALL ROUND BRANCH DUCT TAKE-OFFS THAT ARE ACCESSIBLE. PROVIDE TURNING VANES AT ALL 90 DEGREE SQUARE ELBOWS IN SUPPLY AND RETURN AIR DUCTS. PROVIDE 45 DEGREE HEEL AT ALL RECTANGULAR SUPPLY AND RETURN BRANCH DUCT TAKE-OFFS.</p> <p>6. CONTRACTOR TO LINE EXPOSED, SUPPLY DUCTWORK WITH DUCT LINER INSTALLED WITH ADHESIVE AND MECHANICAL FASTENERS U.N.O. OMIT EXTERNAL INSULATION ON LINED DUCT. LINED DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.</p> <p>7. OUTDOOR AIR INTAKES SHALL BE 10'-0" MINIMUM AWAY FROM ANY EXHAUST AND PLUMBING VENT OUTLET.</p> <p>8. CONTRACTOR TO WIRE UP ALL LOW VOLTAGE (24V) THERMOSTATS AND THEIR REMOTE SENSORS. PROVIDE LOCKING PLASTIC BOX OVER ALL THERMOSTATS.</p> <p>9. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL PIPES, DUCTWORK, UNITS, ETC. WITH ALL OTHER TRADES AND SHIFT LOCATIONS OR OFFSET WHERE NECESSARY. PROVIDE TRANSITIONS IN DUCTWORK TO AVOID CONFLICT WITH BEAMS, ROOF JOISTS AND OTHER STRUCTURES.</p> <p>10. CONTRACTOR SHALL COORDINATE ALL AIR DEVICES WITH ELECTRICAL AND ARCHITECTURAL REFLECTED CEILING PLANS.</p> <p>11. REFER TO SHEETS A3.0 AND A3.1 FOR DUCT AND DIFFUSER MOUNTING HEIGHTS.</p> <p>12. PAINT CEILING ITEMS TO MATCH CEILING COLOR. ROOF ITEMS TO MATCH ROOF COLOR. REFER TO ARCHITECTURAL PLAN.</p>	<p>1. ALL ROOFTOP UNITS WILL BE PROGRAMMED TO OPERATE IN THE OCCUPIED AND UNOCCUPIED MODES OF OPERATION BY THEIR PROGRAMMABLE THERMOSTATS FOR THEIR INDIVIDUAL SPACES.</p> <p>2. OCCUPIED MODE SHALL START AT 6:30 A.M. DAILY, AND CONTINUE UNTIL 8:00 P.M., INCLUDING WEEKENDS AND HOLIDAYS.</p> <p>3. UNITS RTU-4, 5 AND 6 ARE EQUIPPED WITH AN ECONOMIZER CONTROL THAT IN THE OCCUPIED MODE, WHEN THE OUTDOOR AIR IS AT A TEMPERATURE AND HUMIDITY TO PROVIDE FREE COOLING, THE DAMPER WILL OPEN TO 100% TO ALLOW OUTSIDE AIR TO COOL THE SPACE INSTEAD OF THE MECHANICAL COOLING EQUIPMENT. THE UNITS WILL BE ALSO EQUIPPED WITH A BAROMETRIC RELIEF TO PREVENT THE SPACES FROM BEING OVER PRESSURIZED.</p> <p>4. WHENEVER THE ROOFTOP UNITS ARE IN THEIR OCCUPIED MODE, THE OUTSIDE AIR DAMPER WILL AUTOMATICALLY OPEN TO THE MINIMUM SETTING FOR THE REQUIRED VENTILATION FOR THE ZONE, AND CLOSE WHEN THE SPACE GOES INTO AN UNOCCUPIED MODE.</p> <p>5. ROOFTOP UNITS: RTU-1 THRU 7; WHEN ENERGIZED, THE EVAPORATOR FAN SHALL RUN CONTINUOUSLY. A PROGRAMMABLE AUTOMATIC CHANGE-OVER THERMOSTAT SHALL CYCLE THE UNIT IN THE HEATING AND COOLING MODE TO MAINTAIN ROOM TEMPERATURE.</p> <p>6. EXHAUST FANS EF-1 AND 2 SHALL BE ENERGIZED WITH THE LIGHTING CIRCUIT OF THE RESTROOM OR AS SHOWN ON THE ELECTRICAL DRAWINGS.</p> <p>7. EXHAUST FANS EF-3 AND 4 SHALL BE ENERGIZED BY A DUAL ACTING THERMOSTAT SET AT 80/65 DEGREES F IN THE SPACE. WHEN THE SPACE TEMPERATURE IN THE ROOM EXCEEDS 80 DEGREES, OR IS BELOW 65 DEGREES, THE EXHAUST FAN SHALL START AND DRAW AIR FROM THE BUILDING SPACE TO HEAT/COOL THE ROOM.</p>	<p>1. ALL ROOFTOP UNITS WILL BE PROGRAMMED TO OPERATE IN THE OCCUPIED AND UNOCCUPIED MODES OF OPERATION BY THEIR PROGRAMMABLE THERMOSTATS FOR THEIR INDIVIDUAL SPACES.</p> <p>2. WHENEVER THE ROOFTOP UNITS ARE IN THEIR OCCUPIED MODE, THE OUTSIDE AIR DAMPER WILL AUTOMATICALLY OPEN TO THE MINIMUM VOZ VALUES PER THE VENTILATION AIR SCHEDULE IN DRAWING M3.0 AND CLOSE WHEN THE SPACE GOES INTO AN UNOCCUPIED MODE.</p> <p>3. RTUS 2A,2B,4,5,6, AND 7 TO BE PROVIDED WITH MOTORIZED DAMPERS ON OUTSIDE AIR DUCT TO PROVIDE OUTSIDE AIR LEVELS AS INDICATED ON VENTILATION AIR SCHEDULE SHOWN ON SHEET M3.0. PROVIDE CO2 SENSORS FOR EACH ERV AND LOCATE THEM WITHIN THE SPACE THE ERV SERVES. CO2 SENSOR TO ENERGIZE ERV UNIT AND CLOSE MOTORIZED OUTSIDE AIR DAMPER AT RTU WHEN CO2 LEVELS EXCEED 800 PPM. WHEN CO2 LEVELS ARE BELOW SET POINT, ERV UNIT SHOULD TURN OFF AND MOTORIZED OUTSIDE AIR DAMPER TO OPEN TO ALLOW OUTSIDE AIR TO PASS THROUGH RTUS.</p>	<p>1. INSTALL ROOFTOP UNIT ON ROOF CURB SUPPORTED BY THE ROOF STRUCTURE. MAINTAIN MINIMUM REQUIRED CLEARANCE AROUND UNIT FOR SERVICING AND PROPER AIRFLOW.</p> <p>2. PROVIDE MINIMUM 1" DIA. ROOFTOP UNIT CONDENSATE DRAIN LINE FROM UNIT TO SPLASH PAD. SEE DETAIL ON SHEET M4.0</p> <p>3. PROVIDE 1" ACOUSTICAL DUCT LINING IN THE FIRST 10'-0" OF DUCTWORK FROM THE ROOFTOP UNIT.</p> <p>4. PROVIDE AND INSTALL DUCT SMOKE DETECTOR EQUAL TO SYSTEM SENSOR D1400-ACDCHT WITH RESET IN RETURN AIR DUCTWORK. ONCE ACTIVATED, DETECTOR SHALL SHUT DOWN THE AIR DISTRIBUTION SYSTEM.</p> <p>5. EXHAUST DUCT DOWN FROM ERV WITH 3/4" MESH SCREEN OVER THE OPENING. EXTEND DUCT 36" DOWN FROM THE UNDERSIDE OF STRUCTURE.</p> <p>6. EXHAUST DUCT FROM ERV WITH 3/4" MESH SCREEN.</p> <p>7. CO2 SENSOR TO ENERGIZE ERV WHEN HIGH LEVELS OF CARBON DIOXIDE ARE DETECTED.</p> <p>8. OVERRIDE TIME CONTROL SWITCH TO CONTROL THE OPERATION OF THE ERV. PRIOR INSTALLATION, THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH RENEWAIRE TO VERIFY THE INSTALLATION OF THE OVERRIDE SWITCH WILL NOT VOID ANY WARRANTIES OF THE EQUIPMENT.</p>



INSULATION/LINER REQUIREMENTS:
 EXPOSED SUPPLY DUCTWORK SHALL BE INTERNALLY LINED.
 CONCEALED SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED, EXCEPT WHERE INDICATED BY NOTE 3 ON M1.0.
 OMIT INSULATION, WHERE INTERNAL LINING IS USED.

REV	DATE	DESCRIPTION
-	06/17/22	ISSUE FOR BID



PETSUITES - CYPRESS SPRINGS
 7510 FRY RD
 CYPRESS, TX 77433

MECHANICAL FLOOR PLAN

ISSUED FOR:	
PERMIT	-
BID	-
CONSTRUCTION	-
RECORD	-

SITE ID NO.	T.B.D.
PROJECT MANAGER	DESIGNER
KMW	JDF

JOB NO.
21210-00

M1.0

1 FLOOR PLAN — MECHANICAL
 M1.0 SCALE: 1/8"=1'-0"

Drawing Name: \\aseldc1\Projects\2022\220650\M400_M1.0 MECHANICAL FLOOR PLAN.dwg
 Date: 06/17/22
 User: ifortis

1

2

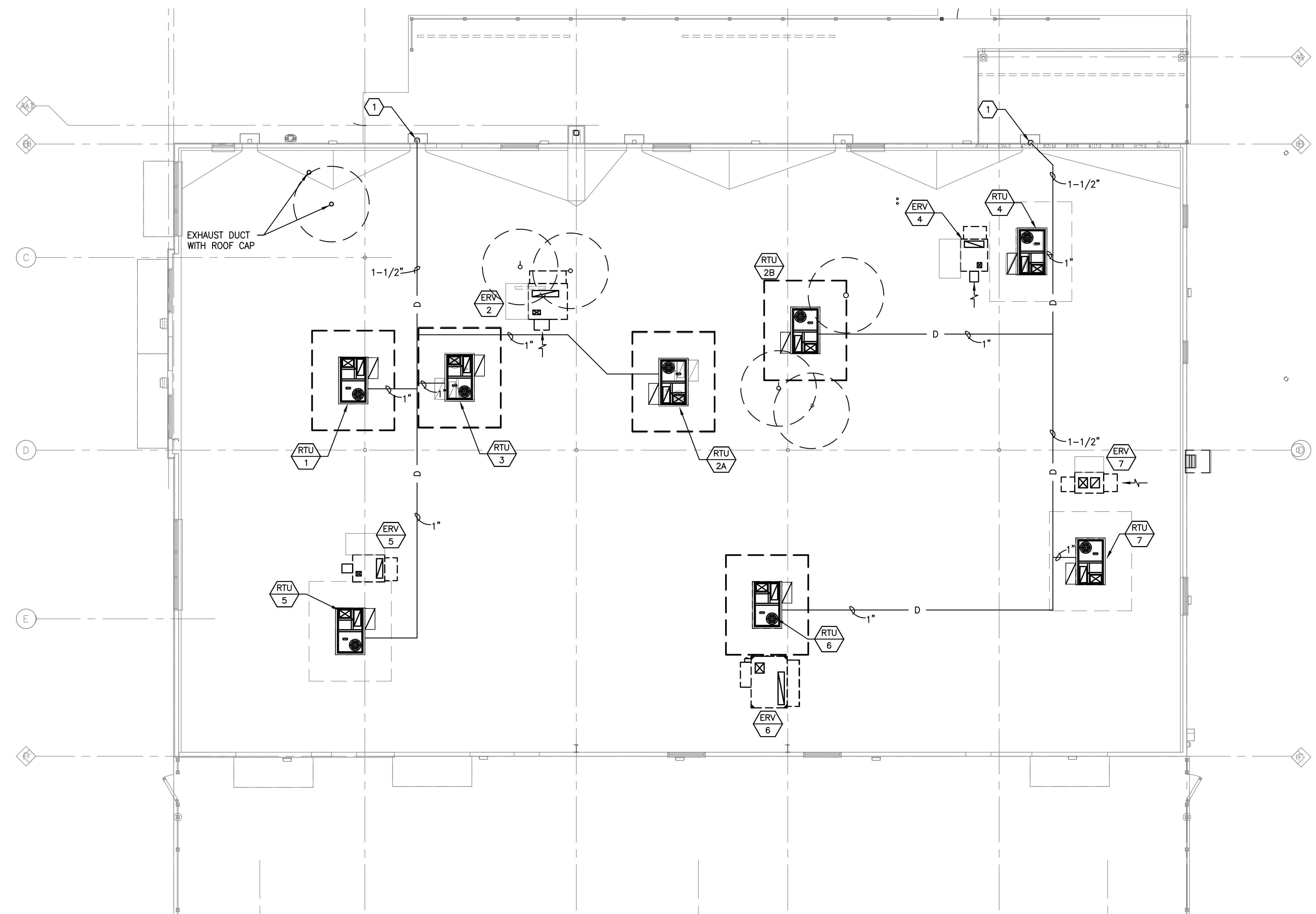
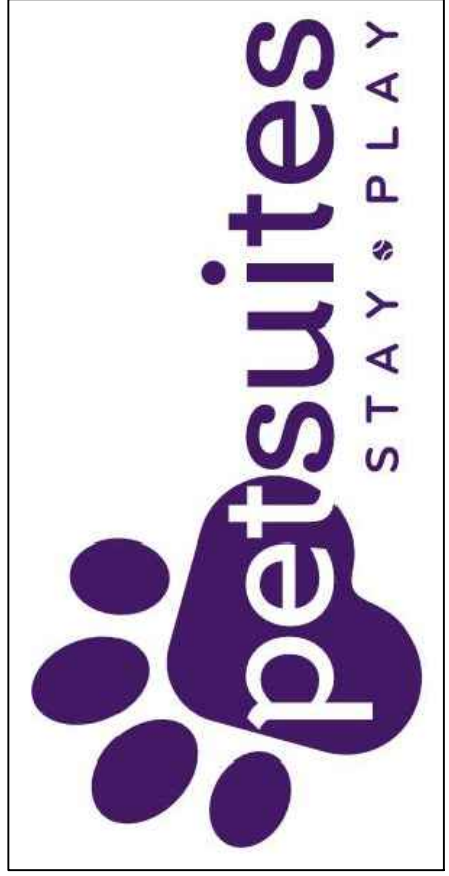
3

4

5

KEY NOTES

- 1. ROUTE 1-1/2" CONDENSATE DRAIN LINE FROM THE ROOF TOP UNITS (RTUs) AND TERMINATE LINE ABOVE SCUPPER. SCUPPER DOWNSPOUT TO CONNECT TO STORM DRAIN PIPING. SEE CIVIL FOR CONTINUATION.



REV	DATE	DESCRIPTION
-	06.17.22	ISSUE FOR BID



PETSUITES - CYPRESS SPRINGS
 7510 FRY RD
 CYPRESS, TX 77433

MECHANICAL ROOF PLAN

ISSUED FOR:	
PERMIT	-
BID	-
CONSTRUCTION	-
RECORD	-

SITE ID NO. T.B.D.	
PROJECT MANAGER KMW	DESIGNER JDF

JOB NO.
21210-00

M1.1

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

TEXAS ENGINEER FIRM REGISTRATION #F-15201

ASEIENGINEERING 350 Glenborough Dr. #270, Houston, TX 77067
 aseieengineering.com o 713.300.9579

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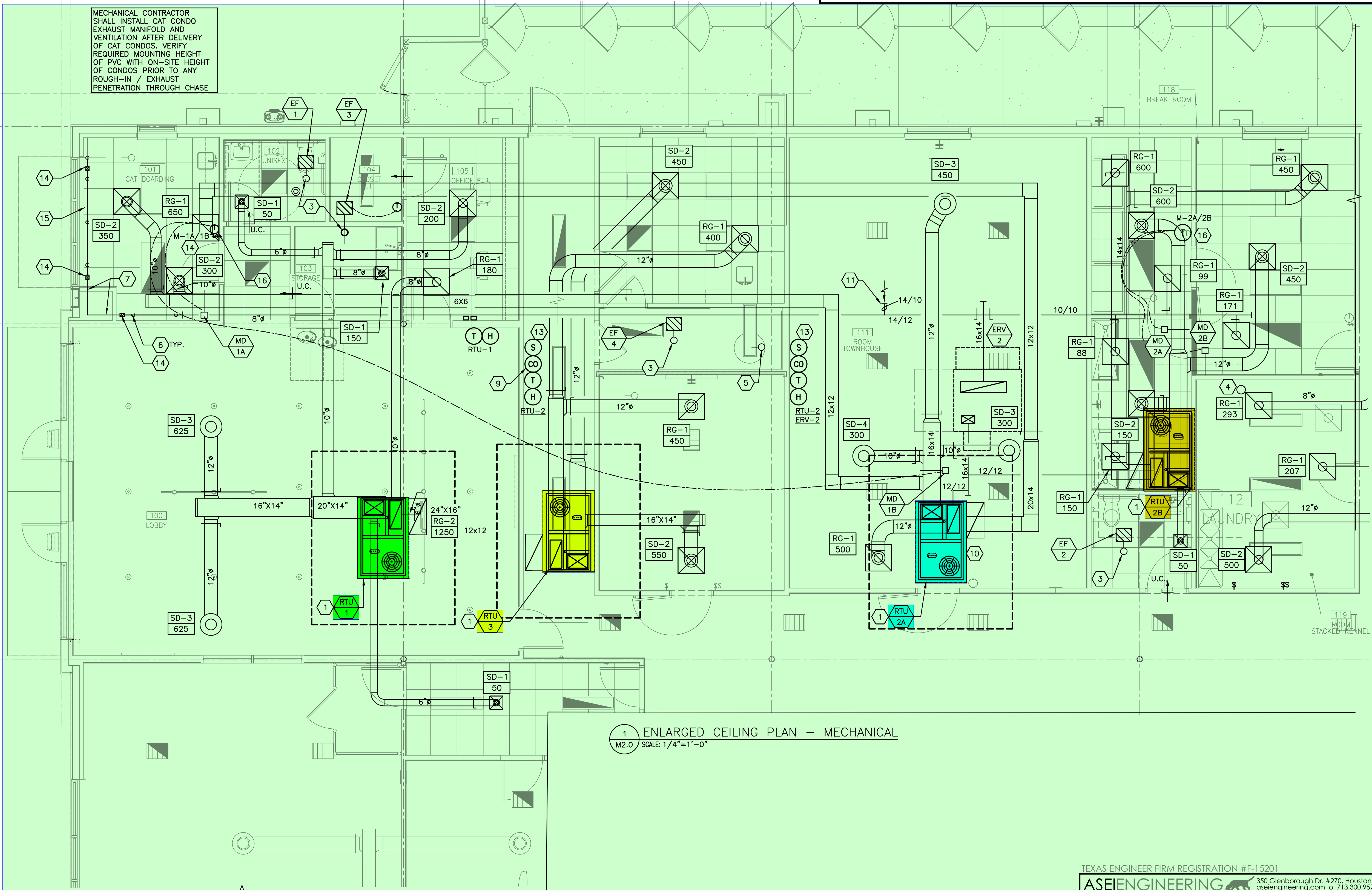
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 DSN: MG
 JOB NO: 220650
 CHK: DEM

Drawing Name: \aseldc\1\Projects\2022\0650\MM400_M1.1_MECHANICAL ROOF PLAN.dwg
 Date: 06/17/22
 User: ifortis

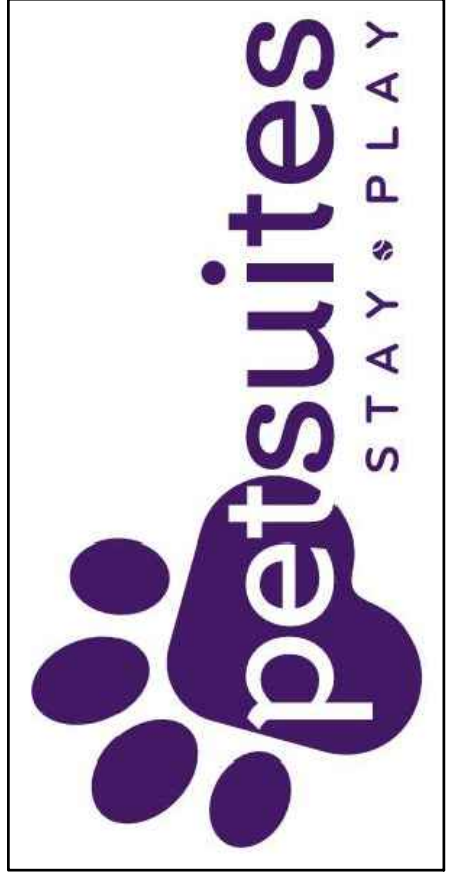
KEY NOTES

1. SUPPORT ROOFTOP UNIT ON MANUFACTURER PROVIDED ROOF CURB RESTING ON THE PEMB ROOF STRUCTURE. DUCTWORK CONNECTIONS TO THE ROOFTOP UNITS TO INCLUDE FLEXIBLE CONNECTORS. COORDINATE LOCATION WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN.
2. PROVIDE AND INSTALL DUCT SMOKE DETECTOR EQUAL TO SYSTEM SENSOR DH400-ACDCIHT WITH RESET IN RETURN AIR DUCTWORK. ONCE ACTIVATED, DETECTOR SHALL SHUT DOWN THE AIR DISTRIBUTION SYSTEM. SMOKE DETECTOR TO BE WIRED INTO FIRE ALARM PANEL.
3. EXHAUST DUCT UP THRU ROOF WITH GREENHECK ROOF CAP RH-6x9. MINIMUM 10'-0" FEET AWAY FROM AIR INTAKE.
4. 8" DOUBLE WALL VENT UP THRU ROOF FROM DRYER VENT. INSTALL PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
5. INSTALL 3" PVC VENT AND COMBUSTION AIR INTAKE PIPE TO GAS WATER HEATER IN ACCORDANCE WITH NATIONAL FUEL GAS CODE. SLOPE VENT PIPE MINIMUM 1/4" PER FOOT. ROUTE UP THROUGH ROOF AND TERMINATE WITH CONCENTRIC VENT COMBUSTION AIR CAP. MAINTAIN 10'-0" SEPARATION FROM OUTDOOR AIR INTAKES. SEE DETAIL ON SHEET M4.0.
6. 6X6X4 PVC SCH. 40 DWV REDUCING TEE, 4" PIPE AND ELBOW TO COVER 3" OPENING PER CAGE FROM MAIN DUCT. PIPE LOCATION TO BE AT TOP (BACK) OF EACH CAGE. SEE SHEET A9.2 FOR ADDITIONAL INFORMATION.
7. SHOR-LINE CAT CONDOS. PROVIDE ALL WORK FOR EXHAUST SYSTEM, DUCTWORK AND PIPING TO CAGES IN CAT BOARDING ROOM 101. COORDINATE INSTALLATION WITH CAT-CAGE PROVIDER. ADJUST FAN TO MAINTAIN MINIMUM 120 CFM EXHAUST IN THE SYSTEM.
8. REFER TO DRAWING M1.0 FOR CONTINUATION.
9. CO2 SENSOR TO ENERGIZE ERV-2 WHEN HIGH LEVELS OF CARBON DIOXIDE ARE DETECT.
10. RTU-2A/2B SHALL BE CONTROLLED BY A 7-DAY PROGRAMMABLE THERMOSTAT. THE THERMOSTAT SHALL HAVE A REMOTE AVERAGING SENSOR WIRED BACK TO THE THERMOSTAT. THE THERMOSTAT WILL OPERATE BASED ON THE AVERAGE TEMPERATURE OF SENSOR AND THERMOSTAT (HONEYWELL TB7220 W/ TR21 SENSOR).
11. EXHAUST DUCT FROM ERV WITH 3/4" MESH SCREEN.
12. CO2 SENSOR TO ENERGIZE ERV-4 WHEN HIGH LEVELS OF CARBON DIOXIDE ARE DETECT.
13. OVERRIDE TIME CONTROL SWITCH TO CONTROL THE OPERATION OF THE ERV. PRIOR INSTALLATION, THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH RENEWAIRE TO VERIFY THE INSTALLATION OF THE OVERRIDE SWITCH WILL NOT VOID ANY WARRANTIES OF THE EQUIPMENT.
14. FERNCO PROFLEX MODEL 3000-66 6" PVC TO 6" PVC STAINLESS STEEL COUPLING WITH NEOPRENE GASKET MATERIAL, STAINLESS STEEL SHIELD AND CLAMPS.
15. SHOR-LINE CAT CONDOS. PROVIDE ALL WORK FOR EXHAUST SYSTEM, DUCTWORK AND PIPING TO CAGES IN CAT BOARDING ROOM 101. COORDINATE INSTALLATION WITH CAT-CAGE PROVIDER. ADJUST FAN SPEED CONTROL TO MAINTAIN MINIMUM 120 CFM EXHAUST IN THE SYSTEM.
16. T-STAT FOR ZONE-DAMPER COORDINATE WITH THE E.C. FOR THE INSTALLATION OF THE 24V/120V, 40VA TRANSFORMER AND CONDUIT. M.C. SHALL PROVIDE THE ZONE T-STAT, SUPPLY AIR SENSOR, ZONE DAMPERS AND LOW VOLTAGE WIRING. E.C. SHALL PROVIDE THE TRANSFORMER AND CONDUIT WITH PULL STRING.

MECHANICAL CONTRACTOR SHALL INSTALL CAT CONDO EXHAUST MANIFOLD AND VENTILATION AFTER DELIVERY OF CAT CONDOS. VERIFY REQUIRED MOUNTING HEIGHT OF PVC WITH ON-SITE HEIGHT OF CONDOS PRIOR TO ANY ROUGH-IN / EXHAUST PENETRATION THROUGH CHASE



1 ENLARGED CEILING PLAN - MECHANICAL
M2.0 SCALE: 1/4"=1'-0"



REV	DATE	DESCRIPTION
-	06/17/22	ISSUE FOR BID



PETSUITES - CYPRESS SPRINGS
7510 FRY RD
CYPRESS, TX 77433

MECHANICAL ENLARGED PLAN

ISSUED FOR:	
PERMIT	-
BID	-
CONSTRUCTION	-
RECORD	-

SITE ID NO. T.B.D.	
PROJECT MANAGER KMW	DESIGNER JDF

JOB NO.
21210-00

M2.0

ROOFTOP HVAC UNIT SCHEDULE

MARK	MANUFACTURER MODEL NUMBER	APPLICATION	NOMINAL TONS	COOLING			SUPPLY FAN					GAS HEAT			MIN. O.A. CFM	ELECTRICAL		MOCP	WEIGHT (lbs.)	REMARKS			
				TOTAL (MBH)	SENS (MBH)	SEER/EER	TYPE	E.S.P. (IN W.G.)	CFM	RPM	BHP	MOTOR HP	INPUT (MBH)	OUTPUT (MBH)		AFUE	VOLTS-PHASE-HERTZ				FLA		
DIRECT RTU 1	CARRIER 48GCSM06B1A5	LOBBY/OFFICE	4	45.85	35.95	16/-	CENT	1	1700	2088	0.98	1.1	50	67	40	54	80	168	208-3-60	26.88	40	798	1589
RTU 2A	CARRIER 48GCSM06B1A5	TOWNHOUSE	4	45.85	35.95	16/-	CENT	1	1700	2088	0.98	1.1	50	67	40	54	80	232	208-3-60	26.88	40	798	1589
RTU 2B	CARRIER 48GCSM06B1A5	GROOMING	4	45.85	35.95	16/-	CENT	1	1700	2088	0.98	1.1	50	67	40	54	80	127	208-3-60	26.88	40	798	1589
RTU 3	CARRIER 48VG-A300605	BREAK/HALL	2.5	29.6	19.7	15/-	CENT	.20	1000	1050	.24	.50	50	67	49	-	81	147	208-3-60	16.2	20	500	158
RTU 4	CARRIER 48HCSE09B3M5	MED. KENNEL	8.5	99.44	76.85	-/12	CENT	1	3750	1070	2.9	3.7	90	125	73	103	80	364	208-3-60	46.08	60	1330	12346789
RTU 5	CARRIER 48HCSE09B3M5	LG DAYCARE	8.5	99.73	77.02	-/12	CENT	1	3750	1051	2.79	3.7	90	125	73	103	80	377	208-3-60	46.28	60	1330	12346789
RTU 6	CARRIER 48HCSE17A3A5-6W2C0	LG KENNELS	15	174.60	128.10	-/12	CENT	1	5870	880	3.4	4.9	120	180	98	148	80	516	208-3-60	84.0	100	2550	12346789
RTU 7	CARRIER 48HCSE07B2M5	SM DAYCARE	6	70.48	53.42	-/12	CENT	1	2700	896	2.35	2.9	105	150	84	120	80	234	208-3-60	29.38	50	1100	12346789

1. PROVIDE UNIT WITH NON-FUSED DISCONNECT, CONVENIENCE OUTLET, CONDENSER COIL HAIL GUARD AND TIME GUARD II COMPRESSOR DELAY, 2" PLEATED MERV 7 AIR FILTERS.
2. PROVIDE UNIT WITH AN ENTHALPY ECONOMIZER CYCLE CONTROL AND RETURN AIR SMOKE DETECTOR.
3. PROVIDE UNIT WITH STAINLESS STEEL HEAT EXCHANGER AND MODULATING OUTSIDE AIR DAMPER INTERLOCK WITH ERV.
4. PROVIDE HUMID-MIZER DEHUMIDIFICATION SYSTEM AND SPACE HUMIDISTAT.
5. PROVIDE BAROMETRIC RELIEF.
6. TWO STAGE COOLING.
7. PROVIDE ECONOMIZER FAULT DETECTION AND DIAGNOSTIC SYSTEM IN ACCORDANCE WITH SECTION C403.2.4.7 OF THE 2015 IECC
8. OR APPROVED EQUAL MANUFACTURER.
9. PROVIDE UNIT WITH "HUMIDIMIZER" DEHUMIDIFICATION SYSTEM.

CONTACT CARRIER STRATEGIC ACCOUNTS FOR INFORMATION:
 FOR QUESTIONS OR QUOTATIONS, CONTACT DEBBIE JOBIN (DEBBIE.JOBIN@CARRIER.COM - 315.432.7942)
 FOR GENERAL ACCOUNT NEEDS, CONTACT RUSS MURRAY (RUSS.MURRAY@CARRIER.COM - 304.210.5485)

EXHAUST FAN SCHEDULE

BASIS OF DESIGN: GREENHECK

TAG	MODEL#	LOCATION	CFM	ESP	FRPM	HP/W	VOLTAGE	SOUND dBA	SONES	REMARKS
EF-1,2	SP-B110-QD	UNISEX 102/113	70	0.375	729	80W	115/60/1	32	1.5	A,C
EF-3,4	SP-B150-QD	IT 104/ELECT 114	150	0.25	1025	128W	115/60/1	42	3.5	I,E

REMARKS
 A. PROVIDE FLEXIBLE CONNECTION AT FAN OUTLET, BACKDRAFT DAMPER, PLUG-IN DISCONNECT, SPEED CONTROLLER, ROOF JACK AND HANGER RODS WITH VIBRATION ISOLATORS.
 B. INLINE FAN ARRANGEMENT ABOVE THE CEILING, FLEXIBLE CONNECTION ON THE FAN INLET.
 C. EXHAUST FAN TO BE WIRED TO OPERATE WITH MANUAL SWITCH IN ROOM TO BE OPERATED BY STAFF.
 D. EXHAUST FAN TO BE WIRED TO OPERATE WITH MANUAL 30 MINUTE TIMER. SEE M1.0 SHEET FOR LOCATION.
 E. EXHAUST FAN TO BE WIRED TO OPERATE WHEN ROOM THERMOSTAT SENSES THE ROOM TEMPERATURE EXCEEDS 80 DEG. F.
 F. PROVIDE AUTOMATIC BACKDRAFT DAMPER, BIRDSCREEN, ECM MOTOR AND NEMA 3R DISCONNECT SWITCH.
 G. EXHAUST FAN TO BE WIRED TO OPERATE WITH PROGRAMMABLE 30 MINUTE TIMER, WITH MANUAL OVERRIDE. SEE M1.0 SHEET FOR LOCATION. SEE DETAIL 4/E4.0 FOR ADDITIONAL INFORMATION.
 I. PROVIDE FLEXIBLE CONNECTION AT FAN OUTLET, BACKDRAFT DAMPER, PLUG-IN DISCONNECT, SPEED CONTROLLER AND HANGER RODS WITH VIBRATION ISOLATORS.

AIR DEVICE SCHEDULE

BASIS OF DESIGN: TITUS

TAG	MODEL	PANEL	NECK SIZE	REMARKS
SD-1	TMSA	12x12 LAY-IN	SAME AS BRANCH OR AS NOTED	1,2
SD-2	TMSA	24x24 LAY-IN	SAME AS BRANCH OR AS NOTED	1,2
SD-3	TMR	22 DIA.	SAME AS BRANCH OR AS NOTED	1,2
SD-4	TMR	26 DIA.	SAME AS BRANCH OR AS NOTED	1,2
SD-5	RUSKIN CDS-16	24x48 CONCENTRIC	AS NOTED	1,3,4
RG-1	50F	24x24 LAY-IN PERF.	SAME AS BRANCH OR AS NOTED	1,3

REMARKS
 1. COLOR SHALL BE # 26 WHITE.
 2. PROVIDE DAMPERS IN TAKEOFFS WHERE ACCESSIBLE. WHERE DAMPERS ARE NOT ACCESSIBLE, PROVIDE AG-75 OPPOSED BLADE DAMPER AT DIFFUSER.
 3. OPPOSED BLADE DAMPER.
 4. PROVIDE S.M. ADAPTER AT GRILLE NECK WHERE ROUND CONN. IS SHOWN.

VENTILATION AIR SCHEDULE based on ANSI/ASHRAE Standard 62.1-2010

Cypress TX PetSuite

Table 6-1
 Vbz=Az x Ra + Rp x Pz
 Voz=Voz/Vpz

Room #	Room Name	Az sqft	Occupancy Category	Rp cfm/P	Ra cfm/sqft	Pz people	Area cfm	OA (cfm) Vbz	Air Eff Ez	Voz= Vbz/Ez	SA (cfm) Vpz	Zp=Voz/Vpz	Ev	EA=(Az x Ev)
100	Lobby	889	Lobby	5	0.06	10	50	103	0.8	129	900	-	-	-
102	Unisex	47	Public Restrooms	-	70 EA	-	-	-	-	-	50	-	-	70
103	Storage	57	Storage	-	0.12	0	0	7	0.8	9	50	0.17	-	-
104	IT Closet	34	Electrical Equip. Rm	-	0.12	0	0	4	0.8	5	0	0.00	-	-
105	Office	117	Office	5	0.06	2	10	7	0.8	21	200	-	-	-
106	Vestibule	124	Office	5	0.06	0	0	7	1.8	4	201	-	-	-
	RTU-1	1,268				12		139		168	1,401	0.12	-	70
101	Cat Boarding	135	Pet Shops (animal areas)	7.5	0.18	1	8	24	0.8	40	450	0.09	0.90	122
111	Townhouse	770	Pet Shops (animal areas)	7.5	0.18	2	15	139	0.8	192	850	0.23	0.90	693
	RTU-2A	905				3		185		232	1,300	0.63	-	815
115	Bathing	98	Pet Shops (animal areas)	7.5	0.18	1	8	18	0.8	31	120	0.26	0.90	88
116	Drying	110	Pet Shops (animal areas)	7.5	0.18	1	8	20	0.8	34	450	0.08	0.90	99
117	Grooming	190	Pet Shops (animal areas)	7.5	0.18	2	15	34	0.8	62	400	0.15	0.90	171
	RTU-2B	398				4		102		127	970	0.37	-	358
108	Hallway	995	Corridors	0	0.06	0	0	60	0.8	75	250	0.30	-	-
112	Laundry	189	Equipment Rm	0	0.12	0	0	23	0.8	28	350	0.08	-	-
113	Unisex	54	Public Restrooms	-	70 EA	-	-	-	-	-	50	-	-	70
114	Utility Room	111	Electrical Rm	0	0.12	0	0	13	0.8	17	0	0.00	-	-
118	Break Room	193	Break Rm	5	0.06	2	10	12	0.8	27	350	-	-	-
	RTU-3	1,542				2		117		147	1,000	0.15	-	70
119	Stacked Kennels	230	Pet Shops (animal areas)	7.5	0.18	1	8	41	0.8	61	200	0.31	0.90	207
120	Dog Boarding B	1,262	Pet Shops (animal areas)	7.5	0.18	2	15	227	0.8	303	850	0.36	0.90	1,136
	RTU-4	1,492				3		291		364	1,050	0	-	1,343
121	Flex Play	565	Pet Shops (animal areas)	7.5	0.18	1	7.5	102	0.8	137	600	0.23	0.90	509
107	Large Daycare	946	Pet Shops (animal areas)	7.5	0.18	3	23	170	0.8	241	1,800	0.13	0.90	851
	RTU-5	1,511				4		302		377	2,400	0.57	-	1,360
110	Dog Boarding A	2,126	Pet Shops (animal areas)	7.5	0.18	4	30	383	0.8	516	2,400	0.21	0.90	1,913
	RTU-6	2,126				4		413		516	2,400	0.21	-	1,913
122	Small Daycare	958	Pet Shops (animal areas)	7.5	0.18	2	15	172	0.8	234	2,400	0.10	0.90	862
	RTU-7	958				2		187		234	2,400	0.36	-	862

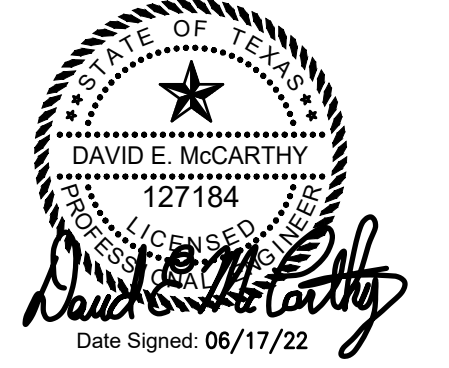
ENERGY RECOVERY VENTILATION SCHEDULE

MARK	MANUFACTURER MODEL #	AIR CAPACITIES			FILTER RATING	CYCLE	PERFORMANCE DATA				ELECTRICAL DATA				OP. UNIT WT. LBS.	REMARKS		
		SUPPLY	SA ESP	EXH ESP			ROOM DB	ROOM WB	OUTSIDE DB	OUTSIDE WB	SUPPLY DB	SUPPLY WB	HP	MAX FLA			MOPD	VOLT/Ø
2	RENEWAIRE HE2XRT	1173	.5	.5	MERV-8	COOL	75	62.5	98	80	80.5	71.1	1.5	9.4	15	208/3	784	SEE NOTES 1 & 2 BELOW
						HEAT	70	-	27	-	58	-	-	-	-	-	-	-
4	RENEWAIRE HE2XRT	1343	.5	.5	MERV-8	COOL	75	62.5	98	80	80.7	71.1	1.5	9.4	15	208/3	784	SEE NOTES 1 & 2 BELOW
						HEAT	70	-	27	-	58	-	-	-	-	-	-	-
5	RENEWAIRE HE2XRT	1360	.5	.5	MERV-8	COOL	75	62.5	98	80	81.0	71.5	1.5	9.4	15	208/3	784	SEE NOTES 1 & 2 BELOW
						HEAT	70	-	27	-	58	-	-	-	-	-	-	-
6	RENEWAIRE HE4XRT	1913	.5	.5	MERV-8	COOL	75	62.5	98	80	81	69.5	(2)2.0	16.3	20	208/3	1,143	SEE NOTES 1 & 2 BELOW
						HEAT	70	-	27	-	58	-	-	-	-	-	-	-
7	RENEWAIRE HE1.5XRT	862	.5	.5	MERV-8	COOL	75	62.5	98	80	81.1	70.8	1.0	2.2	15	208/3	615	SEE NOTES 1 & 2 BELOW
						HEAT	70	-	27	-	58	-	-	-	-	-	-	-

- NOTE:
 1. PROVIDE CO2 SENSORS FOR UNIT OPERATION.
 2. PROVIDE VARIABLE FREQUENCY DRIVE (VFD).



REV.	DATE	DESCRIPTION
06.17.22		ISSUE FOR BID



PETSUITES - CYPRESS SPRINGS
 7510 FRY RD
 CYPRESS, TX 77433

MECHANICAL SCHEDULES

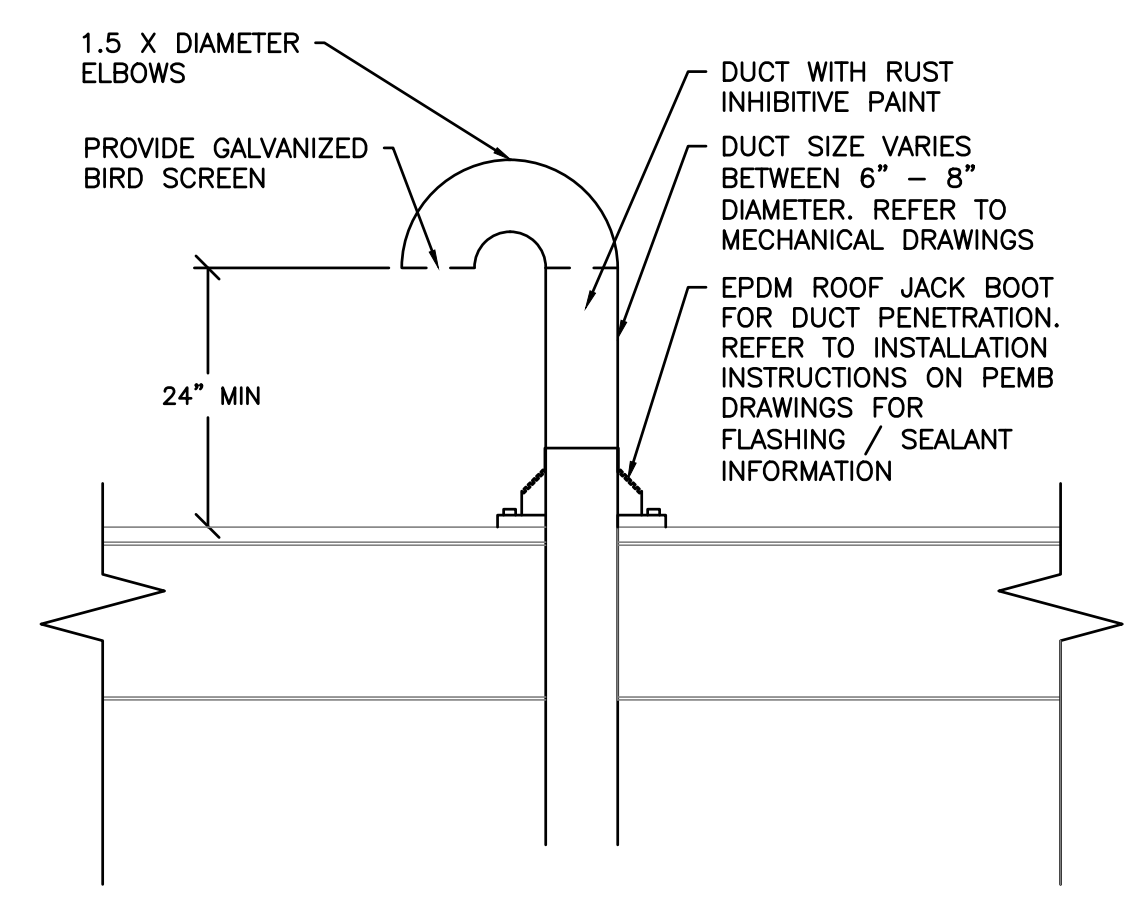
ISSUED FOR:	PERMIT	-
BID	-	-
CONSTRUCTION	-	-
RECORD	-	-

SITE ID NO.
T.B.D.

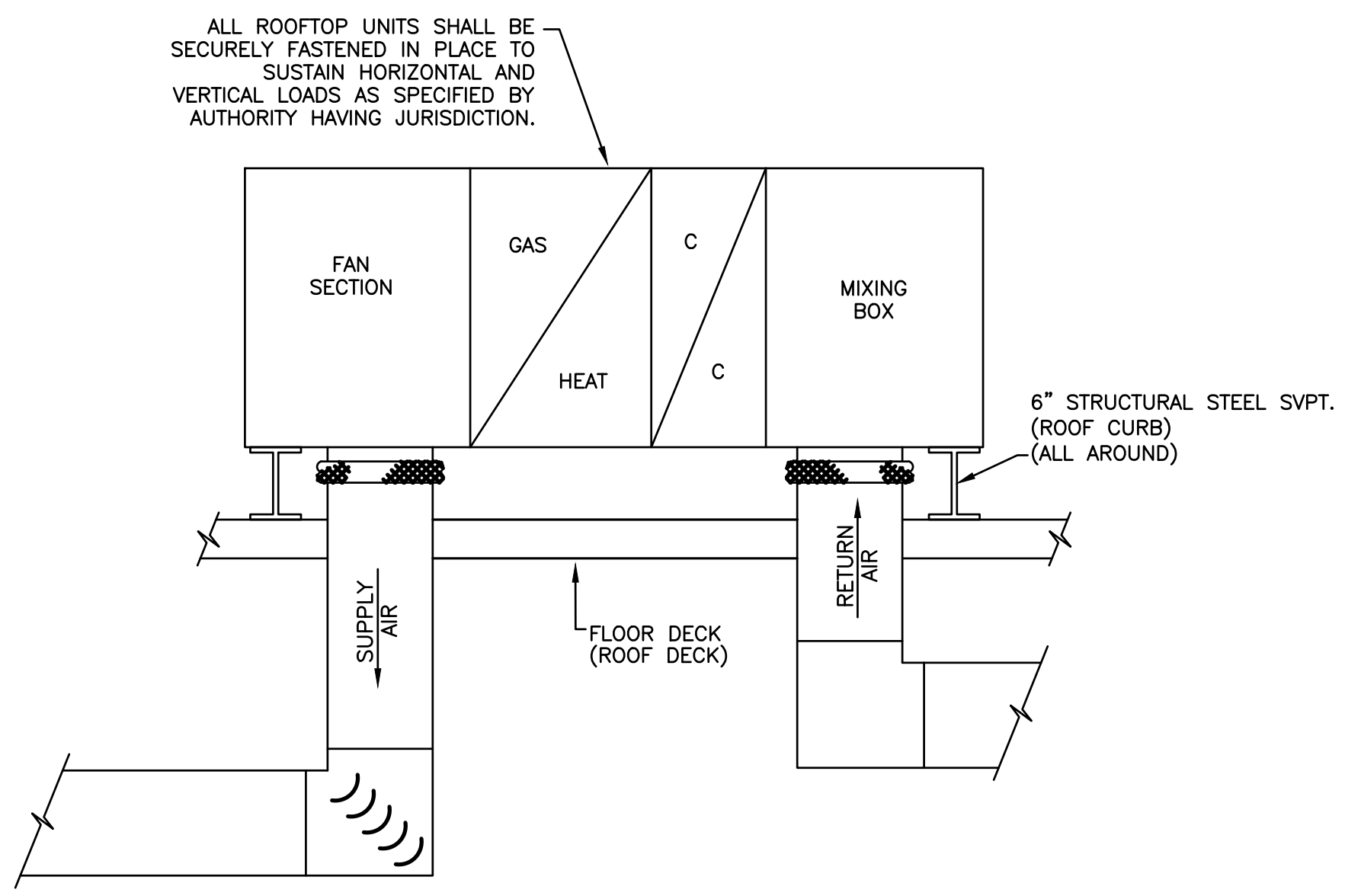
PROJECT MANAGER: KMW
 DESIGNER: JDF

JOB NO.
21210-00

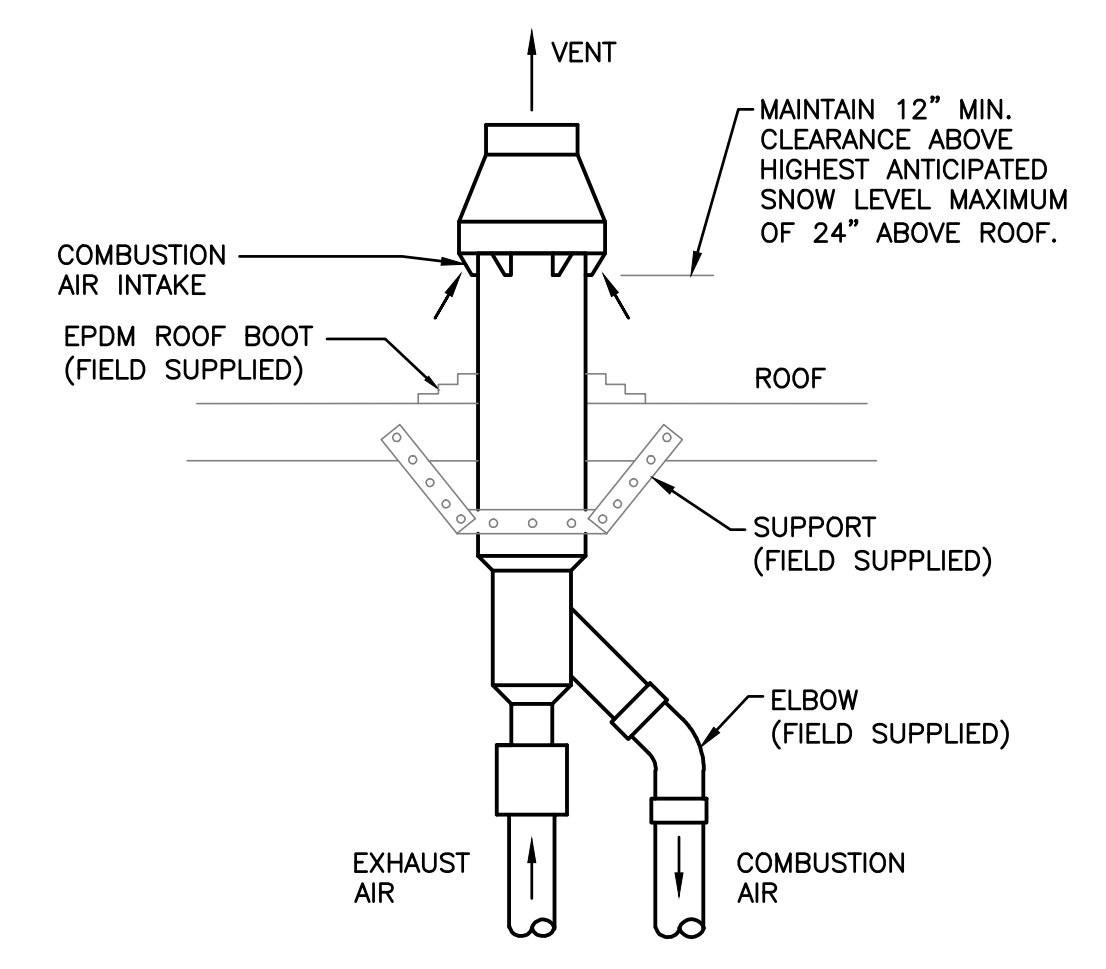
M3.0



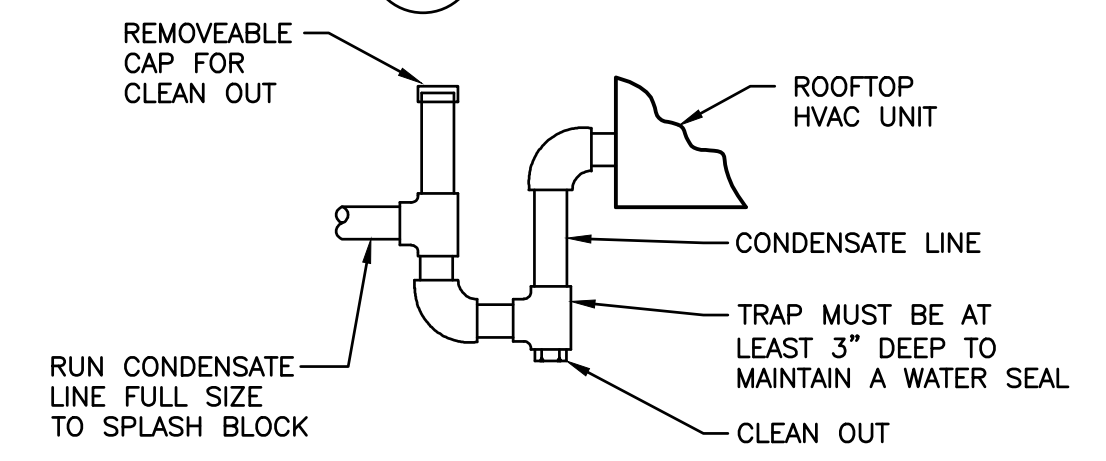
8 EXHAUST DUCT DETAIL
 M4.0 SCALE: 3/4" = 1'-0"



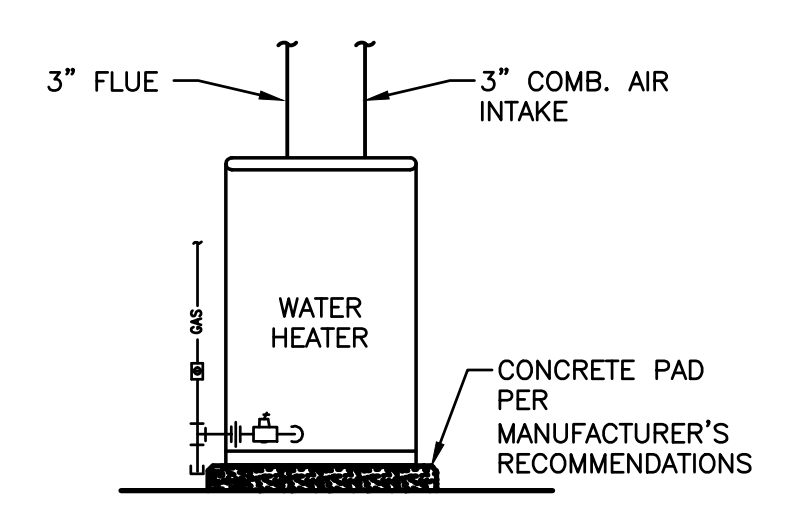
7 ROOF TOP UNIT
 M4.0 SCALE: N.T.S.



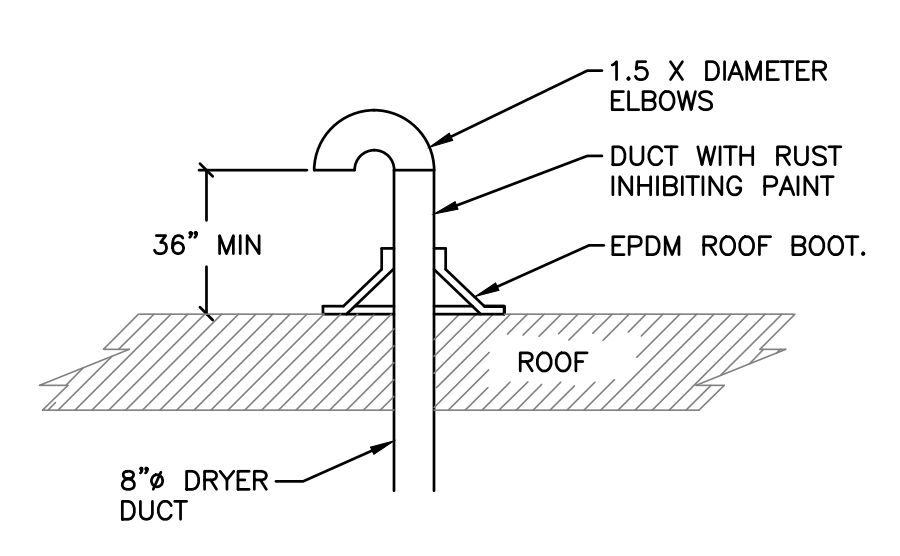
5 WATER HEATER CONCENTRIC VENT
 M4.0 SCALE: N.T.S.



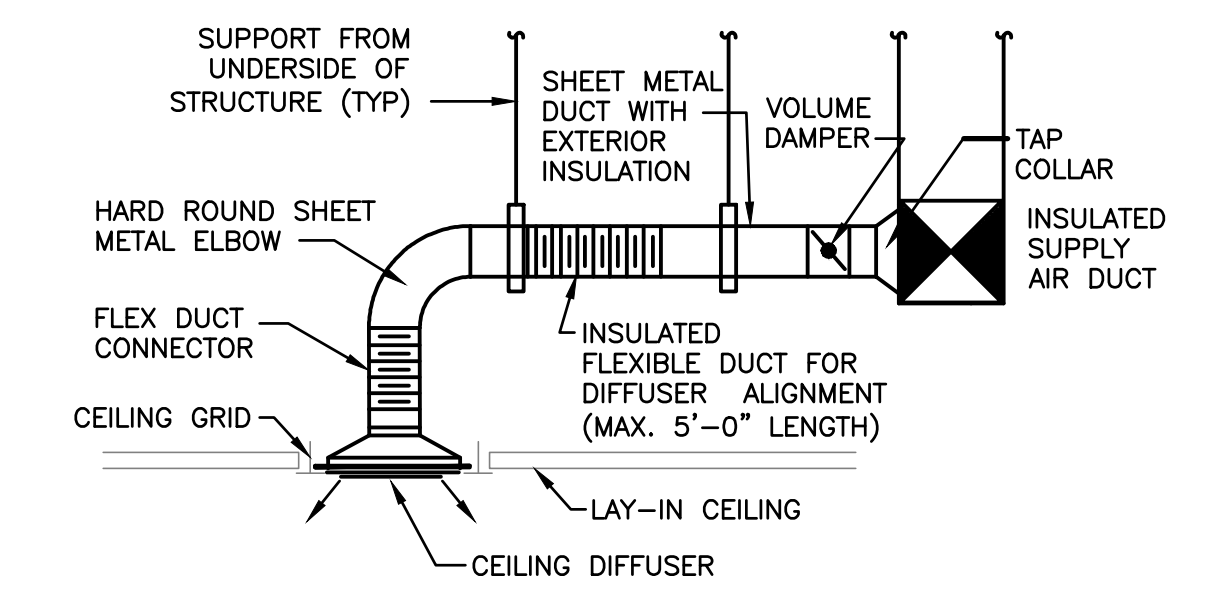
6 CONDENSATE DRAIN PIPING DETAIL
 M4.0 SCALE: N.T.S.



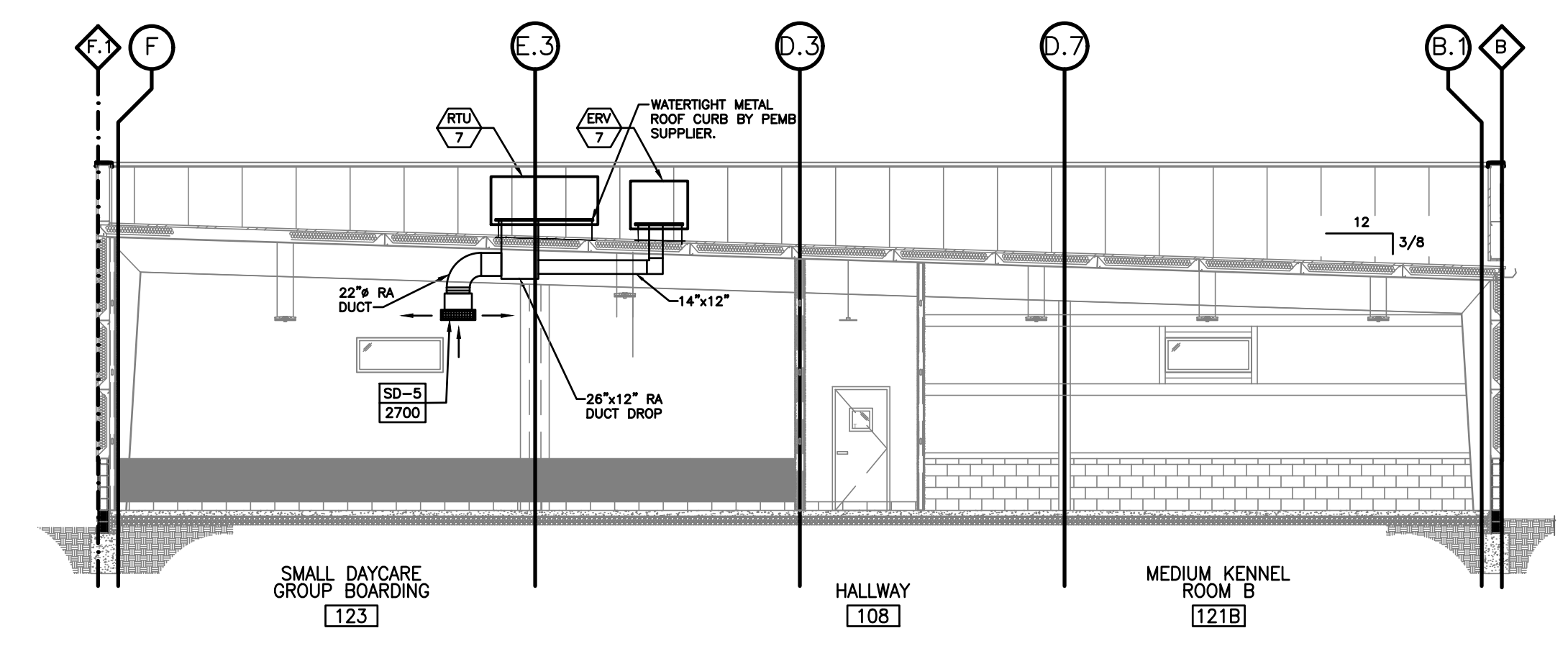
4 GAS-FIRED WATER HEATER DETAIL
 M4.0 SCALE: N.T.S.



3 DRYER VENT EXHAUST DUCT DETAIL
 M4.0 SCALE: N.T.S.



2 CEILING DIFFUSER TAKE OFF DUCT DETAIL
 M4.0 SCALE: N.T.S.



1 BUILDING SECTION
 M4.0 SCALE: 1/8" = 1'-0"



REV	DATE	DESCRIPTION
-	06.17.22	ISSUE FOR BID



PETSUITES - CYPRESS SPRINGS
 7510 FRY RD
 CYPRESS, TX 77433
MECHANICAL DETAILS & SECTIONS

ISSUED FOR:	
PERMIT	-
BID	-
CONSTRUCTION	-
RECORD	-

SITE ID NO. T.B.D.	
PROJECT MANAGER XXX	DESIGNER XXX

JOB NO.
21210-00

M4.0