MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM. DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED. COORDINATION: COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOF WARRANTY. DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS. SHEET METAL DUCTWORK: PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS, SEAL CLASS "A". SHEET METAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G90 ZINC COATING. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC-COATED BY THE HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90º ELBOWS. TRAPEZE DUCT HANGERS: PROVIDE MINIMUM 1" X 2" X 1" X 18 GAUGE CHANNELS WITH MINIMUM 1" X 18 GAUGE STRAPS TO STRUCTURAL SUPPORT. ROUND SHEET METAL DUCT: PROVIDE SPIRAL SEAM (ALL SIZES) OR SNAP LOCK (DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL-1. FIBER GLASS DUCT BOARD IS AN ACCEPTABLE ALTERNATIVE IF APPROVED BY OWNER AND THE LOCAL BUILDING CODE OFFICIAL. PRODUCT AND INSTALLATION MUST MEET NAIMA STANDARDS AND OTHER APPLICABLE CODES AND REGULATIONS. EXPOSED DUCTWORK: EXPOSED DUCTWORK SHALL BE CLEANED OF DEBRIS AND OIL, THEN WIPED DOWN WITH VINEGAR OR OTHER SURFACE PREPARING CHEMICAL TO PREPARE DUCT FOR PAINT. DUCT SEALANT: PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS. DUCT INSULATION: MATERIAL FOR SUPPLY AND RETURN AIR DUCT ABOVE CEILING INSIDE THE BUILDING SHALL HAVE THE EQUIVALENT THERMAL RESISTANCE OF MINIMUM R-6. THE REQUIRED R VALUES ARE FOR INSTALLED INSULATION WITH 25% COMPRESSION AT THE CORNERS. PROVIDE PINS AND WASHERS IN ACCORDANCE WITH SMACNA REQUIREMENTS AND AS REQUIRED TO PREVENT INSULATION FROM SAGGING. PROVIDE ADEQUATE INSULATION AT THE SUPPLY AIR DIFFUSERS TO PREVENT CONDENSATION. FLEXIBLE DUCT : UL #181 LISTED, CLASS 1, AND CONTAIN A 0.1 PERM RATED POLYETHYLENE INNER LINER, WITH R-8 FIBERGLASS INSULATION. FLEXIBLE DUCTS SHALL BE SECURED TO RIGID SHEET METAL COLLARS AND AIR DIFFUSERS WITH NYLON TIES OR STAINLESS STEEL WORM GEAR STRAPS. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT. SUPPORT FLEXIBLE DUCTS FROM THE BUILDINGS STRUCTURE WITH MINIMUM 1" WIDE, 18 GAUGE, GALVANIZED STEEL STRAP AT MAXIMUM 4'-0" CENTERS. PROVIDE 4" WIDE SHEET METAL SADDLES AT EACH SUPPORT EACH STRAP. SAG OF FLEXIBLE DUCT BETWEEN HANGERS SHALL NOT EXCEED 1/2" PER FOOT OF SUPPORT SPACING. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM ½" HEXAGONAL AXLE, BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE. FLEXIBLE DUCT CONNECTORS: PROVIDE U.L. LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS. DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UN-INSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE-TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE-TYPE LATCHES FOR LARGER ACCESS DOORS. HVAC CONTROL SYSTEM: PROVIDE ALL THE NECESSARY CONTROLS AND CONTROL WIRING IN CONDUIT COMPATIBLE TO SYSTEMS SHOWN ON EQUIPMENT SCHEDULE M2.0. PROGRAMMABLE THERMOSTAT FOR EACH SYSTEM SHALL ENABLE THE SUPPLY FAN AND CYCLE THE COOLING AND HEATING STAGES TO MAINTAIN SPACE SET-POINT. SUPPLY FAN RUNS CONTINUOUSLY DURING THE OCCUPIED MODE. EACH THERMOSTAT SHALL HAVE A DEAD BAND OF AT LEAST 5 DEGREES (ADJ) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING IS SHUT OFF, EACH THERMOSTAT SHALL HAVE SETBACK AND SET-UP CAPABILITY DURING THE UNOCCUPIED MODE. FOR SETBACK, THE HEATING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE DOWN TO 55 DEGREES. FOR SET-UP, THE COOLING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE UP TO 85 DEGREES OR TO PREVENT HIGH SPACE HUMIDITY LEVELS. EACH SYSTEM SHALL BE PROVIDED WITH A MOTORIZED OUTSIDE AIR DAMPER THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEM OR SPACES SERVED ARE NOT IN USE. VENTILATION OUTSIDE AIR DAMPERS SHALL BE CAPABLE OF AUTOMATICALLY CLOSING DURING PREOCCUPANCY BUILDING WARM-UP, COOL DOWN, AND SETBACK, EXCEPT WHEN VENTILATION REDUCES ENERGY COSTS (e.g., NIGHT PURGE) OR WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS. COMMISSIONING/VERIFICATION: HVAC CONTROL SYSTEM SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION, AND THAT THE SYSTEM MEETS THE DESIGN REQUIREMENTS. TEST AND BALANCE: CONTRACT DIRECTLY A THIRD PARTY TO PROVIDE TEST AND BALANCE OF THE HVAC SYSTEM. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SCHEDULING. TEST AND ADJUST ALL MECHANICAL SYSTEM AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS-1999 OR AABC 2002, AND ASHRAE STANDARD 111. ELIMINATE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. SUBMIT COMPLETED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCING CONTRACTOR SHALL BE INDEPENDENT AND CERTIFIED WITH NEBB OR AABC. BALANCE ALL SYSTEMS WITHIN 5% OF AIR FLOW INDICATED ON DRAWINGS, AND REPORT ALL DISCREPANCIES TO THE HVAC CONTRACTOR FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER. COMPLETION REQUIREMENTS: THE CONTRACTOR SHALL PROVIDE, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS AND AN OPERATING AND MAINTENANCE MANUAL TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE OWNER. THE RECORD DRAWING SHALL BE OF THE ACTUAL INSTALLATION AND INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES. THE OPERATING AND MAINTENANCE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING; (A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE; (B) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED; (C) NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY; (D) HVAC CONTROLS SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SYSTEM SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-PIONTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS; (E) A COMPLETE NARRATIVE OF HOW EACH SYSTEM EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SET-POINTS.

HVAC GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. DRAWINGS FOR HVAC WORK ARE DIAGRAMATIC SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT, REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. PROVIDE ALL DUCTWORK, MATERIALS, CONNECTIONS, ACCESSORIES, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS AS REQUIRED FOR A COMPLETE WORKABLE SYSTEM.
4. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED LISTING. ALL EQUIPMENT, PIPING AND SUPPORTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE "GUIDLINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA). ALL EQUIPMENT SHALL BE ANCHORED TO RESIST THE LATERAL FORCE REQUIREMENTS OF CHAPTER 16 OF THE 2012 INTERNATIONAL BUILDING CODE.
5. COORDINATE THE INSTALLATION OF THE HVAC SYSTEM WITH ALL OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. COORDINATE THE LOCATIONS OF PENETRATIONS AND FINAL LOCATION OF ALL EQUIPMENT WITH THE GENERAL CONTRACTOR. PROVIDE EQUIPMENT WEIGHTS, EQUIPMENT DIMENSIONS, PLATFORM SIZES & LOCATIONS, CURB SIZES & LOCATIONS, CONCRETE PAD SIZES AND LOCATIONS AST REQUIRED. COORDINATE LOCATIONS OF GAS & CONDENSATE LINES WITH PLUMBING CONTRACTOR. COORDINTAE LOCATIONS OF POWER, DISCONNECTS, AND CONTROL CONDUIT WITH THE ELECTICAL CONTRACTOR. COORDINATE LOCATIONS OF ALL DIFFUSERS, REGISTERS, AND GRILLES WITH ARCHITECTURAL PLANS, ELECTRICAL LIGHTING PLANS AND ARCHITECTURAL ELEVATIONS.
6. DETAILS FOR EQUIPMENT PADS, PLATFORMS, AND FLASHINGS SHALL BE AS INDICATED BY THE ARCHITECTURAL/STRUCTURAL/CIVIL DRAWINGS, UNLESS NOTED OTHERWISE.
7. ALL EQUIPMENT, DUCTS, PIPING, SUPPORTS, AND OTHER DEVICES OUTSIDE OF THE BUILDING OR EXPOSED TO WEATHER, SHALL BE COMPLETELY WEATHER-PROOFED.
8. OUTSIDE AIR INTAKES SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. BELOW ANY VENT OR EXHAUST DISCHARGE.
9. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE CONSTRUCTED, ERECTED, INSULATED AND TESTED IN ACCORDANCE CHAPTER 6 OF THE 2012 INTERNATIONAL MECHANICAL CODE.
10. ALL EXHAUST FANS SHALL BE EQUIPED WITH A BACK DRAFT DAMPER.
11. DUCT AND AIR TRANSFER PENETRATIONS THRU BUILDING ASSEMBLIES REQUIRING PROTECTION SHALL BE PROTECTED WITH FIRE DAMPERS, SMOKE DAMPERS, COMBINATION SMOKE/FIRE DAMPERS AND CEILING RADIATION DAMPERS IN ACCORDANCE WITH SECTION 607 OF THE INTERNATIONAL MECHANICIAL CODE. DUCTS NOT REQUIRING DAMPERS SHALL COMPLY WITH SECTION 714 & 717 OF THE 2019 CALIFORNIA BUILDING CODE.
12. INSTALL SMOKED DETECTORS AND PROVIDE FOR SMOKE DETECTION AND AUTOMATIC SHUT-OFF OF ALL AIR HANDLING EQUIPMENT IN ACCORDANCE WITH SECTION 606 OF THE 2019 CALIFORNIA MECHANICAL CODE.
13. UNLESS NOTED OTHERWISE, ALL LINE VOLTAGE WIRING, CONDUIT, FINAL CONNECTIONS, DISCONNECTS, STARTERS, AND OVER CURRENT PROTECTION DEVICES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THESE MECHANICAL DRAWINGS AND/OR ELECTRICAL DRAWINGS AND/OR ELECTRICAL SECTION OF THE SPECIFICATIONS.
14. INSTALL ALL LOW VOLTAGE HVAC CONTROL WIRE AND DEVICES PER PLAN. ALL WIRE SHALL BE IN CONDUIT PROVIDED AND INSTALLED BY THE ELECTICAL CONTRACTOR UNLESS NOTEDED OTHERWISE.
15. PROVIDE OWNER WITH THREE COPIES OF A CERTIFIED AIR BALANCE REPORT PREPARED IN BY A THIRD PARTY CERTIFIED BY THE AABC OR NEBB. TEST, ADJUST AND BALANCE THE HVAC SYSTEM IN ACCORDANCE WITH AABC OR NEBB PROCEDURES. PROVIDE START-UP/TEST REPORTS FOR ALL AIR HANDLING EQUIPMENT, FANS, AND REFRIGERATION EQUIPMENT. TEST AND VERIFY PROPER OPERATION OF ALL MAKE-UP AIR/EXHAUST AIR INTERLOCK SYSTEMS AND THIER SEQUENCES OF OPERATION. BALANCE ALL AIR FLOWS WITHIN 5% OF DESIGN VALUES. PERMANENTLY MARK BALANCE POSITION OF ALL REGULATING DEVICES.
16. PROVIDE OWNER WITH THREE SETS OF AS-BUILT PLANS AND OPERATIONS AND MAINTENANCE MANUALS. CLEARLY IDENTIFY ALL EQUIPMENT WITH PERMANENT PLASTIC OR METAL LABELS/TAGS (PEN MARKING NOT ACCEPTABLE).
17. PROVIDE ONE YEAR WARRANTY ON ALL LABOR, PARTS AND MATERIALS.
18. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE WRITTEN APPROVAL OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK. 19.0

a) DUCTS FOR DEMAND CONTROLLED VENTILATION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE FAN MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE PROVISIONS ASHRAE 62.2, TABLE 5.3, OR THE AIRFLOW SHALL BE MEASURED AS REQUIRED BY AND IN COMPLIANCE WITH ASHRAE 62.2, 5.4.

1) DUCTS FOR KITCHEN COOKTOPS OR RANGES SHALL BE SHOWN OF METAL WITH A SMOOTH INTERIOR.

a) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE INSTALLED IN ACCORDANCE WITH CMC 504.0.

b) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE RIGID METALLIC DUCTS WITH A MINIMUM MILL THICKNESS OF 16 (0.016-INCH), SHALL HAVE A MINIMUM 4-INCH DIAMETER AND A SMOOTH INTERIOR. THE COMBINED HORIZONTAL AND VERTICAL LENGTH OF THE DUCTS OF THE DUCTS SHALL BE 14-FEET, WHICH SHALL BE REDUCED BY 2-FEET FOR EVERY 90-DEGREE ELBOW IN EXCESS OF TWO ELBOWS.

c) LISTED CLOTHES DRYER TRANSITION DUCTS NOT MORE THAN 6-FEET IN LENGTH SHALL BE PERMITTED TO CONNECT THE DRYER TO THE EXHAUST DUCTS AS LONG AS THEY ARE NOT CONCEALED WITHIN CONSTRUCTION, AND THEY ARE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

LEGEND

AxB		DUCT WORK (WIDTHxDEPTH)
AxB		LINED DUCT WORK (WIDTHxDEPTH DIMENSIONS)
		SUPPLY DUCT, SECTION
		RETURN DUCT, SECTION
		EXHAUST DUCT, SECTION
R OR D		RISE OR DROP IN DIRECTION OF AIR FLOW
	FLEX. CONN.	FLEXIBLE CONNECTION
		DUCT TRANSITION, ROUND AND RECTANGULAR
		SPLITTER DAMPER
		EXTRACTOR AT BRANCH DUCT
		TURNING VANES
		FLEXIBLE DUCT
		SINGLE LINE DUCT WORK
	AVD	AUTOMATIC VOLUME DAMPER
	MVD	MANUAL VOLUME DAMPER
	BDD	BACKDRAFT DAMPER
	MD	MODULATING DAMPER
	AFD	AUTOMATIC FIRE DAMPER
	AD	ACCESS DOOR
	SD	SUPPLY DIFFUSER
	RR	RETURN REGISTER
	ER	EXHAUST REGISTER
	SWR	SIDE WALL SUPPLY REGISTER
	SWE	SIDE WALL RETURN OR EXHAUST
	LD	LINEAR DIFFUSER
D.L.	DL	DOOR LOUVER
U.C.	UC	UNDER CUT DOOR
	VAV	VARIABLE AIR VOLUME
T		THERMOSTAT
S		DUCT SMOKE DECTECTOR
	T/B	TO BELOW
	F/B	FROM BELOW
	T/A	TO ABOVE
	F/A	FROM ABOVE

SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. NO WORK SHALL BE DONE ON ANY PART OF THE BUILDING BEYOND THE POINT INDICATED IN EACH SUCCESSIVE INSPECTION WITHOUT FIRST OBTAINING THE WRITTEN APPROVAL OF THE CODE OFFICIAL. NO CONSTRUCTION SHALL BE CONCEALED WITHOUT BEING INSPECTED AND APPROVED.

No	Date	Issue / Revision

Title

MECH SPECS & GENERAL NOTES

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

M0.01

CALIFORNIA MECHANICAL CODE: CODE CHECKING:

DUCT SIZING, THICKNESS & INSULATION

PLEASE REFER TO TABLE 506.2(1) FOR MINIMUM S HEET METAL THICKNESS FOR ROUND DUCTS

604.0 Insulation of Ducts.

604.1 General. Air ducts conveying air at temperatures exceeding 140°F (60°C) shall be insulated to maintain an insulation surface temperature of not more than 140°F (60°C). Factory-made air ducts and insulations intended for installation on the exterior of ducts shall be legibly printed with the name of the manufacturer, the thermal resistance (R) value at installed thickness, flame-spread index, and smoke developed index of the composite material. Internal duct liners and insulation shall be installed in accordance with SMACNA HVAC Duct Construction standards – Metal and Flexible. **[OSHPD 1, 1R, 2, 3, 4 & 5]** *Cold air ducts shall be insulated wherever necessary or to prevent condensation.*

Exceptions:

(1) Factory-installed plenums, casings, or ductwork furnished as part of HVAC equipment tested and rated in accordance with approved energy efficiency standards.

(2) Ducts or plenums located in conditioned spaces where heat gain or heat loss will not increase energy use.

(3) For runouts less than 10 feet (3048 mm) in length to air terminals or air outlets, the rated R-value of insulation need not exceed R-3.5.

(4) Backs of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding 5 square feet (0.5m^2) need not exceed R-2; those 5 square feet (0.5m^2) or smaller need to be insulated.

(5) Ducts and plenums used exclusively for evaporative cooling systems.

E 502.4 Ducts. Ducts shall be sized, installed, and tested in accordance with Section E 502.4.1 though Section E 502.4.4.

E 502.4.1 Insulation and Ducts. Portions of the air distribution system installed in or on buildings for heating and cooling shall be R-8. Where the mean outdoor dew-point temperature in a month exceeds 60°F (16°C), vapor retarders shall be installed on conditioned-air supply ducts. Vapor retarders shall have a water vapor permeance not exceeding 0.5 perm [2.87 E-11 kg/(Pa.s.m^2)] where tested in accordance with Procedure A in ASTM E96.

Insulation shall not be required where the ducts are within the conditioned space. [ASHRAE 90.2:6.4]

E 502.4.4 Duct Sizing. Duct systems shall be sized in accordance with ACCA Manual D or other methods approved by the Authority Having Jurisdiction with the velocity in the main duct not exceed 1000 feet per minute (ft/min) (5.08m/s) and the velocity in the secondary branch duct not to exceed 600 ft/min (3.048 m/s).

CONDENSATE DRAIN:

310.0 Condensate Wastes and Control.

310.1 Condensate Disposal. Condensate from air washers, air-cooling coils, condensing appliances, and the overflow from evaporative coolers and similar water-supplied equipment or similar air-conditioning equipment shall be collected and discharged to an approved plumbing fixture or disposal area. Where discharged into the drain system, equipment shall drain by means of an indirect waste pipe. The Waste pipe shall have a slope of not less than ⅛ inch per foot (10.4 mm/m) or 1 percent slope and shall be of approved corrosion-resistant material not smaller than the outlet size in accordance with Section 310.3 or Section 310.4 for air-cooling coils or condensing appliances, respectively. Condensate or wastewater shall not drain over a public way.

310.3 Condensate Waste Pipe Material and Sizing. Condensate waste pipes from air-cooling coils shall be sized in accordance with the equipment capacity as specified in Table 310.3. The material of the piping shall comply with the pressure and temperature rating of the appliance or equipment, and shall be approved for use with the liquid being discharged.

TABLE 310.3
MINIMUM CONDENSATE WASTE PIPE SIZE

EQUIPMENT CAPACITY IN TONS OF REFRIGERATION	MINIMUM CONDENSATE PIPE DIAMETER (inches)
Up to 20	¾
21 – 40	1
41 – 90	1 ¼
91 – 125	1 ½
126 – 250	2

For SI units: 1 ton of refrigeration = 3.52 kW, 1 inch = 25 mm

310.3.1 Cleanouts. Condensate drain lines shall be configured or provided with a cleanout to permit the clearing of blockages and for maintenance without requiring the drain line to be cut.

310.5 Point of Discharge. Air conditioning condensate waste pipes shall connect indirectly, except where permitted in Section 310.6, to the drainage system through an air gap or air break to trapped and vented receptors, dry wells, leach pits, or the tailpiece of plumbing fixtures. A condensate drain shall be trapped in accordance with the appliance manufacturer's instructions or as approved.

310.6 Condensate Waste From Air-Conditioning Coils. Where the condensate waste from air-conditioning coils discharges by direct connection to a lavatory tailpiece or to an approved accessible inlet on a bathtub overflow, the connection shall be located in the area controlled by the same person controlling the air-conditioned space.

AIR INTAKE AND EXHAUST:

402.4 Outdoor Air Intake Protection. Required outdoor-air intakes shall be covered with a screen having not less than ¼ of an inch (6.4 mm) openings, and shall have not more than ½ of an inch (12.7 mm) openings.

402.4.1 Weather Protections. Outdoor air intakes that are part of the mechanical ventilation system shall be designed to manage rain entrainment, to prevent rain intrusion, and manage water from snow in accordance with ASHRAE 62.1.

402.5 Bathroom Exhaust Fans. [HCD 1 & HCD 2] *Each bathroom shall be mechanically ventilated in accordance with Division 4.5 of the California Green Building Standards Code (CALGreen).*

407.2.2 Exhaust Outlets. *Exhaust outlets shall be located a minimum of 10 feet (3048 mm) above adjoining grade and 10 feet (3048 mm) from doors, occupied areas, and operable windows.*

Exception: *Airborne infection isolation rooms shall comply with Section 414.1.*

701.10.1 Minimum Screen Mesh Size. Screens shall be not less than ¼ of an inch (6.4 mm) mesh. [NFPA 54:9.3.7.2]

311.3 Prohibited Source. Outside or return air for a heating or cooling air system shall not be taken from the following locations:

(1) Less than 10 feet (3048 mm) in distance from an appliance vent outlet, a vent opening of a plumbing drainage system, or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside-air inlet.

(2) Less than 10 feet (3048 mm) above the surface of an abut ting public way, sidewalk, street, alley, or driveway.

GAS CLOTHES DRYER:

502.1 Exhaust Opening Protection. Exhaust openings terminating to the outdoors shall be covered with a corrosion-resistant screen having not less than ¼ of an inch (6.4 mm) openings, and shall have not more than ½ of an inch (12.7 mm) openings.
Exception: Clothes dryers.

504.4 Clothes Dryers. A clothes dryer exhaust duct shall not be connected to a vent connector, gas vent, chimney, and shall not terminate into a crawl space, attic, or other concealed space. Exhaust ducts shall not be assembled with screws or other fastening means that extend into the duct and that are capable of catching lint, and that reduce the efficiency of the exhaust system.

504.4.1 Provisions for Makeup Air. Make up air shall be provided in accordance with the following:

(1) Makeup air shall be provided for Type 1 clothes dryers in accordance with the manufacturer's instructions. [NFPA 54: 10.4.3.1] Where a closet is designed for the installation of a clothes dryer, an opening of not less than 100 square inches (0.065 m^2) for makeup air shall be provided in the door or by other approved means.

(2) Provision for makeup air shall be provided for Type 2 clothes dryers, with a free area of not less than 1 square inch (0.0006 m^2) for each 1000 British thermal units per hour (Btu/g)(0.293 kW) total input rating of the dryer(s) installed [NFPA 54:10.4.3.2].

504.4.2.1 Length Limitation
Unless otherwise permitted or required by the dryer manufacturer's instructions and approved by the Authority Having Jurisdiction, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of 14 feet (4267 mm), including two 90 degree (1.57 rad) elbows. A length of 2 feet (610 mm) shall be deducted for each 90 degree (1.57 rad) elbow in excess of two

504.4.3.1 Exhaust Ducts for Type 2 Clothes Dryers. Exhaust ducts for Type 2 clothes dryers shall comply with the following:

(1) Exhaust ducts for Type 2 clothes dryers shall comply with Section 504.4. [NFPA 54:10.4.5.1]

(2) Exhaust ducts for Type 2 clothes dryers shall be constructed of sheet metal or other noncombustible material. Such ducts shall be equivalent in strength and corrosion resistance to ducts 0.0195 of an inch (0.4953 mm) thick. [NFPA 54:10.4.5.2]

(3) Type 2 clothes dryers shall be equipped or installed with lint-controling means. [NFPA 54:10.4.5.3]

(4) Exhaust ducts for Type 2 clothes dryers shall be installed with a clearance of not less than 6 inches (152 mm) from adjacent combustible material. Where exhaust ducts for Type 2 clothes dryers are installed with reduced clearances, the adjacent combustible material shall be protected in accordance with Table 303.10.1. [NFPA 54:10.4.5.4]

(5) Where ducts pass through walls, floors, or partitions, the space around the duct shall be sealed with noncombustible material. [NFPA 54:10.4.5.4]

No	Date	Issue / Revision

Title

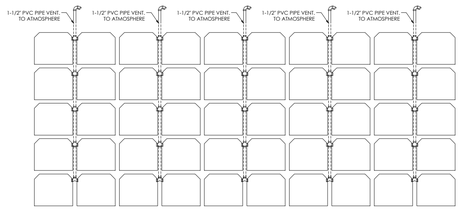
MECHANICAL CODE CHECKING

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

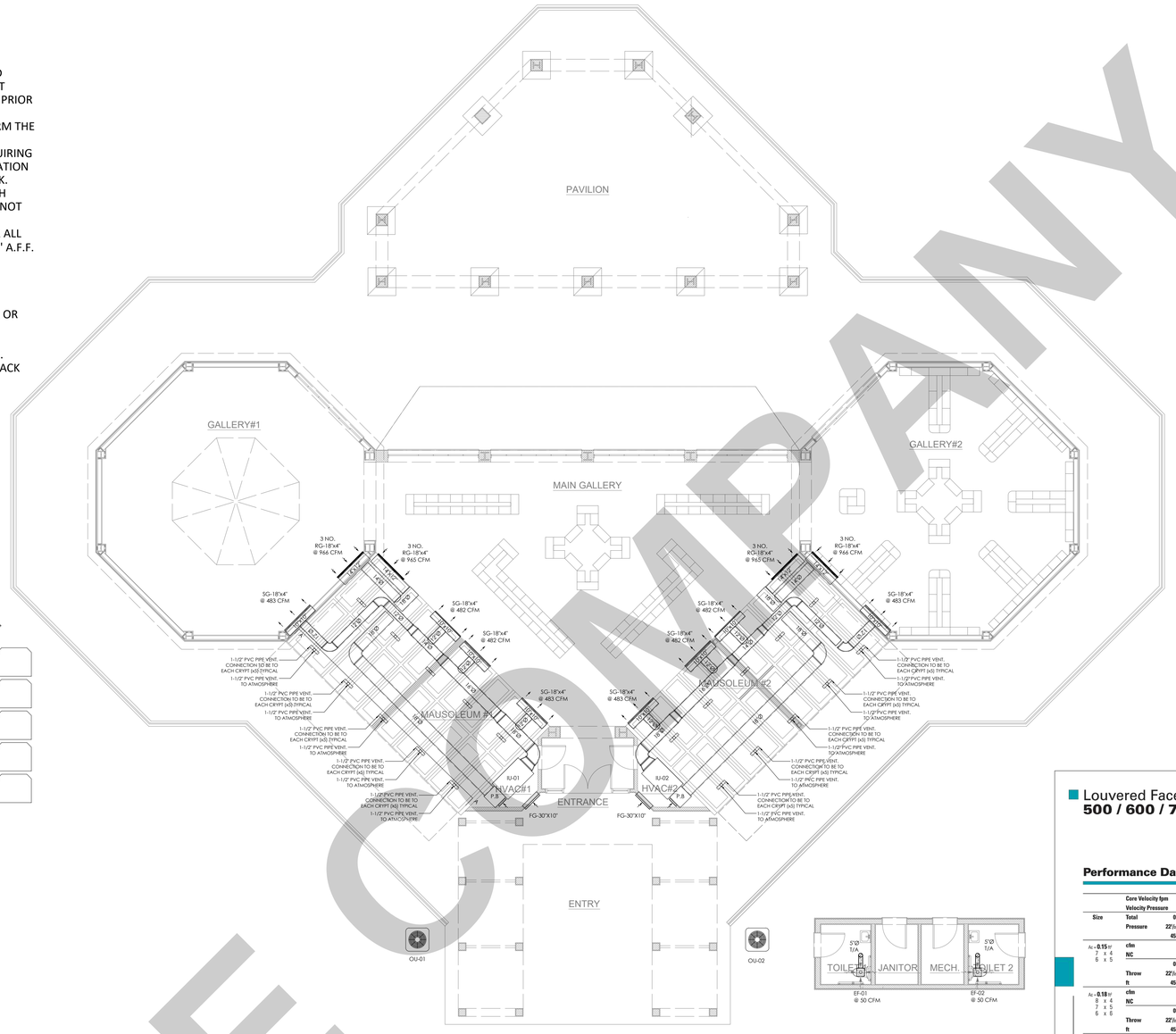
M1.01

GENERAL NOTES:

1. MECHANICAL CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF MECHANICAL COMPONENTS AND EQUIPMENT WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS PRIOR TO PERFORMING WORK.
2. CONTRACTOR TO CUT AND PATCH AS REQUIRED TO PERFORM THE WORK.
3. ACCESS DOORS ARE REQUIRED FOR ANY COMPONENT REQUIRING ACCESS ABOVE HARD LID CEILINGS. COORDINATE SIZE, LOCATION AND FINISH WITH ARCHITECT PRIOR TO PERFORMING WORK.
4. REFER TO THE DIAGRAMS THAT APPLY TO THIS SHEET WHICH PROVIDE GENERAL GUIDANCE FOR INSTALLATION THOUGH NOT ALL COMPONENTS AND ACCESSORIES MAY BE SHOWN.
5. PRIOR TO INSTALLATION, CONFIRM SPECIFIC LOCATION FOR ALL THERMOSTATS / SENSORS WITH ARCHITECT. MOUNT AT 48" A.F.F. OR IN ACCORDANCE WITH ADA REQUIREMENTS. PROVIDE LOCKING COVERS.
6. COORDINATE AND CONFIRM BORDER, FRAME, FINISH, AND LOCATION WITH ARCHITECT PRIOR TO ORDERING.
7. ANY PENETRATIONS THROUGH WALL STUDS, FLOOR JOISTS, OR ROOF TO BE IN ACCORDANCE WITH THE LATEST ADOPTED BUILDING CODE.
8. DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
9. CONTRACTOR TO CONFIRM ADEQUATE RETURN AIR PATH BACK TO MAIN AIR HANDLING UNIT.



SECTION A



SCHEDULE No. 1

ELECTRIC - INDOOR UNIT

TAG	IU-01,02
SERVING	ALL
MANUFACTURER	CARRIER
INDOOR MODEL	40MBDQ-58
POWER SUPPLY	208-230/1/60
RATED HORSEPOWER (HP)	0.75
RATED CURRENT (A)	3.65
AIR FLOW (CFM) - LOW/MEDIUM/HIGH	1,579 / 1,931 / 2,481
EXTERNAL STATIC PRESSURE (INCHES OF WATER)	0.25
COOLING CAPACITY (BTU/H)	58,000
HEATING CAPACITY (BTU/H)	58,000
INDOOR DIMENSIONS (HxWxD) (IN.)	11.81x55.12x33.78

NOTES
1. PROVIDE CONDENSATE PUMP, IF REQUIRED.
2. PROVIDE DISCONNECT SWITCH.
3. PROVIDE 2" MERV 8 THROWAWAY FILTER.
4. PROVIDE VIBRATION ISOLATION.

SCHEDULE No. 2

ELECTRIC - OUTDOOR UNIT

TAG	ODU-01,02
MANUFACTURER	CARRIER
OUTDOOR MODEL	38MBRQ58A--3
SERVING	ALL
CONNECTED INDOOR UNITS	IU-01,02
COOLING CAPACITY (BTU/H)	58,000
HEATING CAPACITY (BTU/H)	58,000
POWER SUPPLY	208-230 / 1 / 60
MINIMUM CIRCUIT AMPACITY	35.0
MAX OVERCURRENT DEVICE	50.0
DIMENSIONS (W x D x H) (inch)	37.48x11.86x52.48

NOTES
1. PROVIDE VIBRATION ISOLATION.
2. PROVIDE FREEZE THERMOSTAT.

SCHEDULE No. 3

FAN SCHEDULE

TAG	EF-01 TO EF-02
LOCATION	TOILETS
SELECTED FLOW (CFM)	50
SELECTED PRESSURE DROP (IN. H2O)	0.25"
ELECTRICAL (V / PH / HZ)	120 / 1 / 60
POWER / Amps	25 W
MOTOR SPEED (RPS)	MULTI SPEED
FAN TYPE	CEILING FANS
MANUFACTURER	PANASONIC
MODEL	WHISPER FV-0511VKS2

NOTES
1. PROVIDE UL LISTING.
2. PROVIDE ENERGY STAR COMPLIANCE.
3. INTERLOCK WITH WALL SWITCH.
4. PROVIDE MOTOR WITH THERMAL OVERLOADS.

SCHEDULE No. 4

SIDE GRILLES SCHEDULE

TAG	RG | SG
SIZE	18" x 4"
SELECTED FLOW (CFM)	965 CFM | 483 CFM
NOISE CRITERIA	23
DEFLECTION ANGLE	22.5°
THROW (FT.) AT 150 FPM	26
Ac (FT2)	0.39 FT2
FAN TYPE	CEILING FANS
MANUFACTURER	EH PRICE
MODEL	910 SERIES

GRILLES AND REGISTERS

Louvered Face Supply
500 / 600 / 700 / 900 Series

price

Performance Data — Models 510, 520 / 610, 620 / 710, 720 / 910, 920

							NC 20	30			40		
	Core Velocity fpm		300	400	500	600	700	800	1000	1200	1400	1600	1800
	Velocity Pressure		.006	.010	.016	.022	.030	.040	.062	.000	.122	.159	.202
Size	Total	0°	.014	.024	.038	.052	.071	.094	.146	.212	.287	.374	.475
	Pressure	22½°	.017	.029	.045	.063	.085	.114	.176	.256	.347	.452	.574
		45°	.025	.042	.067	.093	.126	.168	.261	.379	.514	.669	.850
Ac = 0.15 ft² 7 x 4 6 x 5	cfm		45	60	75	90	105	120	150	180	210	240	270
	NC		—	—	—	—	15	19	26	31	36	40	44
	Throw	0°	4-6-12	5-8-14	7-10-16	8-12-17	9-13-19	11-14-20	13-15-22	14-17-24	15-19-25	16-20-28	17-22-30
		22½°	3-5-10	4-6-11	6-8-13	8-10-14	7-10-15	9-11-16	10-13-18	11-14-19	12-15-21	13-16-22	14-18-24
	ft	45°	2-3-6	3-4-7	3-5-8	4-6-9	5-7-9	5-7-10	6-8-11	7-9-12	8-9-13	8-10-14	9-11-15
Ac = 0.18 ft² 8 x 4 7 x 5 6 x 6	cfm		55	70	90	110	125	145	180	215	250	290	325
	NC		—	—	—	—	16	20	27	32	37	41	45
	Throw	0°	4-7-13	6-8-15	7-11-17	9-13-19	10-15-20	11-16-22	14-17-24	15-19-26	17-21-29	18-22-31	19-24-33
		22½°	3-6-10	5-6-12	6-9-14	7-10-15	8-12-16	9-13-18	11-14-19	12-15-21	14-17-23	14-18-25	15-19-26
	ft	45°	2-3-7	3-4-8	4-5-9	4-7-10	5-7-10	6-8-11	7-9-12	8-10-13	8-10-14	9-11-15	10-12-16
Ac = 0.22 ft² 10 x 4 8 x 5 7 x 6	cfm		65	90	110	130	155	175	220	265	310	350	395
	NC		—	—	—	—	17	21	27	33	38	42	45
	Throw	0°	4-7-14	7-10-17	8-12-19	9-15-21	11-16-23	13-17-24	16-19-27	17-21-29	19-23-32	20-25-34	21-26-36
		22½°	3-6-11	5-8-14	6-10-15	7-12-17	9-13-18	10-14-19	13-15-22	14-17-23	15-18-26	16-20-27	17-21-29
	ft	45°	2-4-7	3-5-9	4-6-10	5-7-10	6-8-11	6-9-12	8-10-13	9-11-15	9-12-16	10-12-17	11-13-18
Ac = 0.26 ft² 12 x 4 10 x 5 8 x 6	cfm			80	105	130	155	180	210	260	310	365	415	470
	NC			—	—	—	—	17	21	28	34	38	42	46
	Throw	0°		5-8-16	7-11-19	9-13-21	10-16-23	12-17-24	14-19-26	17-21-29	19-23-32	20-25-35	22-26-37	23-27-40
		22½°		4-6-13	6-9-15	7-10-17	9-13-18	10-14-19	11-15-21	14-17-23	15-18-26	16-20-28	18-21-30	18-22-32
	ft	45°		3-4-8	4-5-9	4-7-10	5-8-11	6-8-12	7-9-13	8-11-15	9-12-16	10-13-17	11-13-18	12-14-20
Ac = 0.30 ft² 14 x 4	cfm			90	120	150	180	210	240	300	360	420	480	540
	NC			—	—	—	—	18	22	29	34	39	43	47
	Throw	0°		5-8-17	8-11-20	9-14-22	11-17-24	13-19-26	15-20-28	18-23-31	20-25-34	22-27-37	24-29-40	25-30-42
		22½°		4-7-14	6-9-16	7-11-18	9-14-19	10-15-21	12-16-22	14-18-25	16-20-27	18-22-30	19-23-32	20-24-34
	ft	45°		3-4-8	4-6-10	5-7-11	6-8-12	7-9-13	8-10-14	9-11-16	10-12-17	11-13-19	12-14-20	12-15-21
Ac = 0.34 ft² 16 x 4 12 x 5 10 x 6	cfm			100	135	170	205	240	270	340	410	475	545	610
	NC			—	—	—	—	19	23	29	35	40	44	47
	Throw	0°		5-8-18	8-12-21	10-15-24	12-19-26	14-20-28	16-22-30	20-24-33	22-26-37	23-28-40	25-30-42	28-32-45
		22½°		4-7-14	6-10-17	8-12-19	10-15-21	11-16-22	13-18-24	16-19-26	18-21-30	18-22-32	20-24-34	21-26-36
	ft	45°		3-4-9	4-6-11	5-8-12	6-9-13	7-10-14	8-11-15	10-12-17	11-13-18	12-14-20	12-15-21	13-16-22
Ac = 0.39 ft² 18 x 4 14 x 5 12 x 6 8 x 8	cfm			115	155	195	235	275	310	390	470	545	625	700
	NC			—	—	—	—	19	23	30	35	40	44	48
	Throw	0°		6-8-19	9-13-23	11-16-25	13-19-28	15-22-30	17-23-32	21-26-36	23-27-40	25-30-42	27-33-45	28-35-48
		22½°		5-7-15	7-10-18	9-13-20	10-15-22	12-18-24	14-18-26	17-21-29	18-22-32	20-24-34	22-26-36	22-28-38
	ft	45°		3-5-10	4-6-11	5-8-13	7-10-14	8-11-15	9-12-16	11-13-18	12-14-20	12-15-21	13-16-23	14-17-24

Performance Notes:
1. Tested in accordance with ASHRAE Standard 70-2006 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Air flow is in cfm.
3. All pressures are in in. w.g.
4. Throw values are measured in feet for terminal velocities of 150 fpm (minimum), 100 fpm (middle) and 50 fpm (maximum).
5. Throw data is based on supply air and room air being at isothermal conditions.
6. NC values are based on room absorption of 10 dB re 10^{-12} Watts @ 0° deflectionand and one diffuser.
7. Blanks (—) indicate an NC level below 15.
8. **Deflection**
   0°–22 ½°–45°
   The listed deflection settings refer to horizontal deflection. For a 20° upward deflection, use the room throw rating for a 0° setting and the total pressure for a 22 ½° horizontal setting.

NC 20 30 40

The performance tables are based on registers with core style 520 with an opposed blade damper. The performance of other core styles, with or without dampers, can be obtained by the application of correction factors to the tabulated performance data.
See Correction Factor Table, page 023.

All Metric dimensions ( ) are soft conversions.
Imperial dimensions are converted to metric and rounded to the nearest millimeter.

D-20

No	Date	Issue / Revision

Title

FLOOR PLAN MECH. LAYOUTS.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

M2.01

40MBDQ
Ducted Slim Ductless System
Sizes 09 to 58

Carrier

Product Data

Fig. 1 — Sizes 09K - 48K

NOTE: The 09K-48K unit can be mounted vertically as well as horizontally.

Fig. 2 — Size 58K

NOTE: Images are for illustration purposes **only**. Actual models may differ slightly.

INDUSTRY LEADING FEATURES / BENEFITS

A PERFECT BALANCE BETWEEN BUDGET LIMITS, ENERGY SAVINGS AND COMFORT

The **40MBDQ** series ducted slim ductless systems are a matched combination of an outdoor condensing unit and an indoor fan coil unit connected only by refrigerant tubing and wires. The fan coil is mounted in the ceiling.

This selection of fan coils permits creative solutions to design problems such as:

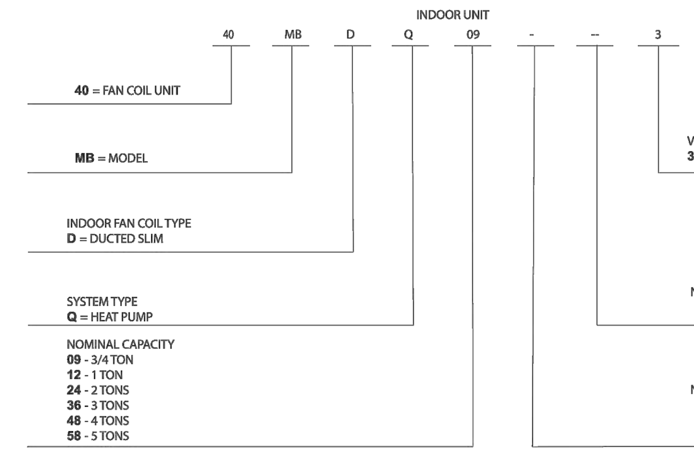
- Add-ons to current space (an office or family room addition)
- Special space requirements
- When changes in the load cannot be handled by the existing system
- Historical renovations or any application where preserving the look of the original structure is essential.

These compact indoor fan coil units take up very little space above the ceiling. Advanced system components incorporate innovative technology to provide reliable cooling performance at low sound levels.

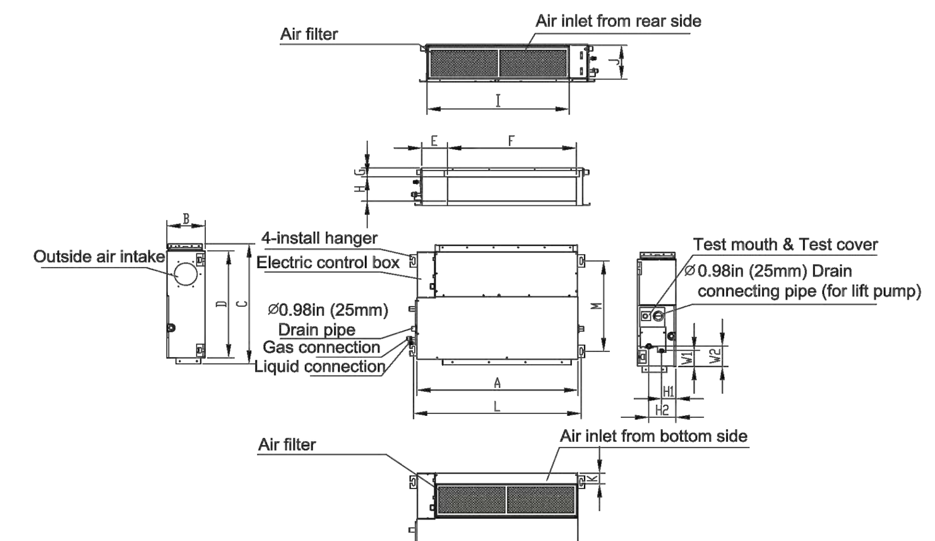
TABLE OF CONTENTS

Specifications subject to change without notice.

MODEL NUMBER NOMENCLATURE



DIMENSIONS



NOTE: Sizes 09K-48K blow-through systems

Fig. 5 — Indoor Unit Sizes 9K - 48K

SPECIFICATIONS

COMPATIBILITY

SOUND POWER

FAN AND MOTOR SPECIFICATIONS

Outdoor Unit Single Zone Heat Pump Ductless System

Outdoor Model: 38MBRQ58A--3

Submittal Data

Job Data: | Location:
Buyer: | Buyer P.O. #: | Carrier #:
Unit Number: | Model Number:
Performance Data Certified By: | Date:

STANDARD FEATURES

Features Outdoor:

- Variable Speed (Inverter) Compressor
- Basepan Heater factory installed
- Quiet operation
- Anti-corrosive fin coating

- Piping length 213 ft. (65 m)

Cooling operating range -13° ~ 122° F (-25° ~ 50°C)
Heating operating range -22°~86°F (-30°~30°C)

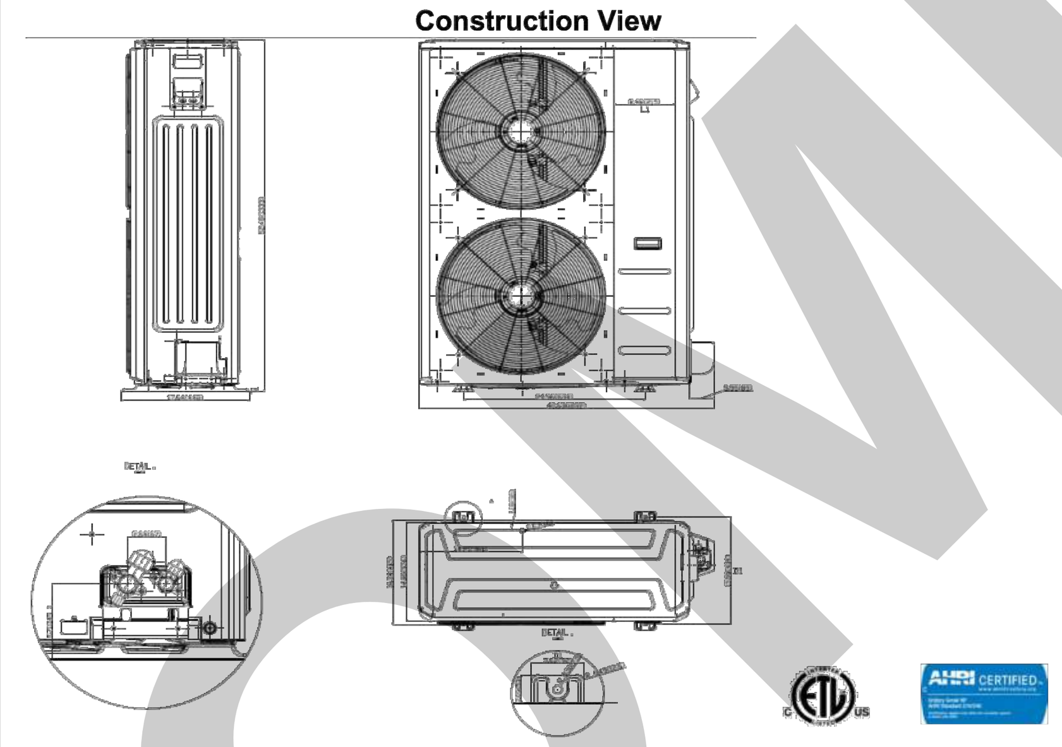
LIMITED WARRANTY*
- 10 year limited to original purchaser on compressor and parts upon timely registration, otherwise 5 years

*For residential applications. See warranty for full details.

Specifications

Performance

Construction View



Panasonic

WhisperGreen® Select™ Connected Ventilation Fans

WhisperGreen Select

Fan Only Models: FV-0511VK2, FV-0511VKS2, FV-1115VK2

Fan/Light Models: FV-0511VKL2, FV-0511VKSL2, FV-1115VKL2

HEALTHY AIR, HEALTHY HOME
True Flow ratings at 0.375" static pressure provide powerful airflow to assure code compliant, healthy homes.

KEY FEATURES

- Precision, whole-house ventilation solution ideal for use in the bathroom, laundry room, sun room, basement or garage
- Helps assure good indoor air quality for a healthy home and healthy living
- Operates as a standalone fan or as part of the Cosmos™ Healthy Home System through two-way wireless communication
- Customizable, connected fan and fan/dimmable LED light combinations
- Pick-A-Flow airflow selector (50-80-110 or 110-130-150 CFM models) combined with SmartFlow™ technology simplifies the selection process and ensures optimum performance to meet code and reduce callbacks
- Elegant grille design complements the aesthetics of any room
- Single-hinged Flex-Z Fast™ bracket provides flexible, fast and easy installation
- Can be used to comply with ASHRAE 62.2, LEED, CALGreen, IAP, California Title 24, WA Ventilation Code and ENERGY STAR for Homes 3.0

ADDITIONAL BENEFITS

- Ideal IAQ solution for green builders
- Environmentally friendly 26 gauge housing using Zinc-Aluminum-Magnesium (ZAM) coating
- Integrated 4" or 6" dual duct adapter enhances installation options / Fits in 2 x 8 construction
- Built-in metal flange provides blocking for penetrations through drywall as an air barrier, and assists with the decrease in leakage in the building envelope during blower door testing
- Suitable for installation in ceilings insulated up to R60
- Dual access junction box simplifies wiring in tight spaces
- UL Listed for tub/shower enclosure when GFCI protected
- UL Listed for use with the Panasonic Ceiling Radiation Damper (model # PC-RD05C5)
- 6-year warranty on ECM motor, 5 years on LED, 3 years on parts

*Industry research indicates static pressure in typical installations ranges from 0.20" to 0.375".

reinventingventing.com

Most Efficient 2021 www.energystar.gov

One Connected Fan. Endless Possibilities.

The customizable IAQ solution for virtually any space

For over 25 years, Panasonic has developed innovative solutions that promote better indoor air quality and healthy home building. On our mission to help you build healthy homes, WhisperGreen® Select™ offers a powerful connected IAQ solution that delivers healthy indoor air quality for healthy living in any space. Now even more versatile, it operates as a standalone fan or as part of the Cosmos™ Healthy Home System through two-way wireless communication.

WHISPERGREEN SELECT™ IS AS EASY AS 1-2-3!

Step 1: Select a Base Fan Model

Select a base model to start building the perfect IAQ solution that satisfies your ventilation design requirements.

Fan	Fan/Light
FV-0511VK2: 50 to 110 CFM single speed	FV-0511VKL2: 50 to 110 CFM single speed + LED Light
FV-0511VKS2: 30 to 110 CFM pre-installed multi-speed	FV-0511VKSL2: 30 to 110 CFM pre-installed multi-speed + LED Light
FV-1115VK2: 50 to 150 CFM single speed	FV-1115VKL2: 50 to 150 CFM single speed + LED Light

Pick-A-Flow™ Airflow Technology
Pick-A-Flow™ Airflow Selector – one fan, you choose the CFM. Provides the unique ability to select your required airflow (50-80-110 and 110-130-150 CFM models) with the simple flip of a switch.

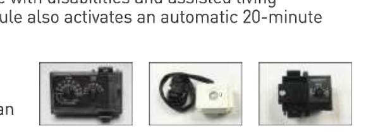
Step 2: Select Value Added Features

WhisperGreen Select™ offers a unique set of three patented modules that allow you to further customize your fan:

Multi-Speed with Time Delay (FV-VS15VK1) – Allows you to select the proper CFM settings to satisfy ASHRAE 62.2 continuous ventilation requirements. The fan runs continuously at a pre-set lower level, then elevates to a maximum level of operation when the wall switch is turned on, or when the SmartAction® motion sensor or condensation sensor module is activated. A high/low delay timer returns the fan to the pre-set CFM level after a period of time set by the user.

SmartAction® Motion Sensor (FV-MSVK1) – Automatically activates when someone enters the room. Once the settings have been applied, the fan becomes truly automatic, making it ideal for people with disabilities and assisted living environments such as nursing homes and retirement communities. This module also activates an automatic 20-minute delay off timer for the fan.

Condensation Sensor (FV-CSVK1) – Helps control bathroom condensation to prevent mold and mildew. Advanced sensor technology detects relative humidity and temperature to anticipate dew point, automatically turning the fan on to control humidity. Built-in Relative Humidity (RH) sensitivity adjustment enables fine tuning for moist conditions (30% to 80%, in 10% increments) and for satisfying CALGreen requirements. When the condensation sensor is used in conjunction with multi-speed functionality, the fan will kick up to high speed when the condensation sensor detects moisture in the room. This module also activates an automatic 20-minute delay off timer for the fan.



Multi-Speed with Time Delay (FV-VS15VK1) | SmartAction® Motion Sensor (FV-MSVK1) | Condensation Sensor (FV-CSVK1)

Step 3: Install Your Ideal Fan with the New! Flex-Z Fast™ Installation System

Single-hinged articulating joints to easily position bracket in between the joist and/or through ceiling hole. → Easily position bracket in between the joist or ceiling hole. → Extend bracket to desired length.

Ingeniously designed installation bracket provides flexible, fast and easy installation for all your new construction or renovation projects.

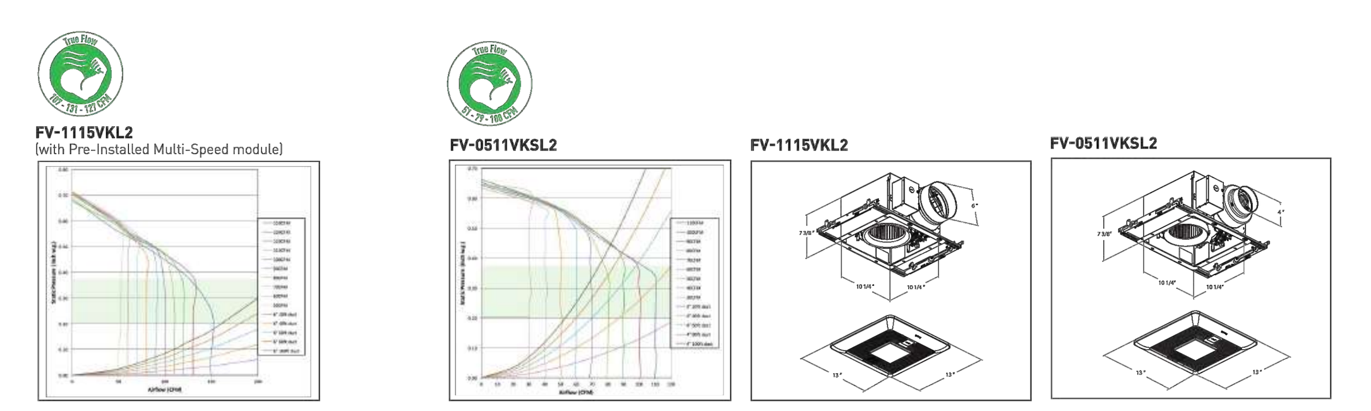
Superior Installed Performance up to 0.375" and Certified Quiet Operation at 0.25" Static Pressure

Although ASHRAE, ENERGY STAR®, LEED for Homes, and HVI have set the industry standard for performance measurement at 0.1" and 0.25", WhisperGreen® Select™ fans provide powerful CFM output at 0.375" that is more representative of typical installations. Sones have also been certified at 0.25" to provide a more realistic, installed value, so they are quiet under pressure and after installation.

WhisperGreen Select

HEALTHY AIR, HEALTHY HOME

FV-1115VKL2 (with Pre-Installed Multi-Speed module) | FV-0511VKSL2 | FV-1115VKL2 | FV-0511VKSL2



No	Date	Issue / Revision

Title

MECHANICAL EQUIPMENT CAT.

Project Number 20001.00
Date 12/29/2022
Drawn By RGC, JM, YM
Checked By CJK

M3.01

Design Weather Parameters & MSHGs

2.2.122 Greenback — 06/22/2022
Omar F. — 12:00AM

Design Parameters:

City Name .... **Sacramento Z12**
Location .... **California**
Latitude .... **37.5** Deg.
Longitude .... **121.2** Deg.
Elevation .... **22.0** ft
Summer Design Dry-Bulb .... **100.0** °F
Summer Coincident Wet-Bulb .... **69.0** °F
Summer Daily Range .... **33.3** °F
Winter Design Dry-Bulb .... **28.0** °F
Winter Design Wet-Bulb .... **24.0** °F
Atmospheric Clearness Number **1.05**
Average Ground Reflectance **0.20**
Soil Conductivity .... **0.800** BTU/(hr·ft·°F)
Local Time Zone (GMT +/- N hours) .... **8.0** hours
Consider Daylight Savings Time .... **No**
Simulation Weather Data .... **N/A**
Current Data is .... **User Modified**
Design Cooling Months .... **January to December**

Design Day Maximum Solar Heat Gains

(The MSHG values are expressed in BTU/(hr·ft²))

Month	N	NNE	NE	ENE	E	ESE	SE	SSE	S
January	21.9	21.9	21.9	94.9	165.6	226.7	254.4	264.7	265.4
February	26.3	26.3	52.2	142.7	205.4	247.2	261.9	254.5	247.0
March	31.2	31.2	110.8	176.8	232.2	251.8	245.7	221.7	206.6
April	35.9	72.6	151.4	206.5	230.5	235.0	206.0	169.4	147.9
May	39.2	109.1	173.7	218.2	230.1	215.1	175.2	127.3	103.3
June	49.7	119.8	181.4	219.6	225.0	205.3	160.2	109.9	86.7
July	40.3	105.0	173.1	213.6	222.5	211.1	170.6	124.4	101.1
August	37.7	71.6	147.7	197.9	224.6	226.7	199.8	164.0	143.3
September	32.2	32.2	104.5	168.1	218.0	241.6	234.8	214.0	199.7
October	27.1	27.1	59.7	127.5	199.1	238.8	253.4	246.8	239.2
November	22.1	22.1	22.1	92.7	165.6	218.9	253.3	262.7	260.6
December	19.7	19.7	19.7	76.6	146.5	212.7	245.8	263.9	265.2
Month	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**HOR**	**Mult**
January	266.7	258.2	219.7	170.3	91.1	21.9	21.9	153.8	1.00
February	253.5	260.6	249.6	204.6	139.0	60.9	26.3	201.3	1.00
March	219.8	242.3	253.1	226.2	182.7	109.0	31.2	243.2	1.00
April	168.7	205.7	234.3	232.7	207.1	150.0	75.9	269.5	1.00
May	127.0	175.6	214.7	230.6	218.1	173.1	109.8	281.0	1.00
June	109.0	161.8	203.4	227.0	218.9	178.4	122.6	283.2	1.00
July	123.4	172.1	208.3	226.9	213.5	168.6	110.7	278.6	1.00
August	162.5	198.7	225.9	224.6	200.2	145.7	75.2	264.9	1.00
September	214.4	235.5	241.0	219.4	164.8	104.4	32.2	234.0	1.00
October	247.1	253.5	236.7	198.5	136.0	52.0	27.1	197.0	1.00
November	261.5	249.7	222.3	159.8	94.5	22.1	22.1	152.3	1.00
December	264.8	247.4	212.1	144.5	77.0	19.7	19.7	132.0	1.00

Mult. = User-defined solar multiplier factor.

Wall Constructions

2.2.122 Greenback — 06/22/2022
Omar F. — 12:15AM

External Wall

Wall Details
Outside Surface Color .... **Light**
Absorptivity **0.450**
Overall U-Value .... **0.077** BTU/(hr·ft²·°F)

Wall Layers Details (Inside to Outside)

Layers	Thickness in	Density lb/ft³	Specific Ht. BTU / (lb·°F)	R-Value (hr·ft²·°F)/BTU	Weight lb/ft²
Inside surface resistance	0.000	0.0	0.00	0.68500	0.0
Gypsum board	2.000	50.0	0.26	2.00000	8.3
Air space	0.083	0.0	0.00	1.00000	0.0
R-30 batt insulation	2.500	0.5	0.20	8.01282	0.1
Face brick	4.000	125.0	0.22	1.00000	41.7
Outside surface resistance	0.000	0.0	0.00	0.33300	0.0
Totals	8.583	-		13.03082	50.1

Window Constructions

2.2.122 Greenback — 06/22/2022
Omar F. — 12:17AM

Fenestration

Window Details:
Detailed Input .... **No**
Height .... **1.00** ft
Width .... **1.00** ft
Overall U-Value .... **0.300** BTU/(hr·ft²·°F)
Overall Shade Coefficient **0.267**

Air System Sizing Summary for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

Air System Information

Air System Name .... **Main Hall**
Equipment Class .... **SPLT AHU**
Air System Type .... **SZCAV**
Number of zones **1**
Floor Area .... **3931.0** ft²
Location .... **Sacramento Z12, California**

Sizing Calculation Information

Calculation Months .... **Jan to Dec**
Sizing Data .... **Calculated**
Zone CFM Sizing .... **Sum of space airflow rates**
Space CFM Sizing .... **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load .... **10.5** Tons
Total coil load .... **125.5** MBH
Sensible coil load .... **113.1** MBH
Coil CFM at Jul 1500 .... **4917** CFM
Max block CFM .... **4917** CFM
Sum of peak zone CFM .... **4917** CFM
Sensible heat ratio **0.901**
CFM/Ton **470.1**
ft²/Ton **375.9**
BTU/(hr·ft²) **31.9**
Water flow @ 10.0 °F rise .... **N/A**

Load occurs at .... **Jul 1500**
OA DB / WB .... **100.0 / 69.0** °F
Entering DB / WB .... **80.9 / 66.5** °F
Leaving DB / WB .... **59.6 / 58.3** °F
Coil ADP .... **57.3** °F
Bypass Factor **0.100**
Resulting RH .... **58** %
Design supply temp. .... **58.0** °F
Zone T-stat Check .... **1 of 1** OK
Max zone temperature deviation .... **0.0** °F

Central Heating Coil Sizing Data

Max coil load .... **86.3** MBH
Coil CFM at Des Htg .... **4917** CFM
Max coil CFM .... **4917** CFM
Water flow @ 20.0 °F drop .... **N/A**

Load occurs at .... **Des Htg**
BTU/(hr·ft²) **21.9**
Ent. DB / Lvg DB .... **61.4 / 77.6** °F

Supply Fan Sizing Data

Actual max CFM .... **4917** CFM
Standard CFM .... **4913** CFM
Actual max CFM/ft² .... **1.25** CFM/ft²

Fan motor BHP .... **0.00** BHP
Fan motor kW .... **0.00** kW
Fan static .... **0.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM .... **983** CFM
CFM/ft² .... **0.25** CFM/ft²
CFM/person .... **8.19** CFM/person

Zone Sizing Summary for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

Air System Information

Air System Name .... **Main Hall**
Equipment Class .... **SPLT AHU**
Air System Type .... **SZCAV**
Number of zones **1**
Floor Area .... **3931.0** ft²
Location .... **Sacramento Z12, California**

Sizing Calculation Information

Calculation Months .... **Jan to Dec**
Sizing Data .... **Calculated**
Zone CFM Sizing .... **Sum of space airflow rates**
Space CFM Sizing .... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	4917	4917	1.25	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	90.2	Jul 1600	41.9	3931.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
Museum Hall	1	90.2	Jul 1600	4917	41.9	3931.0	1.25

Air System Design Load Summary for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 100.0 °F / 69.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 28.0 °F / 24.0 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	1220 ft²	18960	-	1220 ft²	-	-
Wall Transmission	3922 ft²	3310	-	3922 ft²	12641	-
Roof Transmission	4409 ft²	11407	-	4409 ft²	10059	-
Window Transmission	1220 ft²	6967	-	1220 ft²	15372	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	3931 ft²	0	-	3931 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	3145 W	10730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	120	29400	24600	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	8077	2460	10%	3807	0
>> Total Zone Loads	-	**88850**	**27060**	-	**41879**	**0**
Zone Conditioning	-	87832	27060	-	41997	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	4917 CFM	0	-	4917 CFM	0	-
Ventilation Load	983 CFM	25257	-14663	983 CFM	44254	0
Supply Fan Load	4917 CFM	0	-	4917 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	**113089**	**12397**	-	**86251**	**0**
Central Cooling Coil	-	113089	12402	-	0	0
Central Heating Coil	-	0	-	-	86251	-
>> Total Conditioning	-	**113089**	**12402**	-	**86251**	**0**
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Psychrometrics for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

July DESIGN COOLING DAY, 1500

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	100.0	0.00807	983	400	25257	-14663
Vent - Return Mixing	Outlet	80.9	0.01059	4917	1538	-	-
Central Cooling Coil	Outlet	59.6	0.01005	4917	1538	113089	12402
Central Heating Coil	Outlet	59.6	0.01005	4917	1538	0	-
Supply Fan	Outlet	59.6	0.01005	4917	1538	0	-
Cold Supply Duct	Outlet	59.6	0.01005	4917	1538	-	-
Zone Air	-	76.2	0.01121	4917	1822	87832	27060
Return Plenum	Outlet	76.2	0.01121	4917	1822	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4742.8 BTU/(hr-CFM)
Site Altitude = 22.0 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	88850	Cooling	87832	76.2	4917	1822	0	0

System Psychrometrics for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	28.0	0.00171	983	400	-44254	0
Vent - Return Mixing	Outlet	61.4	0.00171	4917	434	-	-
Central Cooling Coil	Outlet	61.4	0.00171	4917	434	0	0
Central Heating Coil	Outlet	77.6	0.00171	4917	434	86251	-
Supply Fan	Outlet	77.6	0.00171	4917	434	0	-
Cold Supply Duct	Outlet	77.6	0.00171	4917	434	-	-
Zone Air	-	69.7	0.00171	4917	443	-41997	0
Return Plenum	Outlet	69.7	0.00171	4917	443	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4742.8 BTU/(hr-CFM)
Site Altitude = 22.0 ft

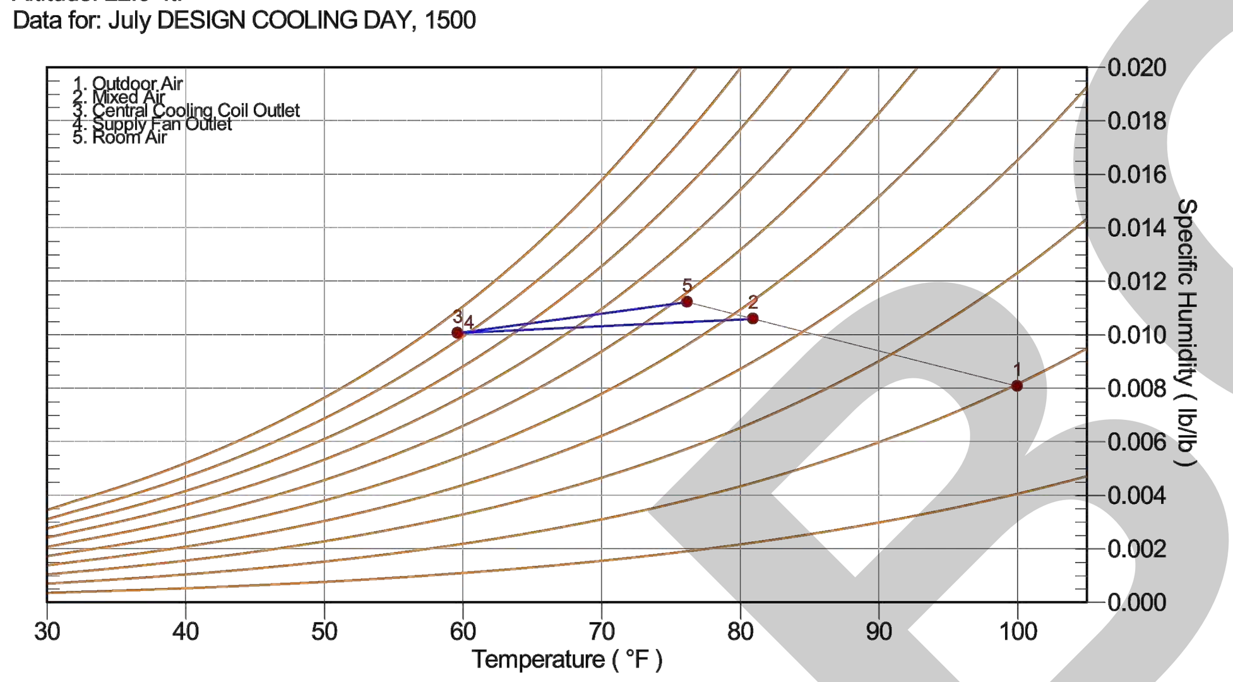
TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	-41879	Heating	-41997	69.7	4917	443	0	0

System Psychrometrics for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

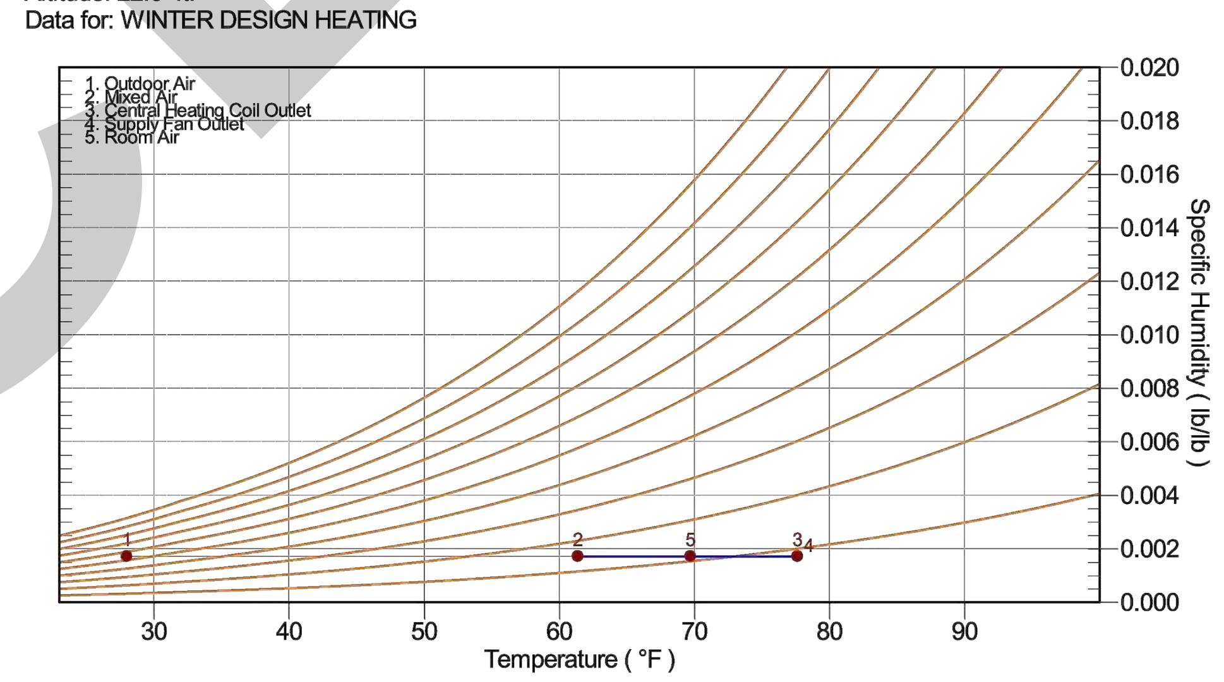
Location: Sacramento Z12, California
Altitude: 22.0 ft.
Data for: July DESIGN COOLING DAY, 1500



System Psychrometrics for Main Hall

Project Name: 2.2.122 Greenback — 06/21/2022
Prepared by: Omar F. — 11:52PM

Location: Sacramento Z12, California
Altitude: 22.0 ft.
Data for: WINTER DESIGN HEATING



No	Date	Issue / Revision

Title

MECHANICAL HEAT LOADS CALCS.

Project Number: 20001.00
Date: 12/29/2022
Drawn By: RGC, JM, YM
Checked By: CJK

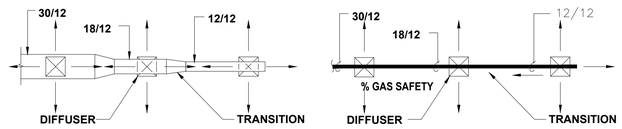
M4.01

GENERAL NOTES

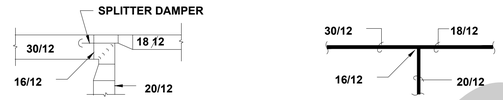
1. MECHANICAL CONTRACTOR SHALL EXAMINE ALL OTHER SPECIFICATIONS, DRAWINGS AND ALL FEATURES OF BUILDING CONSTRUCTION WHICH MAY AFFECT HIS WORK AND SHALL B GOVERNED BY THESE AND OTHER SPECIFICATIONS, INCLUDIN THE GENERAL CONDITIONS AND PARTICULAR INSTRUCTIONS T ALL BIDDER AND SUPPLIERS .
2. ALL WORK SHALL BE EXECUTED AND INSPECTED IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND/OR STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS APPLICABLE TO THIS PARTICULAR CLASS OF WORK, AND EACH CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL APPLICABLE SERVICE CHARGES, FEES, PERMITS, TAXES, AND OTHER SIMILAR COSTS IN CONNECTION THEREWITH .
3. PRIOR TO FABRICATION OF DUCTWORK, THE MECHANICAL CONTRACTOR SHALL EXAMINE AND VERIFY ALL CONDITIONS ABOVE AND BELOW THE CEILING WHICH MAY INTERFERE WITH THE DUCT SYSTEM AND NOTIFY THE ARCHITECT OF ANY CONFLICT ENCOUNTERED. CONTRACTOR SHALL PROVIDE ALL OFFSETS, ETC WHICH MAY BE REQUIRED, WITHOUT ADDITIONAL COST TO THE OWNER
4. ALL SHEET METAL DUCT CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH "SMACNA" LOW PRESSURE DUCT CONSTRUCTION STANDARD
5. TURNING VANES SHALL BE INSTALLED IN ALL BENDS IN RECTANGULAR DUCT EXCEEDING 30"
6. ALL DUCTS SHALL BE SUPPORTED WITH 1"WIDE, 16 GAUGE, GALVANIZED STEEL BANDS .
7. ALL RECTANGULAR DUCT SHALL BE INSULATED WITH A MIN OF 1"INTERNAL LINER, 2 LBS DENSITY R-60 ALL ROUND DUCTS AND DIFFUSER TOPS SHALL HAVE A MIN 2" THICK OF FOIL BACKED BLANKET TYPE INSULATION R=4-4 2, WITH ALL JOINTS BUTTED AND TAPED .
8. ALL DUCT DIMENSIONS SHOWN ON PLANS ARE INTERNAL
9. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF SUPPLY AND RETURN AIR REGISTERS, DUCTS, GRILLES AND DIFFUSERS WITH LIGHTING AND CEILING PATTERNS
10. PROVIDE LATERAL BRACING OF ALL DUCTS AND PIPES AS REQUIRED BY CODE .
11. INSULATE AND SEAL ALL DUCTWORK PER CHAPTER 10 OF THE STATE MECHANICAL CODE (T-24, PART 4)
12. MOUNT ALL THERMOSTATS AT 48" ABOVE FINISHED FLOOR
13. ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES
14. WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT AND THE MECHANICAL ENGINEER
15. DUCT SMOKE DETECTOR SHALL BE INSTALLED BELOW THE ROOF
16. ALL MECHANICAL EQUIPMENT AND SYSTEMS INSTALLED AS PART OF PROJECT SHALL COMPLY WITH ALL REQUIREMENTS OF THE 2013 CALIFORNIA MECHANICAL CODE AND THE 2013 CALIFORNIA BUILDINGCODE AND THE 2013 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS .
17. OUTSIDE AIR FOR A HEATING OR COOLING SYSTEM SHALL NOT BE TAKEN FROM CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, VENT OPENING OF A PLUMBING SYSTEM, OR THE DISCHARGE OUTLET OF EXHAUST FAN, UNLESS THE OUTLET IS 3 FT. ABOVE THE OUTSIDE AIR INLET (CMC 314 3)
18. PROVIDE 120 VOLT ELECTRICAL OUTLETS WITHIN 25 FT OF ALL MECH EQUIPT .(CMC 309)
19. HEATING,VENTILATING,ANDAIR CONDITIONING SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS IN ACCORDANCE WITH CMC 317.1 REQUIREMENTS .
    - A. AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE
    - B. ACCA MANUAL B
    - C. ASHRAE 111
    - D. NEBB PROCEDURAL STANDARDS FOR TESTING,ADJUSTING ADJUSTING BALANCING OF ENVIRONMENTAL SYSTEMS
    - E. SMACNA HVAC TESTING,ADJUSTING,AND BALANCING
20. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NON COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT TO EXCEED 25 AND A SMOKE DEVELOPED INDEX NOT TO EXCEED 50 WHERE TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ASTM E84 OR UL 723 .

DUCTWORK SYMBOLS LEGEND

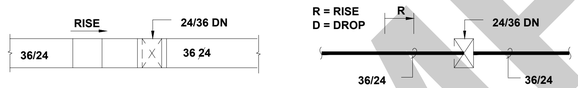
TRANSITIONS



MAIN BRANCH TAKE-OFFS

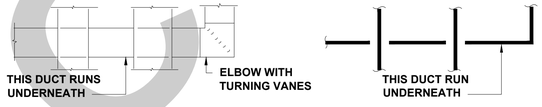


RISERS

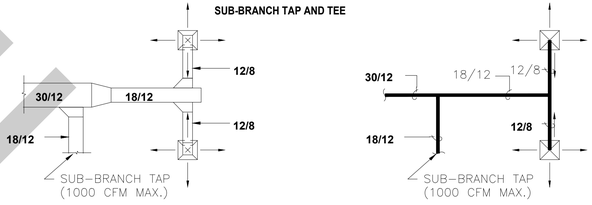


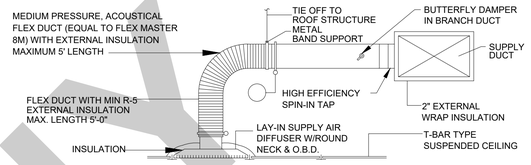
SIDEWALL REGISTERS

DUCT CROSSOVERS

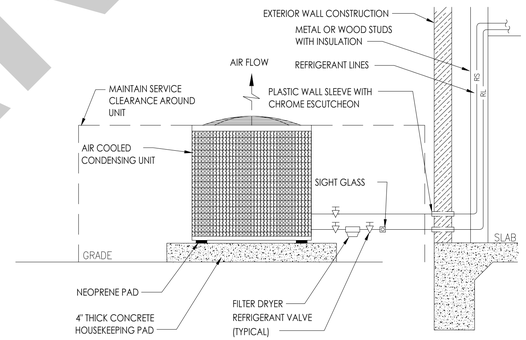


SUB-BRANCH TAP AND TEE

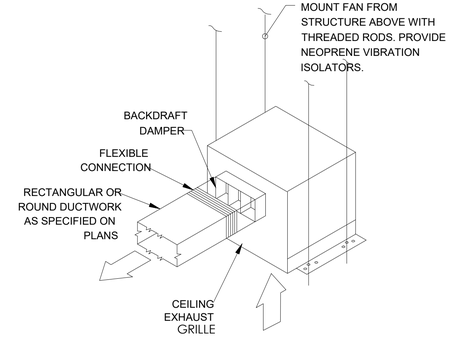




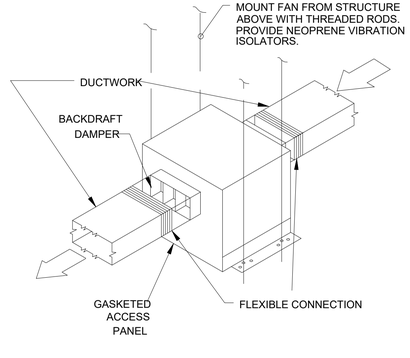
SUPPLY AIR DIFFUSER CONNECTION



OUTSIDE AIR CONDITIONER



CEILING EXHAUST FAN DETAIL



IN-LINE FAN DETAIL

No	Date	Issue / Revision

Title

MECHANICAL GENERAL DETAILS.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

M5.01

LIST OF SYMBOLS AND SERVICES

	SURFACE MTD. 1'W X 4'L LIGHTING FIXTURE, "LITHONIA LIGHTING"ZL1N-L46-3000LM-35K-MVOLT LED 25W
	SURFACE MTD. 1'W X 4'L LIGHTING FIXTURE, "LITHONIA LIGHTING"ZL1N-L46-3000LM-35K-MVOLT LED 25W WITH 90 MIN BATTERY
[0]	INDIRECT COVE LIGHT SIMILAR TO PHILIPS V4 (3Watts per 1 linear foot) INDIRECT LIGHTING POINT OUTLET
[0]	VALANCE LIGHTING SIMILAR TO PHILIPS V4 (3Watts per 1 linear foot) INDIRECT LIGHTING POINT OUTLET
[0]	LED LIGHTING TRACK BEYOND ICON SCREEN SIMILAR TO PHILIPS V4 (3Watts per 1 linear foot) INDIRECT LIGHTING POINT OUTLET
	CEILING RECESSED LED (6" ROUND) "LITHONIA LTG" LDN6 40/05 L06AR LD LED 20W
	CEILING RECESSED LED (6" ROUND) "LITHONIA LTG" LDN6 40/05 L06AR LD LED 20W WITH 90MIN BATTERY
	CEILING MOUNTED EMERGENCY ILLUMINATION FIXTURE, SHALL BE ON ALL TIME WITH 90 BACK UP MINUTES BATTERY BUILT IN SIMILAR TO COOPER CEL10050SD TYPE EE
	EXIT SIGN WITH EMERGENCY LIGHT SHALL BE ON ALL TIME WITH 90 BACK UP MINUTES BATTERY BUILT IN
	WALL MOUNTED LIGHTING POINT, WATTAGE AS INDICATED ON THE LAYOUT
	FLOOR BOX LIGHTING POINT, WATTAGE AS INDICATED ON THE LAYOUT
S 0 D	SINGLE POLE SWITCH , 20A, 120/277 VOLTS - WALL MOUNTED @ +48" A.F.F.L TO CENTER. D: DENOTES SWITCH WITH ELECTRONIC DIMMER O: DENOTES OCCUPANCY SENSOR
S 0 D 3	3 WAY SWITCH , 20A, 120/277 VOLTS - WALL MOUNTED @ +48" A.F.F.L TO CENTER. D: DENOTES SWITCH WITH ELECTRONIC DIMMER O: DENOTES OCCUPANCY SENSOR
S F	ONE WAY ONE GANG SWITCH FOR TOILET EXHAUST FAN - WALL MOUNTED @ +48" A.F.F.L
	120/240V, 1PH, 3W LOAD CENTER
	SINGLE RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED
(F)	JUNCTION BOX - FOR EXHAUST FAN
(J)	JUNCTION BOX FOR LIGHTING RESERVATION (50 WATTS EACH)
YxXXA	NON-FUSED DISCONNECT SWITCH - SIZE AS INDICATED
— — — — —	CONDUITS IN CEILING
— — — — —	CONDUITS UNDER TILES

INSTALLATION HEIGHTS:
- h1: 23.622 inches.
- h2: 43.3071 inches.
- h3: 47.2441 inches.
- h4: 70.86 inches.
- h5: 94.48 inches.
- h6: 60 inches.

GENERAL NOTES:

1. ALL WORK AND EQUIPMENT UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE WITH THE CODES, STANDARDS AND PRACTICES LISTED HEREIN, AND THEIR RESPECTIVE DATES ARE FURNISHED AS THE MINIMUM LATEST REQUIREMENTS.
A. LIFE SAFETY CODE
B. NATIONAL FIRE PROTECTION ASSOCIATION
C. NATIONAL ELECTRICAL CODE
D. AMERICAN NATIONAL STANDARDS INSTITUTE
E. INSTITUTE IF ELECTRICAL AND ELECTRONIC ASSOCIATION
F. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
G. REQUIREMENTS OF LOCAL POWER COMPANY
H. BUILDING CODE

2. THE ELECTRICAL INSTALLATION SHALL MEET THE APPROVAL OF THE LOCAL GOVERNING AUTHORITIES AND THE OWNER'S REPRESENTATIVE PRIOR TO ACCEPTANCE.

3. REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, CIVIL, INTERIOR DESIGN, FOR RELATED INFORMATION AND ADDITIONAL INSTALLATION REQUIREMENTS TO BE CONSIDERED AS PART OF THE ELECTRICAL CONTRACT DOCUMENTS.

4. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION THE CONTRACTOR IS EXPECTED TO FURNISH ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM, PROVIDE EVERYTHING NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MINOR ITEMS WHICH ARE OBVIOUSLY NECESSARY TO COMPLETE THE INSTALLATION.

5. LIGHT SWITCHES SHALL BE MOUNTED 48 INCHES ABOVE FINISHED FLOOR TO CENTER LINE OF THE DEVICE, UNLESS NOTED OTHERWISE. GANG SWITCHES AND DIMMER WITH A COMMON PLATE WHERE TWO (2) OR MORE ARE INDICATED ADJACENT TO EACH OTHER.

6. RECEPTACLES SHALL BE LOCATED 18" ABOVE FINISHED FLOOR TO CENTER LINE OF DEVICE. UNLESS NOTED OTHERWISE. ABOVE-COUNTER RECEPTACLES SHALL BE MOUNTED 6" ABOVE BACK SPLASH TO CENTERLINE OF DEVICE UNLESS NOTED OTHERWISE.

7. USE GALVANIZED RIGID STEEL CONDUIT WHERE EPOSED TO EXTERIOR CONDITIONS OR WHERE EXPOSED IN ANY LOCATIONS WHERE SUBJECT TO MECHANICAL DAMAGE. EMT SHALL BE PROVIDED WITH SET SCREW STEEL FITTINGS FOR INSTALLATION IN ALL CONCEALED WALLS AND CEILINGS IN DRY AREAS. ALL CONDUIT FOR LIGHTING PROTECTION SHALL BE PVC, SCHEDULE 40, UNLESS OTHERWISE NOTED. PVC MAY BE USED WHERE BURIED UNDER GRADE AND ENCASED IN CONCRETE SLAB OR WALLS. ALUMINUM CONDUIT IS NOT ALLOWED. EMT CAN BE USED IN DRY AREAS WHEN INSTALLED 10 FEET ABOVE FINISHED FLOOR LEVEL.

8. ALL CONDUITS IN PUBLIC SHALL BE CONCEALED UNLESS NOTED OTHERWISE.

LIST OF SYMBOLS AND SERVICES

(SD)	SELF CONTAINED SMOKE DETECTOR/ANNUNCIATOR (120 W/BATTERY BACKUP) – CEILING MOUNTED
(HD)	SELF CONTAINED SMOKE/CARBON MONOXIDE (120 W/BATTERY BACKUP) – CEILING MOUNTED

ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
A/C	AMP INTERRUPTING CURRENT
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
BFG	BELOW FINISHED GRADE
BKBD	BACKBOARD
C	CONDUIT
CU	COPPER
DB	DISTRIBUTION BOARD
(E)	EXISTING TO REMAIN
EA	EACH
EM	EMERGENCY
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
EWC	ELECTRIC WATER COOLER
F	FUSE (DUAL ELEMENT, TIME DELAY)
FBO	FINISHED BY OTHERS
FPN	FUSE PER NAMEPLATE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
W.P	WEATHER PROOF
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
IG	ISOLATED GROUND
JBOX	JUNCTION BOX
KVA	KILOVOLT-AMPS
KW	KILOWATT
MCC	MOTOR CONTROL CENTER
MPC	MINI POWER CENTER
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NOT TO SCALE
PB	PULLBOX
PNL	PANEL BOARD
(R)	EXISTING TO BE RELOCATED
RGS	RIGID GALVANIZED STEEL
SWBD	SWITCH BOARD
SQFT	SQUARE FEET
TL	TWISTLOCK
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TVP	TYPICAL
UG	UNDERGROUND
UMC	UNIFORM MECHANICAL CODE
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTABLE POWER SUPPLY
V	VOLTS
VA	VOLT-AMPS
V/PH/A	VOLTS/PHASE/AMPS
V/PH/HZ	VOLTS/PHASE/HERTZ
VFD	CARIABLE FREQUENCY DRIVE - PROVIDED BY MECHANICAL
WP	WEATHER PROOF (NEMA 3R)
(X)	EXISTING TO BE REMOVED
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

ELECTRICAL SPECIFICATIONS

1. DO NOT SCALE DRAWINGS, VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.
2. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN TO "PROVIDE AND INSTALL".
3. FINAL CONNECTIONS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
4. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. THE ENGINEER RESERVES THE RIGHT TO APPROVE METHODS AND MATERIALS NOT REFLECTED HEREIN.
5. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND OTHER RELATED DRAWINGS PRIOR TO BID.
6. CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED IN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL INCLUDE IN HIS BID, ANY COSTS REQUIRED TO MAKE HIS WORK MEET THE CONTRACT SCOPE UTILIZING EXISTING CONDITIONS.
7. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT.
8. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES.
9. PROVIDE PERMITS AND INSPECTIONS REQUIRED.
10. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.
11. PROVIDE RECORD DRAWINGS TO ENGINEER. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
12. VERIFY SPECIFIC LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
13. ELECTRICAL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO OWNER.
14. RECESSED LIGHT FIXTURES INSTALLED IN GYP. BOARD OR PLASTER CEILINGS SHALL HAVE PLASTER FRAMES INSTALLED PRIOR TO CEILING MATERIAL.
15. RECESSED FIXTURES INSTALLED INDOORS SHALL BE THERMALLY PROTECTED.
16. SEE DIVISION 15 DRAWINGS FOR LOCATION OF MECHANICAL EQUIPMENT. PROVIDE SERVICE TO AND CONNECT EQUIPMENT AS REQUIRED.
17. PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS.
18. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
19. WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL BE LISTED AS SUITABLE FOR 75 DEGREE C.
20. THE FOLLOWING CONDUCTOR SIZES SHALL BE UTILIZED FOR 20 AMP CIRCUITS PERTAINING TO DISTANCES (IN FEET) INDICATED:

120VOLT, 1PH	CONDUCTOR	240 VOLT, (1PH)
0-64	#12AWG	0-129
65-106	#10AWG	130-212
107-160	#8AWG	213-321

NOTE: BASED ON 75°c COPPER CONDUCTORS INSTALLED IN EMT WITH 16AMP LOAD @ 85% P.F.

21. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND SHALL PROVIDE LIGHTS, SWITCHES, RECEPTACLES, EQUIPMENT CONNECTIONS, ETC., AND ASSOCIATED CIRCUITING IN NEW AND REMODELED AREAS, EVEN IF SUCH AREAS ARE NOT SHOWN ON ELECTRICAL DRAWINGS. LAYOUTS, FIXTURE TYPES, QUANTITIES AND SPACING SHALL BE IN ACCORDANCE WITH SIMILAR AREAS ON THIS PROJECT. CONTRACTOR SHALL INCLUDE COSTS FOR THE ABOVE IN HIS BID, IN ADDITION, CONTRACTOR SHALL PROVIDE LAYOUT DRAWINGS FOR WORK IN SUCH AREAS AND SUBMIT FOR APPROVAL PRIOR TO ROUGH-IN.
22. WIRE SHALL BE COPPER, 75 DEGREES C RATED FOR GENERAL USE, FOR WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS WIRE SHALL BE COPPER, MINIMUM 90 DEGREES C RATED, SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30 DEGREES C AMBIENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS. 600 VOLT COMPACT ALUMINUM WIRE AND CABLE IN SIZES 1/0 AND LARGER MAY BE SUBSTITUTED FOR COPPER ON SERVICES AND FEEDERS IF AMPACITY IS EQUIVALENT TO OR GREATER
23. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
24. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS, EQUIPMENT OR INSTALLATION METHODS.
25. ELECTRICAL SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION AT COMPLETION OF PROJECT.
26. RECEPTACLES WHICH ARE SHOWN WALL MOUNTED ON THE ELECTRICAL DRAWINGS ON WALLS WHICH, ON THE ARCHITECTURAL DRAWINGS AND ELEVATIONS ARE SHOWN AS GLASS OR PARTITIONS, SHALL BE FLUSH FLOOR DUPLEX RECEPTACLES MOUNTED ADJACENT TO BAS OR WALLS.
27. RECEPTACLES AT COUNTER SHALL BE MOUNTED WITH THEIR LONG AXIS HORIZONTAL AT +46" UNLESS NOTED.
28. FLUSH FLOOR RECEPTACLE OUTLETS SHALL BE WIREMOLD 862 SERIES. PROVIDE CARPET OR TILE FLANGE TO MATCH FLOOR FINISH.
29. THE COLOR OF THE DEVICES AND COVER PLATES SHALL BE AS DIRECTED BY ARCHITECT. IN DAMP OR WET LOCATIONS COVER PLATES SHALL BE STAINLESS STEEL, IN DRY LOCATIONS COVER PLATES SHALL BE SMOOTH HIGH ABUSE NYLON OR EQUIVALENT. PROVIDE COVER PLATES FOR SWITCHES, RECEPTACLES, TELEPHONE, TELEVISION, COMPUTER AND J-BOX OUTLETS AS REQUIRED.
30. ROMEX CABLE WITH A GROUNDING CONDUCTOR MAY BE USED WHERE PERMITTED BY BOTH THE N.E.C. AND LOCAL ORDINANCES.
31. DISCONNECT SWITCHES SHALL BE GENERAL DUTY TYPE. FUSIBLE SWITCHES SHALL ACCEPT CLASS 'R' FUSES ONLY AND REJECT ALL OTHERS.
32. FINAL CONNECTIONS TO VIBRATING EQUIPMENT SHALL BE WITH FLEX (LIQUIDTIGHT FOR EXTERIOR APPLICATIONS) AND APPROVED FITTINGS. DO NOT SECURE CONDUITS, DISCONNECTS OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT.
33. THE ENGINEER OF RECORD HAS PERFORMED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS INDICATED FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.
34. THE ENGINEER OF RECORD HAS PERFORMED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUITS AND FEEDERS COMPLY WITH NEC 210-19(A) FPN NO4.
35. THE CONTRACTOR SHALL PROVIDE 120V CONNECTION TO NEAREST MAINTENANCE RECEPTACLE WHERE REQUIRED FOR CONDENSATE PUMPS ASSOCIATED WITH FAN COIL UNITS. COORDINATE WITH MECHANICAL CONTRACTOR.
36. THE CONTRACTOR SHALL COORDINATE THE SPECIFIC LOCATION, MOUNTING HEIGHT, ROTATION, TYPE, COLOR, ETC. OF ALL DEVICES PRIOR TO INSTALLATION.
37. CONNECTIONS TO HYDROMASSAGE BATHTUBS, JACCUZZI TUBS OR SIMILAR EQUIPMENT SHALL BE MADE IN ACCORDANCE WITH ARTICLE 680.70 OF THE CEC 2019. PROVIDE BONDING AS REQUIRED BY ARTICLE 680.74 OF THE CEC 2019.
38. ALL INDOOR FLUORESCENT FIXTURES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE OR BALLASTED LUMINARIES THAT ARE SUPPLIED FROM MULTIWIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL COMPLY WITH 410.73 (G) OF THE CEC 2019.
39. CEILING MOUNTED SMOKE AND CARBON MONOXIDE DETECTORS MUST COMPLY WITH U.L. 2075 AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
40. ALL SMOKE DETECTORS AND COMBINATION SMOKE/CARBON MONOXIDE DETECTORS SHALL BE HARDWIRED ON SAME CIRCUIT AND HAVE A BATTERY BACKUP SYSTEM.
41. WHEN MORE THAN EITHER ONE (1) SMOKE ALARM OR MORE THAN ONE (1) CARBON MONOXIDE ALARM IS REQUIRED TO BE INSTALLED WITHIN AN INDIVIDUAL DWELLING UNIT, ALL ALARM DEVICES SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WITH ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS.
    A. SMOKE ALARMS IN EACH SLEEPING ROOM.
    B. SMOKE ALARMS OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS.
    C. SMOKE ALARMS ON EACH ADDITIONAL STORY OF THE DWELLING INCLUDING BASEMENTS BUT NOT INCLUDING CRAWL SPACE AND UNINHABITABLE ATTICS. IN DWELLINGS OR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, A SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL PROVIDED THAT THE LOWER LEVEL IS LESS THAN ONE FULL STORY BELOW THE UPPER LEVEL.
    D. CARBON MONOXIDE ALARMS OUTSIDE OF SLEEPING AREAS IN THE IMMEDIATE VICINITY OF THE BEDROOMS IN DWELLING UNITS WITHIN WHICH FUEL-FIRED APPLIANCES ARE INSTALLED AND IN DWELLING UNITS THAT HAVE ATTACHED GARAGES.
    E. CARBON MONOXIDE ALARMS WITHIN EACH BEDROOM WHICH CONTAINS A FUEL-FIRED APPLIANCE.
43. ALL BRANCH CIRCUITS THAT SUPPLY 125-VOLT, SINGLE PHASE, 15 AND 20 AMP BRANCH CIRCUITS SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. CEC 2019 ARTICLE 210.12 (A).
44. ALL ATTIC ACCESSES SHALL BE PROVIDED WITH A SWITCHED LIGHT AND 120 VOLT GFI OUTLET AT OR NEAR THE FORCED AIR UNIT. LOCATE LIGHT SWITCH AT THE ATTIC ACCESS OPENING.
45. ALL RECESSED LED STRIP LIGHTING SALL BE BY KLUS.
46. Receptacles inside kitchen shall comply with following:
a) Receptacle outlets shall not be installed in a face up position in the work surfaces.
b) Receptacle outlets shall be located on or above, but not more than 20 in. above the countertop or work surface. [CEC section 210.52(C)(5)]
c) Receptacle outlets shall be permitted to be mounted not more than 12 in. below the countertop or worksurface provided the countertop does not extend more than 6 in. beyond its support base. (CEC section 210.52(C)(5) Exception)
47. Energy management control system (EMCS) that provides the functionality of an astronomical time clock, does not have an override or bypass switch that allows the luminaire to be always ON, and is programmed to turn the outdoor lighting off during daylight hours.

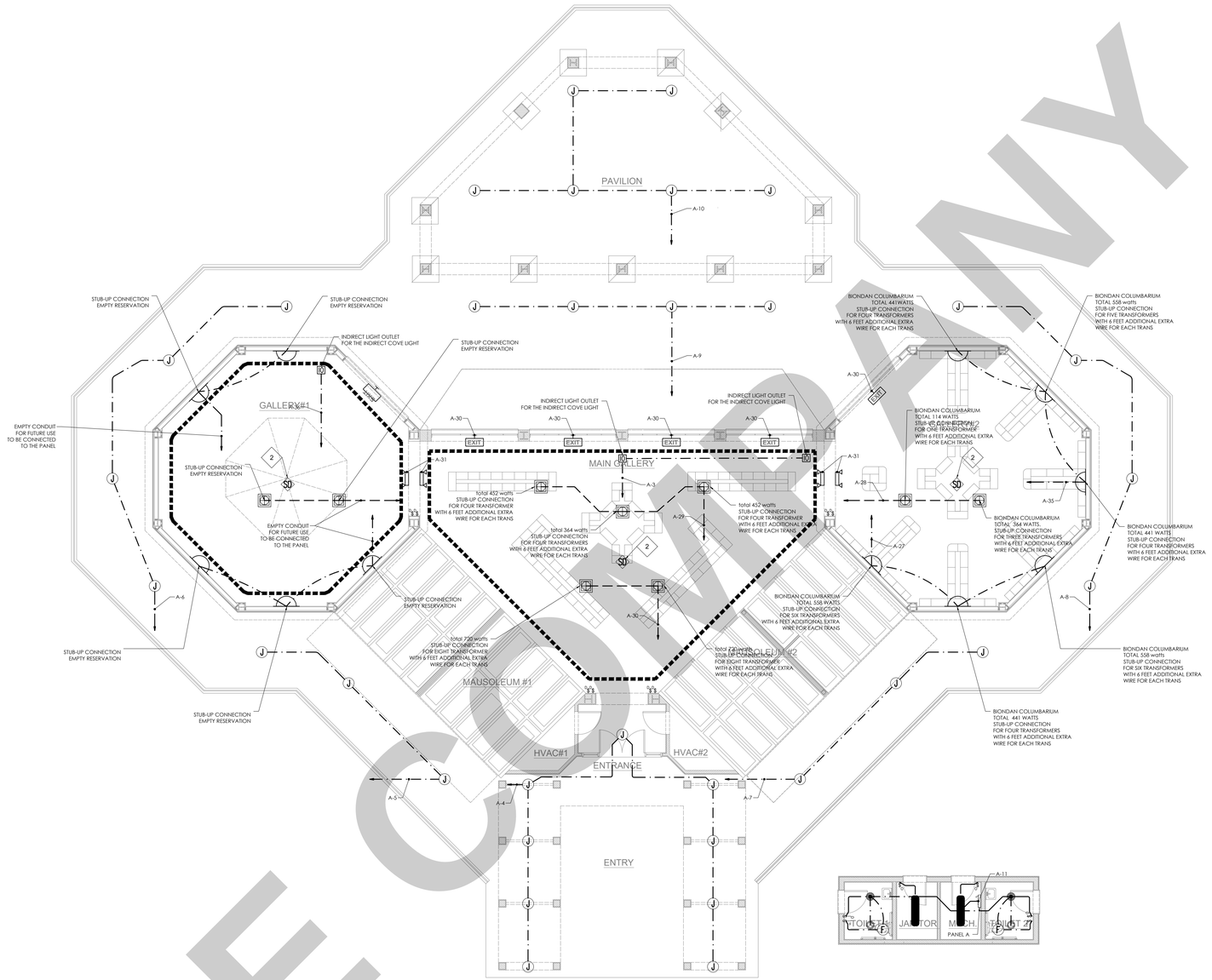
No	Date	Issue / Revision

Title

ELEC LIST OF SYMBOLS AND GENERAL NOTES

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

E0.00



SHEET NOTES:

1. JUNCTION BOX FOR TOILET EXHAUST FAN
2. FURNISH AND INSTALL SMOKE OR COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR AS REQUIRED. INTERLOCK WITH OTHER DETECTORS

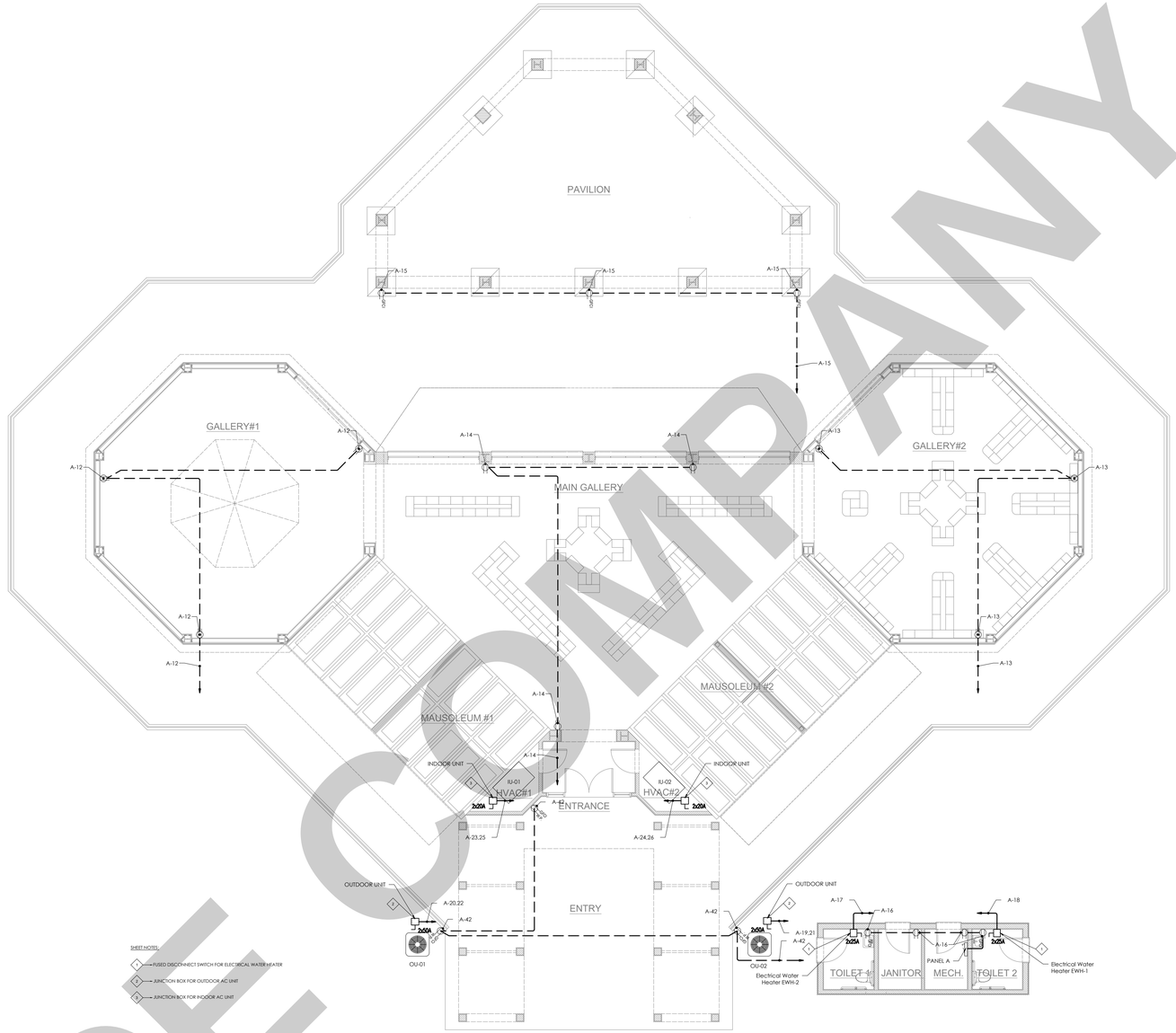
No	Date	Issue / Revision

Title

FLOOR PLAN LIGHTING. LAYOUTS.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

E1.00



No	Date	Issue / Revision

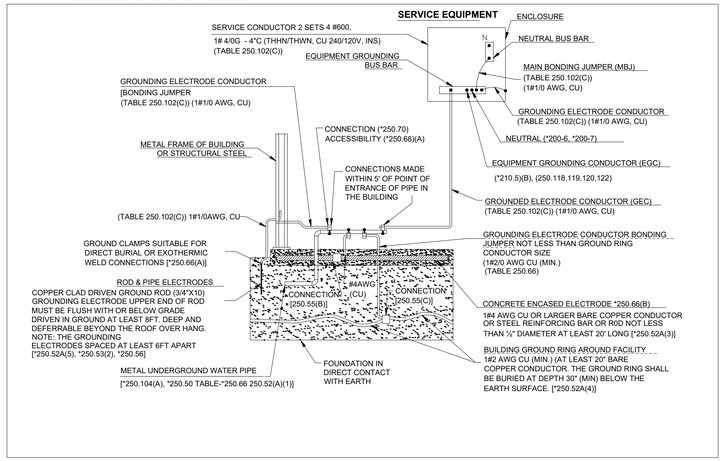
Title

FLOOR PLAN
POWER LAYOUTS.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

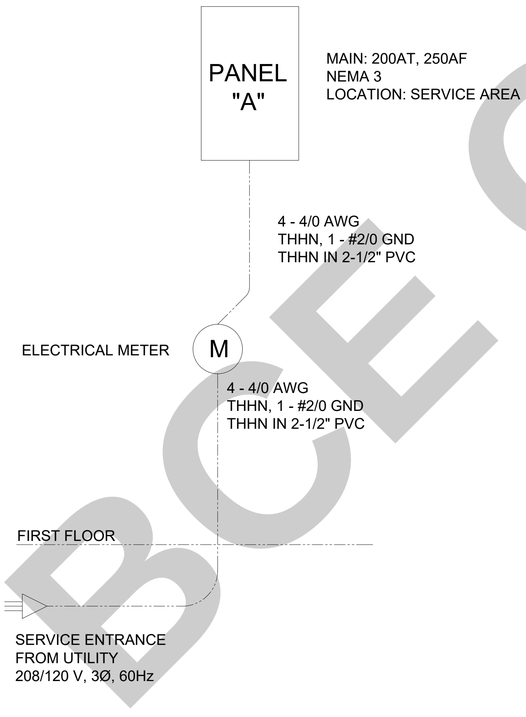
E2.00

UFER GROUND NOTE :
ALL STEEL REBARS MEASURING 1/2 " OR MORE IN DIAMETER AND 20 ' OR LONGER IN LENGTH THAT IS ENCASED IN NOT LESS THAN 2 INCHES OF CONCRETE SHALL BE BONDED TO THE BUILDING'S GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 250 (ELECTRICAL SUB CODE) SECTION 250.52(A)(3). THE "UFER" GROUND CAN BE 20 L.F. OF #2 OR #4 COPPER WIRING LAID INSIDE THE FOOTING AND THE SAME WIRE IS LONG ENOUGH TO REACH TO THE LOCATION OF THE MAIN ELECTRICAL PANEL OF THE HOUSE. UFER GROUND CAN BE (1) L-SHAPED PIECE OF #4 STEEL REBAR CONNECTED TO THE OTHER STEEL REBAR IN THE FOOTING AND STICKING OUT IN SUFFICIENT LENGTH FOR CONNECTION AT THE LOCATION OF THE MAIN ELECTRICAL PANEL OF THE HOUSE



DETAIL "G" OF GROUNDING ELECTRODE SYSTEM (*250.50) & GROUNDING ELECTRODES (*250.52) AS SERVICE

SCALE: NTS



Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	11.06	1.25	1.18	5.01	4.88	11.06
R	Convenience Recept	4.86		1.62	1.62	1.62	4.86
H	Heating (Space)	3.60	1.25			3.60	3.60
C	Cooling		1.00				
A	HVAC	22.66	1.00	11.33	7.30	4.03	22.66
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**42.18**		14.13	13.93	14.13	42.18

Total Demand Load (KVA)	42.18
Total Demand Current (A)	117.09
Min. Feeder Ampacity (A)	146.36

*: Lock on Device as per NEC 700.12 (1)(2)(3)

PANEL A	
PANELBOARD DESIGNATION	
SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	200
SYSTEM TYPE	NORMAL
FEEDER PROT	200A-3P C/B Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	200A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	0.508
FAULT CURRENT	
KAIC RATING	16
ENCLOSURE	TYPE 3

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	SPARE				15A-1P						15A-1P			SPARE		2
3	Indirect Cove Light	L	2X 12 AWG - #12G		15A-1P	0.75		1.13		0.38	15A-1P	2X 12 AWG - #12G		Lighting Junction Boxes	L	4
5	Lighting Junction Boxes	L	2X 12 AWG - #12G		15A-1P	0.38			0.88	0.50	15A-1P	2X 12 AWG - #12G		Lighting Junction Boxes	L	6
7	Lighting Junction Boxes	L	2X 12 AWG - #12G		15A-1P	0.38	0.88			0.50	15A-1P	2X 12 AWG - #12G		Lighting Junction Boxes	L	8
9	Lighting Junction Boxes	L	2X 12 AWG - #12G		15A-1P	0.50		1.00		0.50	15A-1P	2X 12 AWG - #12G		Lighting Junction Boxes	L	10
11	Lighting Toilet & EE Room	L	2X 12 AWG - #12G		15A-1P	0.60			1.41	0.81	15A-1P	2X 12 AWG - #12G		Receptacles Gallerie	R	12
13	Receptacles Gallerie	R	2X 10 AWG - #10G		20A-1P	0.81	1.62			0.81	20A-1P	2X 10 AWG - #10G		Receptacles Mosoleum	R	14
15	Receptacles Outdoor	R	2X 10 AWG - #10G		20A-1P	0.81		1.62		0.81	20A-1P	2X 10 AWG - #10G		Receptacles Toilets & EE Room	R	16
17	Electrical Water Heater EWH-1	H	2X 10 AWG - #8G		25A-1P	1.80			3.60	1.80	25A-1P	2X 10 AWG - #8G		Electrical Water Heater EWH-2	H	18
19	OUTDOOR UNIT	A	2X 8 AWG - #8G		50A-2P	3.65	7.30			3.65	50A-2P	2X 8 AWG - #8G		OUTDOOR UNIT	A	20
21		A				3.65		7.30		3.65					A	22
23	INDOOR UNIT	A	2X 12 AWG - #12G		20A-2P	0.38			4.03	3.65	20A-2P	2X 12 AWG - #12G		INDOOR UNIT	A	24
25		A				0.38	4.03			3.65					A	26
27	Lighting BIONDAN COLUMBARIUM	L	2X 12 AWG - #12G		15A-1P	1.44		2.88		1.44	15A-1P	2X 12 AWG - #12G		Lighting BIONDAN COLUMBARIUM	L	28
29	Lighting BIONDAN COLUMBARIUM	L	2X 12 AWG - #12G		15A-1P	1.27			1.52	0.25	15A-1P	2X 12 AWG - #12G		Exit Light *	L	30
31	Emergency Light *	L	2X 12 AWG - #12G		15A-1P	0.30	0.30				15A-1P			SPARE	R	32
33	SPARE				15A-1P						15A-1P			SPARE		34
35	Lighting BIONDAN COLUMBARIUM	L	2X 12 AWG - #12G		15A-1P	1.44			1.89	0.45	15A-1P	2X 12 AWG - #12G		Indirect Cove Light	L	36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				25A-1P				0.81	0.81	20A-1P	2X 10 AWG - #10G		Receptacles Outdoor	R	42
			(KVA)													
						Total Connected Load	14.13	13.93	14.13							

No	Date	Issue / Revision

Title

PANEL BOARD AND POWER RISER

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

E3.00

PLUMBING SPECIFICATIONS

THE WORK INCLUDES MODIFICATION TO THE EXISTING PLUMBING SYSTEM AND PROVIDING NEW MATERIALS, FITTINGS AND ACCESSORIES NECESSARY FOR A COMPLETE FUNCTIONING PLUMBING SYSTEM. THE WORK ALSO INCLUDES ROUGH-IN AND FINAL CONNECTIONS TO FOOD SERVICE EQUIPMENT AND BEVERAGE DISPENSING EQUIPMENT PROVIDED BY OTHERS. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND/OR ORDINANCES AND IS SUBJECT TO INSPECTION. HOOK-UP CHARGES, PERMITS AND ALL OTHER EXPENSES RELATED TO A COMPLETE AND FUNCTIONING PLUMBING SYSTEM ARE INCLUDED AS A PART OF THIS SECTION. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR PLUMBING WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, FIXTURES AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURER'S STANDARD ROUGH-IN DRAWINGS FOR PLUMBING FIXTURE INSTALLATION REQUIREMENTS. COMPLY WITH ALL APPLICABLE ADA INSTALLATION REQUIREMENTS. COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PIPING SYSTEMS - GENERAL: ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK SUCH AS DUCTS AND ELECTRICAL CONDUIT. AT ALL CONNECTIONS BETWEEN FERROUS PIPING AND NONFERROUS PIPING, PROVIDE AN ISOLATING DIALECTIC UNION. ALL HANGERS SHALL BE COMPATIBLE WITH PIPING MATERIAL TO PREVENT CORROSION. PROVIDE ALL FITTINGS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY TO FACILITATE THE PLUMBING SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED. FIXTURES/EQUIPMENT FURNISHED BY OTHERS: PLUMBING CONTRACTOR SHALL PROVIDE UTILITY CONNECTIONS REQUIRED SUCH AS WATER, GAS, AIR, SUPPLIES, WASTE OUTLET, TRAPS, ETC. AT ALL PLUMBING TYPE FIXTURES OR EQUIPMENT FURNISHED BY OWNER, GENERAL CONTRACTOR, FOOD SERVICE CONTRACTOR, EQUIPMENT SUPPLIER, ETC. INCLUDED ARE STOP VALVES, ESCUTCHEONS, AND CHROME PLATED BRASS TUBING WITH COMPRESSION FITTINGS. SEWER AND WASTE PIPING: PROVIDE ALL DRAINS AND SEWERS WITHIN THE SPACE WITH CONNECTION TO THE EXISTING DRAINAGE SYSTEMS ON-SITE. SANITARY DRAINAGE PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. SANITARY DRAINAGE PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS MAY BE USED (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES). ALL DRAINAGE PIPING SHALL BE UNIFORMLY PITCHED, 1/4" PER FOOT UNLESS OTHERWISE REQUIRED BY EXISTING CONDITIONS, OR INDICATED ON THE DRAWINGS. VENTS: PROVIDE A COMPLETE SYSTEM OF STANDARD WEIGHT CAST IRON NO-HUB VENT RISERS WHERE THE CEILING SPACE IS USED AS A RETURN AIR PLENUM OR USE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES) WHERE THERE IS A DUCTED RETURN AIR SYSTEM. DO NOT USE PVC PIPE IN RETURN AIR PLENUM SPACES. THE VENT SYSTEM SHALL BE CARRIED THROUGH THE ROOF WITH APPROPRIATE FLASHING. CONDENSATE AND INDIRECT DRAIN PIPING:PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV(SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS. CLEANOUTS: PROVIDE CLEANOUTS AT THE END OF EACH HORIZONTAL RUN, AND AT THE BASE OF ALL VERTICAL WASTE AND DRAIN PIPES. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPES THEY SERVE, CONFORMING TO CODE REQUIREMENTS. PROVIDE SUITABLE WALL OR FLOOR CLEANOUTS WITH ACCESSORIES TO OBSCURE FROM VIEW. WATER DISTRIBUTION PIPING: LAYOUT WATER PIPING SO THAT THE ENTIRE SYSTEM CAN BE DRAINED. HOT AND COLD WATER PIPING SHALL BE 1/2" MIN. CPVC PIPE WITH SOLVENT FITTING. PROVIDE WATER HAMMER ARRESTERS AT EACH FIXTURE OR GROUP OF FIXTURES AS REQUIRED. INSTALL CHROME PLATED BRASS ESCUTCHEON PLATES AT ALL PENETRATIONS THROUGH FINISHED SURFACES (INCLUDING CABINET INTERIORS). PIPE INSULATION: INSULATE (AS ALLOWED BY CODE) ALL LISTED SERVICE PIPING AS FOLLOWS. DOMESTIC COLD/HOT WATER, HOT WATER RETURN, STORM WATER PIPING. PROVIDE 1" PREFORMED FIBERGLASS, ASJ/SS-11, FLAME SPREAD 25, SMOKE DEVELOPED 50, ASTM C-547. FOR CONDENSATE PIPING PROVIDE 1/2" THICK INSULATION OF SAME CHARACTERISTICS AS LISTED FOR 1" ABOVE. WHERE PERMITTED BY LOCAL CODES, PROVIDE 1/2" SELF-ADHESIVE UNICELLULAR FOAM PIPE INSULATION WITH PRE-FORMED PVC FITTING COVERS - EQUAL TO SELF-ADHESIVE ARMSTRONG 2000 WITH K FACTOR OF 0.27 AT 75 DEGREES MEAN TEMPERATURE. INSULATE ANY EXPOSED CONDENSATE PIPING WITH WASTE TEMPERATURE BELOW 60 DEGREES F. SHUTOFF VALVES, WITH UNIONS SHALL BE PROVIDED FOR SERVICE TO EACH PLUMBING FIXTURE, FOOD SERVICE EQUIPMENT ITEM OR OTHER EQUIPMENT ITEM, TO FACILITATE ISOLATION FOR REPAIR OR REPLACEMENT. VALVES SHALL BE EQUAL TO JENKINS #902-T BALL VALVE, CHROME-FINISHED BRONZE, TEFLON SEATS AND PACKING, 400 LB. W.O.G., SOLDER END. ACCESS PANELS SHALL BE PROVIDED WHERE CONCEALED CONTROL DEVICES, VALVES, ETC. ARE CONCEALED WITHIN WALLS. WHERE ACCESS FOR ADJUSTMENT AND MAINTENANCE IS POSSIBLE THROUGH LAY-IN SUSPENDED CEILINGS, ACCESS PANELS ARE NOT REQUIRED. PIPING SYSTEM- PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPE WITH SOLVENT FITTINGS SHALL BE USED WHERE PEMITTED BY CODE/LOCAL AUTHORITIES. INSTALLATION: THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. PROCEED AS RAPIDLY AS CONSTRUCTION WILL PERMIT. SET FIXTURES LEVEL AND IN PROPER ALIGNMENT. INSTALL SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES. INSTALL SILICONE SEALANT BETWEEN FIXTURES AND ADJACENT MATERIAL, FOR SANITARY JOINT, AND OMIT ESCUTCHEONS. REPAIR EXISTING PLUMBING SYSTEM COMPONENTS DAMAGED BY CONSTRUCTION OPERATIONS AND RESTORE TO ORIGINAL CONDITIONS. TEST WATER SYSTEM UNDER 150 PSIG HYDROSTATIC PRESSURE, FOR FOUR (4) HOURS MINIMUM. WHEN TESTING INDICATES MATERIALS OR WORKMANSHIP IS DEFICIENT, REPLACE OR REPAIR AS REQUIRED, AND REPEAT TEST UNTIL STANDARDS ARE ACHIEVED. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOFING WARRANTY.

GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE PLUMBING INSTALLATION AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2006 UNIFORM PLUMBING CODE, 2006 INTERNATIONAL BUILDING CODE, 2006 INTERNATIONAL ENERGY CONSERVATION CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. COORDINATE ENTIRE INSTALLATION OF THE PLUMBING SYSTEM WITH THE WORK OF OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS.
5. REPORT ANY DISCREPANCIES, IN WRITING, TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS. PROVIDE ONE YEAR WARRANTY ON ALL PARTS AND LABOR.
6. THE DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW SCOPE. CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES TO PROVIDE THE BEST ARRANGEMENT OF ALL DUCT, PIPE, CONDUIT, ETC.
7. ALL CUTTING AND PATCHING OF THE EXISTING STRUCTURE SHALL BE PROVIDED UNDER OTHER SECTIONS OF THE WORK. PROVIDE NECESSARY REQUIREMENTS TO THE PROJECT SUPERINTENDENT.
8. ALL HOT WATER PIPING AND RECIRCULATION PIPING (EXCEPT RUNOUTS 12 FT. OR SHORTER TO INDIVIDUAL FIXTURES) SHALL BE INSULATED TO MEET THE REQUIREMENTS OF THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE
9. CONDENSATE DRAINS SHALL BE PROVIDED FOR EACH AIR CONDITIONING UNIT. HORIZONTAL CONDENSATE DRAINS ABOVE ANY CEILING SHALL BE INSULATED WITH MIN. 3/8" THICK CLOSED CELL INSULATION.
10. PIPING:

A. WASTE, VENT, AND STORM DRAIN PIPING SHALL BE CO-EXTRUDED PVC SCHEDULE 40) PIPE
B. WATER PIPE SHALL BE CPVC PIPE
C. CONDENSATE PIPING SHALL BE CO-EXTRUDED PVC (SCHEDULE 40) PIPE
D. INSIDE GAS PIPING SHALL BE BLACK IRON SCHEDULE 40 WITH MALLEABLE IRON FITTINGS. OUTSIDE SHALL BE GALVANIZED IRON SCHEDULE 40 WITH GALVANIZED FITTINGS. GAS LINE TO BE PAINTED GRAY IN COLOR. A 24 HOUR METERED GAS TEST SHALL BE REQUIRED.
E. ALL PIPING NOT ENCLOSED IN CONDITION SPACE OR AT EXTERIOR WALLS SHALL BE INSULATED.
F. PIPING: PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPING WITH SOLVENT WELD FITTINGS SHALL BE USED WHERE PERMITTED BY CODE/LOCAL AUTHORITIES

11. ALL VENTS OR EXHAUSTS SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. ABOVE ANY WINDOW, DOOR, OPENING, OR AIR INTAKE.
12. CLEANOUTS SHALL BE INSTALLED PER THE UNIFORM PLUMBING CODE.
13. PROVIDE WATER TIGHT FLASHINGS WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOFS, OR FLOORS.
14. PROVIDE ISOLATION FOR ALL PIPES THAT COME IN CONTACT WITH THE STRUCTURE.
15. LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICES PRIOR TO STARTING WORK OF THIS SECTION. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.
16. VALVES SHALL BE NIBCO, JENKINS, HAMMOND, RED & WHITE OR APPROVED EQUAL. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. THE MAIN WATER SHUT OF VALVE SHALL BE A FULL PORT BALL TYPE AND APPROVED FOR SERVICE INTENDED.
17. CONTRACTOR SHALL PROVIDE ALL SHUT OFF VALVES AS NECESSARY TO ISOLATE ANY EQUIPMENT, PLUMBING ITEMS, OR FIXTURES, THAT MAY NEED SERVICING OR ARE SUBJECT TO FAILURE WHETHER OR NOT SUCH VALVES ARE SHOWN ON THE DRAWINGS.
18. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.
19. CONTRACTOR IS RESPONSIBLE FOR HIS OWN TRENCHING, BACKFILL, AND COMPACTION OF TRENCHES NECESSARY TO COMPLETE HIS SCOPE OF WORK. BACKFILLED TRENCHES SHALL BE RETURNED TO THEIR ORIGINAL GRADE UNLESS NOTED OTHERWISE.
20. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE MAINTENANCE AND OPERATIONAL MANUALS IN ACCORDANCE WITH THE SPECIFICATIONS.
21. ALL EQUIPMENT THAT REQUIRES KEYS OR SPECIAL TOOLS TO OPERATE SHALL SUPPLY THE OWNER WITH TWO OF ANY SUCH KEYS OR TOOLS FOR EACH PIECE OF EQUIPMENT THAT REQUIRE THE SAME.
25. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE APPROVAL, IN WRITING, OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.
26. ALL PLUMBING, ELECTRICAL, AND GAS LINES SHALL BE CONCEALED WITHIN THE THE BUILDING STRUCTURE TO AS GREAT EXTENT AS POSSIBLE. ALL LINES NOT CONCEALED SHALL BE SECURED 6" OFF THE FLOOR AND 3/4" FROM THE WALLS USING STANDOFF BRACKETS
27. AN APPROVED BACKFLOW PREVENTOR SHALL BE PROPERLY INSTALLED UPSTREAM OF ANY POTENTIAL HAZARD BETWEEN THE POTABLE WATER SUPPLY AND SOURCE OF COMTAMINATION.
28. WATER SUPPLY CARBONATORS SHALL BE PROTECTED BY AN APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR. THE RELIEF VALVE SHALL DRAIN IN-DIRECTLY TO A FLOOR SINK WITH A 1" MIN. AIR GAP.

PLUMBING LEGEND

SYMBOL	ABBRV.	DESCRIPTION
	SS or W	NEW SEWER OR WASTE
	V	NEW VENT
	CW	NEW COLD WATER
	HW	NEW HOT WATER
	G	NEW GAS
	CD	NEW CONDENSATE DRAIN
CA	CA	COMPRESSED AIR
	FCO	FLOOR CLEANOUT
	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	TP	TRAP PRIMER & TRAP PRIMER PIPING
	SOV	SHUT-OFF VALVE
	CV	CHECK VALVE
	PRV	BACKFLOW PREVENTER W SOV'S
	T & P	
	DN	PIPE DOWN
	UP	PIPE UP
	POC	POINT OF CONNECTION
7	-	PLUMBING NOTE CALL-OUT
	ABV	ABOVE
	AFF	ABOVE FINISH FLOOR
	AP	ACCESS PANEL
	BEL	BELOW
	BLDG	BUILDING
	CLG	CEILING
	CONT	CONTINUATION
	EL	ELEVATION
	FIN	FINISH
	FL	FLOOR
	GR	GRADE
	NTS	NOT TO SCALE
	OC	ON CENTER
	S= %_	SLOPE AT A PERCENTAGE
	SHT	SHEET
	TYP	TYPICAL
	VTR	VENT THRU ROOF

PLUMBING / GENERAL NOTES

BATHTUBS AND WHIRLPOOL BATHTUBS. THE MAX. HOT WATER TEMPERATURE DISCHARGING SHALL BE LIMITED TO 120 DEGREES.

BATHTUBS WASTE OPENING IN FLOOR OVER CRAWL SPACES SHALL BE PROTECTED BY A METAL SCREEN NOT EXCEEDING 12" OR SOLID COVER.

SHOWERS AND TUB-SHOWERS COMBINATIONS IN ALL BUILDINGS SHALL BE PROVIDED WITH INDIVIDUAL CONTROL VALVES OF THE PRESSURE BALANCE, THERMOSTATIC, OR COMBINATION OF BOTH THAT PROVIDE SCALD AND THERMAL SHOCK PROTECTION. VALVES SHALL BE ADJUSTED TO DELIVER A MAXIMUM MIXED WATER
SETTING OF 120 DEGREES FAHRENHEIT. THE WATER HEATER THERMOSTAT SHALL NOT BE CONSIDERED A SUITABLE CONTROL FOR MEETING THIS PROVISION.
VERIFY AND WHERE WATER PRESSURE EXCEEDS 80 PSI AN APPROVED PRESSURE REGULATOR PRECEDED BY AN ADEQUATE STRAINER SHALL BE INSTALLED
1-INSTALL TEMPERATURE AND PRESSURE RELIEF VALVE WITH MINIMUM 34" DRAIN PIPE AND TERMINATE TO THE EXTERIOR OF THE BUILDING OVER WINDOW, DOOR OR VISIBLE LOCATION. DISCHARGE FROM A RELIEF VALVE INTO A WATER HEATER PAN SHALL BE PROHIBITED
.
2-PROVIDE (ON THE PLANS) A GAS PIPING DIAGRAM OF THE GAS PIPING SYSTEM THAT INCLUDES ALL PIPE SIZES, PIPE LENGTHS AND BTU RATINGS.

3-SUBMIT GAS LOAD CALCULATIONS IN ACCORDANCE WITH CPC TABLE 12-8 TO VERIFY THE PIPE SIZES ARE ADEQUATE FOR THE MAXIMUM DELIVERY CAPACITY OF CUBIC FEET OF GAS PER HOUR.
4- A WHOLE HOUSE HAS TEST IS REQUIRED UPON COMPLETION OF THE INSTALLATION, ALTERATION, OR REPAIR OF ANY GAS PIPING.
THE CITY SHALL BE NOTIFIED WHEN GAS PIPING IS READY FOR INSPECTION.
5- 2 GPM SHOWER FIXTURE, MAX.1.5 GPM BATHROOM FAUCET, MAX. 2 GPM KITCHEN FAUCET, AND MAX 1.28 WATER CLOSET TO CONFORM TO CITY GREEN REQUIREMENTS.
BATHROOMS: PROVIDE AN EXHAUST FAN (AT LEAST 50 CFM) DUCTED TO THE OUTSIDE (MINIMUM 4" DIAMETER FLEX DUCT WITH A MAXIMUM LENGTH OF 70")WITH A MINIMUM VENTILATION RATE OF 100 CFM, IDENTIFY THE REQUIREMENT FOR A BACKDRAFT DAMPER ON THE DUCT, AN ENERGY STAR COMPLIANT EXHAUST FAN THAT IS CONTROLLED BY A HUMIDITY SENSOR THAT IS CAPABLE OF BEING ADJUSTED BETWEEN ≤ 50-PERCENT TO 80-PERCENT HUMIDITY; AND A SEPARATE SWITCH FROM THE LIGHT UNLESS THE FAN IS ALLOWED TO OPERATE WITH THE LIGHT SWITCHED OFF.

6-NOTE THAT ALL PLUMBING VENTS SHALL TERMINATE NOT LESS THAN 6" ABOVE ROOF NOR LESS THAN 1' FROM ANY VERTICAL SURFACE. VENTS SHALL TERMINATE NOT LESS THAN 10" FROM OR 3' ABOVE ANY WINDOW, DOOR OPENING AIR INTAKE, OR VENT SHAFT NOR 3' FROM LOT LINE.
IF WATER PRESSURE EXCEEDS 80 PSI, AND EXPANSION TANK AND AN APPROVED PRESSURE REGULATOR SHALL BE INSTALLED.
NON-REMOVABLE BACK FLOW PRE-VENTER OR BIBB-TYPE VACUUM BREAKER WILL BE INSTALLED ON ALL EXTERIOR HOSE BIBS. HOT WATER RE-CIRCULATING SYSTEM IS INSTALLED, THE ENTIRE LENGTH OF HOT WATER PIPES SHALL BE INSULATED.

NOTES:
1-Projects which disturb less than one acre of soil shall manage storm water drainage during construction by one of the following: A. Retention basins. B. Where storm water is conveyed to a public drainage system, water shall be filtered by use of a barrier system, wattle or other approved method.
2-Site grading or drainage system will manage all surface water flows to keep water from entering buildings (swales, water collection, French drains, etc.). CGC Section 4.106.3. Exception: Additions not altering the drainage path.
3-When a shower is provided with multiple shower heads, the sum of flow to all the heads shall not exceed 1.8 gpm @ 80 psi, or the shower shall be designed so that only one head is on at a time. CGC Section 4.303.1.3.2.
4-Landscape irrigation water use shall have weather or soil based controllers. CGC Section 4.304.1.
5-The plans that a minimum of 65% of construction waste is to be recycled. CGC Section 4.408.1.
6-The contractor shall submit a Construction Waste Management Plan, per CGC Section 4.408.2.
7-The builder is to provide an operation manual (containing information for maintaining appliances, etc.) for the owner at the time of final inspection. CGC Section 4.410.1.
8-The gas fireplace(s) shall be a direct-vent sealed- combustion type. Woodstove or pellet stoves must be US EPA Phase II rated appliances. CGC Section 4.503.1.

WATER SAVING STANDARDS.

THE WATER SAVING PERFORMANCE STANDARDS FOR A PLUMBING FIXTURE ARE THOSE ESTABLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), CURRENT REVISION, OR THE FOLLOWING STANDARDS, WHICHEVER ARE THE MORE RESTRICTIVE
1-THE MAXIMUM FLOW FROM A SINK OR LAVATORY FAUCET OR A FAUCET AERATOR SHALL NOT EXCEED 0.5 GALLONS OF WATER PER MINUTE AT A PRESSURE OF 60 POUNDS PER SQUARE INCH WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES. 2- THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A TOILET SHALL NOT EXCEED AN AVERAGE OF 1.28 GALLONS WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES
3- THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A URINAL AND THE ASSOCIATED FLUSH VALVE, IF ANY, SHALL NOT EXCEED AN AVERAGE OF ONE GALLON WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES

SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

No	Date	Issue / Revision

Title

PLUMBING SPECS AND GENERAL NOTES

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

P0.01

CALIFORNIA PLUMBING CODE CHECKING:

PIPE SUPPORTS:

TABLE 313.3
HANGERS AND SUPPORTS

MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Cast	Lead and Oakum	5 feet, except 10 feet where 10 foot length are installed[1, 2, 3]	Base and each floor, not to exceed 15 feet
	Compression Gasket	Every other joint, unless over 4 feet then support each joint[1, 2, 3]	Base and each floor, not to exceed 15 feet
Cast-Iron Hubless	Shielded Coupling	Every other joint, unless over 4 feet then support each joint[1, 2, 3, 4]	Base and each floor, not to exceed 15 feet
Copper & Copper Alloys	Soldered, Brazed, Threaded, or Mechanical	1 ½ inches and smaller, 6 feet; 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet[5]
Steel Pipe for Water or DWV	Threaded or Welded	¾ inch and smaller, 10 feet; 1 inch and smaller, 12 feet	Every floor, not to exceed 25 feet[5]
Steel Pipe for Gas	Threaded or Welded	½ inch, 6 feet; ¾ inch and 1 inch, 8 feet; 1 ¼ inches and larger, 10 feet	½ inch, 6 feet; ¾ inch and 1 inch, 8 feet; 1 ¼ inches every floor level
Schedule 40 PVC and ABS DWV	Solvent Cemented	All sizes, 4 feet; allow for expansion every 30 feet[3]	Base and each floor; provide mid-story guides; provide for expansion every 30 feet
CPVC	Solvent Cemented	1 inch and smaller, 3 feet; 1 ¼ inches and larger, 4 feet	Base and each floor; provide mid-story guides
CPVC-AL-CPVC	Solvent Cemented	½ inch, 5 feet; ¾ inch, 65 inches; 1 inch, 6 feet	Base and each floor; provide mid-story guides
Lead	Wiped or burned	Continuous Support	Not to exceed 4 feet
Steel	Mechanical	In accordance with standards acceptable to the Authority Having Jurisdiction	
PEX	Cold Expansion, Insert and Compression	1 inch and smaller, 32 inches; 1 ¼ inches and larger, 4 feet	Base and each floor; provide mid-story guides
PEX-AL-PEX	Metal Insert and Metal compression	½ inch, ¾ inch, 1 inch — All sizes 98 inches	Base and each floor; provide mid-story guides
PE-AL-PE	Metal Insert and Metal compression	½ inch, ⅝ inch, 1 inch — All sizes 98 inches	Base and each floor; provide mid-story guides
PE-RT	Insert and Compression	1 inch and smaller, 32 inches; 1 ¼ inches and larger, 4 feet	Base and each floor; provide mid-story guides
Polypropylene (PP)	Fusion weld (socket, but, saddle, electrofusion), threaded (metal threads only), or mechanical	1 inch and smaller, 32 inches; 1 ¼ inches and larger, 4 feet	Base and each floor; provide mid-story guides

For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm

Notes:
[1] Support adjacent to joint, not to exceed 18 inches (457 mm)
[2] Brace not to exceed 40 foot (12 192 mm) intervals to prevent horizontal movement.
[3] Support at each horizontal branch connection.
[4] Hangers shall not be placed on the coupling.
[5] Vertical water lines shall be permitted to be supported in accordance with recognized engineering principles with regard to expansion and contraction, where first approved by the Authority Having Jurisdiction.

DRAINAGE:

TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

SIZE OF PIPE (inches)	1 ¼	1 ½	2	3	4	5	6	8	10	12
Maximum Units Drainage Piping[1]										
Vertical	1	2[2]	16[3]	48[4]	256	600	1380	3600	5600	8400
Horizontal	1	1	8[3]	35[4]	216[5]	428[5]	720[5]	2640[5]	4680[5]	8200[5]
Maximum Length Drainage Piping										
Vertical	45	65	85	212	300	390	510	750	–	–
Horizontal										
Vent Piping Horizontal and Vertical [6]										
Maximum Units	1	8[3]	24	84	256	600	1380	3600	–	–
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

Notes:
[1] Excluding trap arm.
[2] Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.
[3] Except for six-unit traps or water closets.
[4] Only four water closets or six-unit traps allowed on a vertical pipe or stack, and not to exceed three water closets or six-unit traps on a horizontal branch or drain.
[5] Based on ¼ inch per foot (20.8 mm/m) slope, For ⅛ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
[6] The diameter of an individual vent shall be not less than 1 ¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2(2). Not to exceed one third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

719.0 Cleanouts.
719.1 Locations. Cleanouts shall be placed inside the build ing near the connection between the building drain and the building sewer or installed outside the building at the lower end of the building drain and extended to grade.

Additional building sewer cleanouts shall be installed at intervals not to exceed 100 feet (30 480 mm) in straight runs and for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad)

719.2 No additional Cleanouts. Where a building sewer or a branch thereof does not exceed 10 feet (3048 mm) in length and is a straight-line projection from a building drain that is provided with a cleanout, no cleanout will be required at its point of connection to the building drain.

721.0 Location.
721.1 Building Sewer. Except as provided in Section 721.2, no building sewer shall be located in a lot other than the lot that is the site of the building or structure served by such sewer nor shall a building sewer be located at a point having less than the minimum distances referenced in Table 721.1.

706.0 Changes in Direction of Drainage Flow.

706.1 Approved Fittings. Changes in the direction of drainage piping shall be made by the approximate use of approved fittings and shall be of the angles presented by a one-sixteenth bend, one-eight bend, or one-sixth bend, or other approved fittings of equivalent sweep.

706.2 Horizontal to Vertical. Horizontal drainage lines, connecting with a vertical stack, shall enter through 45 degree (0.79 rad) wye branch, 60 degree (1.05 rad) wye branches, combination wye and one-eighth bend branches, sanitary tee or sanitary tapped tee branches, or other approved fittings of equivalent sweep.

706.4 Vertical to Horizontal. Vertical drainage lines con necting with horizontal drainage lines shall enter through 45 degree (0.79 rad) wye branches, combination wye and one-eighth bend branches, or other approved fittings of equiva- lent sweep. Branches, or other approved fittings of equiva- lent sweep. Branches or offsets of 60 degrees (1.05 rad) shall be permitted to be used where installed in a true vertical posi- tion.

707.4 Location. Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that s more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture connecting fitting, serving each urinal, regardless of the location of the urinal in the building.
Exceptions
(1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals

707.5 Cleaning. Each cleanout shall be installed so that it opens to allow cleaning in the direction of flow of the soil or waste or at right angles thereto and, except in the case of wye branch and end-of-line cleanouts, shall be installed vertically above the flow line of the pipe.

708.0 Grade of Horizontal Drainage Piping.
708.1 General. Horizontal drainage piping shall be run in practical alignment and a uniform slope of not less than ¼ inch per foot (20.8 mm/m) or 2 percent toward the point of disposal provided that, where it is impractical due to the depth of the street sewer, to the structural features, or to the arrangement of a building or structure to obtain a slope of ¼ inch per foot (20.8 mm/m) or 2 percent, such pipe or piping 4 inches (100 mm) or larger in diameter shall be permitted to have a slope of not less than ⅛ inch per foot (10.4 mm/m) or 1 percent, where first approved by the Authority Having Jurisdiction.

TABLE 721.1
MINIMUM HORIZONTAL DISTANCE REQUIRED FROM BUILDING SEWER (feet)

Buildings or structures[1]	2
Property line adjoing private property	Clear[2]
Water supply wells	50[3]
Streams	50
On-site domestic water service line	1[4]
Public water main	10[5, 6]

WATER CONVERSION & WATER CONSUMPTION:

WATER CONSERVING PLUMBING FIXTURES AND FITTINGS	
Plumbing fixtures and fittings shall comply with the following: (2019 CGBSC, California Plumbing Code (CPC) and Table 1401.1 of the CPC)	
4303.1.1	All Water closets: ≤1.28 gal/flush Tank type water closet shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.
4303.1.2	Urinals: ≤0.5 gal/flush
4303.1.3.1	Single showerheads: ≤1.8 gpm @ 80 psi
4303.1.3.2	Multiple showerheads: combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gpm @ 80 psi or only one shower outlet is to be in operation at a time.
4303.1.4.1	Residential Lavatory Faucets: 0.8 gpm @ 20 psi < **Flow Rate** ≤1.2 gpm @ 60 psi
4303.1.4.2	Lavatory Faucets in common and Public Use Areas (outside of dwellings or sleeping units) in residential buildings: ≤0.5 gpm @ 60 psi
4303.1.4.3	Metering Faucets: ≤0.25 gallons per cycle
4303.1.4.4	Kitchen Faucets: ≤1.8 gpm @ 60 psi; Maximum Flow Rate of 1.8 gpm
PLUMBING FIXTURE CERTIFICATION REQUIRED: A plumbing fixture certification must be completed and signed by either a licensed general contractor, or a plumbing subcontractor, or the building owner certifying the flow rate of the fixtures installed. A copy of the certification can be obtained from the development services department.	

407.3 Limitation of Hot water Temperature for Public Lavatories.
Hot water delivered from public-use lavatories shall be limited to a maximum temperature of 120ºF (49ºC) by a device that complies with ASSE 1070/ASME A112.1070/CSA B125.70. The water heater thermostat shall not be considered a control for meeting this provision.

407.5 Waste Outlet. Lavatories shall have a waste outlet and fixtures tailpiece not less than 1 ¼ inches (32 mm) in diameter.

TABLE 1208.4.1
APPROXIMATE GAS INPUT FOR TYPICAL APPLIANCES [NFPA 54: TABLE A.5.4.2.1]

APPLIANCE	INPUT (Btu/h approx.)
Space Heating Units	
Warm air furnace	
Single family	100 00
Multifamily, per unit	60 000
Hydronic boiler	
Single family	100 000
Multifamily, per unit	60 000
Space and Water Heating Units	
Hydronic boiler	
Single family	120 000
Multifamily, per unit	75 000
Water Heating Appliances	
Water heater, automatic storage	
30 to 40 gallon tank	35 000
Water heater, automatic storage	
50 gallon tank	50 000
Water heater, automatic instantaneous	
Capacity at 2 gallons per minute	142 800
Capacity at 4 gallons per minute	285 000
Capacity at 6 gallons per minute	428 400
Water heater, domestic, circulating or side-arm	35 000
Cooking Appliances	
Range, freestanding, domestic	65 000
Built-in oven or broiler unit, domestic	25 000
Built-in top unit, domestic	40 000
Other Appliances	
Refrigerator	3000
Clothes dryer, Type 1 (domestic)	35 000
Gas fireplace direct vent	40 000
Gas log	80 000
Barbecue	40 000
Gaslight	2500

409.4 Limitation of Hot Water in Bathtubs and Whirlpool Bathtubs. The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 120ºF (49ºC) by a device that complies with ASSE 1070/ASME A112.1070/CSA B125.70. The water heater thermostat shall not be considered a control for meeting this provision.

WATER HEATER:

501.1 Applicability.
The minimum capacity for storage water heaters shall be in accordance with the first-hour rating listed in Table 501.1(2).

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
First hour rating,[2] Gallons	38	49	49	49	62	62	74	62	74	74	74

For SI units: 1 gallon = 3.785 L.
Notes:
[1] The first-hour rating is found on the "Energy Guide" label.
[2] Solar water heaters shall be sized to meet the appropriate first-hour rating as shown in the table.

504.0 Water Heater Requirements.

504.1 Location. Water heater installations in bedrooms and bathrooms shall comply with one of the following [NFPA54:10.27.1]:

(1) Fuel-burning water heaters shall be permitted to be installed in a closet located in the bedroom or bathroom provided the closet is equipped with a listed, gasketed door assembly and a listed self-closing device. The self- closing door assembly shall meet the requirements of Section 504.1.1. The door assembly shall meet the requirements of Section 504.1.2. Combustion air for such installations shall be obtained from the outdoors in accordance with Section 506.4. The closet shall be for the exclusive use of the water heater.

(2) Water heater shall be of the direct vent type. [NFPA 54: 10.27.1(2)]

504.2 Vent. Water heaters of other than the direct-vent type shall be located as close as practical to the chimney or gas vent.

507.2 Seismic provisions. *Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one third (⅓) and lower one-third (⅓) of its vertical dimensions. At the lower point, a minimum distance of four (4) inches (102 mm) shall be maintained above the controls with the strapping.*

507.4 Ground Support. A water heater supported from the earth shall rest on level concrete or other approved base extending not less than 3 inches (76 mm) above the adjoining ground level.

507.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than ¾ of an inch (20 mm) diameter drain to an approved location. Such pan shall be not less than 1 ½ (38 mm) in depth.

507.13 Installation in Residential Garages. Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 54:9.1.10.1]

508.4.4 Lighting and Convenience Outlet. A permanent 120 V receptacle outlet and a lighting fixture shall be installed near the appliance. The switch controlling the lighting fixture shall be located at the entrance to the passageway. [NFPA 54:9.5.3]

508.2.1 Installation at roof: Clearance. Appliances shall be installed on a well-drained surface of the roof. At least 6 feet (1829 mm) of clearance shall be available between any part of the appliance, and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]

VENT:

906.0 Vent Termination.

906.1 Roof Termination. Each vent pipe or stack shall extend through its flashing and shall terminate vertically not less than 6 inches (152 mm) above the roof nor less than 1 foot (305 mm) from a vertical surface. ABS and PVC piping exposed to sunlight shall be protected by water based synthetic latex paints.

906.2 Clearance. Each vent shall terminate not less than 10 feet (3048 mm) from, or not less than 3 feet (914 mm) above, an openable window, door, opening, air intake, or vent shaft, or not less than 3 feet (914 mm) in every direction from a hot line, alley and street excepted.

909.0 Special Venting for Island Fixtures.

909.1 General. Traps for island sinks and similar equipment shall be roughed in above the floor and shall be permitted to be vented by extending the vent as high as possible, but not less than the drainboard height and then returning it down- ward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain. The return vent shall be connected to the horizontal drain through a wye-branch fitting and shall, in addition, be provided with a foot vent taken off the vertical fixture vent by means of a wye branch immediately below the floor and extending to the nearest partition and then through the roof to the open air, or shall be permitted to be connected to other vents at a point not less than 6 inches (152 mm) above the flood-level rim of the fixtures served. Drainage fittings shall be used on the vent below the floor level, and a slope of not less than ¼ inch per foot (20.8 mm/m) back to the drain shall be maintained. The return bend used under the drainboard shall be a one-piece fitting or an assembly of a 45 degree (0.79 rad), a 90 degree (1.57 rad), and a 45 degree (0.79 rad) elbow in the order named. Pipe sizing shall be as elsewhere required in this code.

The island sink drain, upstream of the returned vent, shall serve no other fixtures. An accessible cleanout shall be installed in the vertical portion of the foot vent.

GAS:

1208.7 Gas Meters. Gas meters shall be selected for the maximum expected pressure and permissible pressure drop. [NFPA 54:5.7.1]

1208.7.1 Location. Gas meters shall be located in ventilated spaces readily accessible for examination, reading, replacement, or necessary maintenance. [NFPA54:5.7.2.1]

1208.7.1.1 Subject to Damage. Gas meters shall not be placed where they will be subjected to damage, such as adjacent to a driveway; under a fire escape; n public passages, halls, or where they will be subject to excessive corrosion or vibration. [NFPA 54:5.7.2.2]

1208.7.1.2 Extreme Temperatures. Gas meters shall not be located where they will be subjected to extreme temperatures or sudden extreme changes in temperature or in areas where they are subjected to temperatures beyond those recommended by the manufacturer. [NFPA 54:5.7.2.3]

1208.7.2 Supports. Gas meters shall be supported or connected to rigid piping so as not to exert a strain n the meters. Where flexible connectors are used to connect a gas meter to downstream piping at mobile homes in mobile home parks, the meter shall be supported by a post or bracket placed in a firm footing or by other means providing equivalent support. [NFPA 54:5.7.3]

1208.7.3 Meter Protection. Meters shall be protected against overpressure, backpressure, and vacuum. [NFPA54:5.7.4]

1208.7.4 Identification. Gas piping at multiple meter installations shall be marked by a metal tag or other permanent means designating the building or the part of the building being supplied and attached by the installing agency. [NFPA 54:5.7.5]

1208.8 Gas Pressure Regulators. A line pressure regulator or gas appliance pressure regulator, as applicable, shall be installed where the gas supply pressure exceeds that at which the branch supply line or appliances are designed to operate or vary beyond design pressure limits. [NFPA 54:5.8.1]

1210.0 Gas Piping Installation.
1210.1 Piping Underground. Underground gas piping shall be installed with sufficient clearance from any other underground structure to avoid contact therewith, to allow maintenance, and to protect against damage from proximity to other structures. In addition, underground plastic piping shall be installed with sufficient clearance or shall be insulated from sources of heat to prevent the heat from impairing the serviceability of the pipe. [NFPA 54:7.1.1]

1212.6 Appliance Shutoff Valves and Connections.
Each appliance connected to a piping system shall have an accessible, approved manual shutoff valve with a non-displaceable valve member or a listed gas convenience outlet.
Appliance shutoff valves and convenience outlets shall serve a single appliance only. The shutoff valve shall be located within 6 feet (1829 mm) of the appliance it serves. Where a connector is used, the valve shall be installed upstream of the connector. A union or flanged connection shall be provided downstream from the valve to permit removal of appliance controls. Shutoff valves serving decorative appliances shall be permitted to be installed in fireplaces if listed for such use.
[NFPA 54:9.6.5, 9.6.5.1(A)(B)]

Exceptions:

(1) Shutoff valves shall be permitted to be accessible located inside or under an appliance where such appliance is removed without removal of the shutoff valve.

(2) Shutoff valves shall be permitted to be accessibly located inside wall heaters and wall furnaces listed for recessed installation where necessary maintenance is performed without removal of the shutoff valve.

WATER SUPPLY:

TABLE 611.4
SIZING OF RESIDENTIAL WATER SOFTENERS[4]

REQUIRED SIZE OF SOFTENER CONNECTION (inches)	NUMBER OF BATHROOM GROUPS SERVED[1]
¾	up to 2[2]
1	up to 4[3]

For Si units: 1 inch = 25 mm
Notes:
[1] Installation of a kitchen sink and dishwasher, laundry tray, and automatic clothes washer permitted without additional size increase.
[2] An additional water closet and lavatory permitted.
[3] Over four bathroom groups, the softener size shall be engineered for the specific installation.
[4] See also Appendix A, Recommended Rules for Sizing the Water Supply Systems, and Appendix C, Alternate Plumbing Systems, for alternate methods of sizing water supply systems.

A backflow preventer shall not be required to separate a stand-alone sprinkler syste from the water distribution system where the sprinkler system material is in accordance with the requirements of Section 604.0.

606.1 General. Valves up to and including 2 inches (50 mm) in size shall be copper alloy or other approved material. Sizes exceeding 2 inches (50 mm) shall be permitted to have cast iron or copper alloy bodies. Each gate or ball valve shall be a fullway or full-port type with working parts of the non-corrosive material. Valves carrying water used in potable water systems intended to supply drinking water shall comply with the requirements of NSF 61 and ASME A112.4.14, ASME B16.34, ASTM F1970, ASTM F2389 AWWA C500, AWWA C504, AWWA C507, IAPMO Z1157, MSS SP-67, MSS SP- 70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP-80, MSS SP-110, MSS SP-122, or NSF 359.

608.4 Pressure Relief Valves. Each pressure relief valve shall be an approved automatic type with drain, and each such relief valve shall be set at a pressure of not more than 150 psi (1034 kPa). No shutoff valve shall be installed between the relief valve and the system.

FIRESTOP PROTECTION

1404.0 Combustible Piping Installations.

1404.2 Fire-Resistance Rating. Where penetrating a fire-resistance-rated wall, partition, floor, floor-ceiling assembly, roof-ceiling assembly, or shaft enclosure, the fire-resistance rating of the assembly shall be restored to its original rating.

1404.3 Firestop Systems. Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E119, ASTM E814, UL 263, or UL 1479 with a positive pressure differential of not less than 0.01 of an inch of water (0.002 kPa). Systems shall have and F rating of not less than 1 hour but not less than the required fire-resistance rating of the assembly being penetrated. Systems protecting floor penetrations shall have a T rating of not less than 1 hour but not less than the required fire-resistance rating of the floor penetrations shall have a T rating of not less than 1 hour but not less than the required fire-resistance rating of the floor being penetrated. Floor penetrations contained within the cavity of a wall at the location of the floor penetration do not require a T rating. No T rating shall be required for floor penetrations by piping that is not in direct contact with combustible material.

1404.6 Sleeves. Where sleeves are used, the sleeves shall be securely fastened to the fire-resistance-rated assembly. The (inside) annular space between the sleeve and the fire-resistance-rated assembly shall be firestopped in accordance with this chapter.

1405.0 Noncombustible Piping Installations.

1405.3 Firestop Systems. Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E119, ASTM E814, UL 263, or UL 1479 with a positive pressure differential of not less than 0.01 of an inch of water (0.002 kPa). Systems shall have an F rating of not less than 1 hour but not less than the required fire-resistance rating of the assembly being penetrated. Systems protecting floor penetrations shall have a T rating of not less than 1 hour but not less than the required fire-resistance rating of the floor being penetrated. Floor penetrations contained within the cavity of a wall at a location of the floor penetration do not require a T rating. No T rating shall be required for floor penetrations by piping that is not in direct contact with combustible material.

1405.6 Sleeves. Where sleeves are used, the sleeves shall be securely fastened to the fire-resistance-rated assembly. The (inside) annular space between the sleeve and the penetrating item and the (outside) annular space between the sleeve and the fire-resistance-rated assembly shall be firestopped in accordance with this chapter.

No	Date	Issue / Revision

Title

PLUMBING CODE CHECKING.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

P1.01

GENERAL NOTES:

1. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
3. REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
4. CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
5. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
6. ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
7. ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
8. ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
9. CONTRACTOR SHALL PROVIDE VALVES LOCATED ABOVE LAY-IN CEILING OR 24"x24" CEILING ACCESS PANEL COORDINATE FINAL LOCATION AND SIZE WITH ARCHITECT. PROVIDE BALANCING VALVES FOR HOT WATER RETURN SYSTEM AS REQUIRED.
10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED 1 1 " PER " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT AT 4 8 FOOT. 1 " PER FOOT 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 8 AND PROVIDE ACCESSIBLE CLEANOUTS AT ALL CHANGES OF DIRECTION.
12. VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
13. REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

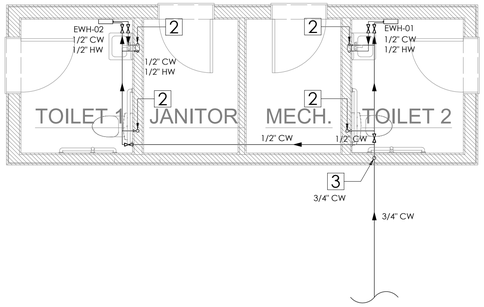
SCHEDULE No. 1
ELECTRIC WATER HEATER SCHEDULE

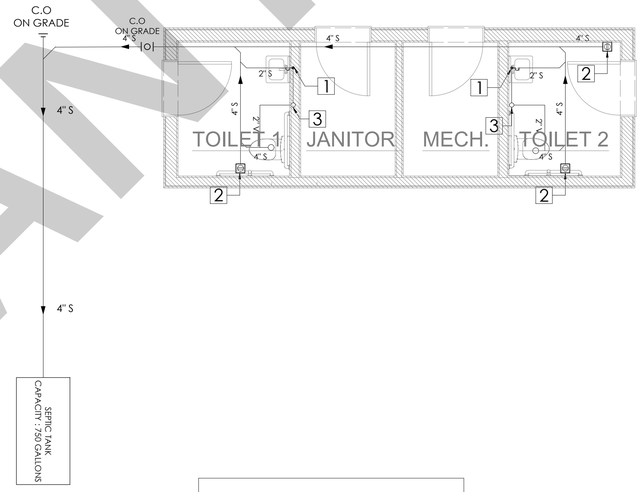
TAG	EWH-01 T0 02
LOCATION	LAVATORY VICINITY
MANUFACTURER	CHRONOMITE
MODEL	SR-15L/120
TYPE	ELECTRIC TANKLESS
GPM (@ 40°F RISE)	31
POWER INPUT (W)	1800
VOLTS - PHASE - FREQ.	120 V - 1Ø - 60 Hz
WIDTH x DEPTH (in.)	17.3" x 13.2"
HEIGHT (in)	27.4"
CW/HW CONNECTION SIZE	3/8"

BUILDING WATER LOAD			
DESCRIPTION	LOAD		PIPE SIZE
	FU	GPM	PEX
DCW	7.0	_	3/4"
DHW	2.0	_	1/2"
TOT. COMBINED	9.0	_	3/4"

MINIMUM PIPE SIZE PER FIXTURE & DRAINAGE F.U VALUES
REFERENCE: CPC 2019 - TABLE 702.1

FIXTURE UNIT	DR (INCH)	VENT (INCH)	DFU - PRIVATE	DFU - PUBLIC
SHOWER	3	2	2.0	2.0
WATER CLOSET	4	2	3.0	4.0
LAVATORY	1-1/2	2	1.0	1.0
KITCHEN SINK	2	2	2.0	2.0
DISHWASHER	1-1/2	2	2.0	2.0
BATHTUB	3	2	2.0	2.0
LAUNDRY MACHINE	1-1/2	2	3.0	3.0





SHEET NOTES:

1 — DCW, DHW RISE TO HIGH LEVEL.
2 — DCW & DHW DROP IN WALL.
3 — DCW FROM BELOW GRADE UP IN WALL.
4 — DHW DOWN TO BELOW GRADE.

PLUMBING SHEET NOTES

SHEET NOTES:

1 — WASTE DROP AND 2" VENT RISE.
2 — 4" FLOOR CLEAN-OUT.
3 — 3" VENT STACK TO ABOVE.
4 — 3" FLOOR DRAIN.
5 — 4" SOIL DROP FROM ABOVE.
6 — 3" MECHANICAL ROOM DRAIN.
7 — SOIL DROP AND 4"VENT RISE.
8 — INDIRECT WASTE DROP & 2" VENT RISE
9 — 4" WASTE DROP FROM ABOVE.
10 — 4" WASTE DROP & VENT RISE.

No	Date	Issue / Revision

Title

SANITARY AND WATER SUPPLY LAYOUTS

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

P2.01

Since 1966 CHRONOMITE® Electric Tankless Water Heaters

ELECTRIC TANKLESS WATER HEATER - POINT OF USE

INSTANT-FLOW® SR - LOW FLOW

IDEAL APPLICATION: *hospitality sink, manual hand washing faucet*

PRODUCT FEATURES

- *Unlimited hot water*
- *Saves water and energy - 99% energy efficient*
- *Vandal resistant rugged cast aluminum housing*
- *Space saving compact size: 6-1/4" (H) x 9-5/8" x 2-3/4" (159 (H) x 244 x 70mm)*
- *Meets applicable building codes including ADA, UL, IAPMO, UPC, CSA.*
- *Environmentally friendly*

Instant-Flow® SR - Low Flow

Chronomite Instant-Flow® SR - Low Flow models are manufactured to provide reliable point-of-use hot water. There is no pressure and temperature relief valve needed (unless required by code), saving time and money on installation.

Housing is fabricated from rugged cast aluminum alloy.

Element assembly is fabricated from Celcon plastic.

Heating coils are nichrome.

Faucet flow controls are supplied with each unit. 3/8" compression fittings are supplied (standard). Optional 1/2" male NPT water connections available.

Member of U.S.Green Building Council — *Water Conserving Product*

GUIDE SPECIFICATION

Tankless Water Heater shall be a Chronomite Laboratories Model

SR - _____ (AMPS) L / _____ (VOLTS) _____ (OPTIONS)

with _____ Amps and _____ Volts

To heat 0.4 GPM (1.5 LPM) at a temperature rise of _____ °F

Unit shall be provided with Celcon waterways, and Nichrome heating coils.

OPTIONS

- ❍ PA 765 ABS Housing (P)
- ❍ Satin Finish Stainless Stee Housing (SS)
- ❍ High Polish Finish Stainless Steel (SSP)
- ❍ Pressure & Temp Relief Valve Assembly (TP)
- ❍ 1/2" Male NPT (NPT08)
- ❍ Disconnect Switch, Rotary 40A - Lockable Nema 4X (2095-1)

For the model being selected, please place the corresponding amps, volts and temperature rise values in the Guide Specifications to the right.

MODEL	AMPS	VOLTS	WATTS	ACTIVATION GPM	°F TEMPERATURE RISE @ 0.40 GPM	0.75 GPM	1.00 GPM
SR-15L/120	15	120	1800	0.35	31	--	--
SR-15L/277	15	277	4150	0.35	71	38	28
SR-20L/120	20	120	2400	0.35	41	22	--
SR-20L/208	20	208	4160	0.35	71	38	28
SR-20L/240	20	240	4800	0.35	82	44	33
SR-20L/277	20	277	5540	0.35	95	50	38
SR-30L/120	30	120	3600	0.35	61	33	25

Complies with Standards for: LISTED TO: UL STD 499 — CERTIFIED TO: CAN/CSA STD C22.2 NO. 88 — LISTED ELECTRIC HEATING EQUIPMENT — Intertek 5001365 — Pb Lead Free Compliant — CA Green — MEMBER OF MORRIS GROUP INTERNATIONAL

CHRONOMITE LABORATORIES, INC.
17451 Hurley St. :: City of Industry, CA 91744
Phone 800-447-4962 :: 626-937-4270
Fax 626-937-4279 :: www.chronomite.com

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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Since 1966 CHRONOMITE® Electric Tankless Water Heaters

ELECTRIC TANKLESS WATER HEATER - POINT OF USE

INSTANT-FLOW® SR - LOW FLOW

INSTANT-FLOW® SR - LOW FLOW METRIC CHART

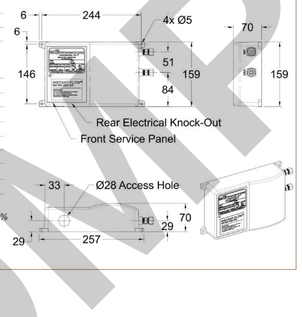
MODEL	AMPS/PHASE	1 ∅ VOLTAGE	WATTS	ACTIVATION LPM	°C TEMPERATURE RISE @ 1.50 LPM	3.00 LPM	4.00 LPM
SR-15L/120	15	120	1800	1.3	17	--	--
SR-15L/277	15	277	4150	1.3	40	20	15
SR-20L/120	20	120	2400	1.3	23	11	--
SR-20L/208	20	208	4160	1.3	40	20	15
SR-20L/240	20	240	4800	1.3	46	23	17
SR-20L/277	20	277	5540	1.3	53	27	20
SR-30L/120	30	120	3600	1.3	34	17	13

TECHNICAL DIMENSIONS

INSTANT-FLOW® SR - LOW FLOW

Dimensions:	159 (H) x 244 x 70mm
Weight:	2.27 Kg
Materials:	Rugged cast aluminum housing Celcon plastic element assembly with nichrome coils
Housing Color:	White
Minimum Operating Flow Rate:	1.3 LPM
Minimum Operating Pressure:	172 kPa
Maximum Operating Pressure:	552 kPa
Maximum Pressure:	1034 kPa
Maximum Water Temperature:	71°C
Maximum Ambient Operating Temperature:	60°C
Listing:	UL, IAPMO, UPC, ADA, ETL

GENERAL NOTES:
- *240V models when operated at 220V will have approximately a 15% temperature decrease.*
- *120V models when operated 110V will have approximately a 15% temperature decrease.*



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SELECTION SUMMARY & APPROVAL FOR MANUFACTURING

Company_____

Model Number & Options_____ Quantity_____

Contact_____ Title_____

Signature (Approval for Manufacturing)_____ Date_____

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IFSR-LF 07/17/20

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Since 1966 CHRONOMITE® Electric Tankless Water Heaters

ELECTRIC TANKLESS WATER HEATER - POINT OF USE

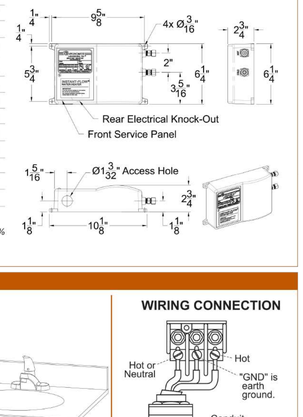
INSTANT-FLOW® SR - LOW FLOW

TECHNICAL DIMENSIONS

INSTANT-FLOW® SR - LOW FLOW

Dimensions:	6-1/4" (H) x 9-5/8" x 2-3/4"
Weight:	5 lbs.
Materials:	Rugged cast aluminum housing Celcon plastic element assembly with nichrome coils
Housing Color:	White
Minimum Operating Flow Rate:	0.35 GPM
Minimum Operating Pressure:	25 PSI
Maximum Operating Pressure	80 PSI
Maximum Pressure:	150 PSI
Maximum Water Temperature:	160°F
Maximum Ambient Operating Temperature:	140°F
Listing:	UL, IAPMO, UPC, ADA, ETL

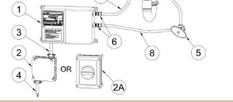
GENERAL NOTES:
- *240V models when operated at 220V will have approximately a 15% temperature decrease.*
- *120V models when operated 110V will have approximately a 15% temperature decrease.*



INSTALLATION DIAGRAM

Notes:
1. Heater to be installed below the level of all hot water outlets serviced by the heater.
2. Diagram shown with standard 3/8" Compression Fitting. Optional 1/2" Male NPT water connections available.

1. Instant-Flow SR-L Heater
2. Electrical Junction Supply Box (optional)
2A. 2095-1 Disconnect Switch (optional)
3. Electrical Supply Conduit
4. Electrical Supply Wire
5. Dual outlet Stop, 3/8" Comp. Outlet Connections
6. 3/8" Comp. x 1/4" NPT Fittings (supplied)
7. 3/8" Hot Water Outlet
8. 3/8" Cold Water Inlet



WIRING CONNECTION

ATTENTION:
Unit must be hard wired.
NOTE: Heaters are single phase.
All tests are measured at the output of the heater.

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SELECTION SUMMARY & APPROVAL FOR MANUFACTURING

Company_____

Model Number & Options_____ Quantity_____

Contact_____ Title_____

Signature (Approval for Manufacturing)_____ Date_____

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IFSR-LF 07/17/20

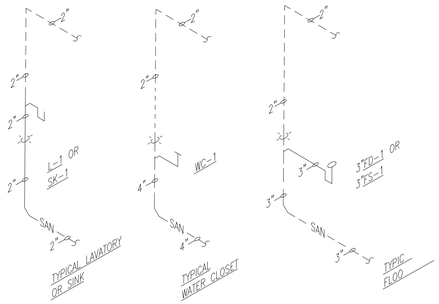
No	Date	Issue / Revision

Title

ELECTRIC WATER HEATER CATALOG.

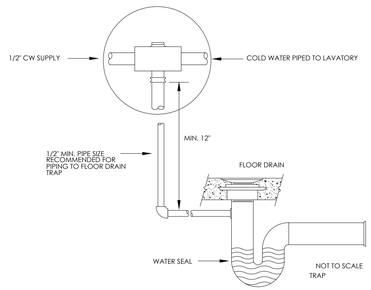
Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

P3.01

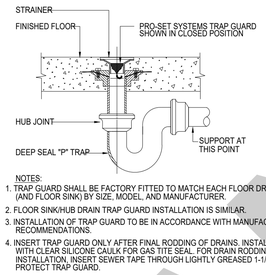


1 TYPICAL WASTE AND VENT RISERS

SCALE: NONE



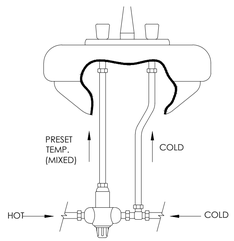
2 TRAP PRIMER



NOTES:
1. TRAP GUARD SHALL BE FACTORY FITTED TO MATCH EACH FLOOR DRAIN (AND FLOOR SINK) BY SIZE, MODEL, AND MANUFACTURER.
2. FLOOR SINK/HUB DRAIN TRAP GUARD INSTALLATION IS SIMILAR.
3. INSTALLATION OF TRAP GUARD TO BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INSERT TRAP GUARD ONLY AFTER FINAL RODDING OF DRAINS. INSTALL TRAP GUARD WITH CLEAR SILICONE CAULK FOR GAS TITE SEAL. FOR DRAIN RODDING AFTER INSTALLATION, INSERT SEWER TAPE THROUGH LIGHTLY GREASED 1-1/2" PVC PIPE TO PROTECT TRAP GUARD.

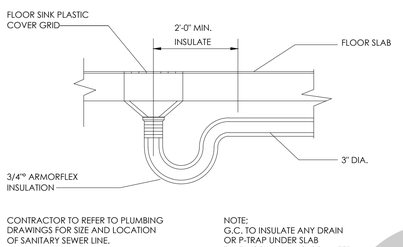
3 FLOOR DRAIN WITH TRAP SEAL PROTECTION

SCALE: NONE



ANTI-SCALD MIXING VALVE

NO SCALE

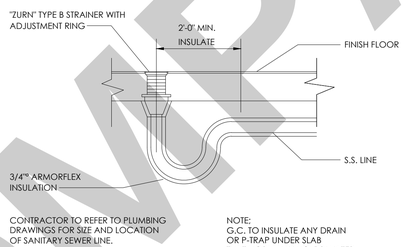


CONTRACTOR TO REFER TO PLUMBING DRAWINGS FOR SIZE AND LOCATION OF SANITARY SEWER LINE.

NOTE:
G.C. TO INSULATE ANY DRAIN OR P-TRAP UNDER SLAB THAT NORMALLY HOLDS WATER

FLOOR SINK DETAIL

NO SCALE

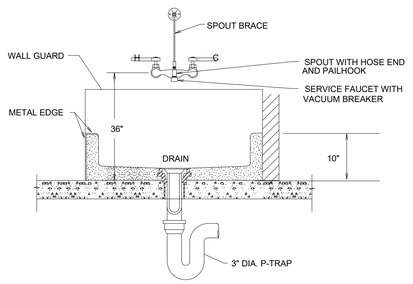


CONTRACTOR TO REFER TO PLUMBING DRAWINGS FOR SIZE AND LOCATION OF SANITARY SEWER LINE.

NOTE:
G.C. TO INSULATE ANY DRAIN OR P-TRAP UNDER SLAB THAT NORMALLY HOLDS WATER

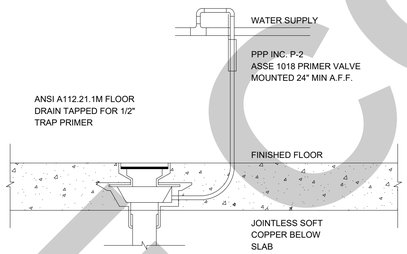
FLOOR DRAIN DETAIL

NO SCALE



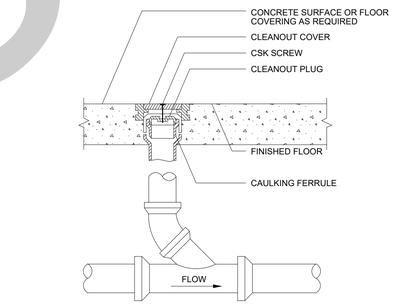
MOP SINK DETAIL

NO SCALE



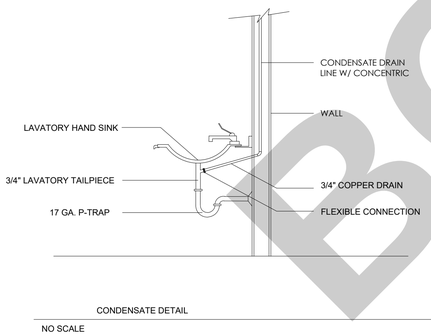
TRAP PRIMER DETAIL

NO SCALE



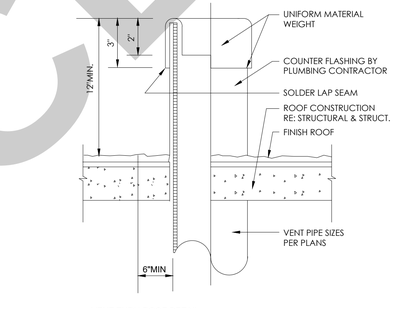
FLOOR CLEANOUT DETAIL

NO SCALE



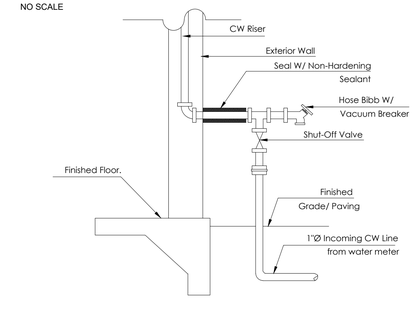
CONDENSATE DETAIL

NO SCALE



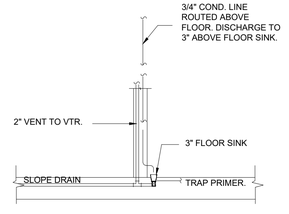
VENT THRU ROOF DETAIL

NO SCALE



WATER ENTRY DETAIL

NO SCALE



COND. ON FLOOR SINK DETAIL

NO SCALE

No	Date	Issue / Revision

Title

PLUMBING GENERAL DETAILS.

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

P4.01

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 1 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

A. GENERAL INFORMATION

1	Project Location (city)	Sacramento	8	Standards Version	Compliance2019
2	CA Zip Code	95841	9	Compliance Software (version)	EnergyPro 8.3
3	Climate Zone	12	10	Weather File	SACRAMENTO-EXECUTIVE_724830_CZ2010.epw
4	Total Conditioned Floor Area in Scope	4,525 ft²	11	Building Orientation (deg)	(W) 315 deg
5	Total Unconditioned Floor Area	218 ft²	12	Permitted Scope of Work	NewComplete
6	Total # of Stories (Habitable Above Grade)	1	13	Building Type(s)	Nonresidential
7	Total # of dwelling units	0	14	Gas Type	NaturalGas

B. PROJECT SUMMARY

Table Instructions: Table B shows which building components are included in the performance calculation. If indicated as not included, the project must show compliance prescriptively if within permit application.

Building Components Complying via Performance						Building Components Complying Prescriptively	
Envelope (see Table G)	☒	Performance	Covered Process: Commercial Kitchens	☐	Performance	*The following building components are ONLY eligible for prescriptive compliance and should be documented on the NRCC form listed if within the scope of the permit application (i.e. compliance will not be shown on the NRCC-PRF-E).*	
	☐	Not Included		☒	Not Included		
Mechanical (see Table H)	☒	Performance	Covered Process: Computer Rooms	☐	Performance	Indoor Lighting (Unconditioned)§140.6	NRCC-LTI-E
	☐	Not Included		☒	Not Included	Outdoor Lighting §140.7	NRCC-LTO-E
Domestic Hot Water (see Table I)	☒	Performance	Covered Process: Laboratory Exhaust	☐	Performance	Sign Lighting §140.8	NRCC-LTS-E
	☐	Not Included		☒	Not Included	Mandatory Measures	
Lighting (Indoor Conditioned, see Table K)	☒	Performance				*Electrical power systems, commissioning, solar ready, elevator and escalator requirements are mandatory and should on the NRCC form listed if applicable (i.e. compliance will not be shown on the NRCC-PRF-E.)*	
	☐	Not Included				Electrical Power Distribution §110.11	NRCC-ELC-E
Solar Thermal Water Heating (see Table I)	☐	Performance				Commissioning §120.8	NRCC-CXR-E
	☒	Not Included				Solar Ready §110.10	NRCC-SRA-E

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 2 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

C1. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft ²-yr)

COMPLIES

Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Space Heating	12.80	8.40	4.40
Space Cooling	102.04	96.61	5.43
Indoor Fans	40.66	49.45	-8.79
Heat Rejection	--	--	--
Pumps & Misc.	--	--	--
Domestic Hot Water	2.75	2.25	0.50
Indoor Lighting	114.23	113.49	0.74
ENERGY STANDARDS COMPLIANCE TOTAL	**272.48**	**270.20**	**2.28 (0.8%)**

[1] *Notes: The number in parenthesis following the Compliance Margin in column 4. represents the Percent Better than Standard.*

C2. RESULTS FOR 'ABOVE CODE' QUALIFICATIONS[1]

☐ This project is pursuing CalGreen Tier 1 ☐ This project is pursuing CalGreen Tier 2

Miscellaneous Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Receptacle	171.55	171.55	--
Process	--	--	--
Other Ltg	3.11	3.11	--
Process Motors	1.12	1.12	--
COMPLIANCE TOTAL PLUS MISCELLANEOUS COMPONENTS	**448.26**	**445.98**	**2.3 (0.5%)**

[1] *Notes: This table is used to document compliance with programs OTHER THAN Title 24 Part 6, if applicable.*

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 3 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

C3. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	--	1.5	-1.5	27.9	--	27.9
Space Cooling	9.2	9.6	-0.4	--	--	--
Indoor Fans	4.6	7.7	-3.1	--	--	--
Heat Rejection	--	--	--	--	--	--
Pumps & Misc.	--	--	--	--	--	--
Domestic Hot Water	0.5	0.4	0.1	--	--	--
Indoor Lighting	17.4	17.3	0.1	--	--	-->
Compliance Total	**31.7**	**36.5**	**-4.8**	**27.9**	**0.0**	**27.9**
Receptacle	26.1	26.1	0.0	--	--	--
Process	--	--	--	--	--	--
Other Ltg	0.5	0.5	0.0	--	--	--
Process Motors	0.2	0.2	0.0	--	--	--
TOTAL	**58.5**	**63.3**	**-4.8**	**27.9**	**0.0**	**27.9**

D. EXCEPTIONAL CONDITIONS

The general lighting exceptional method is employed for one or more spaces. Verify that the lighting allowances match the lighting installed on the plans and serve the areas within each space as identified in the compliance model.

This project uses the Simplified Geometry Performance Modeling Approach which is not capable of modeling daylighting controls and assumes the prescriptive Secondary Daylit Control requirements are met. PRESCRIPTIVE COMPLIANCE documentation (form NRCC-LTI-02-E) for the requirements of section §40.6(d) Automatic Daylighting Controls in Secondary Daylit Zone is required.

E. HERS VERIFICATION

This Section Does Not Apply

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 4 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

G1. ENVELOPE GENERAL INFORMATION (conditioned spaces only)

1	2	3	4
Opaque Surfaces & Orientation	Total Gross Surface Area (ft²)	Total Fenestration Area (ft²)	Window to Wall Ratio (%)
North-Facing[1]	1,079 ft²	137 ft²	12.7%
East-Facing[2]	2,158 ft²	574 ft²	26.6%
South-Facing[3]	1,079 ft²	32 ft²	03.0%
West-Facing[4]	2,158 ft²	448 ft²	20.8%
Total	**6,474 ft²**	**1,192 ft²**	**18.4%**
Roof	4,525 ft²	0 ft²	00.0%

Notes:
[1] *North-Facing is oriented to within 45 degrees of true north, including 45°00'00" east of north (NE), but excluding 45°00'00" west of north (NW).*
[2] *East-Facing is oriented to within 45 degrees of true east, including 45°00'00" south of east (SE), but excluding 45°00'00" north of east (NE).*
[3] *South-Facing is oriented to within 45 degrees of true south, including 45°00'00" west of south (SW), but excluding 45°00'00" east of south (SE).*
[4] *West-Facing is oriented to within 45 degrees of true west, including 45°00'00" north of due west (NW), but excluding 45°00'00" south of west (SW).*

G3. OPAQUE SURFACE ASSEMBLY SUMMARY

1	2	3	4	5	6	7	8	9	10
Surface Name	Surface Type	Area (ft²)	Framing Type	Cavity R-Value	Continuous R-Value	Units	Value	Description of Assembly Layers	Status[1]
copy of Exterior Walls11	ExteriorWall	6474	Wood	25	NA	U-Factor	0.064	Stucco - 7/8 in. Vapor permeable felt - 1/8 in. Wood framed wall, 16in. OC, 5.5in., R-25 Gypsum Board - 1/2 in.	N
Slab On Grade81	UndergroundFloor	4743	NA	0	NA	F-Factor	0.73	Slab Type = UnheatedSlabOnGrade Insulation Orientation = None Insulation R-Value = R0	N

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 5 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

G3. OPAQUE SURFACE ASSEMBLY SUMMARY

1	2	3	4	5	6	7	8	9	10
Surface Name	Surface Type	Area (ft²)	Framing Type	Cavity R-Value	Continuous R-Value	Units	Value	Description of Assembly Layers	Status[1]
New Roof83	Roof	4743	Wood	38	NA	U-Factor	0.034	Asphalt shingles - 1/4 in. Vapor permeable felt - 1/8 in. Plywood - 1/2 in. Air - Cavity - Wall Roof Ceiling - 4 in. or more Wood framed roof, 24in. OC, 3.5in., R-38 Metal Standing Seam - 1/16 in.	N
Exterior Walls90	ExteriorWall	603	Wood	21	NA	U-Factor	0.069	Stucco - 7/8 in. Vapor permeable felt - 1/8 in. Wood framed wall, 16in. OC, 5.5in., R-21 Gypsum Board - 1/2 in.	N

[1] *Status: N - New, A – Altered, E – Existing*

G4. OPAQUE DOOR SUMMARY

1	2	3
Assembly Name	Overall U-factor	Status[1]
Insulated Door92	0.200	N

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 6 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

G5. FENESTRATION ASSEMBLY SUMMARY

1	2	3	4	5	6	7	8	9
Fenestration Assembly Name / Tag or I.D.	Fenestration Type / Product Type / Frame Type	Certification Method[1]	Assembly Method	Area ft²	Overall U-factor	Overall SHGC	Overall VT	Status[2]
Commercial Window	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	1096	0.26	0.25	0.50	N
Residential Cooling	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	96	0.30	0.23	0.50	N

[1] *Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 110.6-A and Table 110.6-B. Center of Glass (COG) values are for the glass only, determined by the manufacturer, and are shown for ease of verification. Site-built fenestration values are calculated per Nonresidential Appendix NA6 and are used in the analysis.*
[2] *Status: N - New, A – Altered, E – Existing*

H1. DRY SYSTEM EQUIPMENT (furnaces, air handling units, heat pumps, VRF, economizers etc.)

1	2	3	4	5	6	7	8	9	10	11	12
			Heating				Cooling				
Equipment Name	Equipment Type	Qty	Total Heating Output (kBtu/h)	Supp Heat Output (kBtu/h)	Efficiency Unit	Efficiency	Total Cooling Output (kBtu/h)	Efficiency Unit	Efficiency	Economizer Type (if present)	Status[1]
High Efficiency Heat Pump	SZHP (Split3Phase)	2	62	0	HSPF	10.50	58	SEER/EER	16.50/12.50	NoEconomizer	N

[1] *Status: N - New, A – Altered, E – Existing*

H2. FAN SYSTEMS SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Design OA	Supply Fan					Return Fan					
Name or Item Tag	Qty	CFM	CFM	Modeling Method	Power	Power Units	Control	CFM	Modeling Method	Power	Power Units	Control	Status[1]
High Efficiency Heat Pump	2	339	1931	BrakeHorsePower	0.750	bhp	ConstantVolume	NA	NA	NA	NA	NA	N

[1] *Status: N - New, A – Altered, E – Existing*

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 7 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

H3. EXHAUST FAN SUMMARY

1	2	3	4	5	6	7	8
System ID	Zone Name	Qty	CFM	Motor BHP	Power Per Flow (W/cfm)	Total Static Pressure (in. H_2O)	Status[1]
Service Building84	2-Service Building	2	50	0.017	0.096	1.40	N

[1] *Status: N - New, A – Altered, E – Existing*

H4. Wet System Equipment(boilers,chillers,cooling towers,etc.)

This Section Does Not Apply

H5. PUMPS

This Section Does Not Apply

H6. SYSTEM SPECIAL FEATURES

1	2	3	4
System Name	Equipment Type	Window Interlocks per §140.4(n)	Other Special Features and Controls
EWH-01&2:1 - SHW	Service Hot Water, Primary Only	NA	Fixed Temperature Control

Notes: This table includes controls related to the performance path only. For projects using the prescriptive path, mandatory and prescriptive controls requirements are documented on the NRCC-MCH-E.

H7. NONRESIDENTIAL VENTILATION

1	2	3	4	5	6	7
	Mechanical Ventilation					
Zone Name	Ventilation Function	# of people	Supply OA CFM	Exhaust CFM	Conditioned Area (sf)	DCV or Occupant Sensor Controls, or Both
1-Main Building	Misc - All others	22.63	679	0	4525	NA

H8. HIGH-RISE RESIDENTIAL DWELLING UNIT AND HOTEL/MOTEL VENTILATION

This Section Does Not Apply

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 8 of 13	
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H9. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13
				Rated Capacity (kBtuh)		Airflow (cfm)			Fan			
System ID	Zone Name	System Type	Qty	Heating	Cooling	Design	Min.	Min. Ratio	Power	Power Units	Cycles	VSD
1-Main Building-Trm	1-Main Building	Uncontrolled	2	NA	NA	3862	NA	0.00	0.750	bhp	NA	☐

H10. EVAPORATIVE COOLER SUMMARY

This Section Does Not Apply

H11. HEAT RECOVERY SUMMARY

This Section Does Not Apply

I1. WATER HEATER EQUIPMENT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name	Heater Element Type	Tank Type	Qty	Tank Vol (gal)	Rated Input	Rated Input Unit	Efficiency	Efficiency Unit	Tank Insulation R-value (int/ext)	Standby Loss Fraction	1st Hour Rating or Flow Rate (gal)	Heat Pump Type	Tank Location or Ambient Condition
Instantaneous Electric2	Electricity	Instantaneous	2	1.00	2.3	kW	0.98	UEF	NA	NA	8	NA	NA

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Input File Name:	Greenback.cibd19x				

K1. INDOOR CONDITIONED LIGHTING GENERAL INFO

1	2	3	4	5	6
				Additional (Custom) Allowance	
Occupancy Type [1]	Conditioned Floor Area [2] (ft²)	Installed Lighting Power (Watts)	Lighting Control Credits (Watts)	Area Category Footnotes (Watts)	Tailored Method (Watts)
Museum Area (Restoration Room)	4,525	5,170	0	1810	0
Building Totals:	**4,525**	**5,170**	**0**	**1810**	**0**

[1] *See Table 140.6-C*
[2] *See NRCC-LTI-01-E for unconditioned spaces*
[3] *Lighting information for existing spaces modeled is not included in the table*

K2. INDOOR CONDITIONED LIGHTING SCHEDULE

Luminaire Schedule (includes all permanent installed lighting in conditioned space, and portable lighting over 0.3 w/ft² in offices)

1	2	3	4	5	6
		Installed Watts (Conditioned)			
Name or Item Tag	Complete Luminaire Description (i.e., 3-lamp fluorescent troffer, F32T8, one dimmable electronic ballast)	Watts per luminaire	How Wattage is Determined	Total Number Luminaires	Installed Watts
L1	L1- Indirect Cove Light	90	According to §130.0(c)	3	270
L5	L5 - Wall Lights	1	According to §130.0(c)	4900	4,900

K3. INDOOR CONDITIONED LIGHTING CONTROL CREDITS

Lighting Control Credits Schedule (includes all lighting controls installed in conditioned space for compliance credit per §140.6(a)2 and Table 140.6-A)

1	2	3	4	5	6	7	8	9
Area Description	Primary Function Area (must meet requirements of Table 140.6-A)	Type of Lighting Control	Power Adjustment Factor (PAF)	Luminaire Name or Item Tag	Watts per Luminaires	# of Luminaires	Lighting Controlled (Watts)	Control Credit (Watts)
S-1-Main Building	Museum Area (Restoration Room)	NA	0.00 0.00 0.00 0.00	L5	2450.0	2450	2450	0

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 10 of 13	
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K3. INDOOR CONDITIONED LIGHTING CONTROL CREDITS

Lighting Control Credits Schedule (includes all lighting controls installed in conditioned space for compliance credit per §140.6(a)2 and Table 140.6-A)

1	2	3	4	5	6	7	8	9
Area Description	Primary Function Area (must meet requirements of Table 140.6-A)	Type of Lighting Control	Power Adjustment Factor (PAF)	Luminaire Name or Item Tag	Watts per Luminaires	# of Luminaires	Lighting Controlled (Watts)	Control Credit (Watts)
S-1-Main Building	Museum Area (Restoration Room)	NA	0.00 0.00 0.00 0.00	L5	2450.0	2450	2450	0
S-3-Main Building	Museum Area (Restoration Room)	NA	0.00 0.00 0.00 0.00 0.00	L1	270.0	3	270	0

K4. INDOOR CONDITIONED LIGHTING MANDATORY LIGHTING CONTROLS

Building Level Controls

1	2
Mandatory Demand Response §110.12(c)	Shut-Off Controls §130.1(c)
Required	Required

Area Level Controls (Includes all lighting controls installed in conditioned space to meet mandatory requirements per §130.1)

4	5	6	7	8	9	10
Area Description	Area Category Primary Function Area	Area Controls 130.1(a)	Multi-Level Controls 130.1(b)	Shut-Off Controls 130.1(c)	Primary Daylighting 130.1(d)	Secondary Daylighting 140.5(d)
Main Building Service Building	Office Area (<250 square feet) Restrooms	Exempt Required	Exempt Exempt	Exempt Required	Required NA	Required NA

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 11 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

L. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections shall be made by Documentation Author to indicate which Certificates of Installation must be submitted for the features to be recognized for compliance. These documents bust be retained and provided to the building inspector during construction and can be found online at: https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Building Component	Form/Title
Envelope	NRCI-ENV-01-E - Must be submitted for all buildings
Mechanical	NRCI-MCH-01-E - Must be submitted for all buildings
Plumbing	NRCI-PLB-01-E - Must be submitted for all buildings
Indoor Lighting	NRCI-LTI-01-E - Must be submitted for all buildings

Project Name:	New Mausoleum		NRCC-PRF-01-E	Page 12 of 13	
Project Address:	Sierra Hills Mortuary Greenback Sacramento 95841		Calculation Date/Time:	11:56, Thu, Dec 29, 2022	
Input File Name:	Greenback.cibd19x				

M. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections shall be made by Documentation Author to indicate which Certificates of Acceptance must be submitted for the features to be recognized for compliance. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit:https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Document/NRCA/

Building Component	Form/Title
Envelope	NRCA-ENV-02-F - NFRC label verification for fenestration
Indoor Lighting	NRCA-LTI-02-A - Occupancy Sensors and Automatic Time Switch Controls
	NRCA-LTI-03-A - Automatic Daylight Controls
Mechanical	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap
	NRCA-MCH-03-A Constant Volume Single Zone HVAC
	NRCA-MCH-11-A Automatic Demand Shed Controls
	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance

No	Date	Issue / Revision

Title

T24-01

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

T 2 4 . 1

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STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

This document is used to demonstrate compliance with mandatory commissioning requirements in §120.8 for nonresidential buildings and hotel/motel or mixed-use buildings with nonresidential spaces. This document does not demonstrate compliance with commissioning requirements within Title 24, Part 11, which need to be documented separately if they apply.

Project Name:	New Mausoleum	**Report Page:**	**(Page 1 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Building Size (ft²)	4525
02	Occupancy Type	Nonresidential	05	Nonresidential Conditioned Floor Area (ft²)	< 10,000 ft²
03	Project Type	Newly constructed	06	HVAC System Type	Unitary or packaged equipment each serving one zone

B. PROJECT SCOPE

Based on project information provided in Table A, Table B indicates which commissioning related requirements apply per §120.8, Table B is not editable by the user.

Commissioning Requirements per §120.8

01	Table F: Design Review Kickoff	§120.8(d)1 and §120.8(d)2	The design review kickoff meeting establishes who will play the role of the design reviewer, the project schedule and identify owner's requirements. This meeting should be conducted during schematic design.
02	Table G: Owner's Project Requirements (OPR)	§120.8(b)	This requirement does not apply.
03	Table H: Basis of Design (BOD)	§120.8(c)	This requirement does not apply.
04	Table I: Design Review	§120.8(d) and §120.8(e)	The design reviewer(s) reviews the construction documents for clarity, completeness, and adherence to the owner's goals. Commissioning measures must be included in the construction documents to facilitate the design review and commissioning process. For projects with >= 10,000 ft² of nonresidential conditioned floor area the design review is for adherence with the Owner's Project Requirements (OPR) and Basis of Design (BOD). This should be conducted during design.
05	Table J: Commissioning Plan	§120.8(f)	This requirement does not apply.
06	Table K: Functional Performance Testing	§120.8(g)	This requirement does not apply.
07	Table L: Documentation and Training	§120.8(h)	This requirement does not apply.
08	Table M: Commissioning Report	§120.8(i)	This requirement does not apply.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 2 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with commissioning requirements per §120.8. This table is not editable by the user. If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

01	02	03	04	05	06	07	08	09
Design Kickoff Review	Owner's Project Requirements	Basis of Design	Design Review	Commissioning Plan	Functional Performance Testing	Documentation and Training	Commissioning Report	Compliance Results
Table F	Table G	Table H	Table I	Table J	Table K	Table L	Table M	
Yes			Yes					COMPLIES
10	Design Reviewer(s) for the project include:							COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 3 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

F. DESIGN REVIEW KICKOFF MEETING

This table indicates that the design reviewer meets the qualification requirements per Title 24, Part 1 Section 10-103(a)1 and demonstrates compliance with design review kickoff requirements per §120.8(d)2. This meeting should occur during the Schematic Design phase of the project.

Design Review Kickoff Meeting Details			
01	Date of Design Review Kickoff Meeting	0001-01-01	
02	Meeting Attendees: (one person may play multiple roles)		
☐	Owner/Facility Manager:	☒	Design Reviewer(s)
☐	Project Manager:	☐	Design Architect/ Engineer(s):
☐	Contractor:	☐	Certified Acceptance Test Tech(s):
☐	Commissioning Provider:	☐	Energy/ T24 Part 6 Consultant:

Design Reviewer Qualifications per Title 24 Part 1 Section 10-103(a)1

		Do the Design Reviewer(s) meet these qualifications?	
		Yes	No
01	The design reviewer(s) must be licensed professional engineers or licensed architects, or licensed contractors representing services performed by or under the direct supervision of a licensed engineer or architect, as specified in the provisions of Division 3 of the Business and Professions Code.	●	○
02	In addition, for buildings with >= 10,000 ft² but < 50,000², the design reviewer(s) shall be a qualified in-house engineer or architect with no other project involvement or a third party engineer, architect, or contractor	●	○
04	The design reviewer(s) for this project will be:		

Preliminary Construction Schedule

		Start Date	Completion Date
05	Schematic Design	0001-01-01	0001-01-01
06	Design Development	0001-01-01	0001-01-01
07	Construction Documents	0001-01-01	0001-01-01
08	Construction	0001-01-01	0001-01-01
09	Building Turnover	0001-01-01	0001-01-01

Project Goals Related to Energy Efficiency

10	Operational Costs	
11	Desired Building Lifespan	
12	Equipment Lifecycle	
13	Project Energy Efficiency Goals	
14	Envelope Goals	

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 4 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

F. DESIGN REVIEW KICKOFF MEETING

15	HVAC System Goals	
16	Indoor Lighting System Goals	
17	Outdoor Lighting System Goals	
18	Water Heating System Goals	
19	Equipment and System Specifications	
20	Operations and Maintenance	

G. OWNER'S PROJECT REQUIREMENTS (OPR)

This section does not apply to this project.

H. BASIS OF DESIGN (BOD)

This section does not apply to this project.

I. CONSTRUCTION DOCUMENT DESIGN REVIEW CHECKLIST

This table is only completed if a design review document is not attached to permit application to demonstrate compliance with §120.8(b) and §120.8(e). For buildings with >= 10,000 ft² conditioned floor area, the design review will ensure the construction documents meet the Owner's Project Requirements (Table G.) and the Basis of Design Documents (Table H.). For buildings with < 10,000 ft² conditioned floor area, the design review will ensure the construction documents meet the goals documented in Table F. during the Design Review Kickoff.

		YES	NO
01	Attaching Completed Design Review Documentation?	●	○

J. COMMISSIONING PLAN

This section does not apply to this project.

K. FUNCTIONAL PERFORMANCE TESTING

This section does not apply to this project.

L. DOCUMENTATION AND TRAINING

This section does not apply to this project.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 5 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

M. COMMISSIONING REPORT

This section does not apply to this project.

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

There are no Certificates of Installation applicable to commissioning requirements.

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Although there are no "CXR" Certificates of Acceptance required to document commissioning requirements, Certificates of Acceptance may be used to supplement functional performance testing required by §120.8(a).

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Nonresidential Building Commissioning
NRCC-CXR-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-CXR-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 6 of 6)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Electrical Power Distribution
NRCC-ELC-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-ELC-E**

This document is used to demonstrate compliance with mandatory requirements in §130.5, for electrical systems in newly constructed nonresidential, high-rise residential and hotel/motel occupancies. Additions and alterations to electrical service systems in these occupancies will also use this document to demonstrate compliance per §141.0(a) or §141.0(b)2F for alterations..

Project Name:	New Mausoleum	**Report Page:**	**(Page 1 of 5)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento
02	Occupancy Types Within Project:	

● Support Areas ● : See Table I

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05
Electrical Service Designation/Description	Scope of Work[1]	Rating (kVA)	Utility Provided Metering System Exception to §130.5(a) [2]	System subject to CA Elec Code Article 517 Exception to §130.5(a)and (b)
	New electrical service equipment and meter	50	☐	☐
06 Demand Response Controls		Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections §120.2, §130.1 and §130.3 and compliance documents NRCC-MCH, NRCC-LTI and NRCC-LTS will indicate when demand response controls are required.		

FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c), no other requirements from 130.5 are required.
2 Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through I. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05
Service Electrical Metering §130.5(a) (See Table F)	AND	Separation for Monitoring §130.5(b) (See Table G)	AND	Voltage Drop §130.5(c) (See Table H)	AND	Controlled Receptacles §130.5(d) (See Table I)	COMPLIES
Yes	AND	Yes	AND	Yes	AND	Yes	

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Electrical Power Distribution
NRCC-ELC-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-ELC-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 2 of 5)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table is includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. SERVICE ELECTRICAL METERING

This table includes new or replacement electrical service systems OR equipment to demonstrate compliance with §130.5(a)

01	02	03				04	05	
Electrical Service Designation/Description	Rating (kVA)	Required Metering Capabilities per Table 130.5-A				Location of Requirements in Construction Documents	Field Inspector	
		Instantaneous Demand (kW)	Historical Peak Demand (kW)	Tracking kWh for user-defined period	kWh per rate period		Pass	Fail
	50	☐	☒	☒	☐		☐	☐

G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with §130.5(b). Any load types that are not included in the service do not need to be shown.

01	02	03	04	05	
Load Type per Table 130.5-B[1]	Minimum Required Separation of Load per Table 130.5-B	Compliance Method[2]	Location of Requirements in Construction Documents	Field Inspector	
				Pass	Fail

** NOTES: If "Other*" is selected under Compliance Method above, please indicate how compliance has been achieved in the space provided below.*

FOOTNOTES: For each separate load type, up to 10% of the connected load may be of any type.
1 Method 1: Switchboards/ motor control centers/ panelboard loads disaggregated for each load type.
Method 2: Switchboards/ motor control centers/ panelboard supply other distribution equipment with loads disaggregated for each load type.
Method 3: Branch circuits serve load types individually and provisions for adding future branch circuit monitoring.
Method 4: Complete metering system measures and reports loads by type.
See Chapter 8 of the Nonresidential Compliance Manual for more detail on Compliance Methods.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Electrical Power Distribution
NRCC-ELC-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-ELC-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 3 of 5)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with §130.5(c). For alterations, only the altered circuits must demonstrate compliance per §141.0(b)2PII

01	02			03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method			Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
						Pass	Fail
	☒ Voltage drop less than 5%	☐	Permitted by CA Elec Code (Exception to §90.5(d))	Attached		☐	☐

** NOTES: If "Permitted by CA Elec Code *" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

I. CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with §130.5(d). Both controlled and uncontrolled receptacles must be provided in office areas, lobbies, conference rooms, kitchen areas in office spaces, copy rooms and hotel/motel guest rooms.

01	02	03	04	05	06	
Room name or Description	Location/ Type of Controlled Receptacles	Shut-Off Controls	Permanent Durable Marking Will be Used	Location of Requirements in Construction Documents	Field Inspector	
					Pass	Fail

** NOTES: If "Other*" is selected under Shut-Off Controls above, please indicate how compliance has been achieved in the space provided below.*

J. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title	Field Inspector	
	Pass	Fail
NRCI- ELC-01-E - Must be submitted for all buildings	☐	☐

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

STATE OF CALIFORNIA
Electrical Power Distribution
NRCC-ELC-E | CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-ELC-E**

Project Name:	New Mausoleum	**Report Page:**	**(Page 4 of 5)**
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

K. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to electrical power distribution requirements.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

No	Date	Issue / Revision

Title

T24-02

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

T 2 4 . 2

STATE OF CALIFORNIA
Electrical Power Distribution
NRCC-ELC-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-ELC-E
Project Name:	New Mausoleum	Report Page:	(Page 5 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance | Report Version: 2019.1.003 Schema Version: rev 20200601 | Report Generated: 2022-12-29 12:00:28

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	New Mausoleum	Report Page:	(Page 1 of 6)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

This document is used to demonstrate compliance with requirements in §110.9, §110.12(c), §130.0, §130.1, §140.6 and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Total Conditioned Floor Area (ft²)	0
02	Climate Zone	12	05	Total Unconditioned Floor Area (ft²)	218
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1

● Support Areas ● : See Table I

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)2 for alterations.

Scope of Work		Conditioned Spaces		Unconditioned Spaces	
	01	02	03	04	05
My Project Consists of (check all that apply):		Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☒	New Lighting System	Area Category Method	0	Area Category Method	218
☐	New Lighting System - Parking Garage				
	Total Area of Work (ft²)	0		218	

C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

	Allowed Lighting Power per §150.6(b) [Watts]						Adjusted Lighting Power per §140.6(a) [Watts]				Compliance Results
	01	02	03	04		05	06	07		08	09
Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)1	Complete Building §140.6(c)1i	Area Category §140.6(c)2	Area Category Additional §140.6(c)2i (+)	Tailored §140.6(c)3 (+)	=	**Total Allowed** (Watts)	Total Designed (Watts)	Adjustments PAF Lighting Control Credits §140.6(a)2 (-)	=	**Total Adjusted** (Watts) *Includes Adjustments	**05 must be >= 08** §140.6
	(See Table I)	(See Table I)	(See Table J)	(See Table K)			(See Table F)	(See Table P)			
Conditioned					=				=		
Unconditioned		141.7	0		=	142	83	0	=	83	COMPLIES

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	New Mausoleum	Report Page:	(Page 2 of 6)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

C. COMPLIANCE RESULTS

Controls Compliance (See Table H for Details)	COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)	

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all permanent designed lighting and all portable lighting in offices.

Designed Wattage: Unconditioned Spaces

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per §140.6(a)3	Design Watts	Field Inspector	
									Pass	Fail
L2	L2 - 1 x 4 Recessed Mounted	No	No	30	Mfr. Spec	2	No	60	☐	☐
L3	L3 - Recessed Can Light	No	No	11.5	Mfr. Spec	1	No	23	☐	☐
						Total Designed Watts: UNCONDITIONED SPACES		83		

[1] *FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per §140.6(c)4B is adjusted to be 75% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2] *Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per §130.0(c) Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

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H. INDOOR LIGHTING CONTROLS (Not including PAFs)

*This table includes lighting controls for conditioned and unconditioned spaces. When a control having a * is shown, the notes section of this table provides more detail on how compliance is achieved. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank.*

Building Level Controls

01	02	03	
Mandatory Demand Response §110.12(c)	Shut-off controls §130.1(c)	Field Inspector	
		Pass	Fail
Required > 10,000 SF	Whole Building Auto Time Switch	☐	☐

Area Level Controls

04	05	06	07	08	09	10	11	12	
Area Description	Complete Building or Area Category Primary Function Area	Area Controls §130.1(a)	Multi-Level Controls §130.1(b)	Shut-Off Controls §130.1(c)	Primary/Skylit Daylighting §140.6(d)	Secondary Daylighting §140.6(d)	Interlocked Systems §140.6(a)1	Field Inspector	
								Pass	Fail
Main Building	Office 250 square feet or less	Manual ON/OFF	Exempt*	Exempt*	Included	Included	No	☐	☐
Service Building	Restrooms	Manual ON/OFF	Exempt*	Occupancy Sensor	N/A	N/A	No	☐	☐

*NOTES: Controls with a * require a note in the space below explaining how compliance is achieved. *EX: Conference 1: Primary/Skylight Daylighting: Exempt because less than 120 watts of general lighting; EXCEPTION 1 to §130.1(d)2*

Main Building	Less than 0.5 W/SQFT
Service Building	Less than 100 SQFT per Room

13 — Plan Sheet Showing Daylit Zones:

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per §140.6(h) are included in this table. Column 06 indicates if additional lighting power allowances per §140.6(c) or adjustments per §140.6(a) are being used .

Unconditioned Spaces

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STATE OF CALIFORNIA
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CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	New Mausoleum	Report Page:	(Page 4 of 6)
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I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

01	02	03	04	05	06
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment
					Area Category / PAF
Service Building	Restrooms	0.65	218	141.7	No / No
	TOTALS:		218	141.7	See Tables J, or P for detail

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED ORNAMENTAL/SPECIAL EFFECTS

This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ALTERATIONS

This section does not apply to this project.

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CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
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R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This section does not apply to this project.

T. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title	Field Inspector	
	Pass	Fail
NRCI-LTI-01-E - Must be submitted for all buildings	☐	☐

U. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selection have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified	Field Inspector	
		Pass	Fail
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	☐	☐	
NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	☐	☐	
NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	☐	☐	

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTO-E
Project Name:	New Mausoleum	Report Page:	(Page 1 of 6)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Total Illuminated Hardscape Area (ft²)	0
02	Climate Zone	12			
03	Outdoor Lighting Zone per Title 24 Part 1 §10-114 or as designated by Authority Having Jurisdiction (AHJ):				
☐	LZ-0: Very Low - Undeveloped Parkland	☐	LZ-2: Moderate - Rural Areas	☐	LZ-4: High - Must be reviewed by CA Energy Commision for Approval
☐	LZ-1: Low - Developed Parkland	☒	LZ-3: Moderately High - Urban Areas		

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.7 or §141.0(b)2L for alterations.

My Project Consists of:

01		02		
☒	New Lighting System	Must Comply with Allowances from §140.7		
☐	Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	○ Yes	○ No
03		04	05	
	% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method	
☐	< 10% ☐ >= 10% and < 50% ☐ >= 50%			

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] *FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.*

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through I. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) §140.7 or §141.0(b)2L												Compliance Results
01		02		03		04		05	OR	06	=	07		08	09
General Hardscape Allowance §140.7(d)1 (See Table I)	+	Per Application §140.7(d)2 (See Table J)	+	Sales Frontage §140.7(d)2 (See Table K)	+	Ornamental §140.7(d)2 (See Table L)	+	Per Specific Area §140.7(d)2 (See Table M)	OR	Existing Power Allowance §141.0(b)2L (See Table N)	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 must be >= 08**
0	+	----	+	----	+	----	+	----	OR	----	=	0	≥	540	DOES NOT COMPLY
Cutoff Compliance (See Table G for Details)															N/A
Controls Compliance (See Table H for Details)															COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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Outdoor Lighting
NRCC-LTO-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTO-E
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F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with §140.7, all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per §141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included).

Designed Wattage:

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[2,3]	How is Wattage determined	Total number luminaires[3]	Luminaire Status[3]	Excluded per §140.7(a)	Design Watts	Cutoff Req. > 6,200 initial lumen output §130.2(b)1 *	Field Inspector
										Pass / Fail
L4	L4 - Outdoor Lighting	☐ Linear	20	Mfr. Spec	27	New	☐	540	NA, < 6200 lumens	☐ / ☐
							Total Design Watts:	540		

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to §130.2(b)

[1] *FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per §130.0(c)*

[2] *For linear luminaires, wattage should be indicated as W/ft instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.*

[3] *Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.*

[4] *Compliance with mandatory cutoff requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by §130.2(b)*

G. CUTOFF REQUIREMENTS (BUG)

This section does not apply to this project.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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Outdoor Lighting
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CERTIFICATE OF COMPLIANCE			NRCC-LTO-E
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H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For sitvration projects, luminaires which are existing to remain (ie unteuched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
*When an option having a * is selected, the notes section of this table must be completed. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank.*

Mandatory Controls

01	02	03	04	05	
Area Description	Shut-Off §130.2(c)1	Auto-Schedule §130.2(c)2	Motion Sensor §130.2(c)3	Field Inspector	
				Pass	Fail
Outdoor Lighting	Photocontrol	Yes	Yes	☐	☐

* NOTES: Controls with a * require a note in the space below explaining how compliance is achieved.
EX: Not permitted by health & safety to be turned off; EXCEPTION 3 to §130.2(c)

I. LIGHTING POWER ALLOWANCE (per §140.7)

This table includes areas using allowance calculations per §140.7, General Hardscape Allowance is per Table 140.7-A while "Use it or lose it" Allowances are per Table 140.7-B - indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.

	☐ General Hardscape Allowance Table I (below)	01 "Use it or lose it" Allowance (select all that apply) (select all that apply)			
		☐ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☐ Per Specific Area Table M
Calculated General Hardscape Lighting Power Allowance per Table 140.7-A (LZ 0, 1 & 4)					
Calculated General Hardscape Lighting Power Allowance per Table 140.7-A (LZ 2 & 3)					

J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTO-E
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L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title	Field Inspector	
	Pass	Fail
NRCI-LTO-01-E - Must be submitted for all buildings	☐	☐
NRCI-LTO-02-E- Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	☐	☐

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified	Field Inspector	
		Pass	Fail
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	☐	☐	

Registration Number: | Registration Date/Time: | Registration Provider: Energysoft

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No	Date	Issue / Revision

Title

T24-03

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

T 2 4 . 3

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTO-E
Project Name:	New Mausoleum	**Report Page:**	(Page 6 of 6)
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STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-PLB-E

This document is used to demonstrate compliance for nonresidential occupancies with requirements in §110.1, §110.3, §120.3, and §140.5, and with requirements in §141.0 for additions and alterations, for domestic water heating scopes using the prescriptive path. For high-rise residential and hotel/motel occupancies compliance is demonstrated with requirements in §110.1, §110.3, §120.3, §150.0 and §150.1(c)8, and with requirements §150.2 for additions.

Project Name:	New Mausoleum	**Report Page:**	(Page 1 of 6)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	02	Climate Zone	12
03	Occupancy Types Within Project (select all that apply):				
☒	Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel		
☐	State Building	☐ Healthcare Facility	☐ Other (Write In)		

B. PROJECT SCOPE

This table includes domestic water heating systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive paths outlined in §140.5, §150.1(c)8, and §141.0(a), or §141.0(b)2N for additions or alterations. Solar water heating systems are documented on the NRCC-SRA compliance document. Combined hydronic water heating systems are documented on the NRCC-MCH compliance document.

01	02	03		
My project consists of (check all that apply):	System Type[1,2]	System Components		
☒ New system (DHW system being installed for the first time in newly constructed building)	Individual System (serving nonresidential spaces)	☒ Equipment	☒ Distribution	☒ Controls
☐ System Alteration (equipment, distribution or controls)		☐ Equipment	☐ Distribution	☐ Controls

[1]FOOTNOTES: Point of use water heaters, or other non-central systems used to serve nonresidential spaces, are considered individual systems.

[2] Dwelling units refers to hotel/motel guest rooms and units in a high-rise residential occupancy.

STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PLB-E
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C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with water heating requirements. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. or the table indicated as not compliant for guidance.

01	02	03	04
Domestic Hot Water Equipment	Distribution Systems	Controls	**Compliance Results**
Table F	Table G	Table H	
Yes	Yes	Yes	COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table is includes remarks made by the permit applicant to the Authority Having Jurisdiction.

STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PLB-E
Project Name:	New Mausoleum	**Report Page:**	(Page 3 of 6)
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F. DOMESTIC HOT WATER EQUIPMENT

This table is used to demonstrate compliance with mandatory equipment requirements in §110.1 and §110.3. For high-rise residential and hotel/motel occupancies, compliance with prescriptive requirements in §150.1(c)8 must also be demonstrated and with §150.2 for addition and alteration scopes.

Equipment Schedule: Individual Systems

01	02	03	04	05	06
Name or Item Tag	Equipment Type	Volume (gal)	Max GPM/ First Hour Rating (FHR)	Rated Uniform Energy Factor (UEF)	Minimum Required Uniform Energy Factor (UEF)[1]
Instantaneous Electric	Electric Instantaneous (12kW)	<=2	GPM >= 4.0	0.98	0.92

[1]FOOTNOTE: Compliant equipment may be found in the Modernized Appliance Efficiency Database System (MAEDBS) on the Energy Commission website: https://cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx

Water Heating Equipment All Occupancies

	Yes	No	Not Applicable	Requirement
18	☐	☐	☒	Unfired storage tank insulation shall have Internal + External >=R-16 OR External >=R-12. Label required per §110.3(c)3
19	☐	☐	☒	New state buildings 60% of energy for service water heating from site solar energy or recovered energy per §110.3(c)5
20	☐	☐	☒	Isolation valves for instantaneous water heater with input rating >6.8 kBTUH or 2 kW has been specified per §110.3(c)6

STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PLB-E
Project Name:	New Mausoleum	**Report Page:**	(Page 4 of 6)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

G. DOMESTIC HOT WATER DISTRIBUTION SYSTEM

This table is used to demonstrate compliance for nonresidential occupancies with distribution requirements in §120.3 and §140.5. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements §110.3(c), §120.3, §150.0, §150.1

Mandatory Pipe Insulation All Occupancies

12	☒	For systems serving nonresidential spaces, pipe insulation for the following applications is specified to comply with Table 120.3-A (see below) per §120.3 : • Recirculating system piping, including supply and return piping of the water heater • The first 8 ft of hot and cold outlet piping, including between storage tank and heat trap, for a nonrecirculating storage system • Pipes that are externally heated
13	☒	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service per §120.3(b) and §150.0(j)3

TABLE 120.3-A PIPE INSULATION THICKNESS

Fluid Temperature Range (°F)	Conductivity Range (Btu-in per hour per ft² per °F)	Insulation Mean Rating Temp (°F)	Nominal Pipe Diameter (in)		
			< 1	1 to < 1.5	1.5 to < 4
			Minimum Insulation Required		
105-140	0.22 - 0.28	100	1.0 in or R-7.7	1.5 in or R-12.5	1.5 in or R-11

STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PLB-E
Project Name:	New Mausoleum	**Report Page:**	(Page 5 of 6)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

H. DOMESTIC HOT WATER CONTROLS

This table is used to demonstrate compliance with control requirements in §110.3 for all occupancies. For high-rise residential and hotel/motel occupancies, compliance is also demonstrated with requirements in §150.1(c)8.

	Yes	No	Not Applicable	Requirement
01	☒	☐	☐	Construction documents require manufacturer certification that service water-heating systems are equipped with automatic temperature controls capable of adjusting temperature settings per §110.3(a).
02	☐	☐	☒	Systems with capacity > 167,000 BTUH equipped with outlet temperature controls per §110.3(c)1 unless covered by California Plumbing Code 613.0.
03	☐	☐	☒	Controls for circulating pumps or electrical heat trace systems are capable of automatically turning off the system per §110.3(c)2 unless systems serves healthcare facility.
04	☐	☐	☒	For recirculation systems serving multiple dwelling units, design includes automatic pump controls per §150.1(c)8Bii, or §150.2 for additions or alterations.
05	☐	☐	☒	For recirculation systems serving individual dwelling units, design includes manual on/off controls as specified in Reference Appendix RA4.4.9 per §150.1(c)8.
06	☐	☐	☒	For replacement single heat pump water heaters serving individual dwelling units in climate zone 1-15, design includes communication interface that meets demand responsive control requirements of §110.12(a) per §150.2(b)1Hiii.

I. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title	Field Inspector	
	Pass	Fail
NRCI-PLB-01-E - Must be submitted for all buildings	☐	☐

J.DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to service water heating requirements.

K. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

There are no NRCV forms required for this project.

STATE OF CALIFORNIA

Domestic Water Heating System

NRCC-PLB-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PLB-E
Project Name:	New Mausoleum	**Report Page:**	(Page 6 of 6)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

STATE OF CALIFORNIA

Process Systems

NRCC-PRC-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-PRC-E

This document demonstrates compliance for process systems that are within the scope of the permit application and are regulated by mandatory requirements in §120.6 or prescriptive requirements in §140.9. This compliance document is used for newly constructed, addition and alteration projects.

Project Name:	New Mausoleum	**Report Page:**	(Page 1 of 4)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Total Conditioned Floor Area	4525
02	Climate Zone	12	05	Total Unconditioned Floor Area	218
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1
☐	Office	☐ Retail	☐	Non-refrigerated Warehouse	
☐	Hotel/ Motel	☐ School	☐	Healthcare Facility	
☐	High-Rise Residential	☐ Relocatable Class Bldg	☒	Other (write in)	

B. PROJECT SCOPE

This table includes process systems that are within the scope of the permit application and are demonstrating compliance with mandatory requirements in §120.6 or prescriptive requirements in §140.9.

My project consists of: (check all that apply):

01	02
☐ Refrigerated Spaces <3,000 ft² Total (no Title 24, Pt6 requirements)	☐ Elevator Lighting & Ventilation Controls (mandatory §120.6(f))
☐ Refrigerated Spaces >=3,000 ft² Total (mandatory §120.6(a))	☐ Escalator & Moving Walkway Speed Controls (mandatory §120.6(g))
☐ Food Stores >8,000 ft² cfa (mandatory §120.6(b))	☐ Computer Rooms >20 W/ ft² Power Density (prescriptive §140.9(a))[1]
☐ Enclosed Parking Garage Exhaust >=10,000 cfm (mandatory §120.6(c))	☐ Commercial Kitchen Ventilation/Exhaust (prescriptive §140.9(b))[1]
☐ Newly Installed Process Boilers (mandatory §120.6(d))	☐ Laboratory Exhaust/Factory Exhaust & Fume Hood (prescriptive §140.9(c))[1]
☐ Compressed Air Systems Combined HP >= 25 (mandatory §120.6(e))	

[1] FOOTNOTES: These building features can comply using the performance method. If using the performance method for these features, compliance should be demonstrated on the NRCC-PRF-E.

STATE OF CALIFORNIA

Process Systems

NRCC-PRC-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PRC-E
Project Name:	New Mausoleum	**Report Page:**	(Page 2 of 4)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through O. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01	02	03	04	05	06	07	08	09	10	11
Refrigerated Warehouse/ Space §120.6(a) (See Table F)	Commercial Refrigeration §120.6(b) (See Table G)	Parking Garage Exhaust §120.6(c) (See Table H)	Process Boilers §120.6(d) (See Table I)	Compressed Air Systems §120.6(e) (See Table J)	Elevators §120.6(f) (See Table K)	Escalators & Moving Walkways §120.6(g) (See Table L)	Computer Rooms §140.9(a) (See Table M)	Commercial Kitchens §140.9(b) (See Table N)	Laboratory/Factory Exhaust §140.9(c) (See Table O)	**Compliance Results**
										COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. REFRIGERATED WAREHOUSES/SPACES

This section does not apply to this project.

G. COMMERCIAL REFRIGERATION

This section does not apply to this project.

H. ENCLOSED PARKING GARAGE EXHAUST

This section does not apply to this project.

I. PROCESS BOILER

This section does not apply to this project.

J. COMPRESSED AIR SYSTEMS

This section does not apply to this project.

STATE OF CALIFORNIA

Process Systems

NRCC-PRC-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PRC-E
Project Name:	New Mausoleum	**Report Page:**	(Page 3 of 4)
Project Address:	Sierra Hills Mortuary Greenback	**Date Prepared:**	12/29/2022

K. ELEVATOR LIGHTING AND VENTILATION

This section does not apply to this project.

L. ESCALATORS AND MOVING WALKWAYS SPEED CONTROLS

This section does not apply to this project.

M. COMPUTER ROOM SYSTEM SUMMARY

This section does not apply to this project.

N. COMMERCIAL KITCHEN EXHAUST AND VENTILATION

O. LABORATORY AND FACTORY EXHAUST AND FUME HOODS

This section does not apply to this project.

P. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title	Field Inspector	
	Pass	Fail
NRCI-PRC-01-E - Covered Process	☐	☐

Q. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no NRCA forms required for this project.

No	Date	Issue / Revision

Title

T24-04

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

T 2 4 . 4

STATE OF CALIFORNIA
Process Systems
NRCC-PRC-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-PRC-E
Project Name:	New Mausoleum	Report Page:	(Page 4 of 4)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

Report Generated: 2022-12-29 12:00:27

STATE OF CALIFORNIA
Solar Ready Areas
NRCC-SRA-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-SRA-E
Project Name:	New Mausoleum	Report Page:	(Page 1 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

This document is used to demonstrate compliance with mandatory requirements in §110.10 for newly constructed buildings which are either high-rise multifamily ten stories or fewer, hotel/motel ten stories or fewer or all other nonresidential buildings three sotries or fewer. It is also used to demonstrate compliance with additions to these building types which add more than 2,000 ft² of roof area. Alterations or additions of less than 2,000 ft² are not required to comply with §110.10.

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Building Type	Other nonresidential bldg 3 stories or fewer
02	Climate Zone	12	05	Construction Type	New Construction
03	☐ Roof is designed for vehicle traffic, parking or for heliport				
03a	Plan sheet showing roof design for vehicle traffic, parking or heliport exception:				

B. PROJECT SCOPE

The compliance path the project is using to comply per §110.10(b)1B is indicated below.

My project consists of (check one):

☒	Provide Solar Ready Area no exceptions	The project has allocated a solar zone on the roof plan per requirements in §110.10(b), as documented in Table F.
☐	Exception to Solar Ready Area: Installed Solar Photovoltaic System	The project includes a permanently installed solar electric system having a nameplate DC power rating, measured under Standard Test Conditions, of no less than one watt per square foot of roof area as documented in Table G.
	Exception to Solar Ready Area: Installed Solar Water Heating System	The project is a hotel/motel or high-rise multifamily occupancy and includes a permanently installed domestic solar water-heating system complying with §150.1(c)8iii and Reference Residential Appendix RA4, as documented in Table H.
	Exception to Solar Ready Area: Smart Thermostat and Alternative Energy Efficiency Measure	The project is a high-rise multifamily occupancy where all thermostats in each dwelling unit comply with §110.12(a) AND at least one additional measure listed in Exception 4 to §110.10(b)1B is installed, as documented in Table I.

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

Report Generated: 2022-12-29 12:00:31

STATE OF CALIFORNIA
Solar Ready Areas
NRCC-SRA-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-SRA-E
Project Name:	New Mausoleum	Report Page:	(Page 2 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through I. Note: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, for guidance or see the applicable Table referenced below.

Allocated Solar Zone			Installed PV System			Installed SWH System			Smart Total and Alternative EE Measure		
01	02		03	04		05	06		07	08	09
Required Minimum Area (ft²)	Designated Area (ft²)		Required Minimum DC Power Rating (Watts)	Designed DC Power Rating (Watts)		Required Minimum Solar Savings Fraction	Designed/Rated Solar Savings Fraction		JAS Compliant Thermostat Specified?	Alternative Energy Efficiency Measure	
(See Table F)			(See Table G)			(See Table H)			(See Table I)		DOES NOT COMPLY
711.4	>= 0	OR		=	OR		=	OR			COMPLIES

Location within the construction documents showing the location for inverters and metering equipment and a pathway for the routing of conduit/plumbing to the electrical service/ water heating system per §110.10b(c).

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections mode or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table is includes remarks mode by the permit applicant to the Authority Having Jurisdiction.

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

Report Generated: 2022-12-29 12:00:31

STATE OF CALIFORNIA
Solar Ready Areas
NRCC-SRA-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-SRA-E
Project Name:	New Mausoleum	Report Page:	(Page 3 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

F. ALLOCATED SOLAR ZONE

This table is completed if the project is designating a solar zone to comply with §110.10(b)1B. New construction consider the total roof area; Additions consider newly added roof area. This table demonstrates that the project has designated the minimum area required for the Allocated Solar Zone, and also that the requirements for Solar Zone Subareas have been met. Each subarea must be shown on a roof plan or documented in construction documents. The solar zones must also comply with fire code requirements, including, but not limited to, setback and pathway requirements. Requirements for interconnection pathways must also be included in construction documents, and the location is specified in this table.

Required Minimum Solar Zone

01	02	03	04	05	06			07	08
					Potential Solar Zone Areas: Roof areas with >= 70% Solar Access				
Minimum Solar Zone Area Calculation Method	Total New or Added Roof Area (ft²)	Total New or Added Roof Area Covered with Skylights (ft²)	Minimum Solar Zone Based on Total or Added Roof Area (0.15 x (Roof-Sky(ft)) (ft²)	Method/ Tools Used to Determine Annual Solar Access for Potential Zones[1]	Low-Sloped Area (<= 2:12 pitch) (ft²)	Steep-Sloped Area (> 2:12 pitch) Oriented 90 ° - 300 ° (ft²)	Total Potential Solar Zone Area (ft²)	Minimum Solar Zone Based on Potential Zone (0.5 x (Total Potential Zone)) (ft²)	Required Minimum Solar Zone Area (ft²)
Total New or Added Roof Area	4743	0	711.45						711.45

Designated Solar Zone Subareas

09	10	11	12	13	14	15	16	17	18	19
Subarea Name or Tag	Building Plan Reference	Roof or Overhang Slope (Low <= 2:12 pitch) (Steep > 2:12 pitch)	Is Steep-Sloped Roof or Overhang between 90 and 300 degrees?	Subarea Complies with Title 24, Part 9	Solar Zone Subarea Free of Obstructions per §110.10(b)1iA	Subarea is Required Distance from Potential Obstructions per §110.10(b)1 ii	Is the Smallest Dimension 5 feet or greater?	Min. Area Required per Subarea (ft²)	Designated Area (ft²)	Subarea Complies?
							Total Designated Solar Zone Area (ft²):		0	

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

Report Generated: 2022-12-29 12:00:31

STATE OF CALIFORNIA
Solar Ready Areas
NRCC-SRA-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-SRA-E
Project Name:	New Mausoleum	Report Page:	(Page 4 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

Interconnection Pathways

Location in construction documents showing the location for inverters and metering equipment and a pathway for the routing of conduit/ plumbing to the electrical service/ water heating system per §110.10(c).

FOOTNOTE: This field is used to document how the percentage of annual solar access was determined per §110.10(b)1B. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

G. PERMANENTLY INSTALLED SOLAR PHOTOVOLTAIC (PV) SYSTEM

This section does not apply to this project.

H. PERMANENTLY INSTALLED SOLAR HOT WATER SYSTEMS

This section does not apply to this project.

I. SMART THERMOSTATS AND ALTERNATIVE EFFICIENCY MEASURE

This section does not apply to this project.

J. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

There are no NRCI forms required for this project.

K. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to solar ready requirements.

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

Report Generated: 2022-12-29 12:00:31

STATE OF CALIFORNIA
Solar Ready Areas
NRCC-SRA-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-SRA-E
Project Name:	New Mausoleum	Report Page:	(Page 5 of 5)
Project Address:	Sierra Hills Mortuary Greenback	Date Prepared:	12/29/2022

Registration Number:

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance

Registration Date/Time:

Report Version: 2019.1.003
Schema Version: rev 20200601

Registration Provider: Energysoft

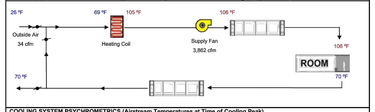
Report Generated: 2022-12-29 12:00:31

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

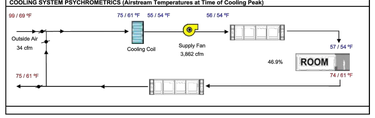
Project Name: New Mausoleum
Date: 12/29/2022
System Name: High Efficiency Heat Pump
Floor Area: 4,525

ENGINEERING CHECKS		SYSTEM LOAD	COIL COOLING PEAK		COIL HTG. PEAK	
			CFM	Sensible	Latent	CFM	Sensible
Number of Systems	2	Total Room Loads	4,540	75,892	475	974	37,464
Heating System		Return Vented Lighting		0			
Output per System	60,000	Return Air Ducts		3,795			1,873
Total Output (Btuh)	120,000	Return Fan		0			0
Output (Btuh/sqft)	26.5	Ventilation	34	881	23	34	1,595
Cooling System		Supply Fan		4,605			-4,605
Output per System	60,000	Supply Air Ducts		3,795			1,873
Total Output (Btuh)	120,000						
Total Output (Tons)	10.0	TOTAL SYSTEM LOAD		88,967	499		38,201
Total Output (Btuh/sqft)	26.5						
Total Output (sqft/Ton)	452.5						
Air System							
CFM per System	1,931	HVAC EQUIPMENT SELECTION					
Airflow (cfm)	3,862	High Efficiency Heat Pump		103,178	3,850		74,948
Airflow (cfm/sqft)	0.85						
Airflow (cfm/Ton)	386.2						
Outside Air (%)	0.9%	Total Adjusted System Output (Adjusted for Peak Design conditions)		103,178	3,850		74,948
Outside Air (cfm/sqft)	0.01						
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Jul 4 PM		Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



No	Date	Issue / Revision

Title

T24-05

Project Number	20001.00
Date	12/29/2022
Drawn By	RGC, JM, YM
Checked By	CJK

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