

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 60% 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 90° 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 GYSEPM 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 1/2" 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 (ΔJ) 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-POINTS 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 "GUIDELINES 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 2022 CALIFORNIA 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 AS REQUIRED. COORDINATE LOCATIONS OF GAS & CONDENSATE LINES WITH PLUMBING CONTRACTOR. COORDINATE LOCATIONS OF POWER, DISCONNECTS, AND CONTROL CONDUIT WITH THE ELECTRICAL 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 2022 CALIFORNIA MECHANICAL CODE.
10. ALL EXHAUST FANS SHALL BE EQUIPPED 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 CALIFORNIA MECHANICAL CODE. DUCTS NOT REQUIRING DAMPERS SHALL COMPLY WITH SECTION 714 & 717 OF THE 2022 CALIFORNIA BUILDING CODE.
12. INSTALL SMOKE DETECTORS AND PROVIDE FOR SMOKE DETECTION AND AUTOMATIC SHUT-OFF OF ALL AIR HANDLING EQUIPMENT IN ACCORDANCE WITH SECTION 606 OF THE 2022 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 ELECTRICAL CONTRACTOR UNLESS NOTED 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 THEIR 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		
		DUCT WORK (WIDTHxDEPTH)
		LINED DUCT WORK (WIDTHxDEPTH DIMENSIONS ARE FOR I.D.)
		SUPPLY DUCT, SECTION
		RETURN DUCT, SECTION
		EXHAUST DUCT, SECTION
		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.	DOOR LOUVER
	U.C.	UNDER CUT DOOR
	VAV	VARIABLE AIR VOLUME
		THERMOSTAT
		DUCT SMOKE DETECTOR
	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.

SHEET TAG	TITLE	SCALE
M 0.00	MECH GENERAL NOTES AND SPECIFICATIONS.	NTS
M 0.01	MECHANICAL CODE CHECKING.	NTS
M 1.01	MAIN FLOOR - MECHANICAL LAYOUT.	3/8"=1'-0"
M 1.02	SECOND FLOOR - MECHANICAL LAYOUT.	3/8"=1'-0"
M 2.01	MECHANICAL EQUIPMENT SCHEDULE.	NTS
M 3.01	HEAT LOADS CALCULATIONS 01	NTS
M 3.02	HEAT LOADS CALCULATIONS 02	NTS
M 4.01	MECHANICAL EQUIPMENT DATA SHEETS 01	NTS
M 4.02	MECHANICAL EQUIPMENT DATA SHEETS 02	NTS
M 5.01	MECHANICAL GENERAL DETAILS.	NTS

REV.

CALIFORNIA MECHANICAL CODE CHECKING:

DUCT SIZING, THICKNESS & INSULATION

PLEASE REFER TO TABLE 506.2(1) FOR MINIMUM SHEET 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 (0.5m²) need not exceed R-2; those 5 square feet (0.5m²) 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.m²)] 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 1/8 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	3/4
21 – 40	1
41 – 90	1 1/4
91 – 125	1 1/2
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 1/4 of an inch (6.4 mm) openings, and shall have not more than 1/2 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 1/4 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 abutting public way, sidewalk, street, alley, or driveway.

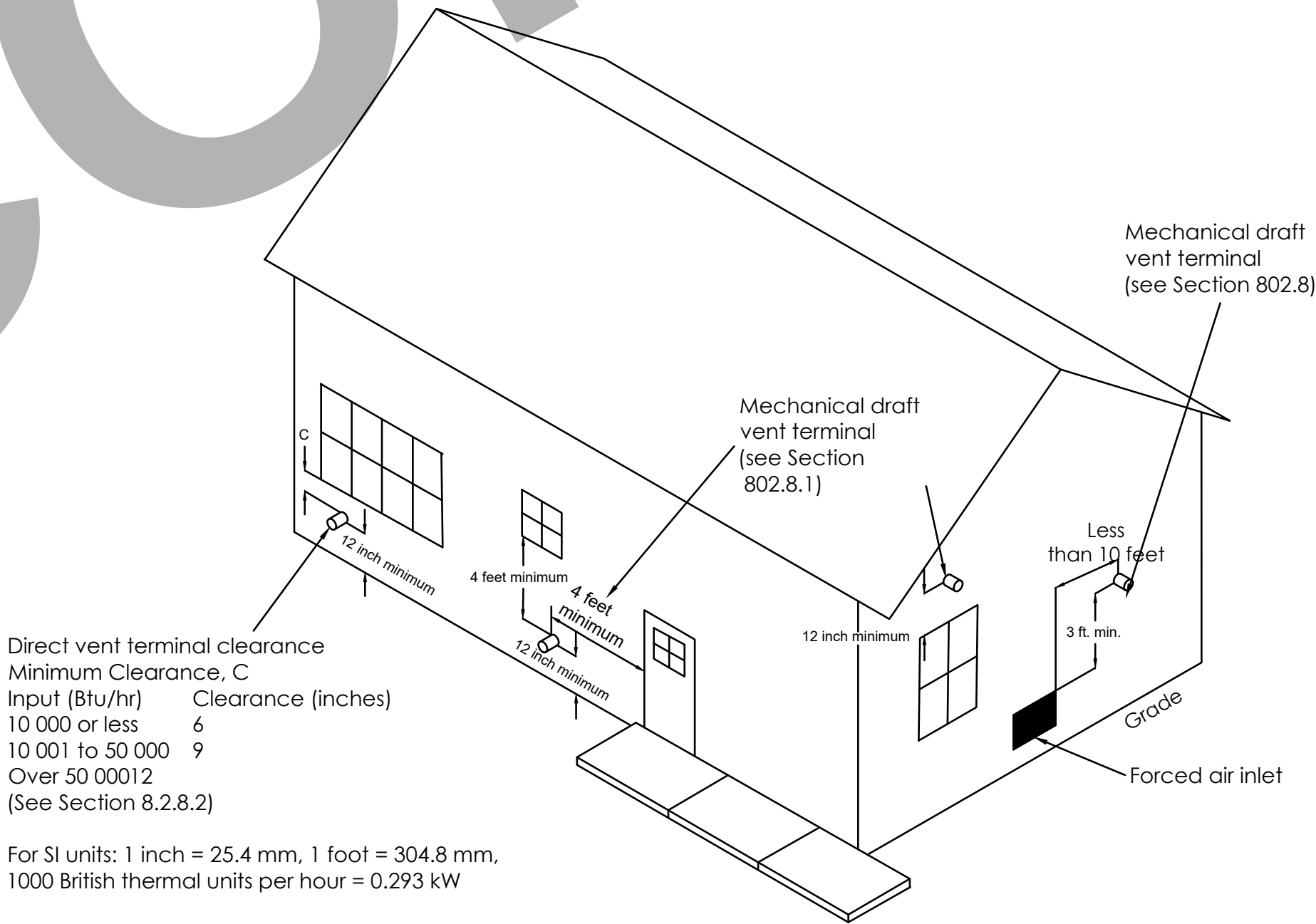


FIGURE 802.8
EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS
[NFPA 54: FIGURE A.12.9]

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 1/4 of an inch (6.4 mm) openings, and shall have not more than 1/2 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 m²) 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 m²) 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-controlling 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]

FACTORY-MADE AIR DUCTS

FACTORY-MADE AIR DUCTS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181 AND INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING. THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE.

FACTORY-MADE AIR DUCTS SHALL NOT BE USED FOR VERTICAL RISERS IN AIR-DUCT SYSTEMS SERVING MORE THAN TWO STORIES AND SHALL NOT PENETRATE A FIRE-RESISTANCE-RATED ASSEMBLY OR CONSTRUCTION.

FACTORY-MADE AIR DUCTS SHALL BE INSTALLED WITH NOT LESS THAN 4 INCHES (102 MM) OF SEPARATION FROM EARTH, EXCEPT WHERE INSTALLED AS A LINER INSIDE OF CONCRETE, TILE, OR METAL PIPE AND SHALL BE PROTECTED FROM PHYSICAL DAMAGE.

THE TEMPERATURE OF THE AIR TO BE CONVEYED IN A DUCT SHALL NOT EXCEED 250°F (121° C). FLEXIBLE AIR CONNECTORS SHALL NOT BE PERMITTED.

RECTANGULAR DUCTS

SUPPORTS FOR RECTANGULAR DUCTS SHALL BE INSTALLED ON TWO OPPOSITE SIDES OF EACH DUCT AND SHALL BE RIVETED, BOLTED, OR METAL SCREWED TO EACH SIDE OF THE DUCT AT INTERVALS SPECIFIED.

METAL DUCTS

DUCTS SHALL BE SUPPORTED AT EACH CHANGE OF DIRECTION AND IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE. RISER DUCTS SHALL BE HELD IN PLACE BY MEANS OF METAL STRAPS OR ANGLES AND CHANNELS TO SECURE THE RISER TO THE STRUCTURE.

METAL DUCTS SHALL BE INSTALLED WITH NOT LESS THAN 4 INCHES (102 MM) SEPARATION FROM EARTH. DUCTS SHALL BE INSTALLED IN A BUILDING WITH CLEARANCES THAT WILL RETAIN THE FULL THICKNESS OF FIRE-PROOFING ON STRUCTURAL MEMBERS.

COMBUSTIBLES WITHIN DUCTS OR PLENUMS

MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NONCOMBUSTIBLE 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.

EXCEPTIONS:

- 1. RETURN-AIR AND OUTSIDE-AIR DUCTS, PLENUMS, OR CONCEALED SPACES THAT SERVE A DWELLING UNIT.
- 2. AIR FILTERS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 311.2.
- 3. WATER EVAPORATION MEDIA IN AN EVAPORATIVE COOLER.
- 4. CHARCOAL FILTERS WHERE PROTECTED WITH AN APPROVED FIRE SUPPRESSION SYSTEM.
- 5. PRODUCTS LISTED AND LABELED FOR INSTALLATION WITHIN PLENUMS IN ACCORDANCE WITH SECTION 602.2.1 THROUGH SECTION 602.2.3.
- 6. SMOKE DETECTORS.
- 7. DUCT INSULATION, COVERINGS, AND LININGS AND OTHER SUPPLEMENTARY MATERIALS INSTALLED IN ACCORDANCE WITH SECTION 604.0.
- 8. MATERIALS IN A HAZARDOUS FABRICATION AREA INCLUDING THE AREAS ABOVE AND BELOW THE FABRICATION AREA SHARING A COMMON AIR RECIRCULATION PATH WITH THE FABRICATION AREA.

NOTES ON DUCTS MATERIAL & CONSTRUCTION:

FLEXIBLE AIR DUCTS

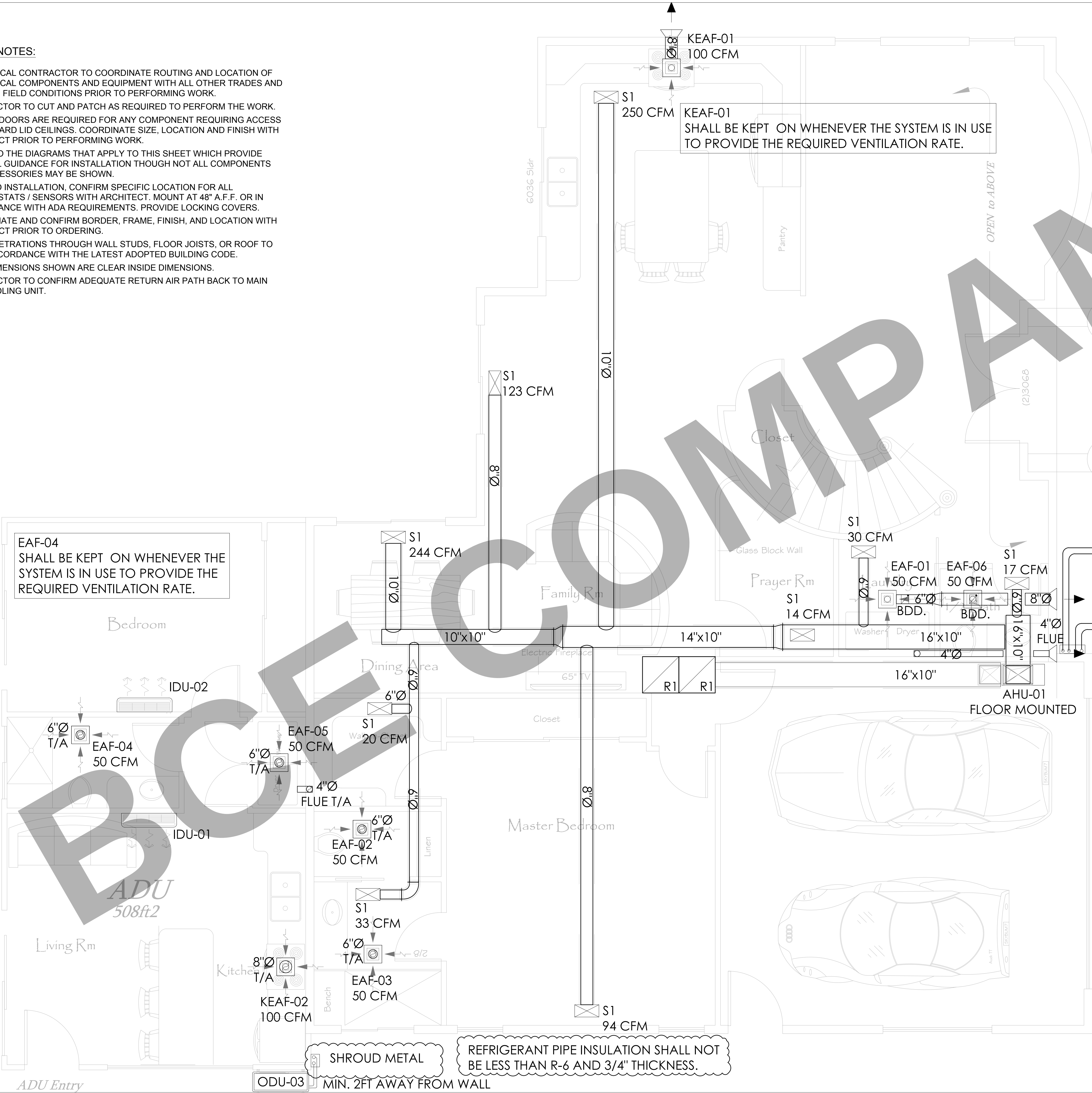
FLEXIBLE AIR DUCTS SHALL COMPLY WITH UL 181, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE.

FLEXIBLE AIR DUCT INSTALLATIONS SHALL COMPLY WITH THE FOLLOWING:

- 1. DUCTS SHALL BE INSTALLED USING THE MINIMUM REQUIRED LENGTH TO MAKE THE CONNECTION.
- 2. HORIZONTAL DUCT RUNS SHALL BE SUPPORTED AT NOT MORE THAN 4 FEET (1219 MM) INTERVALS.
- 3. VERTICAL RISERS SHALL BE SUPPORTED AT NOT MORE THAN 6 FEET (1829 MM) INTERVALS.
- 4. SAG BETWEEN SUPPORT HANGERS SHALL NOT EXCEED 1/2 INCH (12.7 MM) PER FOOT (305 MM) OF SUPPORT SPACING.
- 5. SUPPORTS SHALL BE RIGID AND SHALL BE NOT LESS THAN 1 1/2 INCHES (38 MM) WIDE AT POINT OF CONTACT WITH THE DUCT SURFACE.
- 6. DUCT BENDS SHALL BE NOT LESS THAN ONE DUCT DIAMETER BEND RADIUS.
- 7. SCREWS SHALL NOT PENETRATE THE INNER LINER OF NON-METALLIC FLEXIBLE DUCTS UNLESS PERMITTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 8. FITTINGS FOR ATTACHING NON-METALLIC DUCTS SHALL BE BEADED AND HAVE A COLLAR LENGTH OF NOT LESS THAN 2 INCHES (51 MM) FOR ATTACHING THE DUCT.
- EXCEPTION: A BEAD SHALL NOT BE REQUIRED WHERE METAL WORM-GEAR CLAMPS ARE USED OR WHERE ATTACHING METALLIC DUCTS USING SCREWS IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 9. DUCT INNER LINER SHALL BE INSTALLED AT NOT LESS THAN 1 INCH (25.4 MM) ON THE COLLAR AND PAST THE BEAD PRIOR TO THE APPLICATION OF THE TAPE AND MECHANICAL FASTENER. WHERE MASTIC IS USED INSTEAD OF TAPE, THE MASTIC SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- 10. DUCT OUTER VAPOR BARRIERS SHALL BE SECURED USING TWO WRAPS OF APPROVED TAPE. A MECHANICAL FASTENER SHALL BE PERMITTED TO BE USED IN PLACE OF, OR IN COMBINATION WITH, THE TAPE.
- 11. FLEXIBLE AIR DUCTS SHALL NOT PENETRATE A FIRE-RESISTANCE-RATED ASSEMBLY OR CONSTRUCTION.
- 12. THE TEMPERATURE OF THE AIR TO BE CONVEYED IN A FLEXIBLE AIR DUCT SHALL NOT EXCEED 250°F (121° C).
- 13. FLEXIBLE AIR DUCTS SHALL BE SEALED IN ACCORDANCE WITH SECTION 603.10.

GENERAL NOTES:

- MECHANICAL CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF MECHANICAL COMPONENTS AND EQUIPMENT WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS PRIOR TO PERFORMING WORK.
- CONTRACTOR TO CUT AND PATCH AS REQUIRED TO PERFORM THE WORK.
- ACCESS DOORS ARE REQUIRED FOR ANY COMPONENT REQUIRING ACCESS ABOVE HARD LID CEILINGS. COORDINATE SIZE, LOCATION AND FINISH WITH ARCHITECT PRIOR TO PERFORMING WORK.
- REFER TO THE DIAGRAMS THAT APPLY TO THIS SHEET WHICH PROVIDE GENERAL GUIDANCE FOR INSTALLATION THOUGH NOT ALL COMPONENTS AND ACCESSORIES MAY BE SHOWN.
- 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.
- COORDINATE AND CONFIRM BORDER, FRAME, FINISH, AND LOCATION WITH ARCHITECT PRIOR TO ORDERING.
- ANY PENETRATIONS THROUGH WALL STUDS, FLOOR JOISTS, OR ROOF TO BE IN ACCORDANCE WITH THE LATEST ADOPTED BUILDING CODE.
- DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
- CONTRACTOR TO CONFIRM ADEQUATE RETURN AIR PATH BACK TO MAIN AIR HANDLING UNIT.



166

CLIENT:

ADDRESS:

33758 Mello Way
4555
96

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- THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

ENGINEER
3
11/11/2023

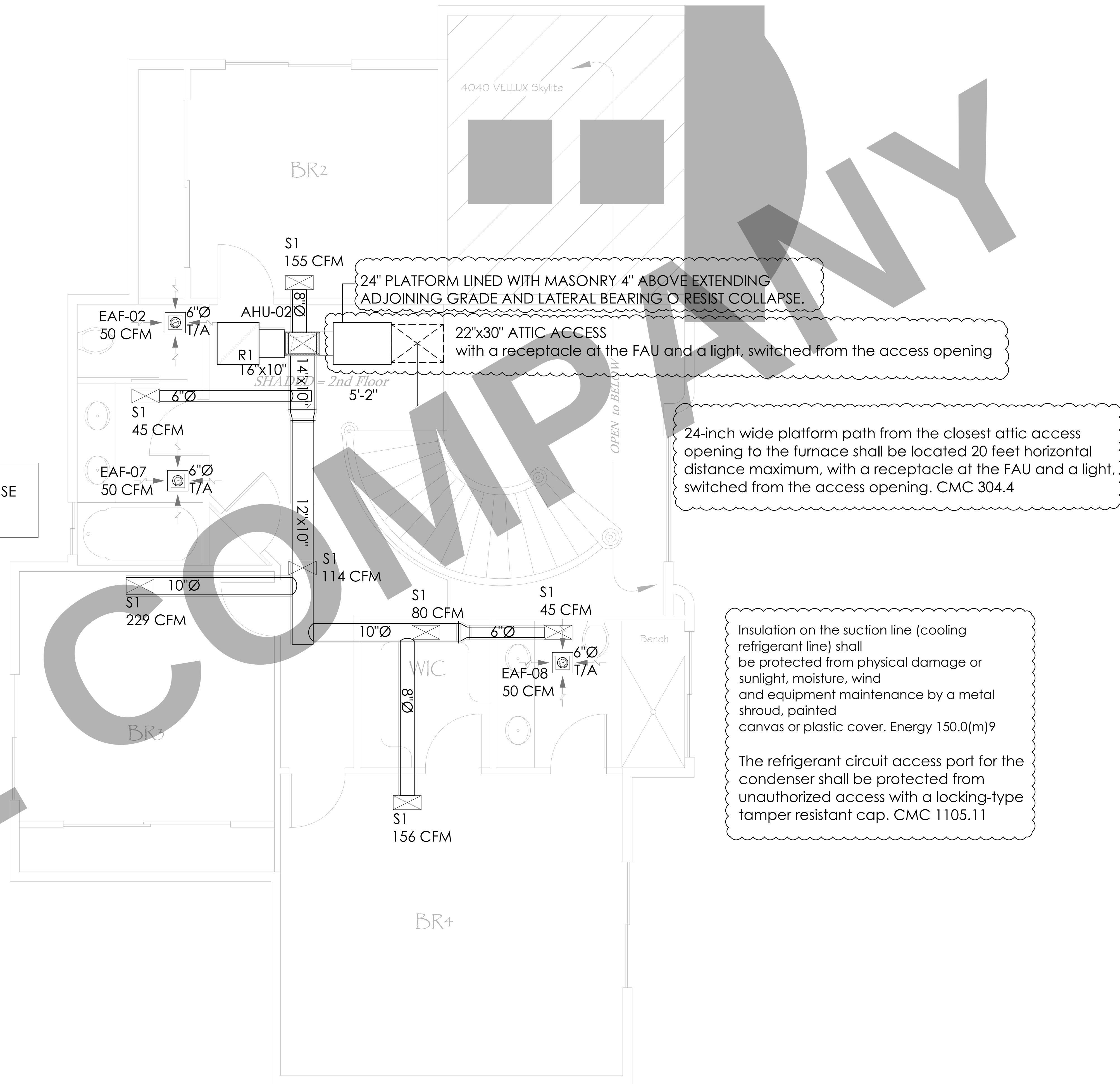
REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

(Father/Son)

TITLE:
**FIRST FLOOR
MECHANICAL LAYOUT.**

PROJ. NO.	PROJ. ENGR.	SCALE @ 24x36: 3/8"=1'-0"	DRAWING NO. M 1 . 0 1	REV. 01
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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.



The refrigerant circuit access port for the condenser shall be protected from unauthorized access with a locking-type tamper resistant cap. CMC 1105.11

:(ol (Father/Son)		
TITLE: SECOND FLOOR MECHANICAL LAYOUT.		
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
DRAWING NO. M 1 . 0 2		REV. 01

SCHEDULE No. 1
HEAT PUMP - INDOOR & OUTDOOR UNIT

TAG	AHU-1,2 & ODU-1,2
SERVING	LEVELS 1 ,2
MANUFACTURER	GOODMAN
INDOOR MODEL	ASPT 25B14*
POWER SUPPLY	208/1/60
INDOOR UNIT MCA (A)	5.8
INDOOR UNIT MOCp (A)	15
AIR FLOW (CFM) - S2-1 "ON" S2-2 "ON"	824.0
EXTERNAL STATIC PRESSURE (INCHES OF WATER)	0.30
COOLING CAPACITY (BTU/H)	24,000
HEATING CAPACITY (BTU/H)	24,000
OUTDOOR MODEL	FSZ140241K*
POWER SUPPLY	208 / 1 / 60
OUTDOOR UNIT MCA (A)	14.6
OUTDOOR UNIT MOP (A)	25.0

NOTES:

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

SCHEDULE No. 4
MULTIZONE - INDOOR UNIT

TAG	IDU-01	IDU-02
SERVING	ADU-LIVING & KITCHEN	ADU-BEDROOM
MANUFACTURER	MITSUBISHI	MITSUBISHI
INDOOR MODEL	MSZ-FS12NA	MSZ-FS09NA
POWER SUPPLY	208/230/1/60	208/230/1/60
POWER (W)	870	560
NOMINAL CAPACITY (BTU/H)	12,000	9,000
AIR FLOW RATE (CFM) - MED SPEED	190	190

AS PER 2022 CEnc, RESIDENTILA VENTILATION REQUIREMENT	
-	O/A = 0.03 x A + 7.5 x (# BR. + 1)
* MAIN FLOOR: (AHU-01)	
-	A = 1,620 FT2
-	# BED ROOMS: 1
-	O/A = 0.03 x 1620 + 7.5 x (1+1) = 63.6 CFM
* SECOND FLOOR (AHU-02):	
-	A = 995 FT2
-	# BED ROOMS: 3
-	O/A = 0.03 x 995 + 7.5 (3+1) = 59.9 CFM
* ADU (ODU-03)	
-	A = 495 FT2
-	# BED ROOMS: 1
-	O/A = 0.03 x 495 + 7.5 x (1+1) = 29.9 CFM

SCHEDULE No. 2
AIR OUTLETS

TAG	DESCRIPTION	MANUFACTURER	MODEL	MOUNTING
S1	SUPPLY DIFFUSER	TITUS	16in. x 8in.	Duct Mounted
R1	RETURN DIFFUSER	TITUS	24in. x 24in.	Duct Mounted

NOTES:

1. COORDINATE FINISH, COLOR, BORDER AND EXACT LOCATION WITH OWNER PRIOR TO ORDERING.
2. PROVIDE OPPOSED BLADE DAMPER ACCESSIBLE THROUGH DIFFUSER FACE FOR GYP BD. CEILING INSTALLATIONS.
3. PROVIDE DUCT TRANSITIONS AS REQUIRED.
4. RETURNS R1 ARE PROVIDED WITH PROPER FILTERS.

SCHEDULE No. 3
FAN SCHEDULE

TAG	EAF-01 TO EAF-08	KEAF-01 & KEAF-02
LOCATION	BATHROOM 2 & LANDRY	KITCHEN & ADU KITCHEN
SELECTED FLOW (CFM)	50	100
SELECTED PRESSURE DROP (IN. H2O)	0.25"	0.25"
ELECTRICAL (V / PH / HZ)	120 / 1 / 60	120 / 1 / 60
POWER / Amps	25 W	25 W
MOTOR SPEED (RPS)	MULTI SPEED	MULTI SPEED
FAN TYPE	CEILING FANS	CEILING FANS
MANUFACTURER	PANASONIC	PANASONIC
MODEL	WHISPER FV-0511VKS2	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. 5
MULTIZONE - OUTDOOR UNIT

TAG	ODU-03
SERVING	ADU
MANUFACTURER	MITSUBISHI
INDOOR MODEL	MSZ-FS12NA MSZ-FS09NA
POWER SUPPLY	230/1/60
MAXIMUM CURRENT (A)	22.1
MOP (A)	25.0
NOMINAL CAPACITY (BTU/HR)	36,000

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ADDRESS:

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ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**MECHANICAL EQUIPMENT
SCHEDULE & VENTILATION.**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO.
M 2 . 0 1

REV.
01



Manual S Compliance Report AHU-01

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Cooling Equipment

Design Conditions

Outdoor design DB:	85.0°F	Sensible gain:	12685 Btuh	Entering coil DB:	75.0°F
Outdoor design WB:	65.0°F	Latent gain:	460 Btuh	Entering coil WB:	62.5°F
Indoor design DB:	75.0°F	Total gain:	13145 Btuh		
Indoor RH:	50%	Estimated airflow:	544 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC	Model:	SEER 14.0
Manufacturer:	Generic		
Actual airflow:	544 cfm		
Sensible capacity:	11416 Btuh	90% of load	
Latent capacity:	4893 Btuh	1063% of load	
Total capacity:	16309 Btuh	124% of load	SHR: 70%

Heating Equipment

Design Conditions

Outdoor design DB:	33.0°F	Heat loss:	15170 Btuh	Entering coil DB:	68.0°F
Indoor design DB:	68.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas furnace	Model:	AFUE 81
Manufacturer:	Generic		
Actual airflow:	544 cfm		
Output capacity:	15170 Btuh	100% of load	Temp. rise: 50 °F

Meets all requirements of ACCA Manual S.



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Manual S Compliance Report AHU-02

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Cooling Equipment

Design Conditions

Outdoor design DB:	85.0°F	Sensible gain:	8070 Btuh	Entering coil DB:	75.0°F
Outdoor design WB:	65.0°F	Latent gain:	503 Btuh	Entering coil WB:	62.5°F
Indoor design DB:	75.0°F	Total gain:	8573 Btuh		
Indoor RH:	50%	Estimated airflow:	346 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC	Model:	SEER 14.0
Manufacturer:	Generic		
Actual airflow:	346 cfm		
Sensible capacity:	7263 Btuh	90% of load	
Latent capacity:	3113 Btuh	619% of load	
Total capacity:	10376 Btuh	121% of load	SHR: 70%

Heating Equipment

Design Conditions

Outdoor design DB:	33.0°F	Heat loss:	7437 Btuh	Entering coil DB:	68.0°F
Indoor design DB:	68.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas furnace	Model:	AFUE 81
Manufacturer:	Generic		
Actual airflow:	346 cfm		
Output capacity:	7437 Btuh	100% of load	Temp. rise: 50 °F

Meets all requirements of ACCA Manual S.



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Manual S Compliance Report ODU-03

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Cooling Equipment

Design Conditions

Outdoor design DB:	85.0°F	Sensible gain:	9839 Btuh	Entering coil DB:	75.0°F
Outdoor design WB:	65.0°F	Latent gain:	350 Btuh	Entering coil WB:	62.5°F
Indoor design DB:	75.0°F	Total gain:	10188 Btuh		
Indoor RH:	50%	Estimated airflow:	500 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP	Model:	SEER 14.0, HSPF 8.1
Manufacturer:	Generic		
Actual airflow:	500 cfm		
Sensible capacity:	10500 Btuh	107% of load	
Latent capacity:	4500 Btuh	1287% of load	
Total capacity:	15000 Btuh	147% of load	SHR: 70%

Heating Equipment

Design Conditions

Outdoor design DB:	33.0°F	Heat loss:	6893 Btuh	Entering coil DB:	68.0°F
Indoor design DB:	68.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP	Model:	SEER 14.0, HSPF 8.1
Manufacturer:	Generic		
Actual airflow:	500 cfm		
Output capacity:	14825 Btuh	217% of load	Capacity balance: 3.9 °F
Supplemental heat required:	0 Btuh		Economic balance: -99 °F

Meets all requirements of ACCA Manual S.



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AED Assessment AHU-02

Job:
Date: Jan 04, 2023
By:

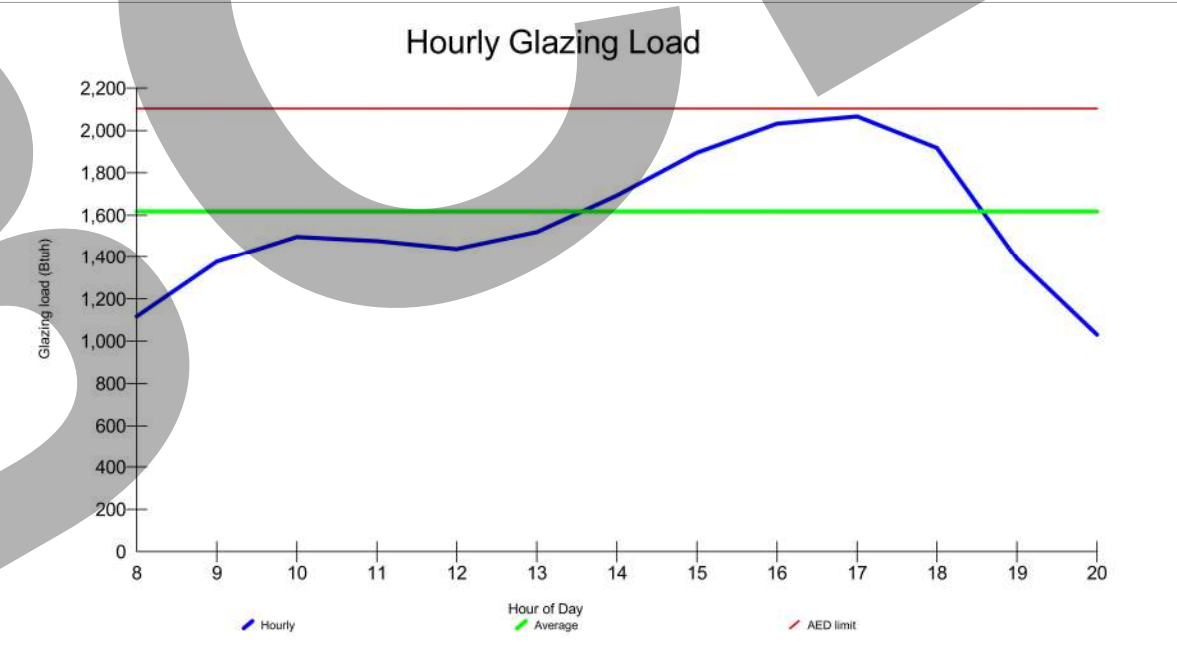
Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Design Conditions

Location: Fremont, CA, US Elevation: 56 ft Latitude: 38°N	Indoor: Indoor temperature (°F) Design TD (°F) Relative humidity (%) Moisture difference (gr/lb)	Heating 88 35 50 28.9	Cooling 75 10 50 -4.3
Outdoor: Dry bulb (°F) Daily range (°F) Wet bulb (°F) Wind speed (mph)	Heating 33 - 65 15.0	Cooling 85 24 (M) 65 7.5	Infiltration:

Test for Adequate Exposure Diversity



Maximum hourly glazing load exceeds average by 27.7%.

Zone has adequate exposure diversity (AED), based on AED limit of 30%.

AED excursion: 0 Btuh



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Load Multizone Summary Report

Job:
Date: Jan 04, 2023
By:

Infiltration Summary

ZONE-NAME	Volume ft³	Heating				Cooling			
		ACH	AVF cfm	HTM Btuh/ft³		ACH	AVF cfm	HTM Btuh/ft³	
AHU-01	17926	0.31	94	2.2		17926	0.16	48	0.3
ODU-03	4455	0.46	34	2.2		4455	0.23	17	0.3
AHU-02	8953	0.44	65	2.2		8953	0.22	33	0.3
Entire House	31334	0.37	193	2.2		31334	0.19	99	0.3

Load and AVF Summary

ROOM NAME	Area ft²	Htg load Btuh	Clg load Btuh	Htg AVF cfm	Clg AVF cfm
M. Bath	90	824	506	30	22
M. Bedroom	318	1600	1756	57	75
1/2 Bath	30	401	252	14	11
Dining Family	415	2797	3745	100	161
Din.Kitch	203	2629	3839	94	165
Prayer Room	65	0	218	0	9
Laundry	42	0	475	0	20
Open T/A	457	6919	1894	248	81
AHU-01	1620	15170	12685	544	544
ADU Living Kitch.	231	3468	4735	252	241
ADU Bath	52	606	796	44	40
ADU Bedroom	173	2774	3808	201	194
Utility	39	46	500	3	25
ODU-03	495	6893	9839	500	500
Bedroom 2	165	1536	1510	71	65
Bedroom 3	181	1730	2240	80	96
Bedroom 4	304	2410	2178	112	93
Bathroom	78	858	722	40	31
Bath RM	71	672	583	31	25
Lobby	196	233	838	11	36
AHU-02	995	7437	8070	346	346
Entire House	3110	29500	30556	1390	1390



Right-Sub® Universal 2022 22.0.05 RSL02812
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2023-Jan-04 17:03:01
Page 1



AED Assessment AHU-01

Job:
Date: Jan 04, 2023
By:

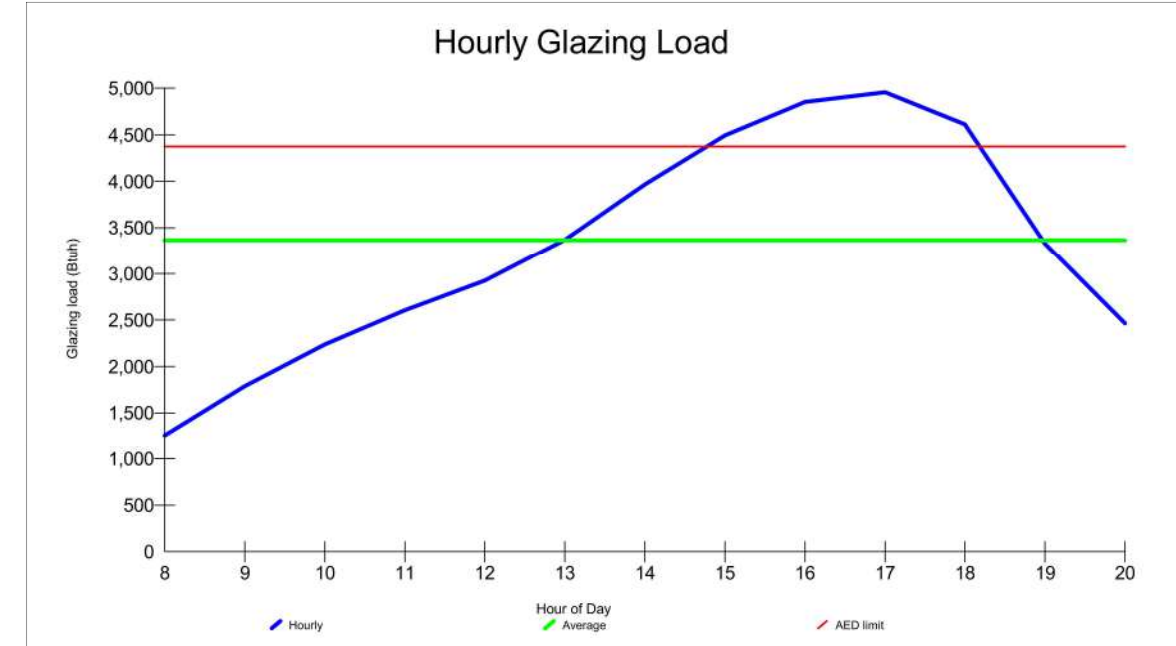
Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Design Conditions

Location: Fremont, CA, US Elevation: 56 ft Latitude: 38°N	Indoor: Indoor temperature (°F) Design TD (°F) Relative humidity (%) Moisture difference (gr/lb)	Heating 88 35 50 28.9	Cooling 75 10 50 -4.3
Outdoor: Dry bulb (°F) Daily range (°F) Wet bulb (°F) Wind speed (mph)	Heating 33 - 65 15.0	Cooling 85 24 (M) 65 7.5	Infiltration:

Test for Adequate Exposure Diversity



Maximum hourly glazing load exceeds average by 47.2%.

Zone does not have adequate exposure diversity (AED), based on AED limit of 30%.

AED excursion: 580 Btuh (PFG - 1.3*AFG)



Right-Sub® Universal 2022 22.0.05 RSL02812
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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**MECHANICAL HEAT
LOADS CALCULATIONS 01**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO.

M 3 . 0 1

REV.

01



AED Assessment
ODU-03

Job:
Date: Jan 04, 2023
By:

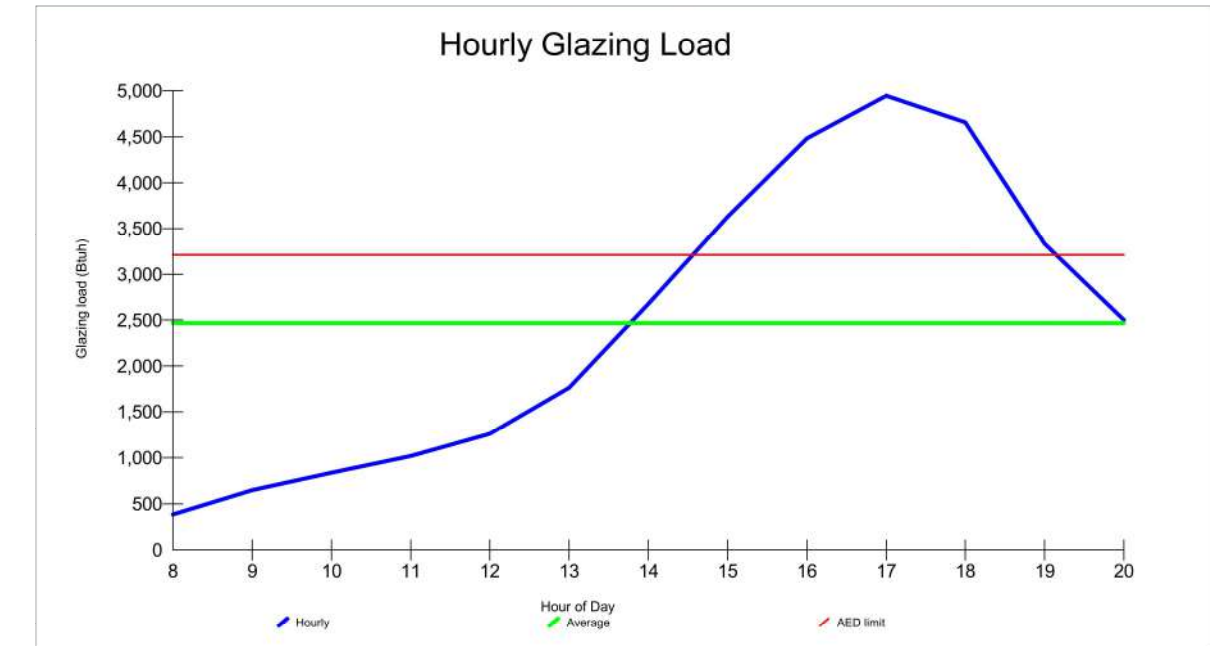
Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

Design Conditions

Location: Fremont, CA, US Elevation: 56 ft Latitude: 38°N		Indoor: Indoor temperature (°F) 68 Design TD (°F) 35 Relative humidity (%) 50 Moisture difference (grlb) 28.9		Heating 68 35 50 28.9	Cooling 75 10 50 -4.3
Outdoor: Dry bulb (°F) 33 Daily range (°F) - Wet bulb (°F) 65 Wind speed (mph) 15.0		Heating 85 24 (M) 65 7.5		Cooling 24 (M) 65 7.5	
		Infiltration:			

Test for Adequate Exposure Diversity



Maximum hourly glazing load exceeds average by 100.2%.

Zone does not have adequate exposure diversity (AED), based on AED limit of 30%.

AED excursion: 1734 Btu/h (PFG - 1.3°AFG)



Right-Side Universal 2022 22.0.05 RSL02812
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2023-Jan-04 17:03:01
Page 4



Duct System Summary
AHU-01

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

		Heating	Cooling
External static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Pressure losses		0 in H ₂ O	0 in H ₂ O
Available static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Supply / return available pressure		0.150 / 0.150 in H ₂ O	0.150 / 0.150 in H ₂ O
Lowest friction rate		0 in/100ft	0 in/100ft
Actual air flow		544 cfm	544 cfm
Total effective length (TEL)		0 ft	

Supply Branch Detail Table

Name	Design (Btu/h)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
1/2 Bath	h 252	14	11	0	0	0x 0	MIFx	0	0	
Dir/Kitchen	c 3839	94	165	0	0	0x 0	MIFx	0	0	
Dining Family	c 3745	100	161	0	0	0x 0	MIFx	0	0	
Laundry	c 475	0	20	0	0	0x 0	MIFx	0	0	
M. Bath	h 506	30	22	0	0	0x 0	MIFx	0	0	
M. Bedroom	c 1756	57	75	0	0	0x 0	MIFx	0	0	
Open T/A	h 1894	248	81	0	0	0x 0	MIFx	0	0	
Prayer Room	c 218	0	9	0	0	0x 0	MIFx	0	0	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb1	0x 0	544	544	0	0	0	0	0x 0		MIFx	



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Page 1



Duct System Summary
AHU-02

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

		Heating	Cooling
External static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Pressure losses		0 in H ₂ O	0 in H ₂ O
Available static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Supply / return available pressure		0.150 / 0.150 in H ₂ O	0.150 / 0.150 in H ₂ O
Lowest friction rate		0 in/100ft	0 in/100ft
Actual air flow		346 cfm	346 cfm
Total effective length (TEL)		0 ft	

Supply Branch Detail Table

Name	Design (Btu/h)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Bath RM	h 583	31	25	0	0	0x 0	MIFx	0	0	
Bedroom	h 722	40	31	0	0	0x 0	MIFx	0	0	
Bedroom 2	h 1510	71	65	0	0	0x 0	MIFx	0	0	
Bedroom 3	c 2240	80	96	0	0	0x 0	MIFx	0	0	
Bedroom 4	h 2178	112	93	0	0	0x 0	MIFx	0	0	
Lobby	c 838	11	36	0	0	0x 0	MIFx	0	0	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb3	0x 0	346	346	0	0	0	0	0x 0		MIFx	



Right-Side Universal 2022 22.0.05 RSL02812
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Page 2



Duct System Summary
ODU-03

Job:
Date: Jan 04, 2023
By:

Project Information

For: Avatar Aman Deol (Father/Son), Innodez
33758 Mello Way, Fremont, CA 94555

		Heating	Cooling
External static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Pressure losses		0 in H ₂ O	0 in H ₂ O
Available static pressure		0.30 in H ₂ O	0.30 in H ₂ O
Supply / return available pressure		0.150 / 0.150 in H ₂ O	0.150 / 0.150 in H ₂ O
Lowest friction rate		0 in/100ft	0 in/100ft
Actual air flow		500 cfm	500 cfm
Total effective length (TEL)		0 ft	

Supply Branch Detail Table

Name	Design (Btu/h)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
ADU Bath	h 796	44	40	0	0	0x 0	MIFx	0	0	
ADU Bedroom	h 3808	201	194	0	0	0x 0	MIFx	0	0	
ADU Living Kitchen	h 2368	126	120	0	0	0x 0	MIFx	0	0	
ADU Living Kitchen-A	h 2368	126	120	0	0	0x 0	MIFx	0	0	
Utility	c 500	3	25	0	0	0x 0	MIFx	0	0	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb2	0x 0	500	500	0	0	0	0	0x 0		MIFx	



Right-Side Universal 2022 22.0.05 RSL02812
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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**MECHANICAL HEAT
LOADS CALCULATIONS 2**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO.

M 3 . 0 2

REV.

01

Panasonic

WhisperGreen® Select™ Connected Ventilation Fans

WhisperGreen® Select™
Ventilation Fans

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

Fan/Light Models: FV-0511VKL2,
FV-0511VKS2, 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 0.32" to 0.375"

reinventingventing.com



MXZ-C Model

INVERTER-driven Multi-zone Heat Pump

Type	Up to 2 indoor units	Up to 3 indoor units	Up to 4 indoor units	Up to 5 indoor units	Up to 8 indoor units
Outdoor Unit	MXZ-2C09A2	MXZ-3C24A2	MXZ-3C30A2	MXZ-4C36A2	MXZ-8C48A2
Branch Box Required	No	No	No	No	No
Power Supply	1-phase, 60Hz, 208/230V	1-phase, 60Hz, 208/230V	1-phase, 60Hz, 208/230V	1-phase, 60Hz, 208/230V	1-phase, 60Hz, 208/230V
Cooling Capacity	18,000	22,000	28,000	35,000	45,000
Heating Capacity	22,000	25,000	28,000	35,000	45,000
Dimensions	33-1/16 (840)	37-13/32 (950)	37-13/32 (950)	41-11/32 (1,050)	41-11/32 (1,050)
Weight	125.8 (35)	137.6 (39)	137.6 (39)	189.8 (54)	271.1 (76)
Sound Level	48 (A)	51 (A)	51 (A)	54 (A)	59 (A)
Piping	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	3/8 (9.52)
Height	14 - 115°FDB	14 - 115°FDB	14 - 115°FDB	14 - 115°FDB	23 - 115°FDB
Guaranteed Operation Range	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB

NOTE:
Test conditions are based on AHRI 210/240.
*1 Rating Conditions (Cooling) - Indoor: 80°F DB, 67°F WB, Outdoor: 95°F DB, (75°F WB) (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 47°F DB, 43°F WB
*2 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB
*3 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB
*5 T DB - 115°F DB when optional wind baffles are installed

Branch Box

Type	Branch Box
Model Name	PAC-MKA28C PAC-MKA528C
Connectable Number of Indoor Units	Maximum 3 Maximum 5
Power Supply	1-phase, 60Hz, 208/230V
Input Running Current	0.003 A 0.05 A 0.05 A
Dimensions	W (in.) 17.23 (435) 17.23 (435) 17.23 (435) D (in.) 6-11/16 (170) 6-11/16 (170) 6-11/16 (170) H (in.) 15 (6.7) 15 (6.7) 15 (6.7)
Weight	3.8 (9.52) x 3 12 (2.71) x 1 14 (6.35) x 5 5.8 (15.88) 3.8 (9.52)
Piping Connection (flange)	Gas (in.) 3/8 (9.52) x 3 1/4 (6.35) x 5 5/8 (15.88) 3/8 (9.52)

*The piping connection size differs according to the type and capacity of indoor units. Match the piping connection size for indoor and branch box. If the piping connection size of branch box does not match the piping connection size of indoor units, use optional different-diameter (deformed) joints to the branch box side. (Connect deformed joint directly to the branch box side.)

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-0511VKS2: 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-VS1VK1] - 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.



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



Ingenuously 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. Some have also been certified at 0.25" to provide a more realistic, installed value, so they are quiet under pressure and after installation.

MSZ-FS Model



* To confirm compatibility with the MXZ Model multi-zone system, refer to MXZ Model pages.

Indoor Unit	MSZ-FS06A	MSZ-FS09A	MSZ-FS12A	MSZ-FS18A	MSZ-FS24A
Outdoor Unit	MSZ-FC09A	MSZ-FC12A	MSZ-FC18A	MSZ-FC24A	MSZ-FC36A
Cooling Capacity	6,000	9,000	12,000	18,000	24,000
Heating Capacity	9,000	12,000	18,000	24,000	36,000
Dimensions	33-1/16 (840)	37-13/32 (950)	37-13/32 (950)	41-11/32 (1,050)	41-11/32 (1,050)
Weight	125.8 (35)	137.6 (39)	137.6 (39)	189.8 (54)	271.1 (76)
Sound Level	48 (A)	51 (A)	51 (A)	54 (A)	59 (A)
Piping	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	3/8 (9.52)
Height	14 - 115°FDB	14 - 115°FDB	14 - 115°FDB	14 - 115°FDB	23 - 115°FDB
Guaranteed Operation Range	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB	15 - 24°CDB
NOTE:	Test conditions are based on AHRI 210/240.				
*1 Rating Conditions (Cooling) - Indoor: 80°F DB, 67°F WB, Outdoor: 95°F DB, (75°F WB) (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 47°F DB, 43°F WB					
*2 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB					
*3 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB					
*5 T DB - 115°F DB when optional wind baffles are installed					

NOTE:
*1 Rating Conditions (Cooling) - Indoor: 80°F DB, 67°F WB, Outdoor: 95°F DB, (75°F WB) (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 47°F DB, 43°F WB
*2 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB
*3 Rating Conditions (Heating) - Indoor: 70°F DB, 60°F WB, Outdoor: 57°F DB, 15°F WB
*5 T DB - 115°F DB when optional wind baffles are installed

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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE: MECHANICAL EQUIPMENT DATA SHEETS 01

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

M 4 . 0 1

REV.

01



COOLING CAPACITY: 18,000 TO 60,000 BTU/H
HEATING CAPACITY: 18,000 TO 60,000 BTU/H

GSZ14

ENERGY-EFFICIENT
SPLIT SYSTEM HEAT PUMP
UP TO 15 SEER & 9.0 HSPF
1½ TO 5 TONS



Standard Features

- High-efficiency scroll compressor
- SmartShift® technology to ensure quiet reliable defrost
- Factory-installed bi-flow liquid-line filter drier
- Factory-installed suction-line accumulator
- Factory-installed compressor crankcase heater
- Factory-installed high-capacity muffler
- High- and low-pressure switches
- Service valves with sweat connections and easy access to gauge ports
- Copper tube/extended aluminum fin coil
- Fully charged for 15' of tubing length
- Contactor with lug connection
- Ground lug connection
- AHRI Certified; ETL Listed

Cabinet Features

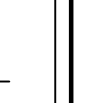
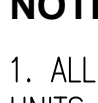
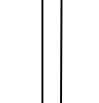
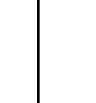
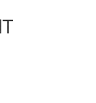
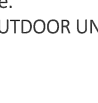
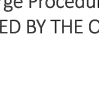
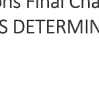
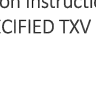
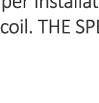
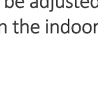
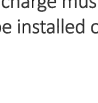
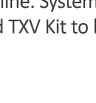
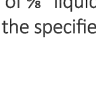
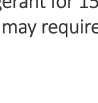
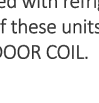
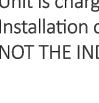
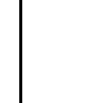
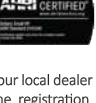
- Goodman® brand sound control top design
- Steel lower coil guard
- Heavy-gauge galvanized-steel cabinet
- Attractive Architectural Gray powder-paint finish with 500-hour salt-spray approval
- Top and side maintenance access
- Service ports and controls are accessible while unit is operating
- When properly anchored, meets the 2017 Florida Building Code unit integrity requirements for hurricane-type winds (Anchor bracket kits available.)



Proper sizing and installation of equipment is critical to achieving optimal performance. Split system air conditioners and heat pumps must be matched with appropriate coil components to meet ENERGY STAR® criteria. Ask your contractor for details or visit www.energystar.gov.



Complete warranty details available from your local dealer or at www.goodmanmfg.com. To receive the 10-Year Parts Limited Warranty, online registration must be completed within 60 days of installation. Online registration is not required in California or Quebec.



Air Conditioning & Heating

ASPT SERIES

MULTI-POSITION, MULTI-SPEED,
ECM-BASED AIR HANDLER
WITH INTERNAL TXV
1½ TO 5 TONS

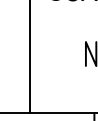
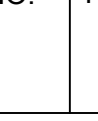


Product Features

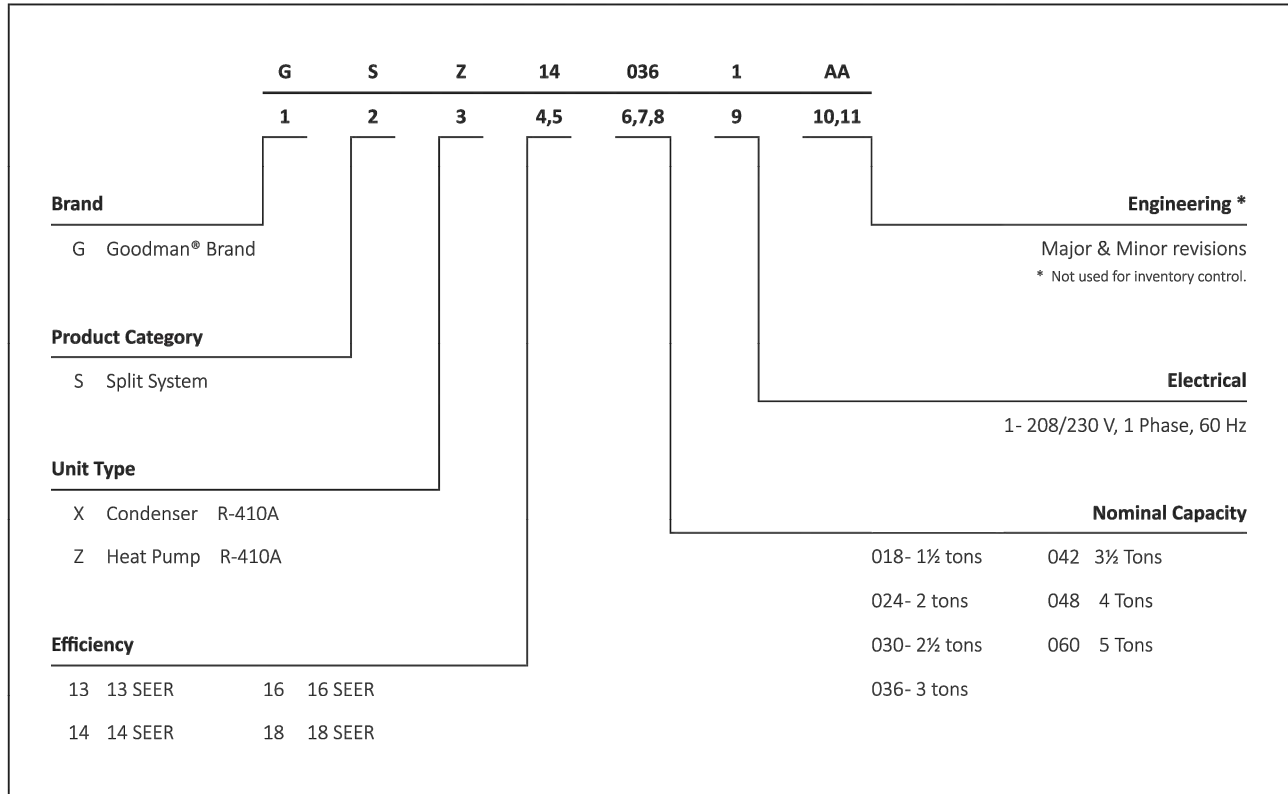
- Internal factory-installed thermal expansion valves for cooling and heat pump applications
- Direct drive, multi-speed ECM blower motor
- All-aluminum evaporator coil
- Coil mounting track for quick repositioning
- Optimized for use with R-410A refrigerant
- Cabinet air leakage less than 2.0% at 1.0 inch H₂O when tested in accordance with ASHRAE standard 193
- Cabinet air leakage less than 1.4% at 0.5 inch H₂O when tested in accordance with ASHRAE standard 193
- AHRI certified; ETL Listed
- Rigid SmartFrame™ cabinet
- Horizontal or vertical configuration capabilities
- 21" depth for easier attic access
- DecaBDE-free thermoplastic drain pan with secondary drain connections
- Screw-less sides and back helps to reduce condensation when installed in humid locations
- Foil-faced insulation covers the internal casing to reduce cabinet condensation
- Galvanized, leather grain-embossed finish
- Glue-less cabinet insulation retention
- Tool-less filter access
- Field Installed 3 kW – 25 kW electric heater kits available



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NOMENCLATURE

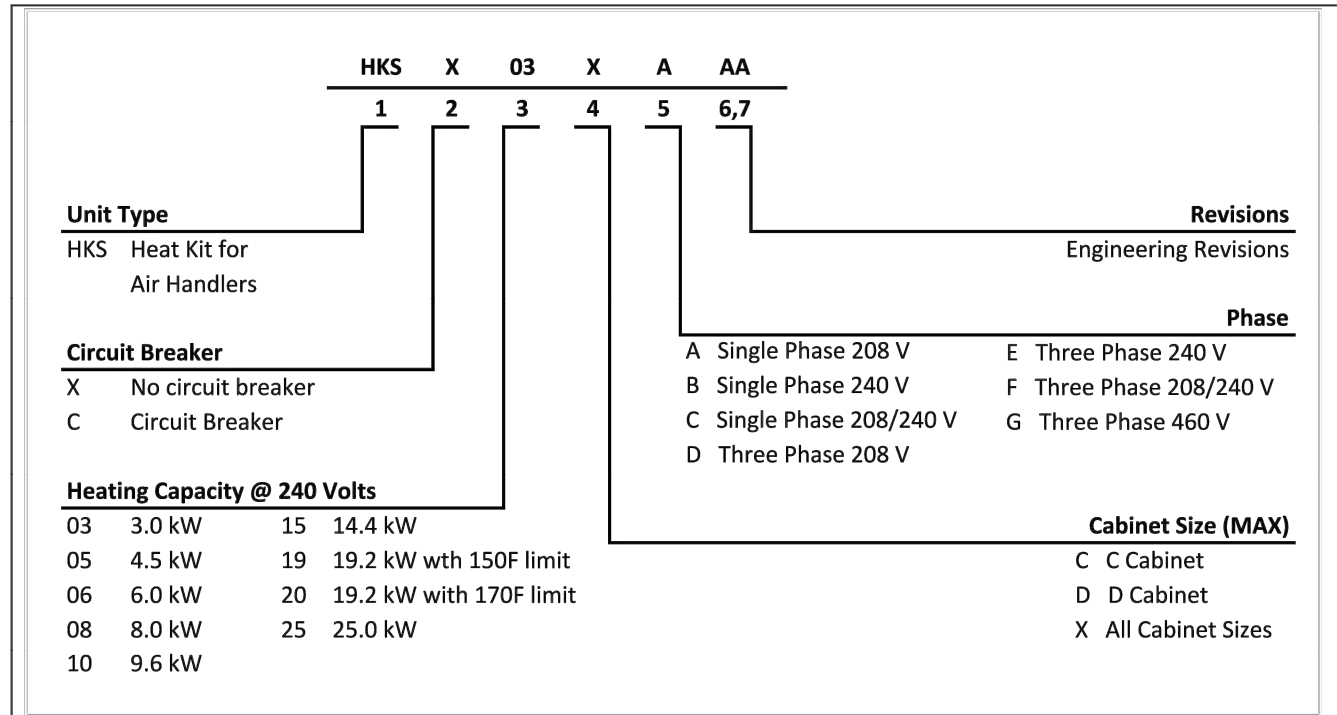
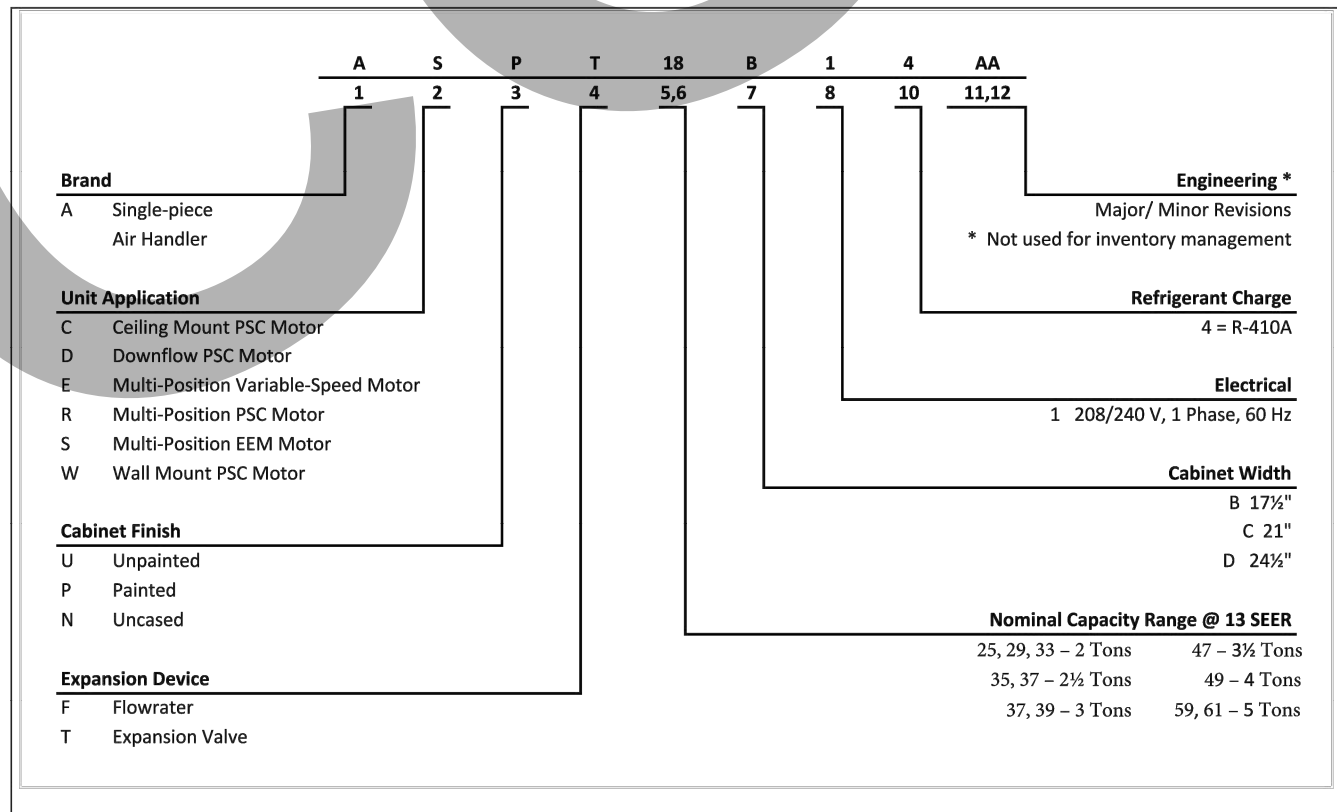


PRODUCT SPECIFICATIONS

	GSZ14 0181K*	GSZ14 0181L*	GSZ14 0191A*	GSZ14 0241K*	GSZ14 0251A*	GSZ14 0301K*	GSZ14 0311A*
NOMINAL CAPACITIES							
Cooling (BTU/h)	18,000	18,000	17,400	24,000	23,200	30,000	28,000
Heating (BTU/h)	18,000	18,000	18,000	24,000	23,200	30,000	31,000
Decibels	72	74	72	72	72	74	75
COMPRESSOR							
RLA	9.0	6.0	9.0	10.9	10.9	13.5	13.5
LRA	47.5	37.5	47.5	62.9	62.9	72.5	72.5
Type	Scroll	Rotary	Scroll	Scroll	Scroll	Scroll	Scroll
CONDENSER FAN MOTOR							
Horsepower	1/6	1/6	1/6	1/6	1/6	1/6	1/6
FLA	0.95	0.95	1.1	0.95	1.1	0.95	1.1
REFRIGERATION SYSTEM							
Refrigerant Line Size ¹							
Liquid Line Size ("O.D.)	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Suction Line Size ("O.D.)	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Refrigerant Connection Size							
Liquid Valve Size ("O.D.)	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Suction Valve Size ("O.D.)	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Standard Line Set Length (max. feet)	80	80	80	80	80	80	80
Long Line Set Length (max. feet) ²							
Equivalent Length	250	150	250	250	250	250	250
Linear Length	200	150	200	200	200	200	200
Vertical Length (outdoor below indoor)	80	80	80	80	80	80	80
Vertical Length (outdoor above indoor)	80	80	200	80	200	80	200
Valve Connection Type	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge (oz.)	108	127	108	108	108	108	160
ELECTRICAL DATA							
Volts/Phase (60 Hz)	208-230/1	208-230/1	208-230/1	208-230/1	208-230/1	208-230/1	208-230/1
Minimum Circuit Ampacity ³	12.2	8.5	12.4	14.6	14.7	17.8	17.9
Max. Overcurrent Protection ⁴	20	15	20	25	25	30	30
Min / Max Volts	197 / 253	197 / 253	197 / 253	197 / 253	197 / 253	197 / 253	197 / 253
Electrical Conduit Size	¾" or ¾"	¾" or ¾"	¾" or ¾"	¾" or ¾"	¾" or ¾"	¾" or ¾"	1/2" or 3/4"
UNIT WEIGHTS							
Equipment Weight (lbs.)	143	143	143	143	143	171	186
Ship Weight (lbs)	154	154	154	154	154	182	206
ENERGY STAR® CERTIFIED *			NO		NO		NO

- Energy Star Notes**
- Proper sizing and installation of equipment is critical to achieving optimal performance. Split system air conditioners and heat pumps must be matched with appropriate coil components to meet ENERGY STAR® criteria. Ask your contractor for details or visit www.energystar.gov. The www.energystar.gov website provides up-to-date system combinations certified to meet ENERGY STAR® requirements.
 - Tested and rated in accordance with AHRI Standard 210/240
 - Reference TP-107P for additional application requirements
 - Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes
 - Must use time-delay fuses or HACR-type circuit breakers of the same size as noted.
- NOTES**
- Always check the S&R plate for electrical data on the unit being installed.
 - Installer will need to supply ¾" to 1½" adapters for suction line connections.
 - Unit is charged with refrigerant for 15' of ¾" liquid line. System charge must be adjusted per Installation Instructions Final Charge Procedure.
 - Installation of these units may require the specified TXV Kit to be installed on the indoor coil. THE SPECIFIED TXV IS DETERMINED BY THE OUTDOOR UNIT NOT THE INDOOR COIL.

NOMENCLATURE



PRODUCT SPECIFICATIONS

	ASPT 25B14*	ASPT 29B14*	ASPT 33C14*	ASPT 35B14*	ASPT 37B14*	ASPT 37C14*	ASPT 39C14*	ASPT 47C14*	ASPT 49C14*	ASPT 59C14*	ASPT 47D14*	ASPT 49D14*	ASPT 61D14*
NOMINAL RATINGS													
Cooling (Btu/h)	24,000	24,000	24,000	28,000	30,000	36,000	36,000	42,000	48,000	60,000	42,000	48,000	60,000
BLOWER													
Diameter	9½"	9½"	10½"	9½"	9½"	10½"	10½"	10½"	10½"	10½"	10½"	11½"	11½"
Width	6"	6"	8"	6"	6"	8"	8"	10½"	8"	10½"	10½"	10½"	10½"
COIL CONNECTIONS													
Liquid	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Suction	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Coil Drain Connect (FPT)	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
ELECTRICAL DATA													
Voltage	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
Minimum Circuit Ampacity	5.8 / 5.8	5.8 / 5.8	4.9 / 4.9	5.6 / 5.6	5.6 / 5.6	5.6 / 5.6	4.9 / 4.9	4.9 / 4.9	7.1 / 7.1	7.9 / 7.9	5.6 / 5.6	8.6 / 8.6	8.6 / 8.6
Max. Overcurrent Device (Amps)	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15	15 / 15
Minimum VAC	197	197	197	197	197	197	197	197	197	197	197	197	197
Maximum VAC	253	253	253	253	253	253	253	253	253	253	253	253	253
Blower Motor													
Full Load Amps (FLA)	4.6	4.6	3.9	4.5	4.5	4.5	3.9	3.9	5.7	6.3	4.5	6.9	6.9
Horsepower (HP)	¾	¾	¾	¾	¾	¾	¾	¾	1	¾	1	1	1
SHIP WEIGHT (LBS.)	116	129	118	129	129	144	118	144	125	144	155	167	167

*Airflow rate @ 3 static.
Note: Assumes dry coil; SCFM correction for wet coil = 4% (208V / 240V)

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NOTES:

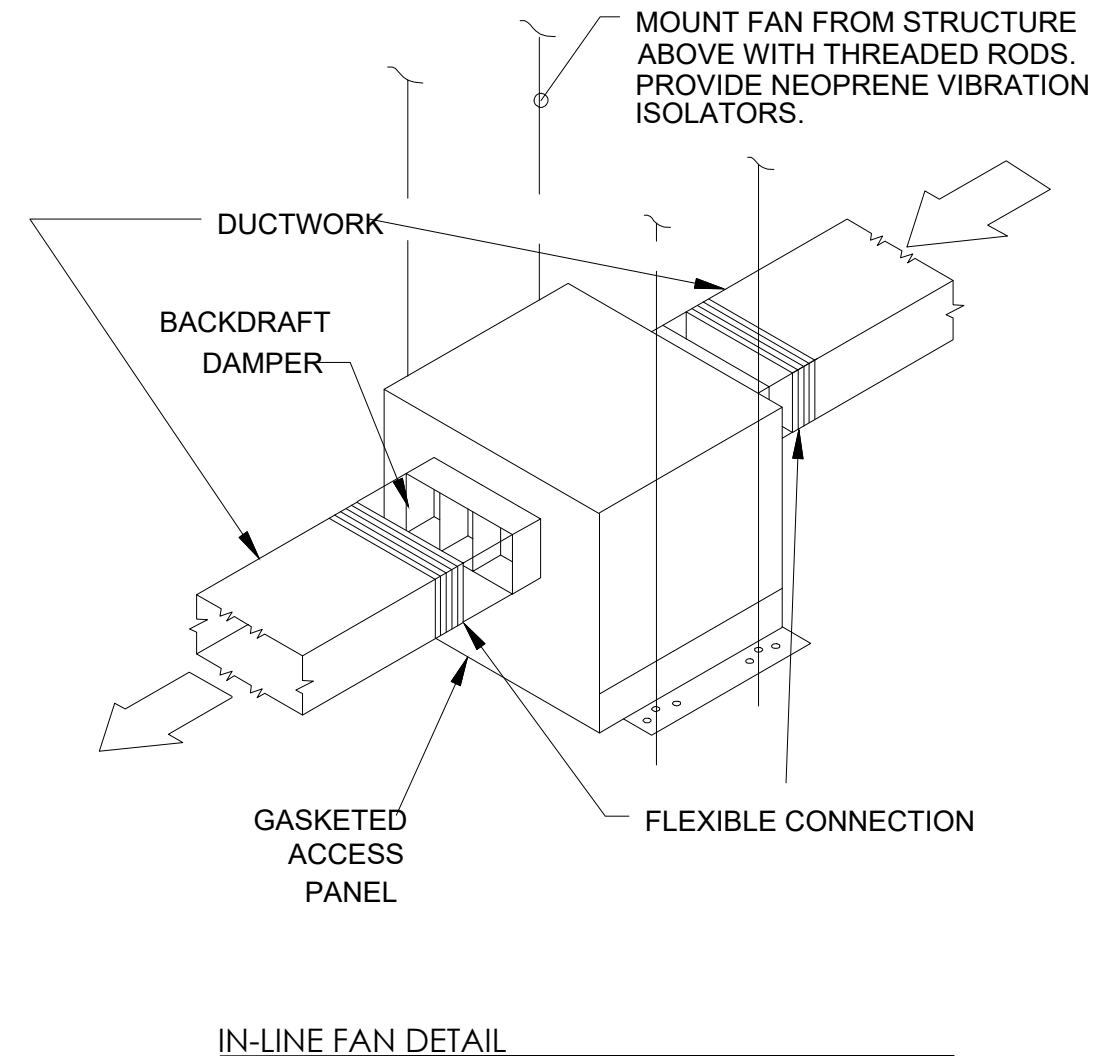
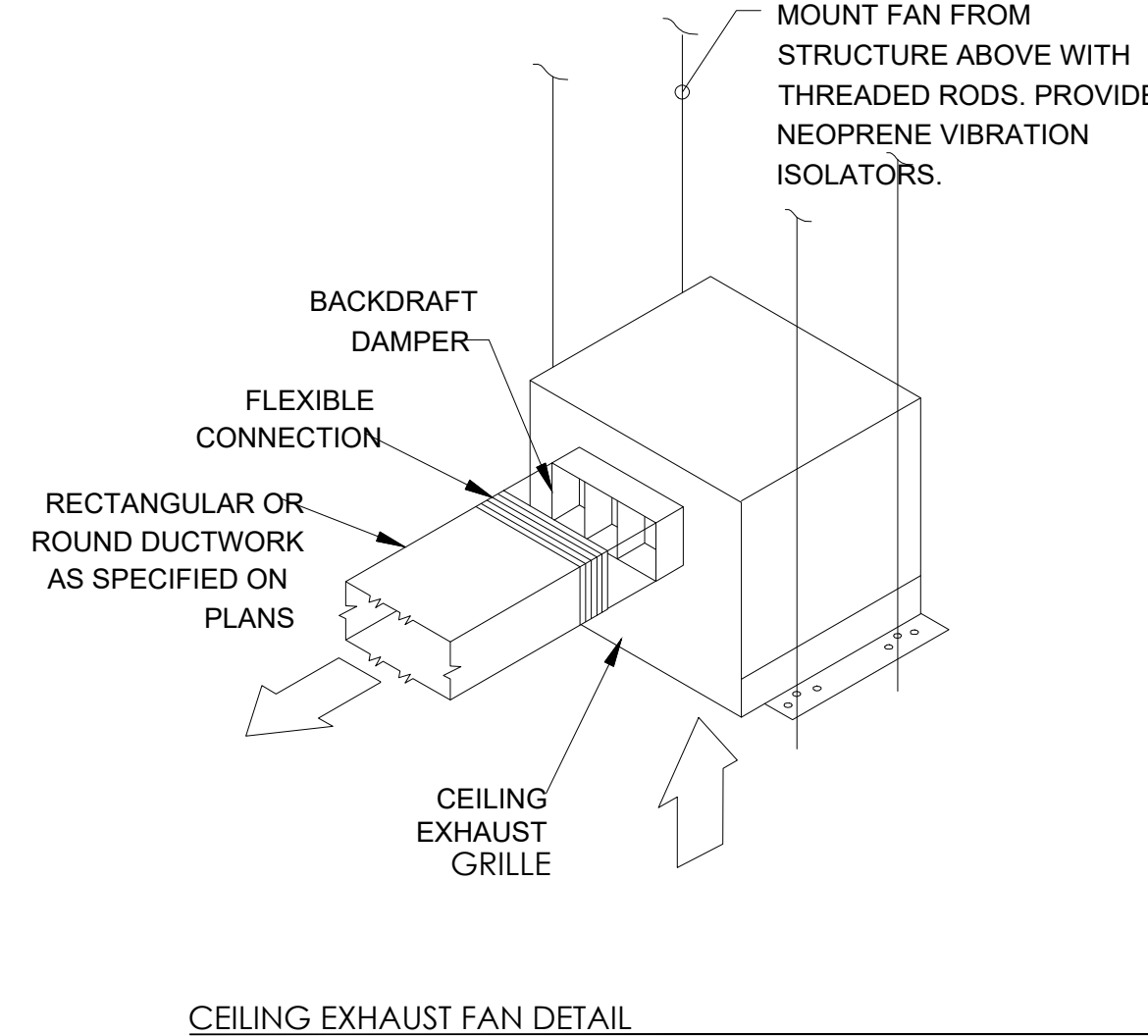
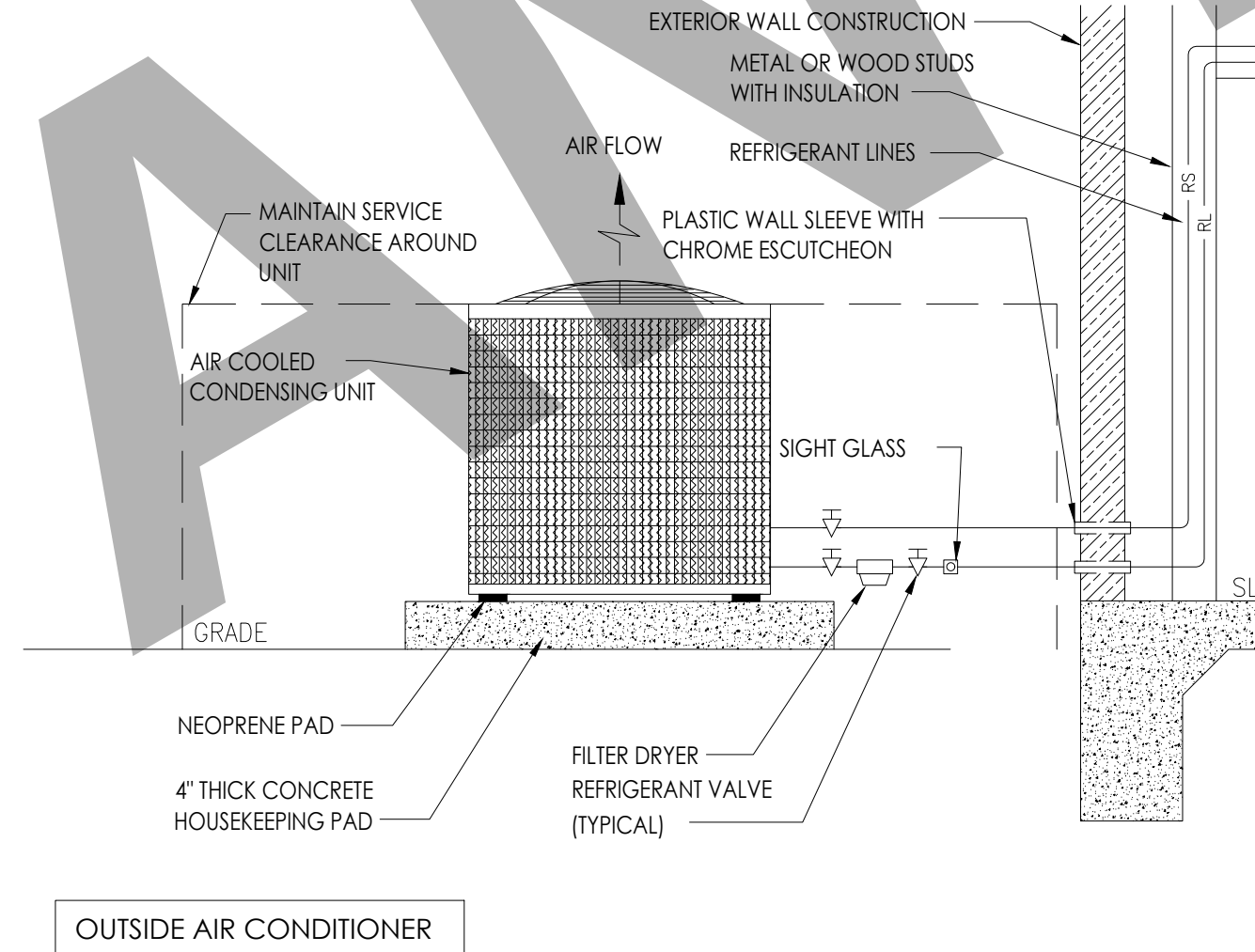
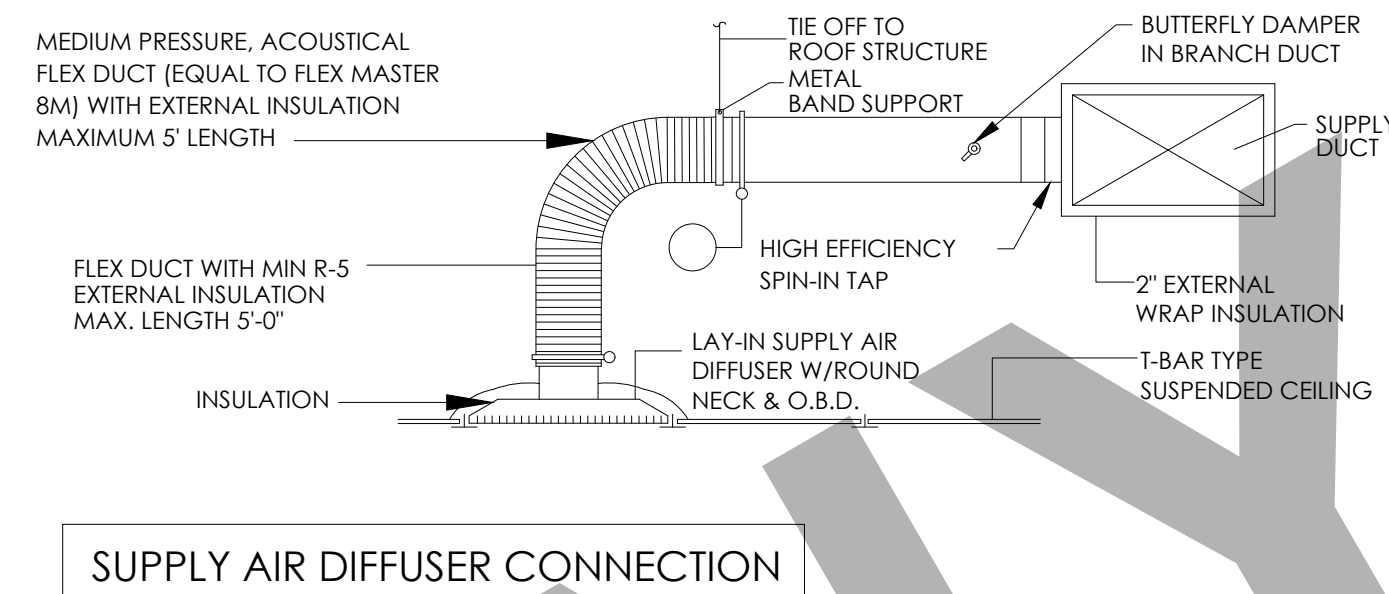
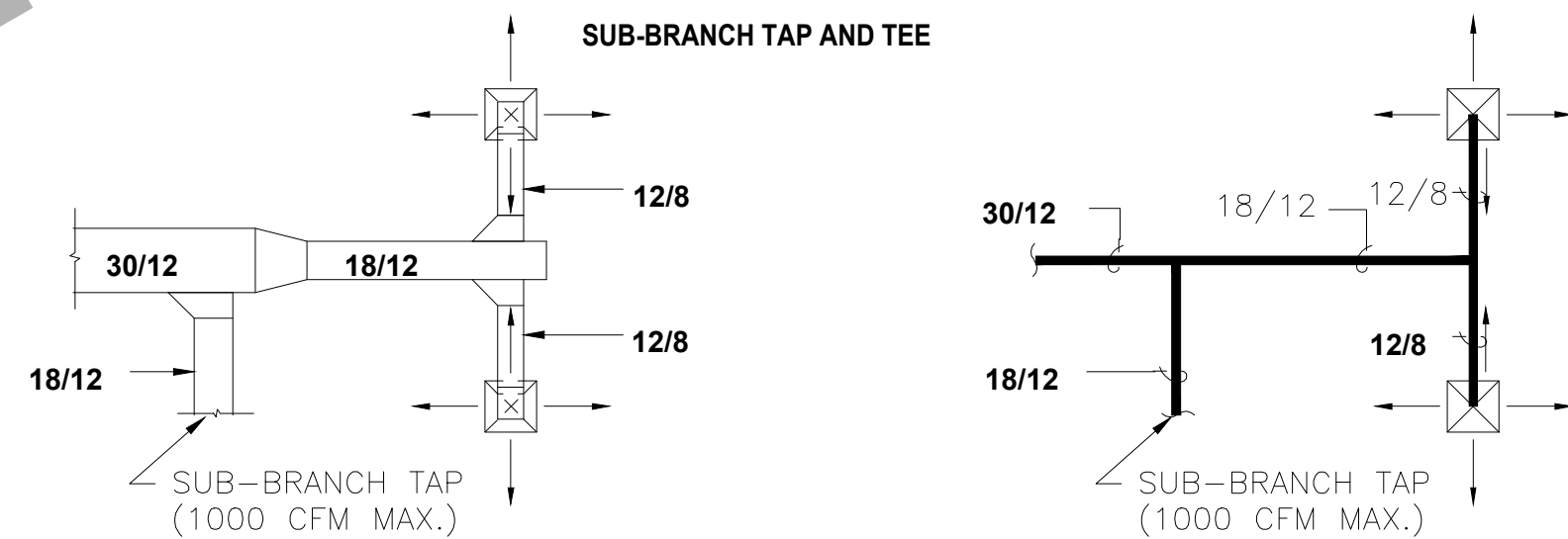
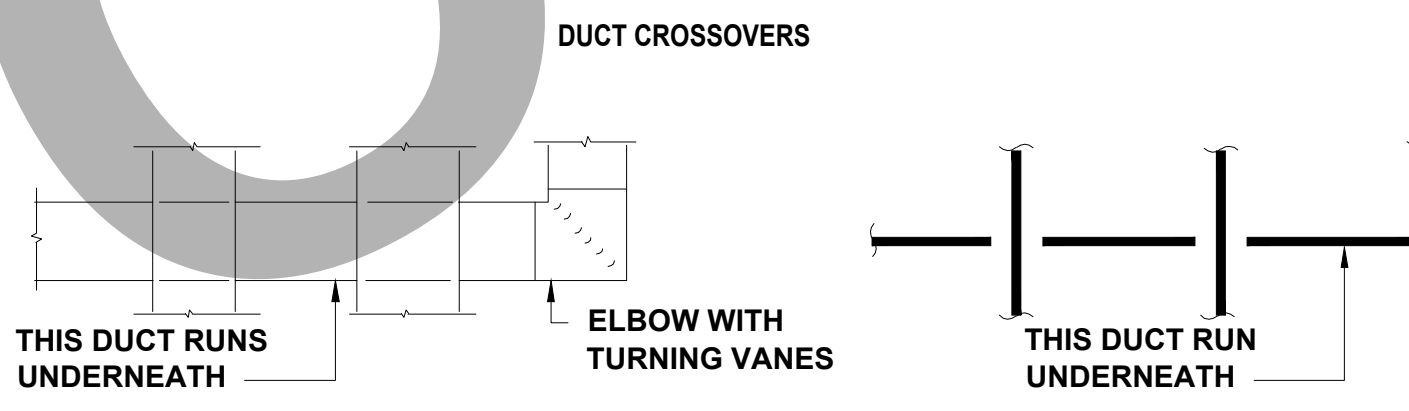
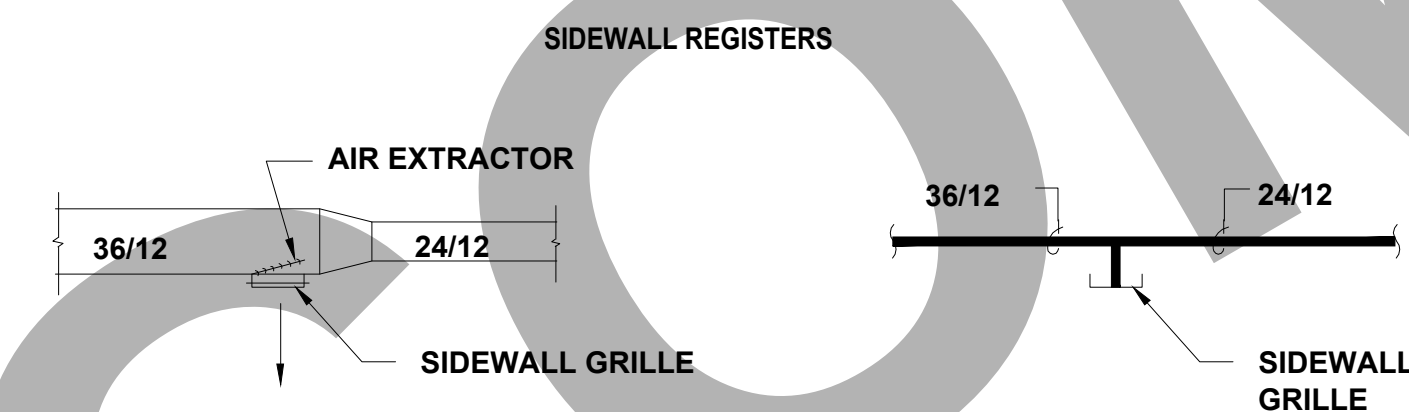
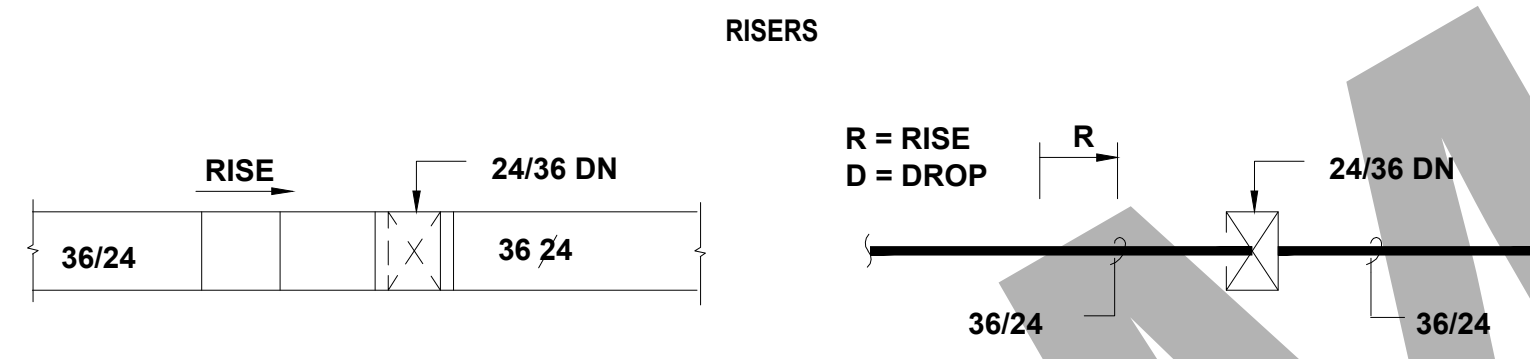
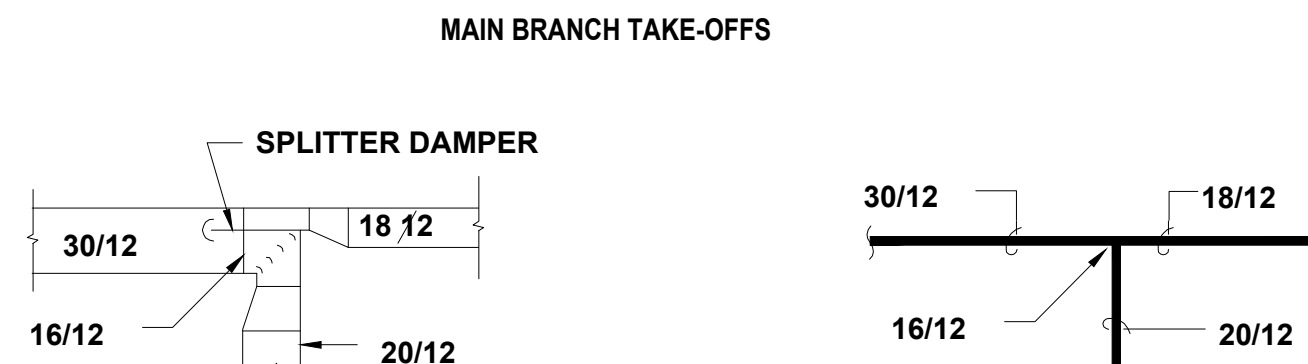
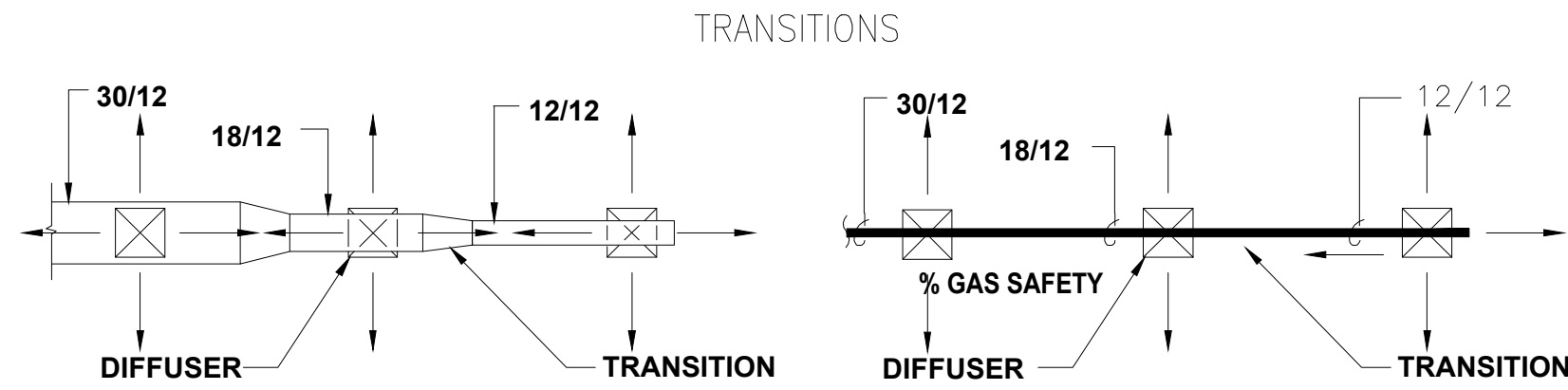
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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

GENERAL NOTES

- 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
- 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
- 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
- ALL SHEET METAL DUCT CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH "SMACNA" LOW PRESSURE DUCT CONSTRUCTION STANDARD
- TURNING VANES SHALL BE INSTALLED IN ALL BENDS IN RECTANGULAR DUCT EXCEEDING 30"
- ALL DUCTS SHALL BE SUPPORTED WITH 1" WIDE, 16 GAUGE, GALVANIZED STEEL BANDS
- 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
- ALL DUCT DIMENSIONS SHOWN ON PLANS ARE INTERNAL
- THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF SUPPLY AND RETURN AIR REGISTERS, DUCTS, GRILLES AND DIFFUSERS WITH LIGHTING AND CEILING PATTERNS
- PROVIDE LATERAL BRACING OF ALL DUCTS AND PIPES AS REQUIRED BY CODE
- INSULATE AND SEAL ALL DUCTWORK PER CHAPTER 10 OF THE STATE MECHANICAL CODE (T-24, PART 4)
- MOUNT ALL THERMOSTATS AT 48" ABOVE FINISHED FLOOR
- ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES
- 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
- DUCT SMOKE DETECTOR SHALL BE INSTALLED BELOW THE ROOF
- ALL MECHANICAL EQUIPMENT AND SYSTEMS INSTALLED AS PART OF PROJECT SHALL COMPLY WITH ALL REQUIREMENTS OF THE 2022 CALIFORNIA MECHANICAL CODE AND THE 2022 CALIFORNIA BUILDING CODE AND THE 2022 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS
- 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)
- PROVIDE 120 VOLT ELECTRICAL OUTLETS WITHIN 25 FT. OF ALL MECH. EQUIPT. (CMC 309)
- HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS IN ACCORDANCE WITH CMC 317.1 REQUIREMENTS
 - AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE
 - ACCA MANUAL B
 - ASHRAE 111
 - NEBB PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, ADJUSTING BALANCING OF ENVIRONMENTAL SYSTEMS
 - SMACNA HVAC TESTING, ADJUSTING, AND BALANCING
- 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



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PROJECT:

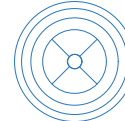
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MECHANICAL GENERAL DETAILS.

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO. REV.

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LIST OF SYMBOLS AND SERVICES

	3" LED PENDANT		SELF CONTAINED SMOKE DETECTOR/ANNUNCIATOR (120 W/BATTERY BACKUP) - CEILING MOUNTED SPECIFIED UL217		CHANDELIER		
	6" FLUORESCENT RECESSED PIN-TYPE		SELF CONTAINED SMOKE/CARBON MONOXIDE (120 W/BATTERY BACKUP) - CEILING MOUNTED SPECIFIED UL2034/2075		LED CEILING FIXTURE		
	5 1/2" LED RECESSED		EXTERIOR LED MOTION-SENSOR PER TITLE-24		WALL MOUNTED LED FIXTURE		
	LIGHT SWITCH - WALL MOUNTED @ +48" AFF UNLESS NOTED SUBSCRIPTS: S2 = 2-POLE SWITCH S3 = 3 WAY SWITCH S4 = 4 WAY SWITCH D = DIMMER SWITCH P = SWITCH WITH PILOT LIGHT T = TIMER SWITCH M=WITH BUILT IN OCCUPANCY SENSOR		2040 FLUORESCENT FIXTURE	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 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.			
	120/240V, 1PH, 3W LOAD CENTER						
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED WITH GROUND FAULT CIRCUIT INTERRUPTER						
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED						
	JUNCTION BOX - WALL MOUNTED - HEIGHT AS INDICATED						
	JUNCTION BOX						
	NON-FUSED DISCONNECT SWITCH - SIZE AS INDICATED						
	JUNCTION BOX FOR EXHAUST FAN						
	CONDUITS IN CEILING						
	CONDUITS UNDER TILES						
INSTALLATION HEIGHTS: h1: 24 in h2: 42 in h3: 48 in h4: 72 in h5: 94 in h6: 60 in							

ELECTRICAL ABBREVIATIONS

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

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ALL DRAWINGS AND WRITTEN MATERIALS
APPEARING HEREIN CONSTITUTE THE
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DESIGNER AND THE SAME MAY NOT BE
DUPLICATED, USED OR DISCLOSED WITHOUT
CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PF

OWNER / USER

TITLE:

GENERAL NOTES AND ABBREVIATIONS

PROJ. NO.

PROJ. ENGR.

SCALE @ 24X36:

NTS

DRAWING NO.

EO-00

REV.

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. 400 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 NO.4.
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, JACUZZI TUBS OR SIMILAR EQUIPMENT SHALL BE MADE IN ACCORDANCE WITH ARTICLE 680.70 OF THE NEC. PROVIDE BONDING AS REQUIRED BY ARTICLE 680.74 OF THE NEC.
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 NEC.
39. CEILING MOUNTED SMOKE AND CARBON MONOXIDE DETECTORS PER NFPA 72, SECTION R314 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 WILL ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS. (IRC SECTION R314.3 AS AMENDED)

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. NEC 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.

NOTES:
1. FIXTURES SHALL HAVE APPROPRIATE U.L. LABEL (i.e., DAMP OR WET) AS REQUIRED BY CODES AND ORDINANCES.
2. FIXTURES SHALL INCLUDE ALL ACCESSORIES NECESSARY FOR INSTALLATION ACCORDING TO MANUFACTURER'S SHOP DRAWINGS AND AS REQUIRED BY CODES AND LOCAL ORDINANCES.
3. PRIOR TO ORDERING ANY LIGHTING EQUIPMENT, THE CONTRACTOR SHALL COORDINATE ALL FIXTURE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS AND CEILING CAVITY DEPTHS.
4. ALL LAMPS SHALL BE PROVIDED AND INSTALLED ACCORDING TO THE ATTACHED FIXTURE SCHEDULE AND SPECIFICATIONS ENSURE COMPATIBILITY BETWEEN FIXTURE, LAMP(S) AND BALLAST(S). (OSRAM SYLVANIA SERIES)
5. CONTRACTOR SHALL VERIFY FIXTURE VOLTAGES AND CEILING TRIM COMPATIBILITY PRIOR TO ORDERING FIXTURE.
6. PROVIDE APPROVED FIRE-RATED ENCLOSURES FOR ALL LIGHTING FIXTURES LOCATED IN FIRE-RATED CEILINGS.
7. LIGHTING FIXTURE CATALOG NUMBERS ARE SERIES TYPE ONLY. PROVIDE ALL NECESSARY HARDWARE AS REQUIRED BY THE SPECIFICATIONS, DRAWINGS, AND PROJECT CONDITIONS FOR A COMPLETE INSTALLATION.
8. ALL FIXTURES SHALL BE ORDERED WITH APPROPRIATE BALLAST(S) THAT HAVE U.L. AND CB, LABELS. ALL BALLASTS MUST CONFORM TO TITLE 24 AND/OR IECC REQUIREMENTS FOR PERFORMANCE. PROVIDE MULTIPLE BALLASTS FOR DUAL LEVEL SWITCHING AND WIRING (i.e. TANDEM) AS INDICATED ON THE PLANS.
9. UPON INITIAL ENERGIZING OF ALL NEW FLUORESCENT LAMPS, A CONTINUOUS PERIOD OF 30 HOURS SHALL OCCUR PRIOR TO DE-ENERGIZING OF LAMPS FOR MANUFACTURER REQUIRED
10. ALL FLUORESCENT BALLASTS SHALL BE ELECTRONIC TYPE. PROVIDE END OF LIFE (EOL) SHUT-DOWN PROTECTION FOR COMPACT FLUORESCENT LAMPS.
11. ENSURE COMPATIBILITY OF ALL LIGHTING SYSTEM COMPONENTS, ESPECIALLY DIMMED SYSTEMS. FIXTURES, LAMPS, BALLAST(S), AND DIMMING SYSTEMS/INDIVIDUAL CONTROLS MUST BE FACTORY CERTIFIED COMPATIBLE FOR FULL RANGE OF DIMMING COMPATIBILITY.
12. PROVIDE CLEARANCES FROM COMBUSTIBLES, A MINIMUM OF 3/4" (OTHER THAN AT POINTS OF SUPPORT) AND 3" FROM INSULATION FOR RECESSED LIGHTING FIXTURES WHICH ARE NON-HC RATED.
13. PROVIDE A MINIMUM OF TWO (2) #12 SUPPORT WIRES ATTACHED TO BUILDING FRAME IN ADDITION TO T-BAR CLIPS FOR FLUORESCENT FIXTURES RECESSED IN SUSPENDED T-BAR CEILING.
14. FIXTURES WITH EMERGENCY BATTERY BACKUP SHALL BE WIRED AHEAD OF ANY LOCAL SWITCHING IN COMPLIANCE WITH NEC ARTICLE 700.
15. EMERGENCY LIGHTING UNITS SHALL BE EQUIPPED WITH FACTORY-INSTALLED INTEGRAL TEST SWITCHES.
16. PROVIDE DOOR-TO-FRAME AND LENS-TO-DOOR GAS KETLING, INVERTED LENS, AND FOOD SERVICE RATING FOR ALL FIXTURES LOCATED IN FOOD SERVICE AREAS.
17. FLUORESCENT LUMINARIES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE, OR BALLASTED LUMINAIRES THAT ARE SUPPLIED FROM MULTI- WIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL HAVE DISCONNECTING MEANS EITHER INTERNAL OR EXTERNAL TO EACH LUMINAIRE SO TO DISCONNECT SIMULTANEOUSLY FROM THE SOURCE OF SUPPLY ALL CONDUCTORS OF THE BALLAST (INCLUDING THE GROUNDED CONDUCTOR IF ANY). IN ACCORDANCE WITH NEC ARTICLE 410, THE LINE-SIDE TERMINALS OF THE DISCONNECTING MEANS SHALL BE LOCATED SO AS TO BE ACCESSIBLE TO QUALIFIED PERSONS BEFORE SERVICING OR MAINTAINING THE BALLAST.
18. ALL FLUORESCENT LAMPS SHALL BE OF A LOW MERCURY DESIGN, HAVE A MINIMUM CRI RATING OF 85 AND 3500K COLOR TEMPERATURE UNLESS NOTED OTHERWISE.

SHEET NUMBER	DESCRIPTION
E0-00	GENERAL NOTES AND ABBREVIATION
E0-01	ELECTRICAL SPECIFICATIONS
E1-00	FIRST FLOOR LIGHTING LAYOUT
E1-01	SECOND FLOOR LIGHTING LAYOUT
E2-00	FIRST FLOOR POWER LAYOUT
E2-01	SECOND FLOOR POWER LAYOUT
E3-00	PANEL BOARDS SCHEDULES
E4-00	ONE LINE DIAGRAM AND GROUNDING DETAIL

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REV. NO.	DESCRIPTION	DATE	BY

PF

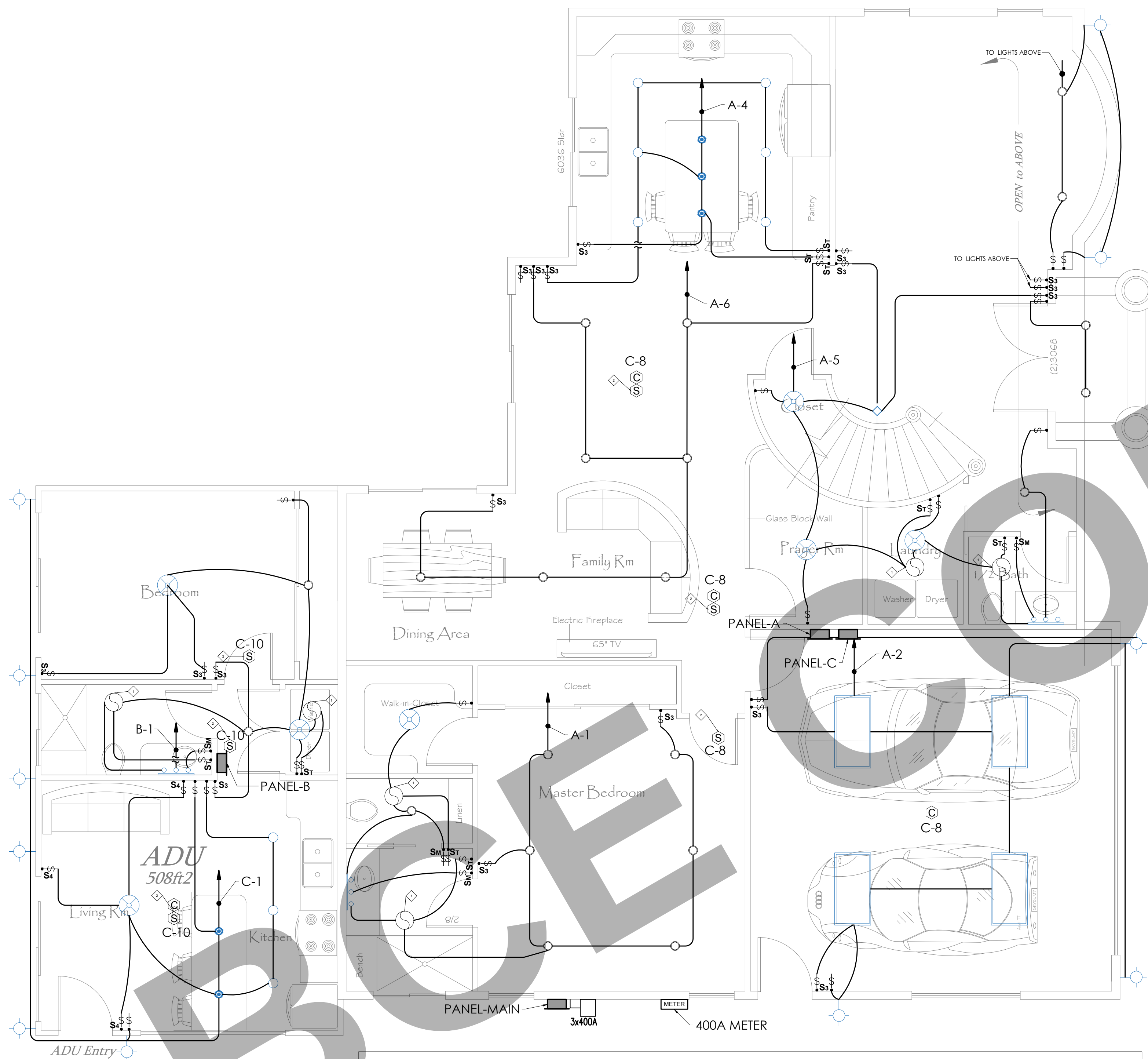
OWNER / USER

TITLE:
**ELECTRICAL
SPECIFICATIONS**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO. REV.

E0-01



SHEET NOTES:

- ◇—PROVIDE HEAVY DUTY JUNCTION BOX, FLUSH IN CEILING (OR WALL) FOR EXHAUST FAN
- ◇—FURNISH AND INSTALL SMOKE OR COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR AS REQUIRED. INTERLOCK WITH OTHER DETECTORS

GENERAL NOTES

- ALL 120 VOLT, SINGLE PHASE 15 AND 20 AMPERE BRANCH CIRCUIT SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION TYPE INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. (NEC ARTICLE 210.12(A))
- IN EVERY KITCHEN, FAMILY ROOM, DINING ROOM, LIVING ROOM, PARLOR, LIBRARY, DEN, SUNROOM, BEDROOM, RECREATION ROOM OR SIMILAR ROOM OR AREA OF DWELLING UNITS RECEPTACLE OUTLETS SHALL BE INSTALLED IN ACCORDANCE WITH THE GENERAL PROVISIONS SPECIFIED IN THE FOLLOWING ARTICLES.
 - NEC ARTICLE 210.52(A) (1) SPACING. RECEPTACLES SHALL BE INSTALLED THAT NO POINT ALONG THE FLOOR LINE OF THE WALL IS MORE THAN 6-FEET FROM A RECEPTACLE.
 - NEC article 210.52(a) (2) AS AMENDED WALL SPACE. ANY WALL 24-INCHES OR MORE IN LENGTH SHALL BE PROVIDED WITH A RECEPTACLE OUTLET. WALL SPACE SHALL INCLUDE AROUND CORNERS, THE FIRST SLIDING PANEL OF A SLIDING DOOR, FIXED ROOM DIVIDERS SUCH AS A FREESTANDING BAR TYPE COUNTER. WALL SPACE NED NOT INCLUDE THE SPACE BEHIND OPERABLE DOORS. AND NEED NOT INCLUDE ENTRIES, HALLWAYS ETC. LESS THAN 5-FEET WIDE LOCATED IN BEDROOMS.
 - NEC ARTICLE 210.52(A) (3) AS AMENDED FLOOR RECEPTACLES.
- IN EVERY KITCHEN, FAMILY ROOM, DINING ROOM, LIVING ROOM, PARLOR, LIBRARY, DEN, SUNROOM, BEDROOM, RECREATION ROOM OR SIMILAR ROOM OR AREA OF DWELLING UNITS, ALL 125 VOLT 15 AND 20 AMP RECEPTACLES SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES NEC 406.12)

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955

CONFIDENTIALITY STATEMENT:

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REV. NO.	DESCRIPTION	DATE	BY

PF

(PAPER / 3014)

TITLE:
**FIRST FLOOR
LIGHTING LAYOUT**

PROJ. NO.

PROJ. ENGR.

SCALE @ 24X36:

1/4" = 1' - 0"

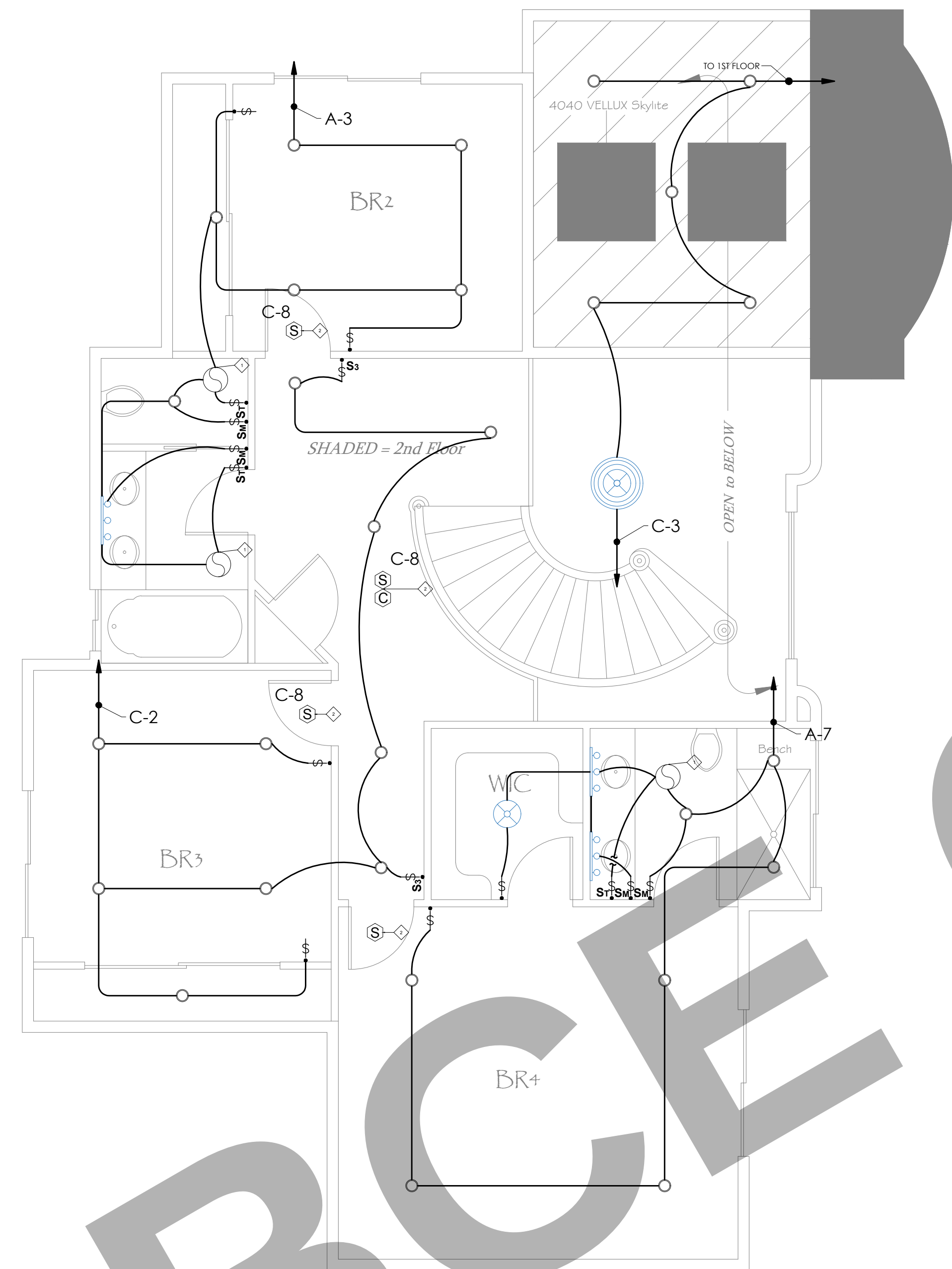
DRAWING NO.

E1-00

REV.

GENERAL NOTES

- ALL 120 VOLT, SINGLE PHASE 15 AND 20 AMPERE BRANCH CIRCUIT SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION TYPE INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. (NEC ARTICLE 210.12(A))
- IN EVERY KITCHEN, FAMILY ROOM, DINING ROOM, LIVING ROOM, PARLOR, LIBRARY, DEN, SUNROOM, BEDROOM, RECREATION ROOM OR SIMILAR ROOM OR AREA OF DWELLING UNITS RECEPTACLE OUTLETS SHALL BE INSTALLED IN ACCORDANCE WITH THE GENERAL PROVISIONS SPECIFIED IN THE FOLLOWING ARTICLES.
 - NEC ARTICLE 210.52(A) (1) SPACING. RECEPTACLES SHALL BE INSTALLED THAT NO POINT ALONG THE FLOOR LINE OF THE WALL IS MORE THAN 6-FEET FROM A RECEPTACLE.
 - NEC article 210.52(a) (2) AS AMENDED WALL SPACE. ANY WALL 24-INCHES OR MORE IN LENGTH SHALL BE PROVIDED WITH A RECEPTACLE OUTLET. WALL SPACE SHALL INCLUDE AROUND CORNERS, THE FIRST SLIDING PANEL OF A SLIDING DOOR, FIXED ROOM DIVIDERS SUCH AS A FREESTANDING BAR TYPE COUNTER. WALL SPACE NED NOT INCLUDE THE SPACE BEHIND OPERABLE DOORS. AND NEED NOT INCLUDE ENTRIES, HALLWAYS ETC. LESS THAN 5-FEET WIDE LOCATED IN BEDROOMS.
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SHEET NOTES:

- ◇—PROVIDE HEAVY DUTY JUNCTION BOX, FLUSH IN CEILING (OR WALL) FOR EXHAUST FAN
- ◇—FURNISH AND INSTALL SMOKE OR COMBINATION SMOKE AND CARBON MONOXIDE DETECTOR AS REQUIRED. INTERLOCK WITH OTHER DETECTORS

CLIENT:

ADDRESS:

33758 MELLO WAY
155

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REV. NO.	DESCRIPTION	DATE	BY

PF

(OWNER / USER)

TITLE:
**SECOND FLOOR
LIGHTING LAYOUT**

PROJ. NO.

PROJ. ENGR.

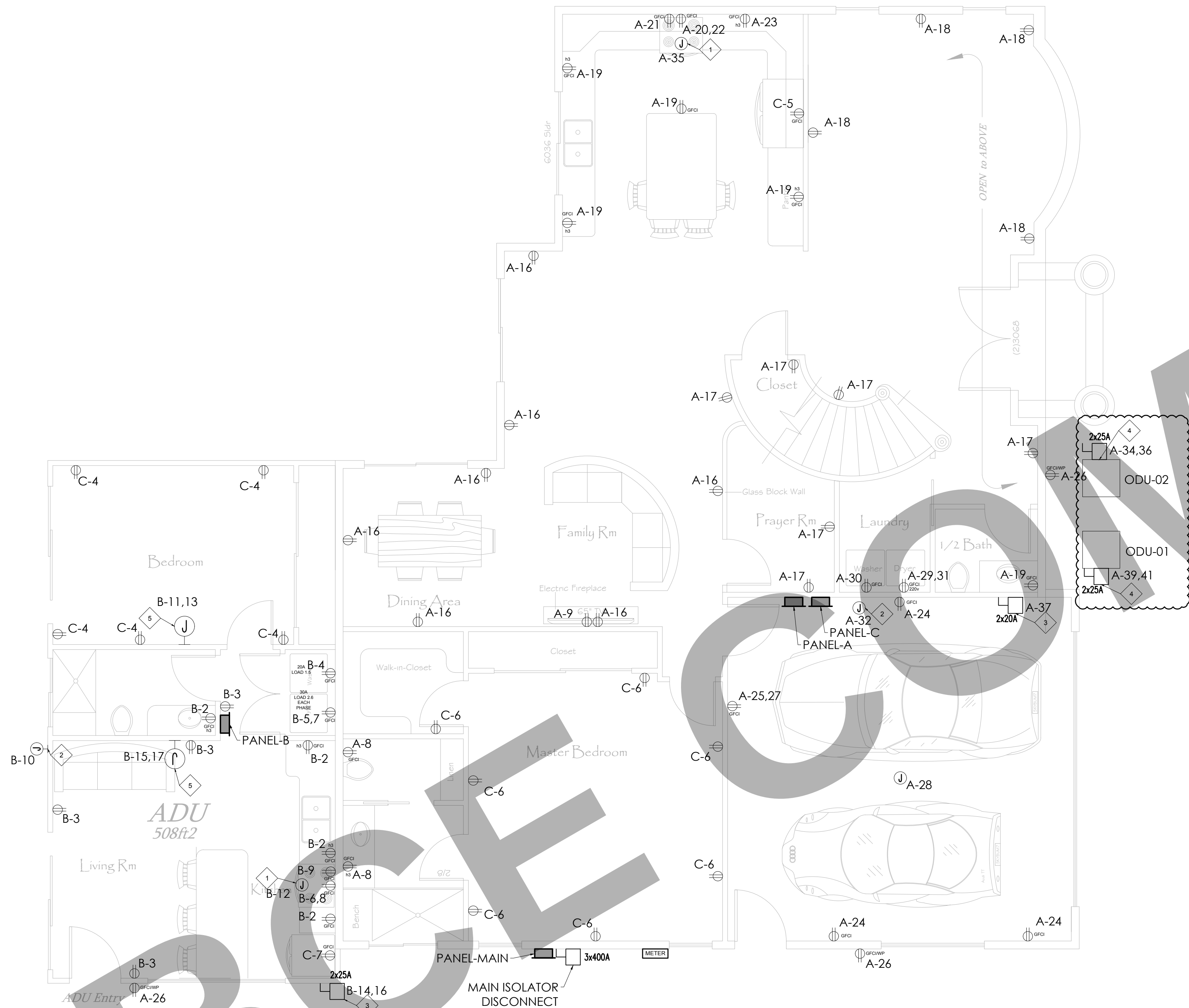
SCALE @ 24X36:

1/4" = 1' - 0"

DRAWING NO.

E1-01

REV.



GENERAL NOTES

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SHEET NOTES:

- PROVIDE HEAVY DUTY JUNCTION BOX, FLUSH IN CEILING (OR WALL) FOR KEF
- PROVIDE HEAVY DUTY JUNCTION BOX, FLUSH IN CEILING (OR WALL) FOR GAS WATER HEATER
- PROVIDE NEMA 3R DISCONNECT SWITCH FOR AHU
- PROVIDE NEMA 3R DISCONNECT SWITCH FOR ODU
- PROVIDE HEAVY DUTY JUNCTION BOX, WALL MOUNTED AC INDOOR UNIT

CLIENT:

ADDRESS:

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
**FIRST FLOOR
POWER LAYOUT**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
1/4" = 1' - 0"

DRAWING NO.

E2-00

REV.

InnoDez

Address: Foxbrough pl
Pleasanton, CA. 94566
Phone: (424) 414-0997
Web site: www.innodez.com
Email: hello@innodez.com

CLIENT:

ADDRESS:
33758 MELLO WAY
FREMONT, CA 94 555
510 674 - 8796

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
AVTAR / AMAN DEOL
(FATHER / SON)

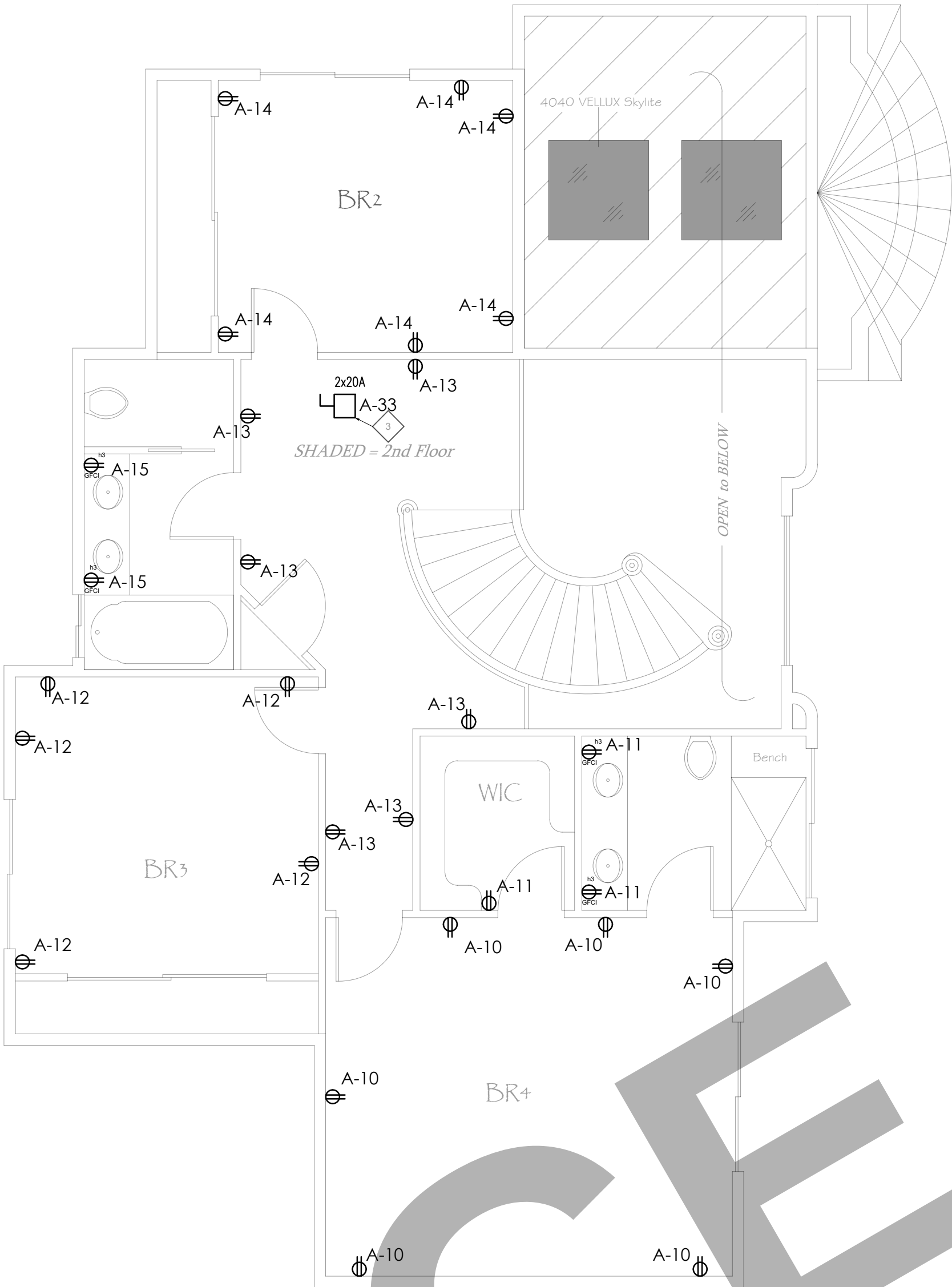
TITLE:
SECOND FLOOR
POWER LAYOUT

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
1/4" = 1' - 0"

DRAWING NO. REV.
E2-01

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SHEET NOTES:

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3. PROVIDE NEMA 3R DISCONNECT SWITCH FOR AHU
4. PROVIDE NEMA 3R DISCONNECT SWITCH FOR ODU
5. PROVIDE HEAVY DUTY JUNCTION BOX, WALL MOUNTED AC INDOOR UNIT

Location: ADU CORRIDOR				CONNECTED LOAD		DEMAND TOTAL		B			
* LOAD SUMMARY	CL	DF		A	B			PANELBOARD DESIGNATION			
L Lighting	0.17	1.25		0.17		0.21		SYSTEM VOLTAGE		240/120V, 1Ø, 3W	
R Convenience Recept	1.26			0.54	0.72	1.26		BUS SIZE		100A	
H Heating (Space)	0.30	1.25		0.30		0.38		SYSTEM TYPE		NORMAL	
C Cooling		1.00						FEEDER PROT		100A-2P C/B Bus Plug	
A HVAC	6.77	1.00		3.37	3.40	8.46		CONDUCTOR SIZE		2 AWG - #6G CU	
P Process		1.00						CONDUCTOR/PHASE		1	
O Other Continuous		1.25						MAINS		100A MCB	
K Kitchen	15.00	6.00		6.90	8.10	9.75		SCCR		FULLY RATED	
N Noncontinuous		1.00						MCB RATING		80%	
		1.00						GROUND FAULT		NO	
Total	23.50			11.28	12.22	20.06		FEEDER LENGTH (FT)		100	
								FEEDER V. DROP (%)		1.620	
Total Demand Load (KVA)	20.06							FAULT CURRENT			
Total Demand Current (A)	83.57							KAIC RATING		22	
Min. Feeder Ampacity (A)	104.46							ENCLOSURE		TYPE 1	

	DESCRIPTION	* WIRE	GRD	CB	KVA	A	B	KVA	CB	WIRE	GRD	DESCRIPTION	* R
1	LIGHTING BEDROOM-BATHROOM-LAUNDRY	L 2x 14 AWG	-#14G	15A-1P	0.17	0.71	0.54		20A-1P	2x 12 AWG	-#12G	RECEPTACLES KITCHEN	R 2
3	RECEPTACLES LIVING ROOM	R 2x 12 AWG	-#12G	20A-1P	0.72	2.22	1.50		20A-1P	2x 12 AWG	-#12G	WASHER	K 4
5	PROVISION FOR ELECTRIC DRYER	K 3x 10 AWG	-#10G	30A-2P	2.60	6.60	4.00		50A-2P	3x 8 AWG	-#8G	PROVISION FOR ELECTRIC COOKTOOP	K 6
7					2.60		4.00						K 8
9	GAS COOKTOP	K 2x 12 AWG	-#12G	20A-1P	0.30	0.60	0.30		20A-1P	2x 12 AWG	-#12G	GW4-02	H 10
11	IDU-02	A 3x 12 AWG	-#12G	20A-2P	0.28	0.31	0.03		20A-1P	2x 12 AWG	-#12G	KEF-02	A 12
13					0.28	2.93	2.65						A 14
15	IDU-01	A 3x 12 AWG	-#12G	20A-2P	0.44	3.08	2.65		25A-2P	3x 10 AWG	-#10G	ODU-03	A 16
17					0.44	0.44							A 18
19	SPACE											SPACE	20
21	SPACE											SPACE	22
23	SPACE											SPACE	24
	(KVA)				11.28	12.22							
					Total Connected Load	11.28	12.22						

Location: Garage				CONNECTED LOAD		DEMAND TOTAL		PANELBOARD DESIGNATION					
* LOAD SUMMARY	CL	DF		A	B								
L Lighting	1.59	1.25		0.93	0.66	1.99		SYSTEM VOLTAGE					
R Convenience Recept	10.98			6.08	4.90	10.49		BUS SIZE					
H Heating (Space)	0.30	1.25		0.30	0.38			SYSTEM TYPE					
C Cooling		1.00						FEEDER PROT					
A HVAC	8.43	1.00		4.90	3.53	10.53		CONDUCTOR SIZE					
P Process		1.00						CONDUCTOR/PHASE					
O Other Continuous		1.25						MAINS					
K Kitchen	15.50	6.00		8.40	7.10	10.08		SCCR					
N Noncontinuous	15.96	1.00		3.19	3.19	15.96		MCB RATING					
		1.00						GROUND FAULT					
Total	52.76			23.50	19.68	49.42		FEEDER LENGTH (FT)					
								FEEDER V. DROP (%)					
								FAULT CURRENT					
								KAIC RATING					
								ENCLOSURE					
Total Demand Load (KVA)	49.42												
Total Demand Current (A)	205.91												
Min. Feeder Ampacity (A)	257.30												

DESCRIPTION	* WIRE	GRD	CB	KVA	A	B	KVA	CB	WIRE	GRD	DESCRIPTION	*
1 LIGHTING MASTER BEDROOM	L 2x 14 AWG	- #14G	15A-1P	0.30	0.53	0.23	15A-1P	2x 14 AWG	- #14G		LIGHTING GARAGE-OUTDOOR	L 2
3 LIGHTING BEDROOM 2	L 2x 14 AWG	- #14G	15A-1P	0.20	0.40	0.20	15A-1P	2x 14 AWG	- #14G		LIGHTING KITCHEN	L 4
5 LIGHTING PRAYER. ROOM-LAUNDRY-BATH	L 2x 14 AWG	- #14G	15A-1P	0.28	0.40	0.14	15A-1P	2x 14 AWG	- #14G		LIGHTING FAMILY ROOM	L 6
7 LIGHTING BEDROOM 2	L 2x 14 AWG	- #14G	15A-1P	0.26	0.62	0.36	20A-1P	2x 12 AWG	- #12G		RECEPTACLES MASTER BEDROOM	R 8
9 RECEPTACLE ELECTRICAL FIREPLACE	R 2x 12 AWG	- #12G	20A-1P	0.50	1.58	1.08	20A-1P	2x 12 AWG	- #12G		RECEPTACLES BEDROOM 4	R 10
11 RECEPTACLES BEDROOM 4 BATHROOM-WIC	R 2x 12 AWG	- #12G	20A-1P	0.54	1.44	0.90	20A-1P	2x 12 AWG	- #12G		RECEPTACLES BEDROOM 3	R 12
13 RECEPTACLES CORRIDOR	R 2x 12 AWG	- #12G	20A-1P	0.08	2.16	1.08	20A-1P	2x 12 AWG	- #12G		RECEPTACLES BEDROOM 2	R 14
15 RECEPTACLES BATH 2ND FLOOR	R 2x 12 AWG	- #12G	20A-1P	1.38	1.44	1.08	20A-1P	2x 12 AWG	- #12G		RECEPTACLES FAMILY ROOM	R 16
17 RECEPTACLES ENTRANCE-PRAYER ROOM	R 2x 12 AWG	- #12G	20A-1P	1.08	1.80	0.72	20A-1P	2x 12 AWG	- #12G		RECEPTACLES ENTRANCE	R 18
19 RECEPTACLES KITCHEN	R 2x 12 AWG	- #12G	20A-1P	0.72	4.72	4.00	50A-2P	3x 8 AWG	- #8G		PROVISION FOR ELECTRIC COOKTOP	K 20
21 GAS COOKTOP	K 2x 12 AWG	- #12G	20A-1P	0.30	4.30	4.00						K 22
23 MICROWAVE	K 2x 12 AWG	- #12G	20A-1P	0.50	1.04	0.54	20A-1P	2x 12 AWG	- #12G		RECEPTACLES GARAGE	R 24
25 EV PROVISION	N 3x 6 AWG	- #10G	60A-2P	5.75	6.29	0.54	20A-1P	2x 12 AWG	- #12G		RECEPTACLES OUTDOOR	R 26

Location: Garage				CONNECTED LOAD			DEMAND TOTAL	
* LOAD SUMMARY	CL	DF	A	B				
L Lighting	1.04	1.25	0.46	0.58	1.30			
R Recessance Recept	2.16		1.26	0.90	2.16			
H Heating (Space)		1.25						
C Cooling		1.00						
A HVAC		1.00						
P Process		1.00						
O Other Continuous		1.25						
K Kitchen	1.00	2.00	0.50	0.50	1.00			
N Noncontinuous		1.00						
		1.00						
Total	4.20		2.22	1.98	4.46			
Total Demand Load (KVA)	4.46							
Total Demand Current (A)	18.58							
Min. Feeder Ampacity (A)	23.25							

C	
PANELBOARD DESIGNATION	
SYSTEM VOLTAGE	240/120V, 1Ø, 3W
BUS SIZE	60A
SYSTEM TYPE	NORMAL
FEEDER PROT	80A-2P C/B Bus Plug
CONDUCTOR SIZE	6 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	60A MCB
SCOR	FULLY RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	100
FEEDER V. DROP (%)	2.458
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 1

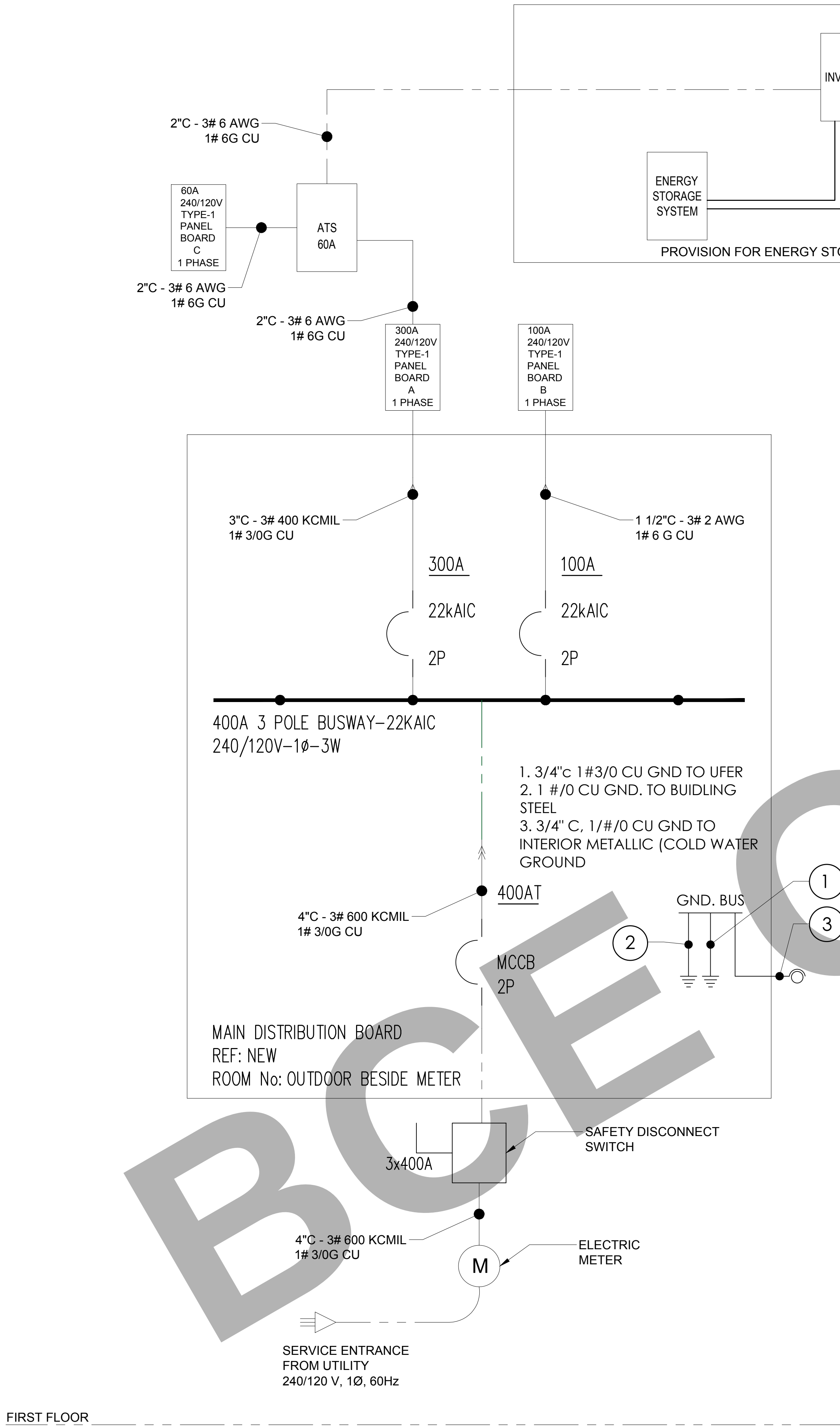
	DESCRIPTION	* WIRE	GRD	CB	KVA	A	B	KVA	CB	WIRE	GRD	DESCRIPTION	*
1	LIGHTING ENTRY ADU	L 2x 14 AWG	- #14G	15A-1P	0.26	0.46		0.20	15A-1P	2x 14 AWG	- #14G	LIGHTING CORRIDOR 2ND FLOOR-BEDROOM 3	L 2
3	LIGHTING MAIN ENTRANCE	L 2x 14 AWG	- #14G	15A-1P	0.38		1.28	0.90	20A-1P	2x 12 AWG	- #12G	RECEPTACLES BEDROOM	R 4
5	FRIDGE MAIN	K 2x 12 AWG	- #12G	20A-1P	0.50	1.76		1.26	20A-1P	2x 12 AWG	- #12G	RECEPTACLES MASTER BEDROOM	R 6
7	FRIDGE ADU	K 2x 12 AWG	- #12G	20A-1P	0.50		0.70	0.20	15A-1P	2x 14 AWG	- #14G	SMOKE DETECTORS MAIN HOUSE	L 8
9	SPACE								15A-1P	2x 14 AWG	- #14G	SMOKE DETECTORS ADU	L 10
11	SPACE											SPACE	L 12
(KVA)													
Total Connected Load 2.22 1.98													

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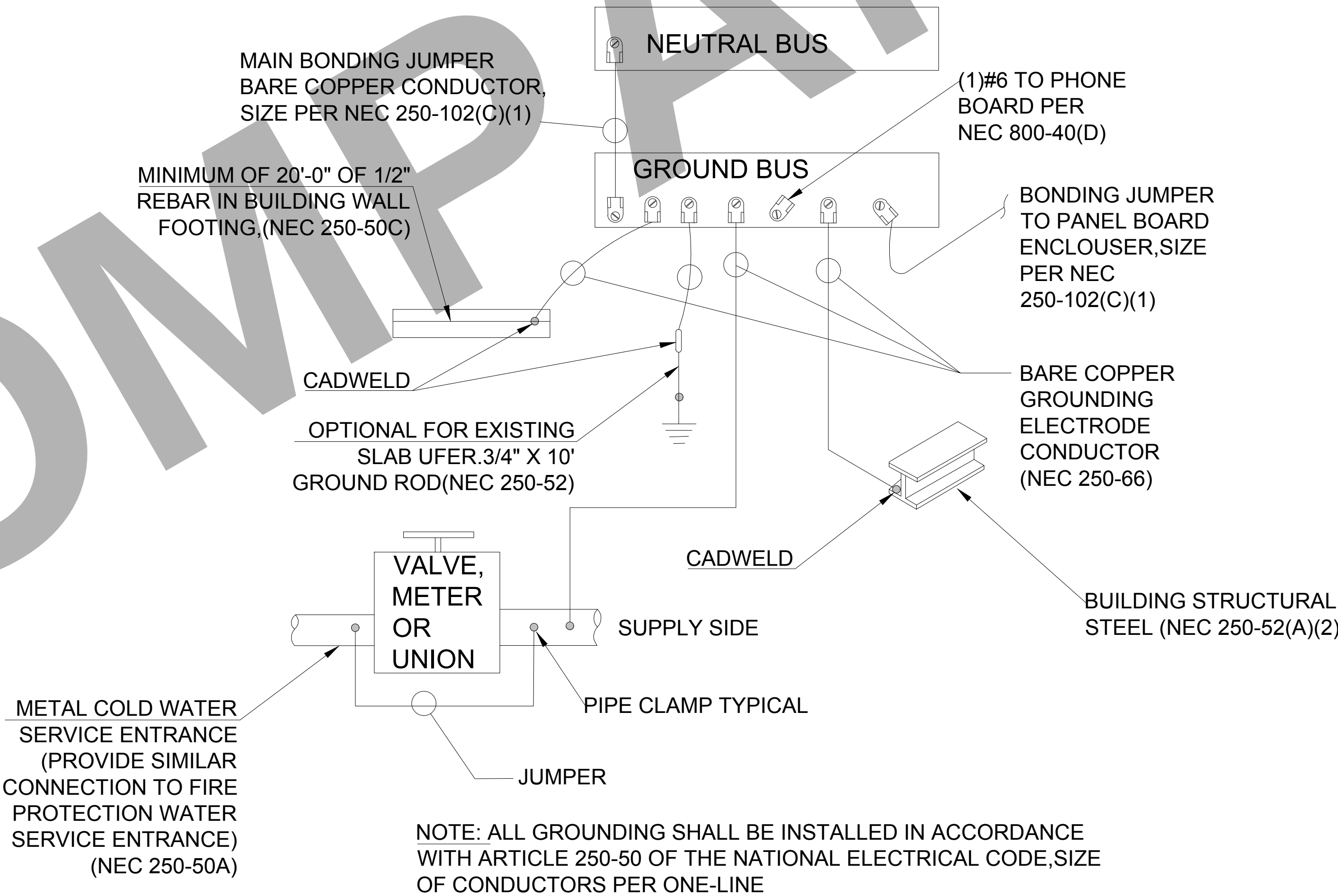
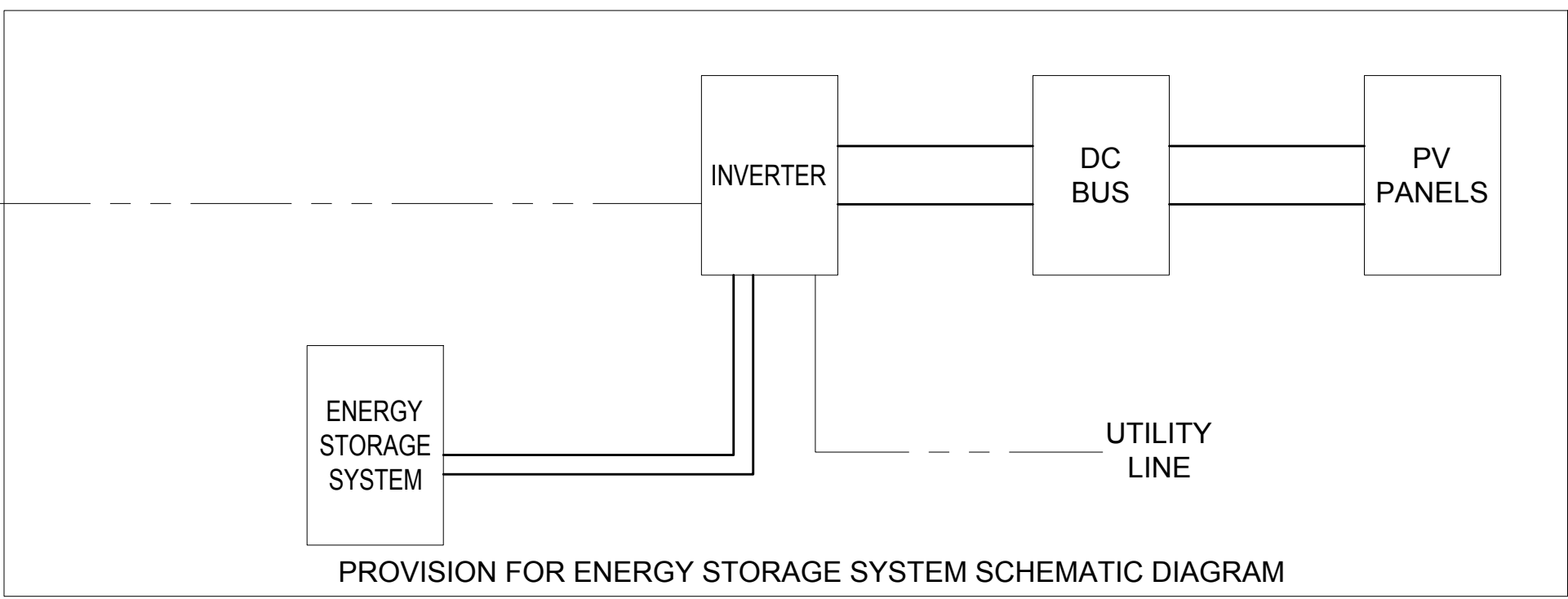


REV. NO.	DESCRIPTION	DATE	BY

DRAWING NO.	REV.
E3-00	



FIRST FLOOR



GROUNDING DETAIL

CLIENT:

ADDRESS:

33758 MELLO WAY
155

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REV. NO.	DESCRIPTION	DATE	BY

PF			
OWNER / USER			
TITLE: ONE LINE DIAGRAM AND GROUNDING DETAIL			
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS	
DRAWING NO. E4-00			REV.

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, AS/JS-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 PERMITTED 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 2022 CALIFORNIA PLUMBING CODE, 2022 CALIFORNIA BUILDING CODE, 2022 CALIFORNIA 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. REPORT ANY DISCREPANCIES, IN WRITING, TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
5. 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. 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 2022 CALIFORNIA 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 CALIFORNIA 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 CONTAMINATION.
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	COMPRESSED AIR
— CA —	FCO	FLOOR CLEANOUT
— Ho —	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
— [] —	-	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
— [] —	ON	ON CENTER
— [] —	SE %	SLOPE AT A PERCENTAGE
— [] —	SHT	SHEET
— [] —	TYP	TYPICAL
— [] —	VTR	VENT THRU ROOF

PLUMBING / GENERAL NOTES

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

BATHUBS 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 3/4" 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 80 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.

PLUMBING LIST OF DRAWINGS (LoD):

SHEET TAG	TITLE	SCALE
P 0.00	PLUMBING GENERAL NOTES AND SPECIFICATIONS.	NTS
P 0.01	PLUMBING CODE CHECKING.	NTS
P 1.01	MAIN FLOOR - WATER SUPPLY LAYOUT.	3/8"=1'-0"
P 1.02	SECOND FLOOR - WATER SUPPLY LAYOUT.	3/8"=1'-0"
P 2.01	MAIN FLOOR - SEWER LAYOUT.	3/8"=1'-0"
P 2.02	SECOND FLOOR - SEWER LAYOUT.	3/8"=1'-0"
P 3.01	MAIN FLOOR - GAS LAYOUT.	3/8"=1'-0"
P 4.01	GAS CODE CHECKING AND ISOM. RISER DIAGRAM.	NTS
P 5.01	HOT WATER CALCULATION AND DATA SHEETS.	NTS
P 6.01	PLUMBING GENERAL DETAILS.	NTS

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
PLUMBING GENERAL NOTES AND SPECIFICATIONS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS
DRAWING NO.		REV.
P 0 . 0 0		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 ^{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 1/2 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	3/4 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	3/8 inch, 6 feet; 1/2 inch and 1 inch, 8 feet; 1 1/4 inches and larger, 10 feet	3/8 inch, 6 feet; 1/2 inch and 1 inch, 8 feet; 1 1/4 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 1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
CPVC-AL-CPVC	Solvent Cemented	3/8 inch, 5 feet; 1/2 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 1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
PEX-AL-PEX	Metal Insert and Metal compression	3/8 inch 1 inch } All sizes 98 inches	Base and each floor; provide mid-story guides
PE-AL-PE	Metal Insert and Metal compression	3/8 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 1/4 inches and larger, 4 feet	Base and each floor; provide mid-story guides
Polypropylene (PP)	Fusion weld (socket, butt, saddle, electrofusion), threaded (metal threads only), or mechanical	1 inch and smaller, 32 inches; 1 1/4 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 Base 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:

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-eighth 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 topped 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-eighths 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

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

SIZE OF PIPE (inches)	1 1/4	1 1/2	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	5400	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 ⁴										
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 1/4 inch per foot (20.8 mm/m) slope. For 1/8 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 1/4 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 lim- itations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

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 1/4 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 1/4 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 1/8 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 ²	2
Property line adjoining private property	Clear ²
Water supply wells	50 ²
Streams	50
On-site domestic water service line	14
Public water main	10 ^{2,3,4}

WATER CONVERSION & WATER CONSUMPTION:

WATER CONSERVING PLUMBING FIXTURES AND FITTINGS	
Plumbing fixtures and fittings shall comply with the following: (2022 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 120°F (49°C) 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 1/4 inches (32 mm) in diameter.

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 120°F (49°C) 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 (1/3) and lower one-third (1/3) 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 1/4 of an inch (20 mm) diameter drain to an approved location. Such pan shall be not less than 1 1/2 (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 1/4 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.

WATER SUPPLY:

TABLE 611.4 SIZING OF RESIDENTIAL WATER SOFTENERS ⁴	
REQUIRED SIZE OF SOFTENER CONNECTION (inches)	NUMBER OF BATHROOM GROUPS SERVED ¹
3/4	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 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.

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.

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REV. NO	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

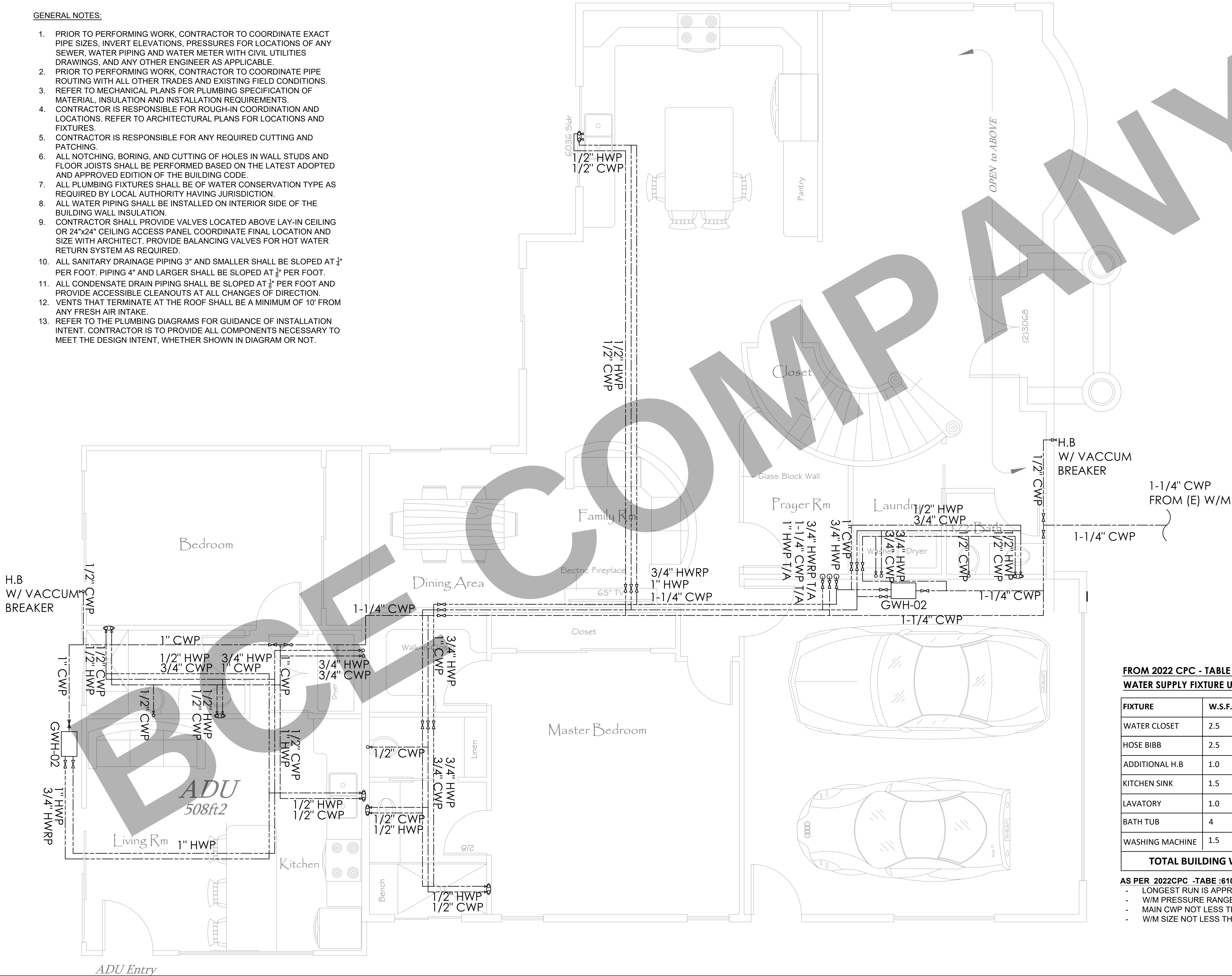
TITLE:
PLUMBING CODE CHECKING.

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO. REV.
P 0 . 0 1 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.
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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 AT $\frac{1}{4}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT 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.



FROM 2022 CPC - TABLE 610.3:
WATER SUPPLY FIXTURE UNITS LOADS:

FIXTURE	W.S.F.U	QTY.	TOTAL W.S.F.U
WATER CLOSET	2.5	5	12.5
HOSE BIBB	2.5	1	2.5
ADDITIONAL H.B	1.0	1	1.0
KITCHEN SINK	1.5	2	3.0
LAVATORY	1.0	7	7.0
BATH TUB	4	4	16.0
WASHING MACHINE	1.5	2	3.0
TOTAL BUILDING WSFU =			45

AS PER 2022CPC -TAFE :610.4

- LONGEST RUN IS APPROX. 80FT.
- W/M PRESSURE RANGE 30-45 PSI.
- MAIN CWP NOT LESS THAN 1-1/4"Ø
- W/M SIZE NOT LESS THAN 1"Ø

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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**MAIN FLOOR
WATER SUPPLY LAYOUT**

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
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DRAWING NO.

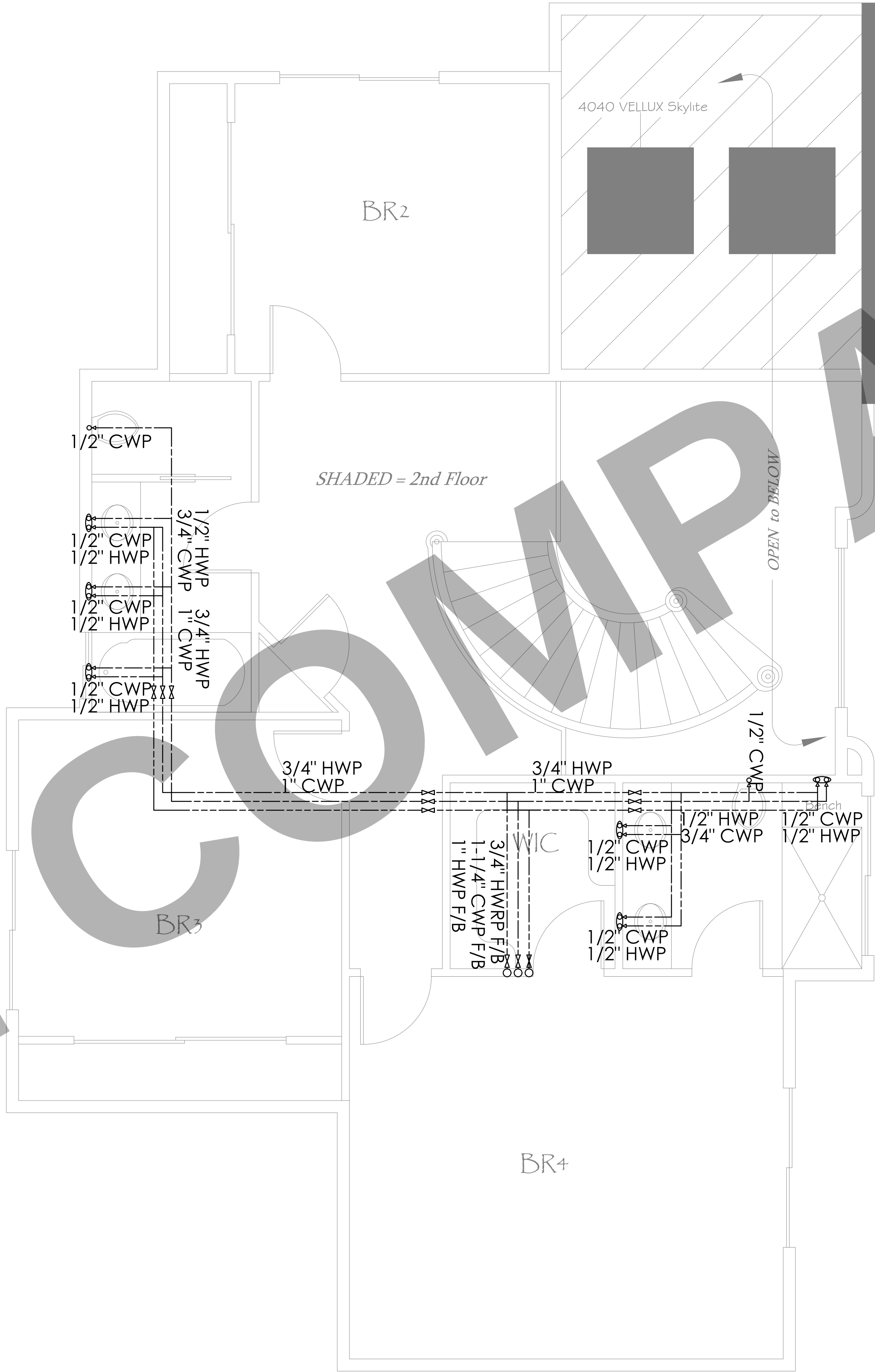
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REV.

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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 AT $\frac{1}{4}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT 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.



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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**SECOND FLOOR
WATER SUPPLY LAYOUT**

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
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DRAWING NO.

P 1 . 0 2

REV.

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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.
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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.

SANITARY 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 — WASTE DROP
- 7 — SOIL DROP AND 4" VENT RISE.
- 8 — INDIRECT WASTE
- 9 — 2" VENT RISE TO HIGH LEVEL.

FROM 2022 CPC - TABLE 702.1:

DRAINAGE FIXTURE UNIT VALUES (DFU)

FIXTURE	D.F.U	QTY.	TOTAL D.F.U
BATH TUB	4.0	4	16.0
KITCHEN SINK	2.0	2	4.0
WATER CLOSET	3.0	5	15.0
LAVATORY	1.0	7	7.0
DRYER	2.0	2	4.0
WASHING MACHINE	2.0	2	4.0
TOTAL BUILDING DFU =			50.0

CLIENT:

ADDRESS:

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4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**MAIN FLOOR
SEWER LAYOUT**

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
3/8"=1'-0"

DRAWING NO.

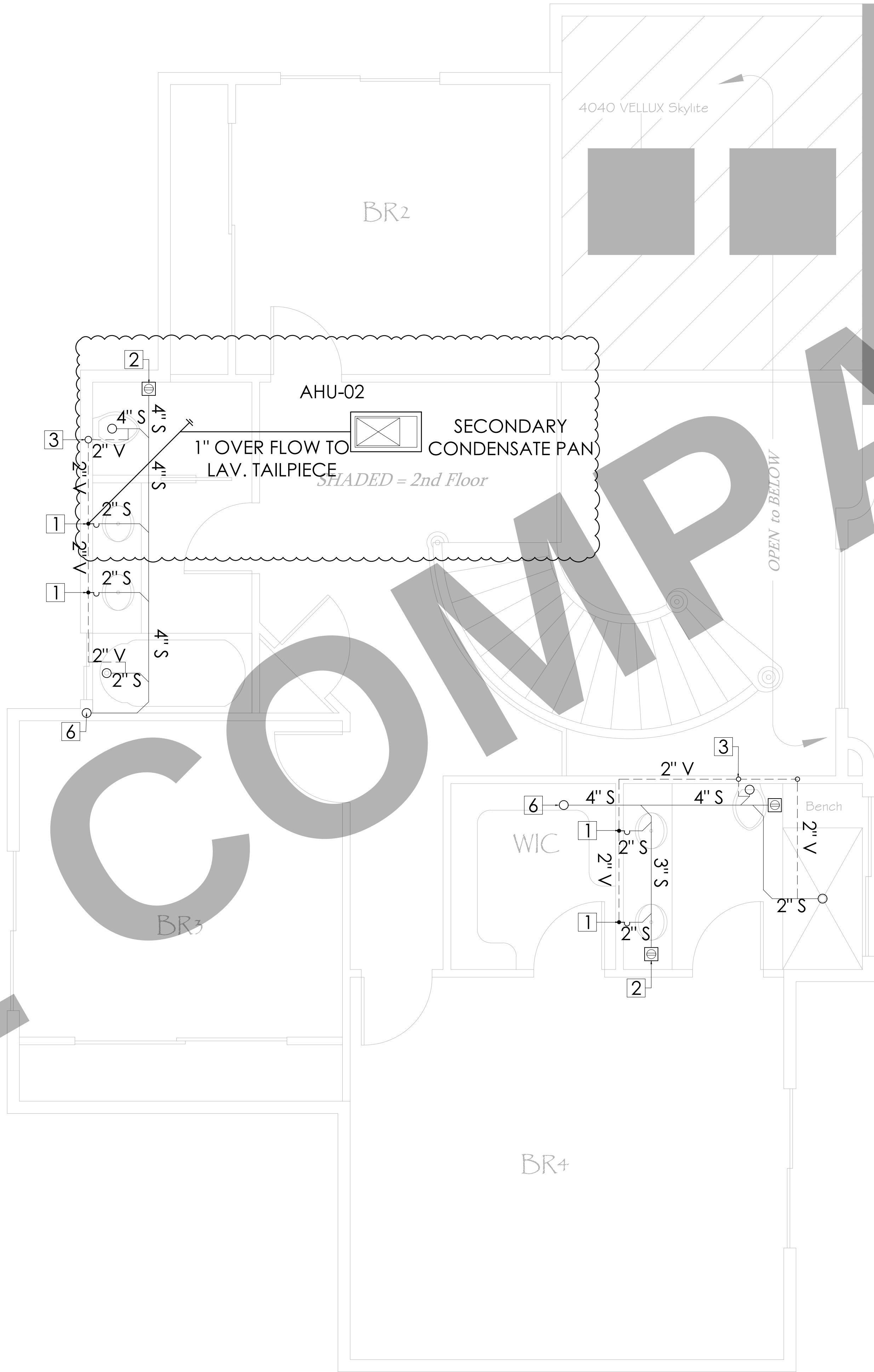
P 2 . 0 1

REV.

01

GENERAL NOTES:

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2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS. 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 AT $\frac{1}{4}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT 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.



SANITARY 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 → WASTE DROP
- 7 → SOIL DROP AND 4" VENT RISE.
- 8 → INDIRECT WASTE

CLIENT:

ADDRESS:

33758 Mello Way
4555
96

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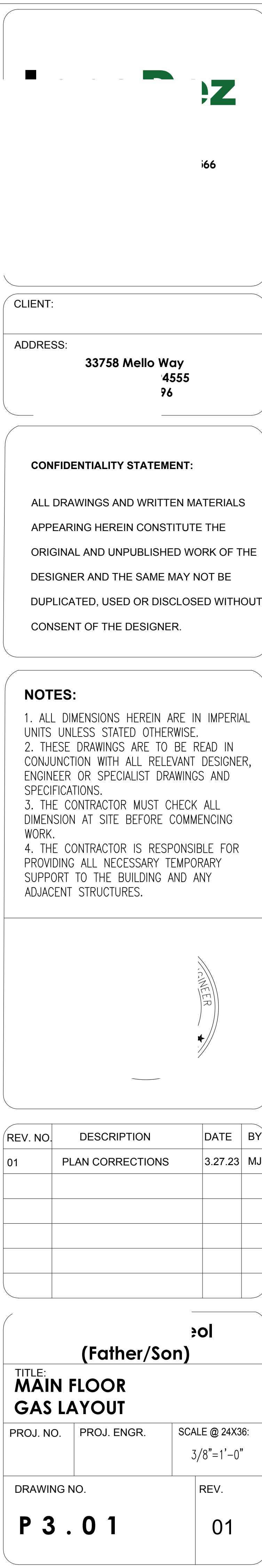
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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

TITLE: SECOND FLOOR SEWER LAYOUT		
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
DRAWING NO. P 2 . 0 2		REV. 01

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 AT $\frac{1}{4}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT 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.
14. 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.
15. 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 LOT LINE, ALLEY AND STREET EXCEPTED.

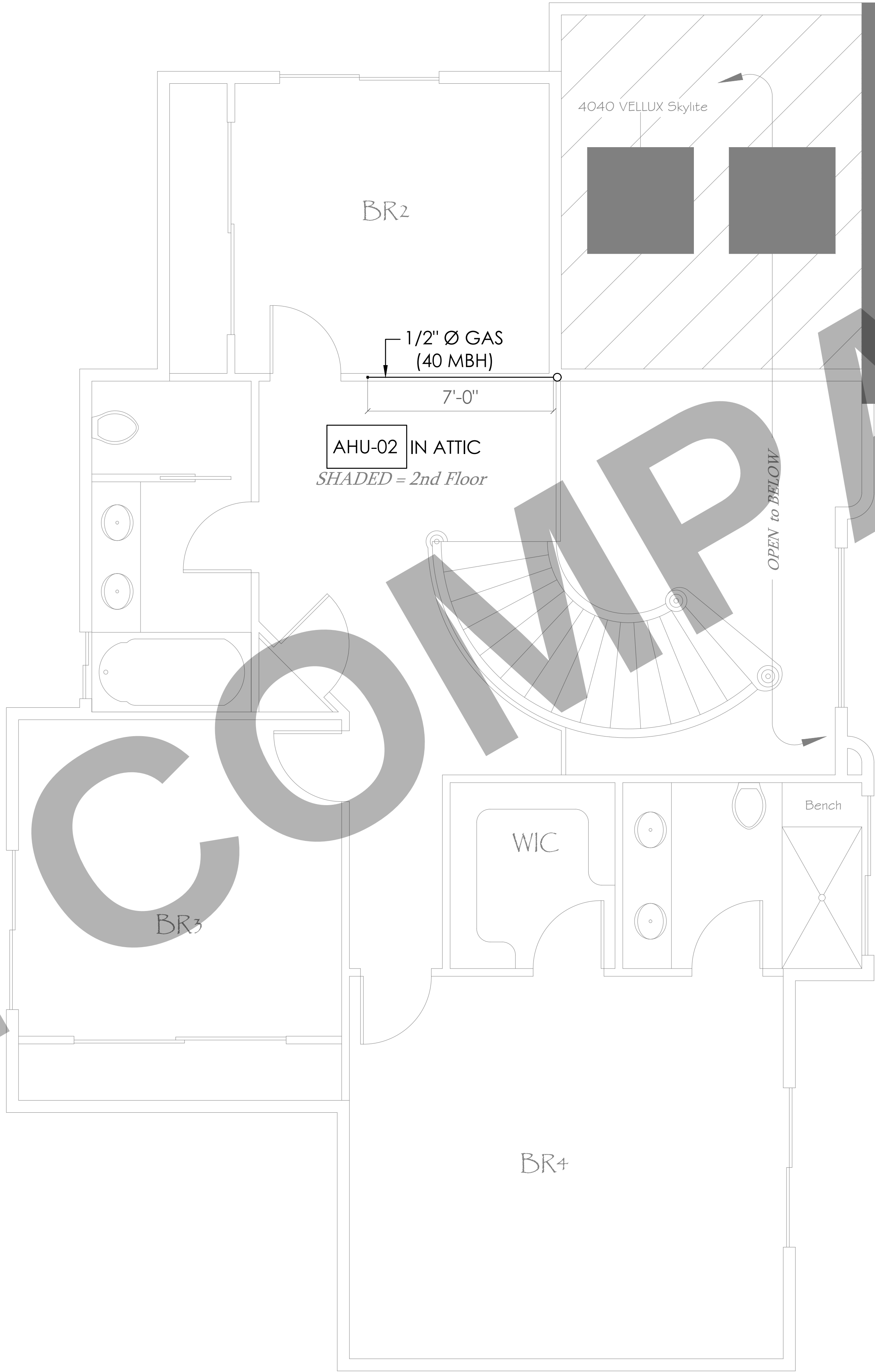


REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

(Father/Son)		
TITLE: MAIN FLOOR GAS LAYOUT		
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
DRAWING NO. P 3 . 0 1		REV. 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 AT $\frac{1}{8}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ " PER FOOT 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.
14. 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.
15. 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 LOT LINE, ALLEY AND STREET EXCEPTED.



CLIENT:

ADDRESS:

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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**SECOND FLOOR
GAS LAYOUT**

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/8"=1'-0"
-----------	-------------	------------------------------

DRAWING NO. P 3 . 0 2	REV. 01
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CALIFORNIA GAS CODE CHECKING:

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.

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

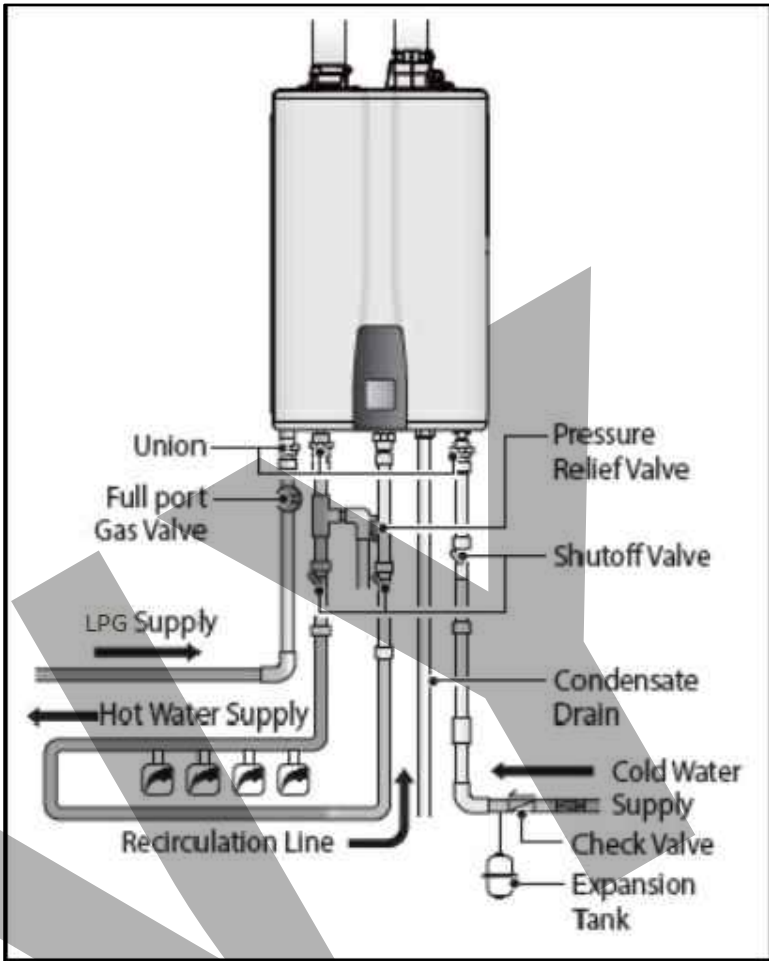
APPLIANCE	INPUT (Btu/h approx.)
Space Heating Units	
Warm air furnace	
Single family	100 000
Multifamily, per unit	60 000
Hydronic boiler	
Single family	100 000
Multifamily, per unit	60 000
Space and Water Heating Units	
Hydronic boiler	
Single family	120 000
Multifamily, per unit	75 000
Water Heating 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

ALL GAS PIPES ARE METALLIC SHCD40.

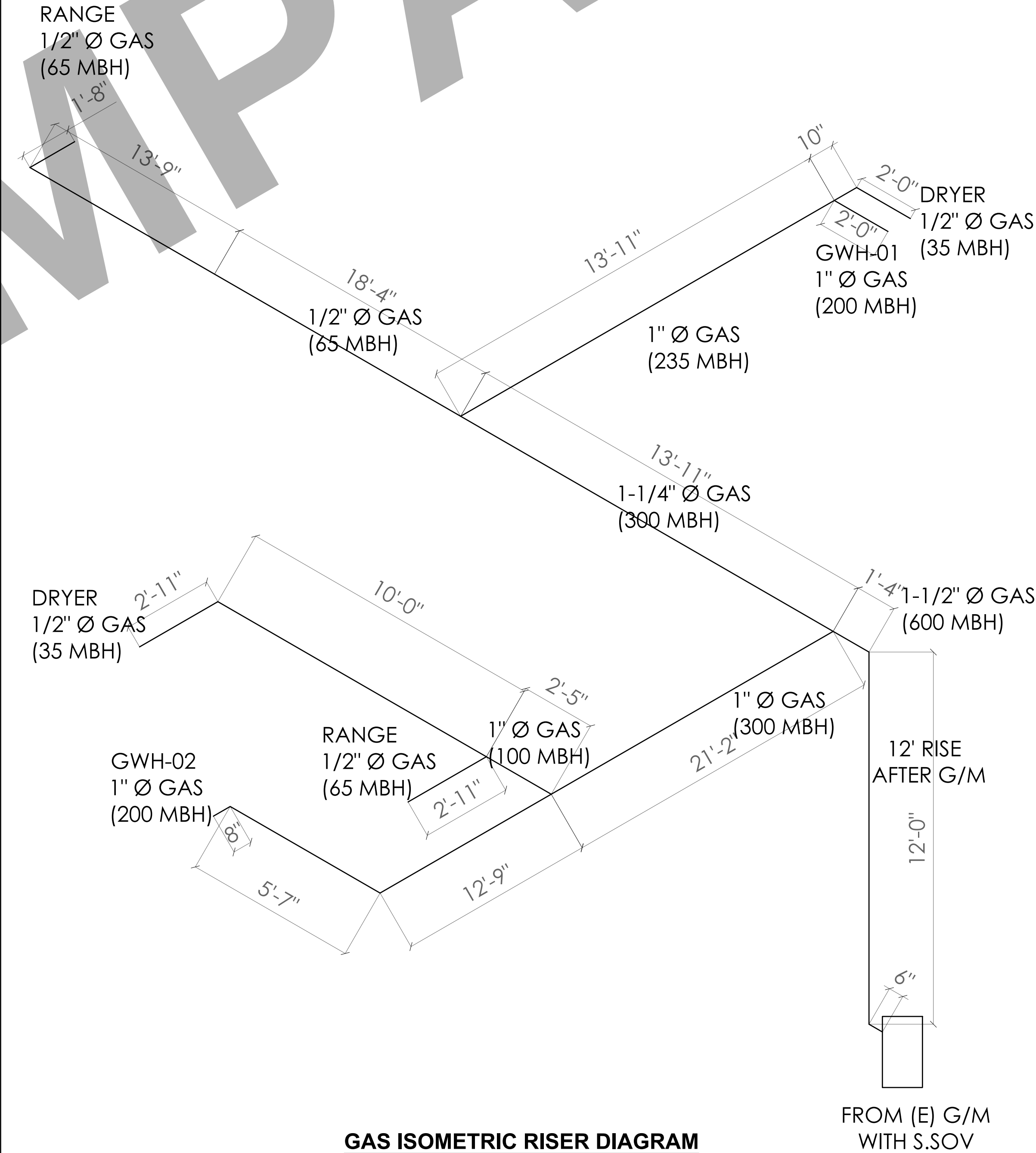
THE TOTAL GAS PIPE LENGTH FROM GAS METER TO THE FARTHEST EQUIPMENT IS APPRX 60 . FEET.

GAS UNITS AND MBH:

ITEM	MBH
GWH-01	200
GWH-02	200
RANGE	65
RANGE	65
DRYER	35
DRYER	35
TOTAL =	600



GAS WATER HEATER GWH
CONNECTION DETAIL



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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
**GAS CODE CHECKING
AND ISOM. RISER DIAGRAM**

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.	REV.
P 4 . 0 1	01

TAG	GWH-01
LOCATION	GARAGE
MANUFACTURER	AO SMITH
MODEL	ACT-199I-N
TYPE	GAS
STORAGE CAPACITY (U.S.GAL)	NO STORAGE
MAX. GAS INPUT (BTU/hr)	15,000 / 199,000
APPROX. WEIGHT (lbs)	71
WIDTH x DEPTH (in.)	17-3/4" x 11-1/4"
HEIGHT (in)	23-5/8"
WATER CONNECTION SIZE	3/4"
GAS INLET CONNECTION	3/4"
RE-CIRCULATING PUMP	INTEGRATED

TAG	GWH-02
LOCATION	OUTDOOR
MANUFACTURER	AO SMITH
MODEL	ACT-1990-N
TYPE	GAS
STORAGE CAPACITY (U.S.GAL)	NO STORAGE
MAX. GAS INPUT (BTU/hr)	15,000 / 199,000
APPROX. WEIGHT (lbs)	69
WIDTH x DEPTH (in.)	17-3/4" x 11-1/4"
HEIGHT (in)	23-5/8"
WATER CONNECTION SIZE	3/4"
GAS INLET CONNECTION	3/4"
RE-CIRCULATING PUMP	INTEGRATED

AC Smith.

Commercial Gas Tankless Water Heater

TANKLESS CONDENSING HIGH EFFICIENCY COMMERCIAL GAS

Ultra-low NOx gas tankless water heaters with condensing technology featuring up to 0.95 Uniform Energy Factor (UEF) which lowers operating costs and is environmentally friendly.

FEATURES:

- ULTRA-LOW NOx CONDENSING TECHNOLOGY PROVIDES UP TO 0.95 UNIFORM ENERGY FACTOR**
- DURABLE HEAT EXCHANGER**
 - Primary Heat Exchanger is constructed of Commercial Copper Cores that is more resistant to erosion and is 2x better at heat transfer than stainless steel thus adding longevity when water temperatures are higher
 - Secondary Heat Exchanger is made of Type 316L Stainless Steel to protect against corrosion
- CONTINUOUS MAXIMUM FLOW RATES UP TO 10.0 GPM**
- ENERGY STAR® QUALIFIED**
- AVAILABLE IN NATURAL GAS OR PROPANE (LP)**
- INDOOR MODEL - INCLUDES INTEGRATED TEMPERATURE CONTROLLER AND ADVANCED DIAGNOSTICS TO SIMPLIFY TROUBLESHOOTING**
- OUTDOOR MODEL - INCLUDES A WALL MOUNT TEMPERATURE REMOTE CONTROLLER AND ADVANCED DIAGNOSTICS TO SIMPLIFY TROUBLESHOOTING**
- FACTORY-INSTALLED POWER CORD AVAILABLE FOR INDOOR MODELS**
- EASY-LINK™ UP TO 4 UNITS (CT-199 MODELS ONLY)**
 - With no additional parts or accessories needed

MULTI-LINK UP TO 20 UNITS

COMMON VENT UP TO 5 UNITS COMPLIES WITH LEAD FREE STANDARDS

- Safety Features:
 - Air-Fuel Ratio (AFR) Sensor
 - Exhaust & Water Temperature Safety Control
 - Overheat Cut-Off Switch
- INTERNAL PROTECTION FREEZE PROTECT 37°F TO 0°F**

POWER DIRECT VENT DESIGN

- Exhaust, 3" PVC Venting up to 70 feet or 4" PVC Venting up to 100 feet
- Provides Tankless venting with PEX® A/C or ABS Pipe for Water and Gas (Solid Core only). Condensing applications require UL-580B Listed PVC or CPVC Pipe for Venting.

ACCESSORIES

- Category III IR TVI viewing can be used
- Pipe Coater
- Neutralizer Kit
- Isolation Valve
- Condensate Evaporation Kit

WARRANTY

- 6-year limited warranty on heat exchanger in commercial applications
- 5-year limited warranty on all parts

INDOOR MODEL CT-199



OUTDOOR MODEL CT-199



ANSI Z39.1-93 CSA 4.3

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Page 1 of 6
A006144006

A.C. Smith Tankless Water Heater

Model Number	Type	Gas Consumption Input		Inlet Gas Pressure		UEF	Maximum GPM ¹	Hot/Cold Connections	Gas Connection	Dimensions in Inches		Approx Shipping Weight (lbs)
		Minimum BTU/Hr	Maximum BTU/Hr	Minimum in. W.C.	Maximum in. W.C.					Height	Width	Depth
Indoor Models												
ACS-1995-N	Natural	15,000	199,000	4.0	10.5	0.93	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4
ACS-1995-P	Propane	13,000	199,000	8.0	14.0	0.93	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4
Outdoor Models												
ACS-1990-N	Natural	15,000	199,000	4.0	10.5	0.95	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4
ACS-1990-P	Propane	13,000	199,000	8.0	14.0	0.95	10	3/4" NPT	3/4" NPT	23-5/8	17-3/4	11-1/4

All GPM's are in inches.

1. 1/2" gas inlet pressure, 40 psi or above is recommended for maximum flow.

2. 1/2" gas inlet pressure, 40 psi or above is recommended for continuous flow after initial ignition.

3. Input models are certified from sea level to 10,000' elevation.

4. Output models are certified from sea level to 10,000' elevation.

The manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Page 2 of 6
 A25C614006



Smith.

Innovation has a name.

A. O. Smith
Phone: 888.362.4958
www.hobasolar.com

Pro-Size Selection Report

January 8, 2023

Project Information

Project #

Project Name

Location

Engineer

Contractor

1

Mello Way

California

AI

Prepared for:

Prepared by:

InnoDaz

Selected Product

ACT-1990-N

CT-199 Commercial Condensing Outdoor Gas Tankless Water Heater

Heaters

Model Number

Input (btu)

Total Flow

% Demand

1

ACT-1990-N

199,000 Btu/hr

4.8 USGPM

24%

- Ultra Low NOx condensing technology provides up to 13.5% uniform energy factor
- Primary heat exchanger constructed of commercial grade copper alloy. Secondary heat exchanger constructed of 316L Stainless Steel
- Continuous maximum flow rates up to 10.0 gpm
- Energy Star® qualified
- Common vent 8 heaters for up to 100 foot vent run using tech. 40 PVC
- Common vent 16 heaters with no additional controls. Multi-Line, up to 20 heaters with Multi-Unit Controller (Cat. 1901-1201)

- Complies with Lead Free standards
- Thermal Efficiency > 98%
- 6-year limited warranty on the heat exchangers
- 5-year warranty on parts
- 1-year warranty on labor



Application Labels

Summary

Peak Demand:

2.1 USGPM

Temperature Rise:

80 °F

Inlet Temperature:

49 °F

Set Temperature:

120 °F

Application Settings

Type:

Required Flow:

Equipment:

Fuel Type:

Location:

ASME:

Apartment Building

2.1 USGPM

Commercial Tankless Heaters (no storage)

Natural Gas

Outdoor

Not Required

The A. O. Smith Pro-Size using program is a tool that can be used to retrieve water heater requirements for many common applications. Pro-Size is intended to assist in selecting water heaters to better fit best meet the specific job requirements. It is the sole responsibility of the system designer to select the correct products needed for the specific application. A. O. Smith reserves the right to make changes to this tool without notice.

Page 1 of 2

January 8, 2023

Heaters:

Not Specified

Altitude:

Less than 2000 ft

Load Data

Private Lavatory: 1

Tub/Shower: 1

Domestic Kitchen Sink: 1

Domestic Clothes Washer: 1

Additional Load: 0.0 USGPM

Design Overhead: 0%

Statements & Warnings

For recreation systems through the CT-180, the pump shall provide no less than 2 gpm and no more than 4 gpm through each activated unit and shall be controlled by an aquastat. Refer to the heater's specification sheet for pressure drop data.

A recirculation line is required to a commercial dishwasher.

In areas of hard water, refer to the heater's installation manual for water quality criteria.

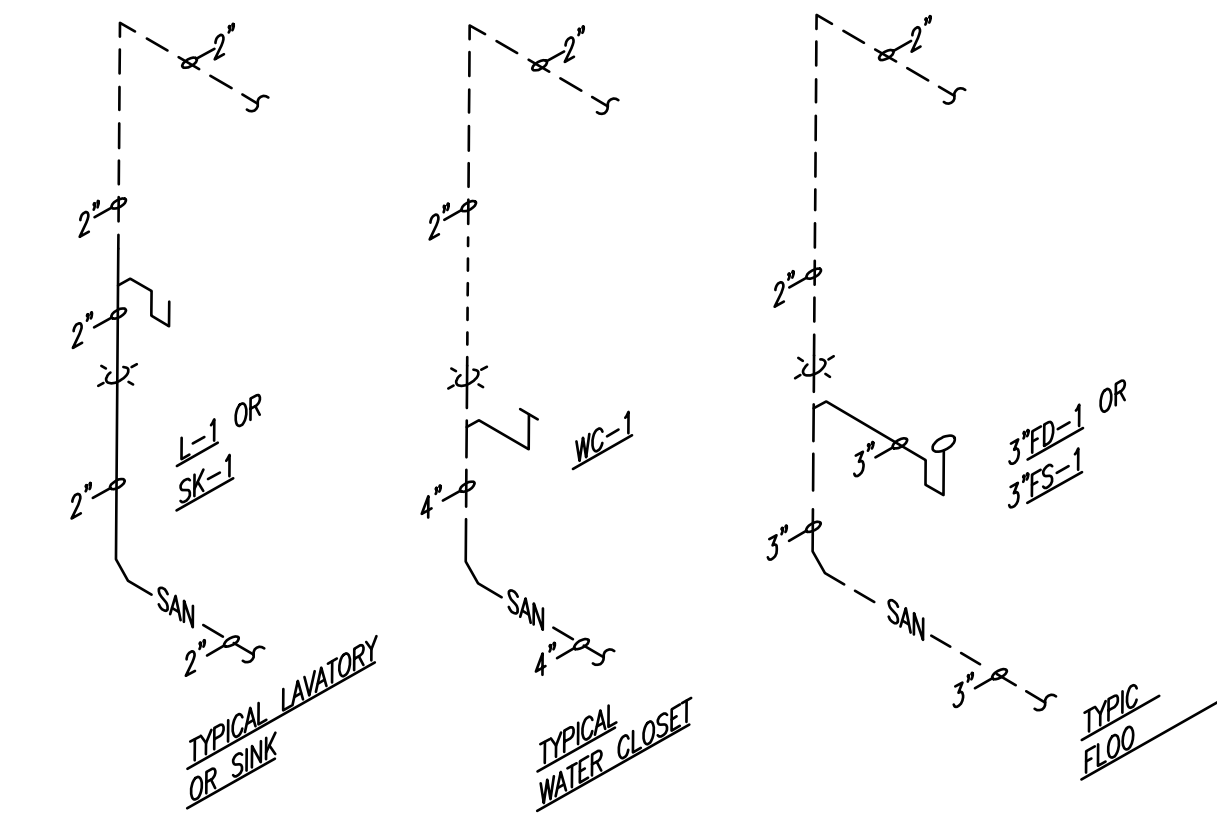
The A. C. Smith Pro-Size sizing program is a tool that can be used to estimate water heater requirements for many common applications. Pro-Size is intended to assist in selecting water heaters or boilers that meet the specific size requirements. It is the sole responsibility of the system designer to select the correct products needed for the specific application. A. C. Smith reserves the right to make changes to Pro-Size without notice.

Page 2 of 2

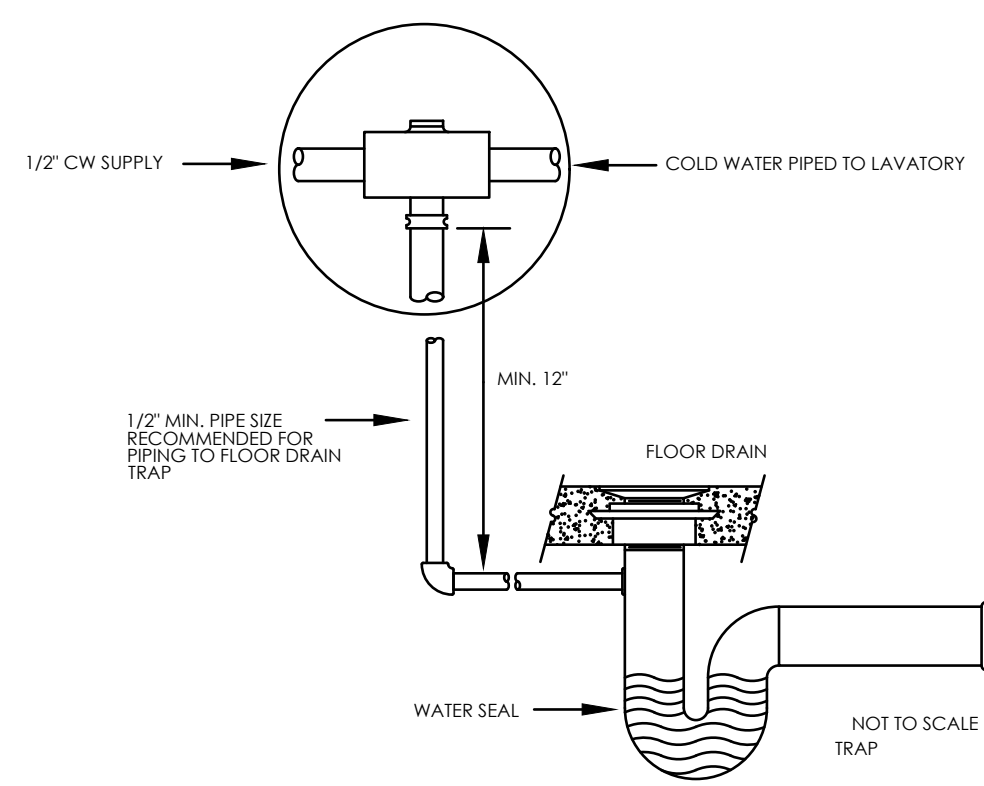
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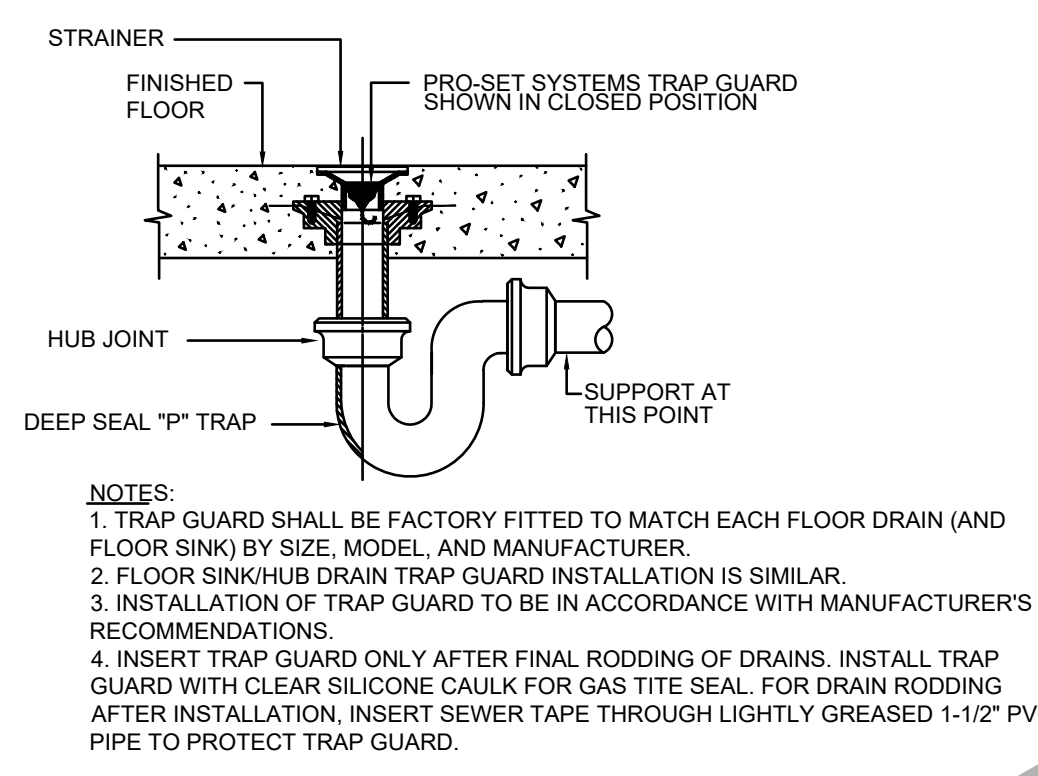
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TITLE: HOT WATER CALCULATION AND DATA SHEETS.		
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS
DRAWING NO.		REV.
P 5 . 0 1		01



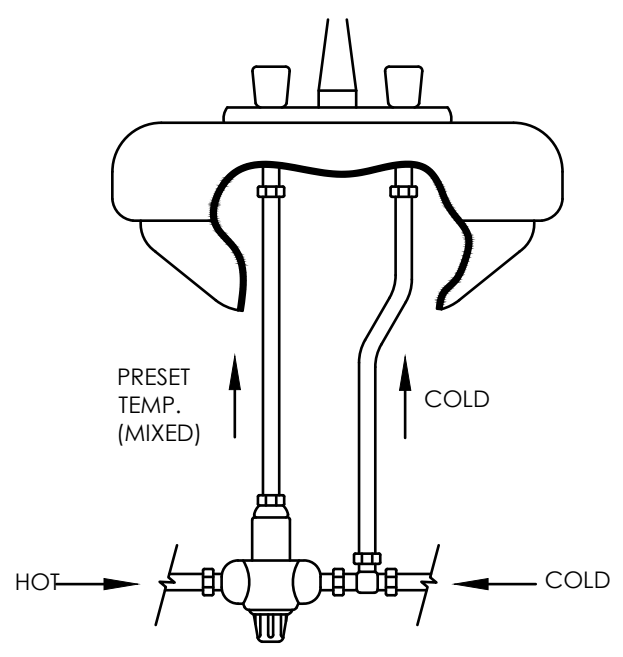
1 TYPICAL WASTE AND VENT RISERS
SCALE: NONE



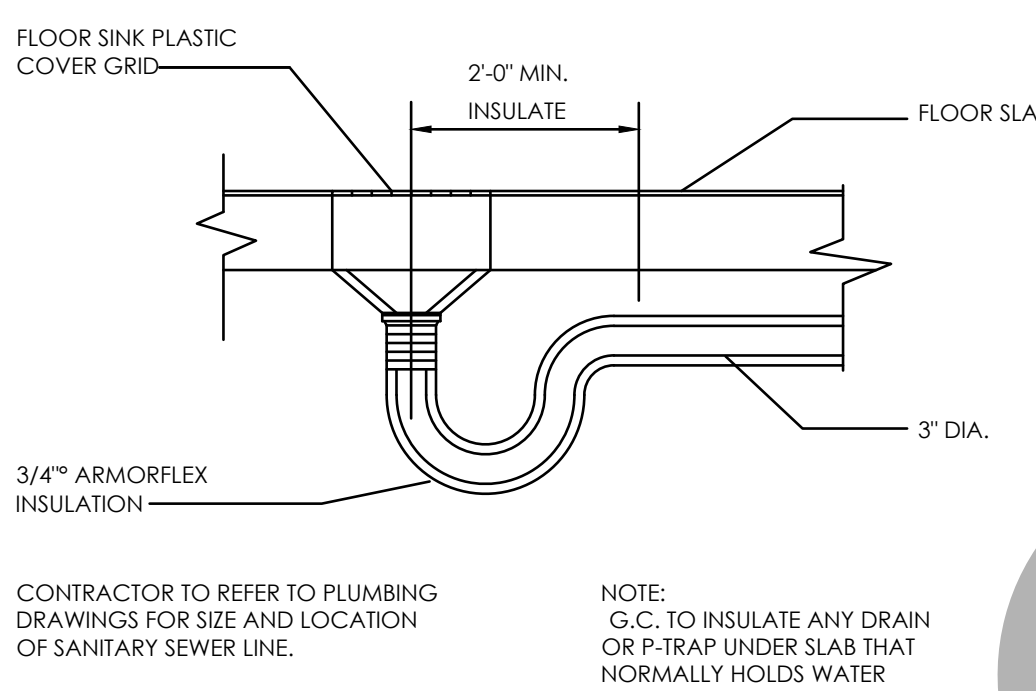
2 TRAP PRIMER
SCALE: NONE



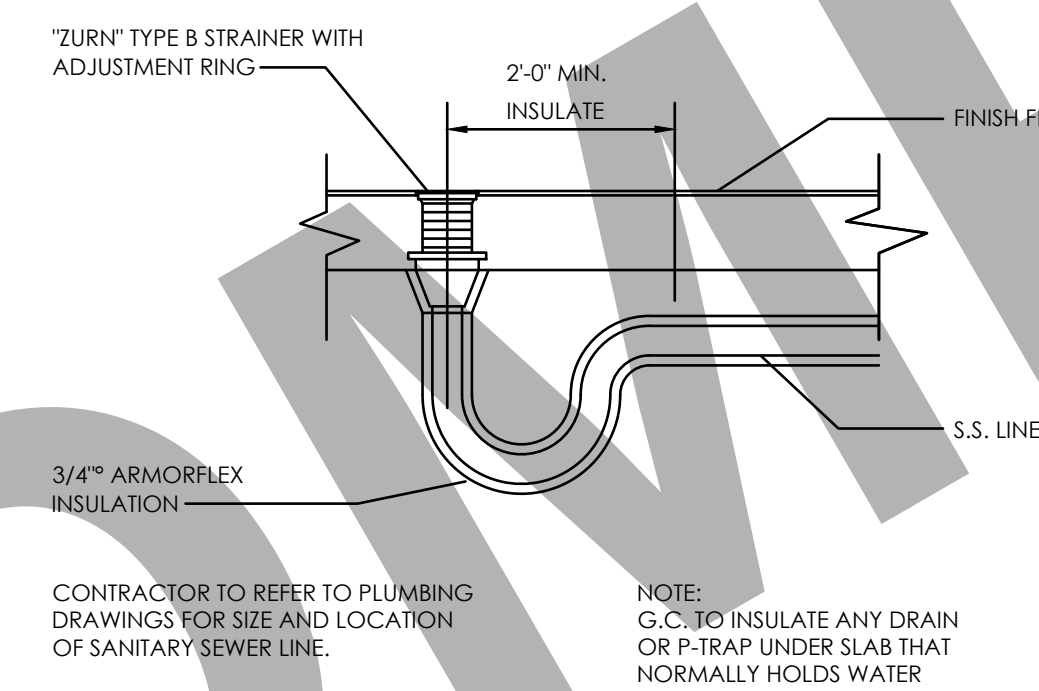
3 FLOOR DRAIN WITH TRAP SEAL PROTECTION
SCALE: NONE



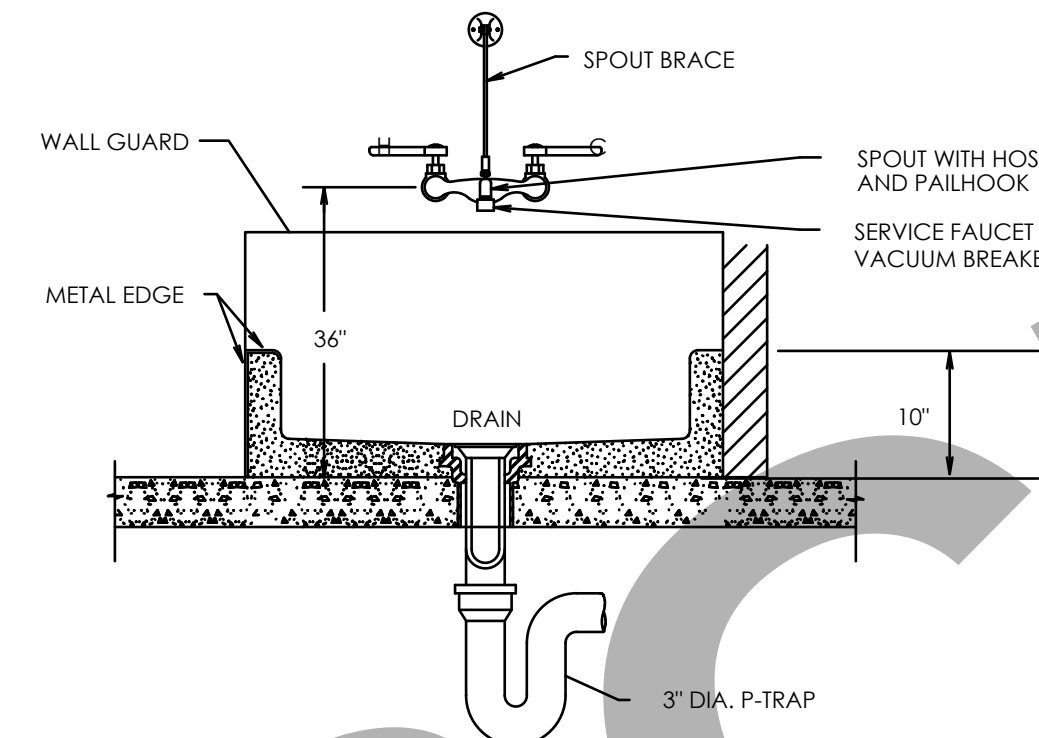
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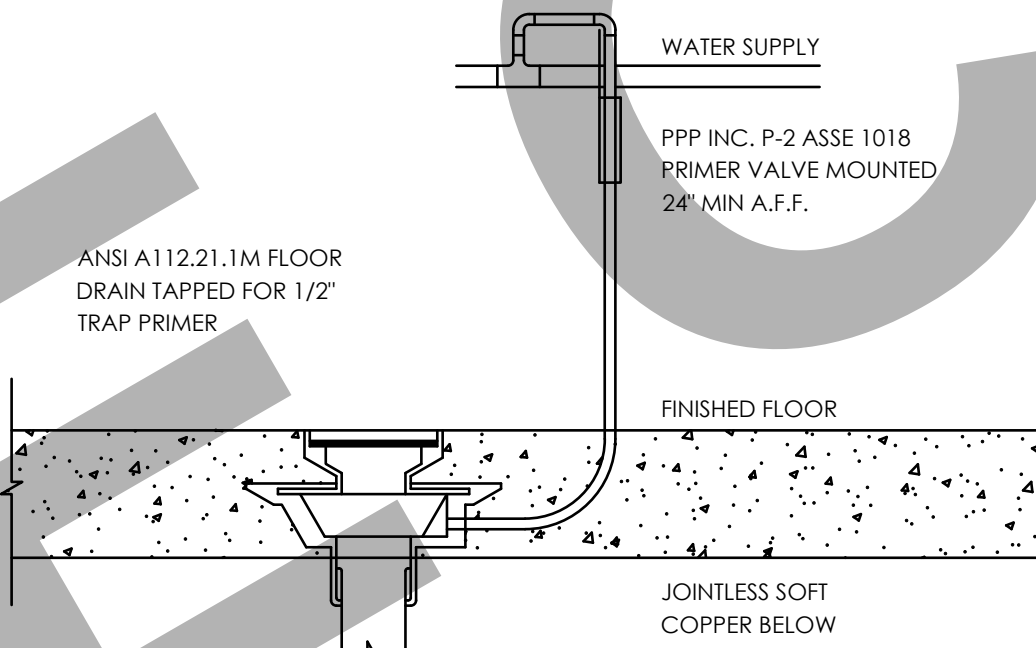
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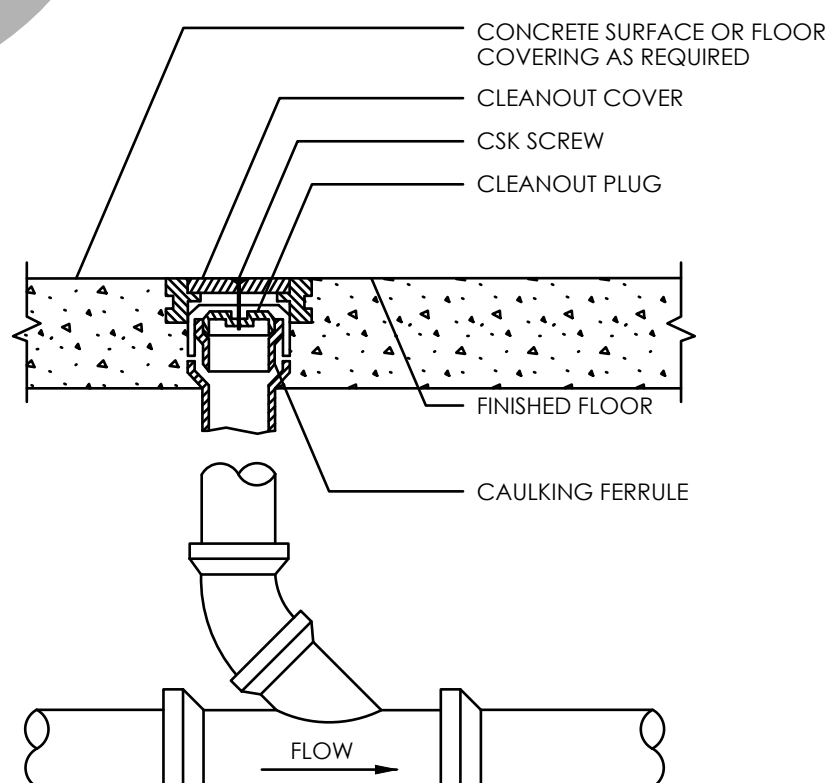
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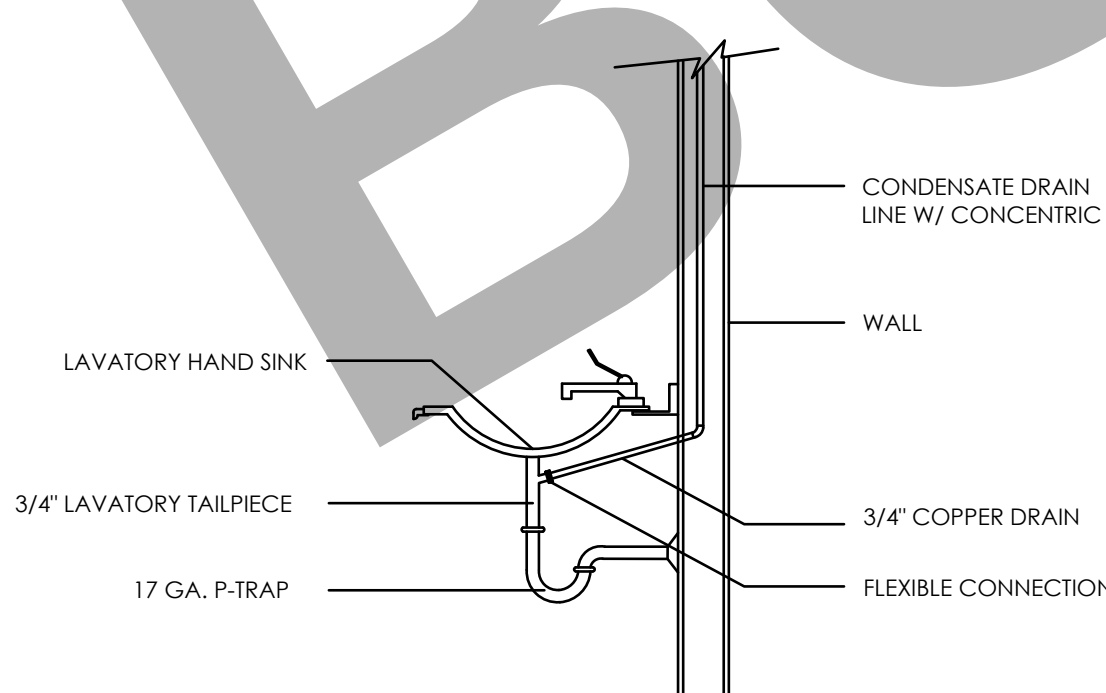
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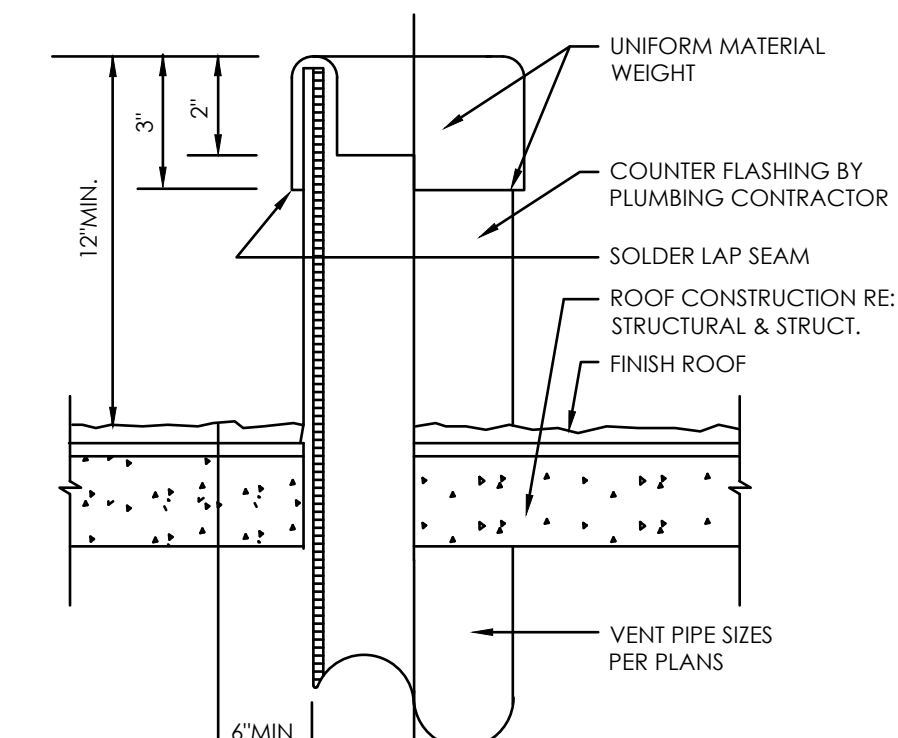
TRAP PRIMER DETAIL
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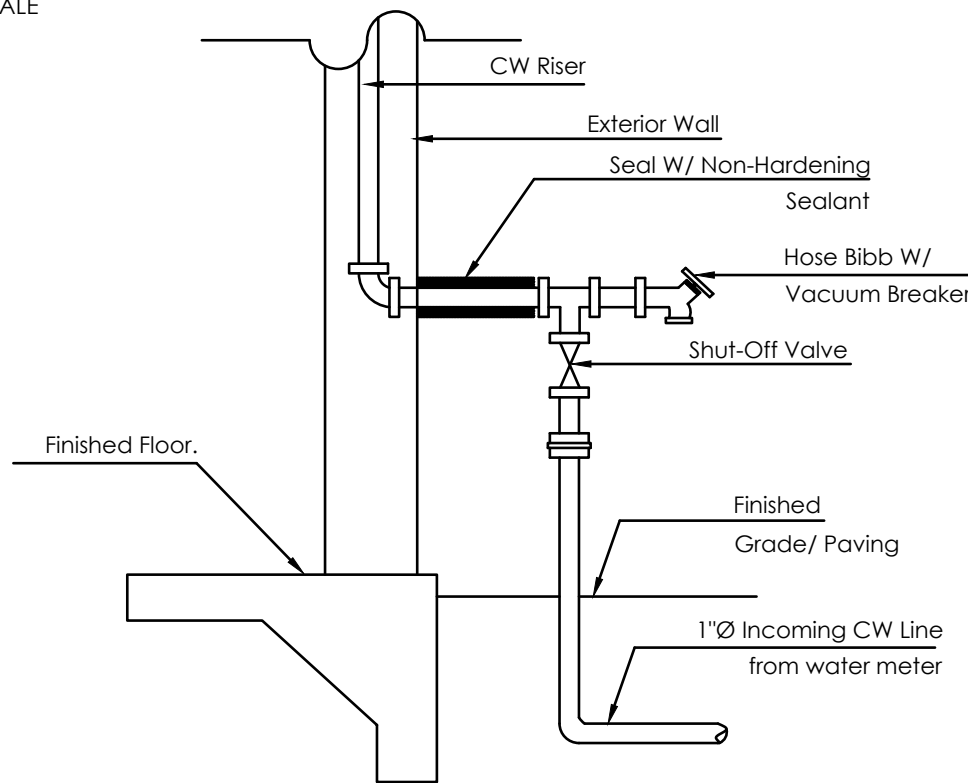
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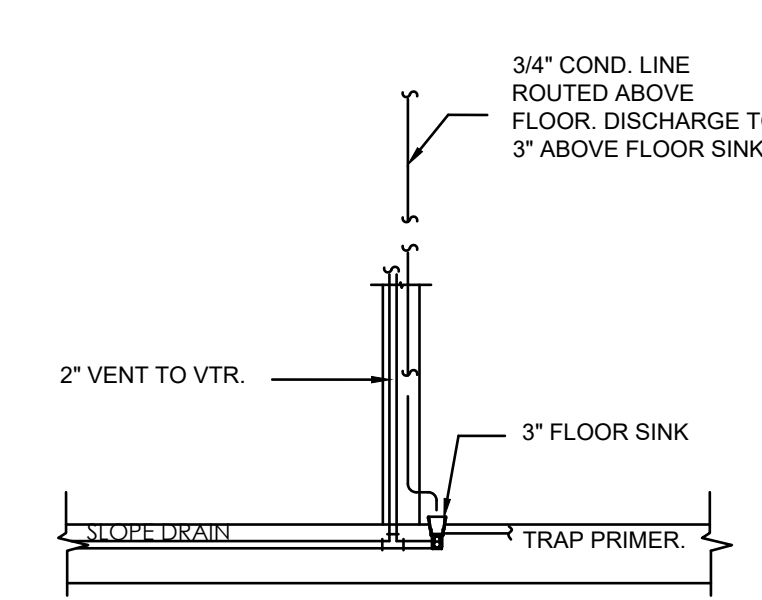
CONDENSATE DETAIL
NO SCALE



VENT THRU ROOF DETAIL
NO SCALE



WATER ENTRY DETAIL
NO SCALE



COND. ON FLOOR SINK DETAIL
NO SCALE

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REV. NO.	DESCRIPTION	DATE	BY
01	PLAN CORRECTIONS	3.27.23	MJ

PROJECT:

TITLE:
PLUMBING GENERAL DETAILS.

PROJ. NO. PROJ. ENGR. SCALE @ 24X36:
NTS

DRAWING NO. REV.

P 6 . 0 1 01

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x

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GENERAL INFORMATION											
01	Project Name		Avtar/Aman Deol (Father/Son)								
02	Run Title		Title 24 Analysis								
03	Project Location		33758 Mello Way								
04	City		Fremont		05	Standards Version		2022			
06	Zip code		94555		07	Software Version		EnergyPro 9.0			
08	Climate Zone		3		09	Front Orientation (deg/ Cardinal)		0			
10	Building Type		Single family		11	Number of Dwelling Units		1			
12	Project Scope		Newly Constructed		13	Number of Bedrooms		5			
14	Addition Cond. Floor Area (ft²)		0		15	Number of Stories		2			
16	Existing Cond. Floor Area (ft²)		n/a		17	Fenestration Average U-factor		0.23			
18	Total Cond. Floor Area (ft²)		3091		19	Glazing Percentage (%)		20.30%			
20	ADU Bedroom Count		n/a								

COMPLIANCE RESULTS

01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

Registration Number: 423-P010006208A-000-000-0000000-0000

Registration Date/Time: 01/16/2023 09:00

HERS Provider: CHEERS

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

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Input File Name: Mello Way T24.rbd22x

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ENERGY USE INTENSITY				
	Standard Design (kBtu/ft ² - yr)	Proposed Design (kBtu/ft ² - yr)	Compliance Margin (kBtu/ft ² - yr)	Margin Percentage
Gross EU1	13.46	12.51	0.95	7.06
Net EU1	7.47	6.51	0.96	12.85
Notes				
1. Gross EU1 is Energy Use Total (not including PV) / Total Building Area.				
2. Net EU1 is Energy Use Total (including PV) / Total Building Area.				

REQUIRED PV SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
3.52	NA	Standard (14-17%)	Fixed	none	true	150-270	n/a	n/a	<=7:12	96	98

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- IAQ Ventilation System: as low as 0.142857 W/CFM
- Ducts with high level of insulation
- Ceiling has high level of insulation
- Non-standard duct location (any location other than attic)
- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)

Registration Number: 423-P010006208A-000-000-0000000-0000

Registration Date/Time: 01/16/2023 09:00

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Calculation Description: Title 24 Analysis

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Input File Name: Mello Way T24.rbd22x

(Page 5 of 17)

HERS FEATURE SUMMARY

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- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood
- Whole house fan airflow and fan efficacy
- Minimum Airflow
- Verified SEER/SEER2
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)
- Fan Efficacy Watts/CFM
- Verified HSPF
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)
- Duct leakage testing
- Ducts located entirely in conditioned space confirmed by duct leakage testing
- Pipe Insulation, All Lines

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft²)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Avtar/Aman Deol (Father/Son)	3091	1	5	8	0	2

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft²)	Avg. Ceiling Height	Water Heating System 1	Status
Main Residence Main floor	Conditioned	Main Residence Main Floor1	1583	9.3	DHW Sys 1	New
Main Residence Second flo	Conditioned	Main Residence Second Flo2	1000	9.3	DHW Sys 1	New
ADU	Conditioned	ADU3	508	9.3	DHW Sys 3	New

Registration Number: 423-P010006208A-000-000-0000000-0000

Registration Date/Time: 01/16/2023 09:00

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Calculation Description: Title 24 Analysis

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Input File Name: Mello Way T24.rbd22x

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ENERGY USE INTENSITY				
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REQUIRED PV SYSTEMS

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REQUIRED SPECIAL FEATURES

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis

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Input File Name: Mello Way T24.rbd22x

(Page 5 of 17)

HERS FEATURE SUMMARY

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- Airflow in habitable rooms (SC3.1.4.1.7)
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BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft²)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Avtar/Aman Deol (Father/Son)	3091	1	5	8	0	2

ZONE INFORMATION

01	02	03	04	05	06	07
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Main Residence Second flo	Conditioned	Main Residence Second Flo2	1000	9.3	DHW Sys 1	New
ADU	Conditioned	ADU3	508	9.3	DHW Sys 3	New

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis

Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x

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OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft²)	Window and Door Area (ft2)	Tilt (deg)
North Walls	Main Residence Main floor	R-19 Wall	0	Front	327.25	133.67	90
East Walls	Main Residence Main floor	R-19 Wall	90	Left	214.7	86.25	90
South Walls	Main Residence Main floor	R-19 Wall	180	Back	256.5	71.05	90
West Walls	Main Residence Main floor	R-19 Wall	270	Right	394.25	49	90
North Walls 2	Main Residence Second flo	R-19 Wall	0	Front	465.5	57	90
East Walls 2	Main Residence Second flo	R-19 Wall	90	Left	311.6	0	90
South Walls 2	Main Residence Second flo	R-19 Wall	180	Back	465.5	26	90
West Walls 2	Main Residence Second flo	R-19 Wall	270	Right	311.6	21	90
East Walls 3	ADU	R-19 Wall	90	Left	160.66	49.75	90
South Walls 3	ADU	R-19 Wall	180	Back	286	121.34	90
West Walls 3	ADU	R-19 Wall	270	Right	160.55	0	90
Adjacent to Garage	Main Residence Main floor>>_Garage_	R-15 Wall	n/a	n/a	370	0	n/a
Adjacent to ADU	Main Residence Main floor>>ADU	R-15 Wall	n/a	n/a	286.9	0	n/a
Adjacent to Main Residence	ADU>>Main Residence Main floor	R-15 Wall	n/a	n/a	286.9	0	n/a
Adjacent to Garage 2	_Garage_>>Main Residence Main floor	copy of R-15 Wall	n/a	n/a	190	0	n/a
Adjacent to Garage 3	_Garage_>>Main Residence Main floor	copy of R-15 Wall	n/a	n/a	190	0	n/a

Registration Number: 423-P010006208A-000-000-0000000-0000

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

TITLE:

T24-01

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

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Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft²)	Window and Door Area (ft²)	Tilt (deg)
Roof 2	Main Residence Main floor	R-38 HP Attic	n/a	n/a	583	n/a	n/a
Roof 3	Main Residence Second flo	R-38 HP Attic	n/a	n/a	968	n/a	n/a
Roof 4	ADU	R-38 HP Attic	n/a	n/a	508	n/a	n/a
Roof 5	__Garage__	R-38 Roof Attic	n/a	n/a	425	n/a	n/a
Floor Ceiling	Main Residence Main floor	copy of R-21 Wall	n/a	n/a	1000	n/a	n/a
Floor Ceiling 2	Main Residence Second flo	Flooring	n/a	n/a	1000	n/a	n/a
North Walls 3	__Garage__	R-21 Wall	0	Front	201	112	90
East Walls 4	__Garage__	R-21 Wall	90	Left	200	33	90

OPAQUE SURFACES - CATHEDRAL CEILINGS

01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Construction	Azimuth	Orientation	Area (ft²)	Skylight Area (ft²)	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Cool Roof
Roof	Main Residence Second flo	R-38 HP Attic1	0	Front	32.1	32	4	0.1	0.85	No

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic __Garage__	Attic Garage Roof Cons	Ventilated	4	0.1	0.85	Yes	No
Attic Main Residence Main floor	Attic Roof/Main Residence Main floor	Ventilated	4	0.1	0.85	No	No
Attic Main Residence Second flo	Attic Roof/Main Residence Second flo	Ventilated	4	0.1	0.85	No	No

Registration Number: 423-P010006208A-000-000-00000000-0000

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Schema Version: rev 20220901

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

(Page 10 of 17)

Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

01	02	03	04	05	06	07	08
Name	Zone	Area (ft²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab-on-Grade 3	__Garage__	425	0.1	none	0	0%	No

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
R-21 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-21	None / None	0.069	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x6 Exterior Finish: 3 Coat Stucco
R-19 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-19	None / None	0.074	Inside Finish: Gypsum Board Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6 Exterior Finish: 3 Coat Stucco
R-38 HP Attic1	Cathedral Ceilings	Wood Framed Ceiling	2x12 @ 24 in. O. C.	R-38	None / None	0.029	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-38 / 2x12 Inside Finish: Gypsum Board
copy of R-15 Wall	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.086	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Other Side Finish: Gypsum Board
R-15 Wall	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.086	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Other Side Finish: Gypsum Board

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

(Page 8 of 17)

Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic ADU	Attic RoofADU	Ventilated	4	0.1	0.85	No	No

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
W1	Window	North Walls	Front	0		1	55	0.23	NFRC	0.23	NFRC		Bug Screen
W2	Window	North Walls	Front	0		1	78.67	0.23	NFRC	0.23	NFRC		Bug Screen
W13	Window	East Walls	Left	90		1	28.75	0.23	NFRC	0.23	NFRC		Bug Screen
W14	Window	East Walls	Left	90		1	28.75	0.23	NFRC	0.23	NFRC		Bug Screen
W15	Window	East Walls	Left	90		1	28.75	0.23	NFRC	0.23	NFRC		Bug Screen
W8	Window	South Walls	Back	180		1	46.67	0.23	NFRC	0.23	NFRC		Bug Screen
W9	Window	South Walls	Back	180		1	24.38	0.23	NFRC	0.23	NFRC		Bug Screen
W17	Window	West Walls	Right	270		1	12.5	0.23	NFRC	0.23	NFRC		Bug Screen
W18	Window	West Walls	Right	270		1	12.5	0.23	NFRC	0.23	NFRC		Bug Screen
W19	Window	West Walls	Right	270		1	24	0.23	NFRC	0.23	NFRC		Bug Screen
W3	Window	North Walls 2	Front	0		1	25	0.23	NFRC	0.23	NFRC		Bug Screen
W4	Window	North Walls 2	Front	0		1	16	0.23	NFRC	0.23	NFRC		Bug Screen
W5	Window	North Walls 2	Front	0		1	16	0.23	NFRC	0.23	NFRC		Bug Screen
W10	Window	South Walls 2	Back	180		1	21	0.23	NFRC	0.23	NFRC		Bug Screen
W11	Window	South Walls 2	Back	180		1	5	0.23	NFRC	0.23	NFRC		Bug Screen

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Report Version: 2022.0.000

Report Generated: 2023-01-12 10:41:53

Schema Version: rev 20220901

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

(Page 11 of 17)

Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Attic Garage Roof Cons	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic Roof/Main Residence Main floor	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic Roof/Main Residence Second flo	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic RoofADU	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
R-38 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-38.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
R-38 HP Attic	Ceilings (below attic)	Wood Framed Ceiling	2x12 @ 24 in. O. C.	R-38	None / None	0.026	Over Ceiling Joists: R-8.8 insul. Cavity / Frame: R-29.3 / 2x12 Inside Finish: Gypsum Board
Flooring	Interior Floors	Wood Framed Floor	2x6 @ 16 in. O. C.	R-19	None / None	0.049	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6 Ceiling Below Finish: Gypsum Board

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

(Page 9 of 17)

Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

PENETRATION / GLAZING													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft ²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
W20	Window	West Walls 2	Right	270		1	21	0.23	NFRC	0.23	NFRC	Bug Screen	
W15 2	Window	East Walls 3	Left	90		1	28.75	0.23	NFRC	0.23	NFRC	Bug Screen	
W6	Window	South Walls 3	Back	180		1	60.67	0.23	NFRC	0.23	NFRC	Bug Screen	
W7	Window	South Walls 3	Back	180		1	60.67	0.23	NFRC	0.23	NFRC	Bug Screen	
W12	Window	East Walls 4	Left	90		1	12	0.23	NFRC	0.23	NFRC	Bug Screen	
SKY01	Skylight	Roof	Front	0		1	16	0.23	NFRC	0.23	NFRC		
SKY02	Skylight	Roof	Front	0		1	16	0.23	NFRC	0.23	NFRC		

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft²)	U-factor
D3	East Walls 3	21	0.2
D1	North Walls 3	112	0.7
D2	East Walls 4	21	0.5

SLAB FLOORS

01	02	03	04	05	06	07	08
Name	Zone	Area (ft²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab-on-Grade	Main Residence Main floor	1583	0.1	none	0	80%	No
Slab-on-Grade 2	ADU	508	0.1	none	0	80%	No

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Project Name: Avtar/Aman Deol (Father/Son)

Calculation Date/Time: 2023-01-12T10:37:21-08:00

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Calculation Description: Title 24 Analysis

Input File Name: Mello Way T24.rbd22x

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
copy of R-21 Wall	Interior Ceiling	Wood Framed Ceiling	2x4 @ 16 in. O. C.	R-19	None / None	0.052	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x4 Ceiling Below Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04	05
Quality Insulation Installation (QI)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50	CFM50
Required	Not Required	N/A	n/a	n/a

WATER HEATING SYSTEMS

01	02	03	04	05	06	07	08	09
Name	System Type	Distribution Type	Water Heater Name	Number of Units	Solar Heating System	Compact Distribution	HERS Verification	Water Heater Name (ft)
DHW Sys 1	Domestic Hot Water (DHW)	HERS Verified Pipe Insulation credit	DHW Heater 1	1	n/a	None	DHW Sys 1-hers-dhw	DHW Heater 1 (1)
DHW Sys 3	Domestic Hot Water (DHW)	Standard	DHW Heater 3	1	n/a	None	n/a	DHW Heater 3 (1)

Registration Number: 423-P010006208A-000-000-00000000-0000

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x (Page 13 of 17)

01	02	03	04	05	06	07	08	09	10	11	12	13
Name	Heating Element Type	Tank Type	# of Units	Tank Vol. (gal)	Heating Efficiency Type	Efficiency	Rated Input Type	Input Rating or Pilot	Tank Insulation R-value (in/Fat)	Standby Loss or Recovery Eff	1st Hr. Rating or Flow Rate	Tank Location
DHW Heater 1	Gas	Consumer Instantaneo us	1	0	UEF	0.96	8tu/Hr	200000	0	n/a		
DHW Heater 3	Gas	Consumer Instantaneo us	1	0	UEF	0.96	8tu/Hr	200000	0	n/a		

01	02	03	04	05	06	07
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Shower Drain Motor Heat Recovery
DHW Sys 1 - 1/1	Required	Not Required	None	None	Not Required	Not Required
DHW Sys 3 - 1/1	Not Required	Not Required	Not Required	None	Not Required	Not Required

01	02	03	04	05	06	07	08	09
Name	System Type	Heating Unit Name	Heating Equipment Count	Cooling Unit Name	Cooling Equipment Count	Fan Name	Distribution Name	Required Thermostat Type
Main Residence Main Floor1	Heat pump heating cooling	Heat Pump System 1	1	Heat Pump System 1	1	HVAC Fan 1	Air Distribution System 1	Setback
Main Residence Second Flo2	Heat pump heating cooling	Heat Pump System 2	1	Heat Pump System 2	1	HVAC Fan 2	Air Distribution System 2	Setback
ADU3	Heat pump heating cooling	Heat Pump System 3	1	Heat Pump System 3	1	n/a	n/a	Setback

Registration Number: 423-P010010505A-000-000-0000000-0000
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x (Page 14 of 17)

01	02	03	04	05	06	07	08	09	10	11	12	13
Name	System Type	Number of Units	Efficiency Type	HSPF / HSPF2 / COP	Cap 47	Cap 17	Efficiency Type	SEER / SEER2	EER / EER / CEER	Zonally Controlled	Compressor Type	HERS Verification
Heat Pump System 1	Central split HP	1	HSPF	9	26000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump
Heat Pump System 2	Central split HP	1	HSPF	9	25000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 2-hers-tqump
Heat Pump System 3	VCHP-ductless	1	HSPF	10	38000	14000	EERSEER	16	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEER/SEER2	Verified Refrigerant Charge	Verified HSPF/HSPF2	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 3-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 2-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 3-hers-tqump	Not Required	0	Not Required	Required	Yes	Yes	Yes	Yes

01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCHP System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing & Pressure Drop Rating	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3.3 and SC3.3.3.4.1	Certified non-continuous Fan	Indoor Fan not Running Continuously
Heat Pump System 3	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

Registration Number: 423-P010010505A-000-000-0000000-0000
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x (Page 15 of 17)

HVAC - DISTRIBUTION SYSTEMS											
01	02	03	04	05	06	07	08	09	10	11	12
Name	Type	Design Type	Duct Ins. R-value Supply	Return	Duct Location Supply	Return	Surface Area Supply	Return	Bypass Duct	Duct Leakage	HERS Verification
Air Distribution System 1	Conditioned space-entirely	Non-Verified	R-8	R-8	Conditioned Zone	Conditioned Zone	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 1-hers-dis
Air Distribution System 2	Conditioned space-entirely	Non-Verified	R-8	R-8	Conditioned Zone	Conditioned Zone	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 2-hers-dis

01	02	03	04	05	06	07	08	09
Name	Duct Leakage Verification	Duct Leakage Target (%)	Verified Duct Location	Verified Duct Design	Buried Ducts	Deeply Buried Ducts	Low-Leakage Air Handler	Low Leakage Ducts Entirely in Conditioned Space
Air Distribution System 1-hers-dis	Yes	5.0	Required	Not Required	Not Required	Credit not taken	Not Required	No
Air Distribution System 2-hers-dis	Yes	5.0	Required	Not Required	Not Required	Credit not taken	Not Required	No

01	02	03	04
Name	Type	Fan Power (Watts/CFM)	Name
HVAC Fan 1	HVAC Fan	0.45	HVAC Fan 3-hers-fan
HVAC Fan 2	HVAC Fan	0.45	HVAC Fan 2-hers-fan

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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Avtar/Aman Deol (Father/Son)
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2023-01-12T10:37:21-08:00
Input File Name: Mello Way T24.rbd22x (Page 16 of 17)

01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)
HVAC Fan 3-hers-fan	Required	0.45
HVAC Fan 2-hers-fan	Required	0.45

01	02	03	04	05	06	07	08	09
Dwelling Unit	Airflow (CFM)	Fan Efficiency (W/CFM)	IAQ Fan Type	Includes Heat/Energy Recovery?	IAQ Recovery Effectiveness - SRE	Includes Fault Indicator Display?	HERS Verification	Status
Sfam IAQVentRpt 1-1	70	0.142857	Exhaust	No	n/a	No	Yes	
Sfam IAQVentRpt 2-1	50	0.2	Exhaust	No	n/a	No	Yes	
Sfam IAQVentRpt 3-1	50	0.2	Exhaust	No	n/a	No	Yes	

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Input File Name: Mello Way T24.rbd22x (Page 17 of 17)

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RESIDENTIAL MEASURES SUMMARY RMS-1

Avtar/Aman Deol (Father/Son)		California Energy Climate Zone	Total Cond. Floor Area	Addition	1/12/2023
33758 Mello Way Fremont		CA Climate Zone 03	3,516	n/a	# of Units 1
INSULATION	Construction Type	Cavity	Area (ft²)	Special Features	Status
Wall	Wood Framed	R-20	296		New
Door	Opaque Door	- no insulation	112		New
Door	Opaque Door	- no insulation	21		New
Demising	Wood Framed	R-15	380		New
Slab	Unheated Slab-on-Grade	- no insulation	2,516	Perim = 0'	New
Roof	Wood Framed Attic	R-38	425		New
Wall	Wood Framed	R-19	2,739		New
Demising	Wood Framed	R-15	944		New

01	02	03	04	05	06	07	08	09	10	11	12	13
Name	System Type	Number of Units	Efficiency Type	HSPF / HSPF2 / COP	Cap 47	Cap 17	Efficiency Type	SEER / SEER2	EER / EER / CEER	Zonally Controlled	Compressor Type	HERS Verification
Heat Pump System 1	Central split HP	1	HSPF	9	26000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump
Heat Pump System 2	Central split HP	1	HSPF	9	25000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 2-hers-tqump
Heat Pump System 3	VCHP-ductless	1	HSPF	10	38000	14000	EERSEER	16	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEER/SEER2	Verified Refrigerant Charge	Verified HSPF/HSPF2	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 3-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 2-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 3-hers-tqump	Not Required	0	Not Required	Required	Yes	Yes	Yes	Yes

01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCHP System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing & Pressure Drop Rating	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3.3 and SC3.3.3.4.1	Certified non-continuous Fan	Indoor Fan not Running Continuously
Heat Pump System 3	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

01	02	03	04	05	06	07	08	09	10
Name	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw
HVAC Fan 3-hers-fan	Required	0.45	Required	0.45	Required	0.45	Required	0.45	Required
HVAC Fan 2-hers-fan	Required	0.45	Required	0.45	Required	0.45	Required	0.45	Required

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RESIDENTIAL MEASURES SUMMARY RMS-1

Project Name	Building Type	Single Family	Addition Alone	Date
Avtar/Aman Deol (Father/Son)	Single Family	☒	☐	1/12/2023
Project Address	California Energy Climate Zone	Total Cond. Floor Area	Addition	# of Units
33758 Mello Way Fremont	CA Climate Zone 03	3,516	n/a	1
INSULATION Construction Type	Cavity	Area (ft²)	Special Features	Status
Demising	Wood Framed Rafter	R-19	1,000	New
Roof	Wood Framed Attic	R-38	2,069	New
Demising	Wood Framed w/o Crawl Space	R-19	1,000	New
Door	Opaque Door	R-5	21	New

01	02	03	04	05	06	07	08	09	10	11	12	13
Name	System Type	Number of Units	Efficiency Type	HSPF / HSPF2 / COP	Cap 47	Cap 17	Efficiency Type	SEER / SEER2	EER / EER / CEER	Zonally Controlled	Compressor Type	HERS Verification
Heat Pump System 1	Central split HP	1	HSPF	9	26000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump
Heat Pump System 2	Central split HP	1	HSPF	9	25000	20000	EERSEER	15	12.2	Not Zonal	Single Speed	Heat Pump System 2-hers-tqump
Heat Pump System 3	VCHP-ductless	1	HSPF	10	38000	14000	EERSEER	16	12.2	Not Zonal	Single Speed	Heat Pump System 3-hers-tqump

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEER/SEER2	Verified Refrigerant Charge	Verified HSPF/HSPF2	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 3-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 2-hers-tqump	Required	350	Not Required	Not Required	No	Yes	Yes	Yes
Heat Pump System 3-hers-tqump	Not Required	0	Not Required	Required	Yes	Yes	Yes	Yes

01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCHP System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing & Pressure Drop Rating	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3.3 and SC3.3.3.4.1	Certified non-continuous Fan	Indoor Fan not Running Continuously
Heat Pump System 3	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

01	02	03	04	05	06	07	08	09	10
Name	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)	Verified Fan Watt Draw
HVAC Fan 3-hers-fan	Required	0.45	Required	0.45	Required	0.45	Required	0.45	Required
HVAC Fan 2-hers-fan	Required	0.45	Required	0.45	Required	0.45	Required	0.45	Required

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CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

TITLE:

T24-03

