MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION.

PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED.

COORDINATION: COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOF WARRANTY.

DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

SHEET METAL DUCTWORK: PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS, SEAL CLASS "A". SHEET METAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G90 ZINC COATING, SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC-COATED BY THE HOT DIP PROCESS, ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING, SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90º ELBOWS.

TRAPEZE DUCT HANGERS: PROVIDE MINIMUM 1" X 2" X 1" X 18 GAUGE CHANNELS WITH MINIMUM 1" X 18 GAUGE STRAPS TO STRUCTURAL SUPPORT.

ROUND SHEET METAL DUCT: PROVIDE SPIRAL SEAM (ALL SIZES) OR SNAP LOCK (DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL-1.

FIBER GLASS DUCT BOARD IS AN ACCEPTABLE ALTERNATIVE IF APPROVED BY OWNER AND THE LOCAL BUILDING CODE OFFICIAL. PRODUCT AND INSTALLATION MUST MEET NAIMA STANDARDS AND OTHER APPLICABLE CODES AND REGULATIONS.

EXPOSED DUCTWORK: EXPOSED DUCTWORK SHALL BE CLEANED OF DEBRIS AND OIL, THEN WIPED DOWN WITH VINEGAR OR OTHER SURFACE PREPARING CHEMICAL TO PREPARE DUCT FOR PAINT.

DUCT SEALANT: PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS.

DUCT INSULATION: MATERIAL FOR SUPPLY AND RETURN AIR DUCT ABOVE CEILING INSIDE THE BUILDING SHALL HAVE THE EQUIVALENT THERMAL RESISTANCE OF MINIMUM R-6. THE REQUIRED R VALUES ARE FOR INSTALLED INSULATION WITH 25% COMPRESSION AT THE CORNERS. PROVIDE PINS AND WASHERS IN ACCORDANCE WITH SMACNA REQUIREMENTS AND AS REQUIRED TO PREVENT INSULATION FROM SAGGING. PROVIDE ADEQUATE INSULATION AT THE SUPPLY AIR DIFFUSERS TO PREVENT CONDENSATION.

FLEXIBLE DUCT : UL #181 LISTED, CLASS 1, AND CONTAIN A 0.1 PERM RATED POLYETHYLENE INNER LINER, WITH R-6 FIBERGLASS INSULATION. FLEXIBLE DUCTS SHALL BE SECURED TO RIGID SHEET METAL COLLARS AND AIR DIFFUSERS WITH NYLON TIES OR STAINLESS STEEL WORM GEAR STRAPS. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT. SUPPORT FLEXIBLE DUCTS FROM THE BUILDINGS STRUCTURE WITH MINIMUM 1" WIDE, 18 GAUGE, GALVANIZED STEEL STRAP AT MAXIMUM 4'-0" CENTERS. PROVIDE 4" WIDE SHEET METAL SADDLES AT EACH SUPPORT EACH STRAP. SAG OF FLEXIBLE DUCT BETWEEN HANGERS SHALL NOT EXCEED 1/2" PER FOOT OF SUPPORT SPACING. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION.

ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.

RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM ½" HEXAGONAL AXLE, BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.

FLEXIBLE DUCT CONNECTORS: PROVIDE U.L. LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS.

DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UN-INSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE-TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE-TYPE LATCHES FOR LARGER ACCESS DOORS.

HVAC CONTROL SYSTEM: PROVIDE ALL THE NECESSARY CONTROLS AND CONTROL WIRING IN CONDUIT COMPATIBLE TO SYSTEMS SHOWN ON EQUIPMENT SCHEDULE M2.0.

PROGRAMMABLE THERMOSTAT FOR EACH SYSTEM SHALL ENABLE THE SUPPLY FAN AND CYCLE THE COOLING AND HEATING STAGES TO MAINTAIN SPACE SET-POINT. SUPPLY FAN RUNS CONTINUOUSLY DURING THE OCCUPIED MODE.

EACH THERMOSTAT SHALL HAVE A DEAD BAND OF AT LEAST 5 DEGREES (ADJ) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING IS SHUT OFF.

EACH THERMOSTAT SHALL HAVE SETBACK AND SET-UP CAPABILITY DURING THE UNOCCUPIED MODE. FOR SETBACK, THE HEATING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE DOWN TO 55 DEGREES. FOR SET-UP, THE COOLING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE UP TO 85 DEGREES OR TO PREVENT HIGH SPACE HUMIDITY LEVELS.

EACH SYSTEM SHALL BE PROVIDED WITH A MOTORIZED OUTSIDE AIR DAMPER THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEM OR SPACES SERVED ARE NOT IN USE. VENTILATION OUTSIDE AIR DAMPERS SHALL BE CAPABLE OF AUTOMATICALLY CLOSING DURING PREOCCUPANCY BUILDING WARM-UP, COOL DOWN, AND SETBACK, EXCEPT WHEN VENTILATION REDUCES ENERGY COSTS (e.g., NIGHT PURGE) OR WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS.

COMMISSIONING/VERIFICATION: HVAC CONTROL SYSTEM SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION, AND THAT THE SYSTEM MEETS THE DESIGN REQUIREMENTS.

TEST AND BALANCE: CONTRACT DIRECTLY A THIRD PARTY TO PROVIDE TEST AND BALANCE OF THE HVAC SYSTEM. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SCHEDULING. TEST AND ADJUST ALL MECHANICAL SYSTEM AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS-1999 OR AABC 2002, AND ASHRAE STANDARD 111. ELIMINATE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. SUBMIT COMPLETED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCING CONTRACTOR SHALL BE INDEPENDENT AND CERTIFIED WITH NEBB OR AABC. BALANCE ALL SYSTEMS WITHIN 5% OF AIR FLOW INDICATED ON DRAWINGS, AND REPORT ALL DISCREPANCIES TO THE HVAC CONTRACTOR FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER.

COMPLETION REQUIREMENTS: THE CONTRACTOR SHALL PROVIDE, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS AND AN OPERATING AND MAINTENANCE MANUAL TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE OWNER.

THE RECORD DRAWING SHALL BE OF THE ACTUAL INSTALLATION AND INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT. GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES.

THE OPERATING AND MAINTENANCE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING: (A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE; (B) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED; (C) NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY; (D) HVAC CONTROLS SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SYSTEM SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-PIONTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS; (E) A COMPLETE NARRATIVE OF HOW EACH SYSTEM EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SET-POINTS.

HVAC GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.

2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.

3. DRAWINGS FOR HVAC WORK ARE DIAGRAMATIC SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT, REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. PROVIDE ALL DUCTWORK, MATERIALS, CONNECTIONS, ACCESSORIES, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS AS REQUIRED FOR A COMPLETE WORKABLE SYSTEM.

4. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED LISTING. ALL EQUIPMENT, PIPING AND SUPPORTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE "GUIDLINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA). ALL EQUIPMENT SHALL BE ANCHORED TO RESIST THE LATERAL FORCE REQUIREMENTS OF CHAPTER 16 OF THE 2012 INTERNATIONAL BUILDING CODE.

5. COORDINATE THE INSTALLATION OF THE HVAC SYSTEM WITH ALL OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION, COORDINATE THE LOCATIONS OF PENETRATIONS AND FINAL LOCATION OF ALL EQUIPMENT WITH THE GENERAL CONTRACTOR. PROVIDE EQUIPMENT WEIGHTS, EQUIPMENT DIMENSIONS, PLATFORM SIZES & LOCATIONS, CURB SIZES & LOCATIONS, CONCRETE PAD SIZES AND LOCATIONS AST REQUIRED. COORDINATE LOCATIONS OF GAS & CONDENSATE LINES WITH PLUMBING CONTRACTOR. COORDINTAE LOCATIONS OF POWER, DISCONNECTS, AND CONTROL CONDUIT WITH THE ELECTICAL CONTRACTOR. COORDINATE LOCATIONS OF ALL DIFFUSERS, REGISTERS, AND GRILLES WITH ARCHITECTURAL PLANS, ELECTRICAL LIGHTING PLANS AND ARCHITECTURAL ELEVATIONS.

6. DETAILS FOR EQUIPMENT PADS, PLATFORMS, AND FLASHINGS SHALL BE AS INDICATED BY THE ARCHITECTURAL/STRUCTURAL/CIVIL DRAWINGS. UNLESS NOTED OTHERWISE.

7. ALL EQUIPMENT, DUCTS, PIPING, SUPPORTS, AND OTHER DEVICES OUTSIDE OF THE BUILDING OR EXPOSED TO WEATHER, SHALL BE COMPLETELY WEATHER-PROOFED.

8. OUTSIDE AIR INTAKES SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. BELOW ANY VENT OR EXHAUST DISCHARGE.

9. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE CONSTRUCTED, ERECTED, INSULATED AND TESTED IN ACCORDANCE CHAPTER 6 OF THE 2012 INTERNATIONAL MECHANICAL CODE.

10. ALL EXHAUST FANS SHALL BE EQUIPED WITH A BACK DRAFT DAMPER.

11. DUCT AND AIR TRANSFER PENETRATIONS THRU BUILDING ASSEMBLIES REQUIRING PROTECTION SHALL BE PROTECTED WITH FIRE DAMPERS, SMOKE DAMPERS, COMBINATION SMOKE/FIRE DAMPERS AND CEILING RADIATION DAMPERS IN ACCORDANCE WITH SECTION 607 OF THE INTERNATIONAL MECHANICIAL CODE. DUCTS NOT REQUIRING DAMPERS SHALL COMPLY WITH SECTION 714 & 717 OF THE 2019 CALIFORNIA BUILDING CODE.

12. INSTALL SMOKED DETECTORS AND PROVIDE FOR SMOKE DETECTION AND AUTOMATIC SHUT-OFF OF ALL AIR HANDLING EQUIPMENT IN ACCORDANCE WITH SECTION 606 OF THE 2019 CALIFORNIA MECHANICAL CODE.

13. UNLESS NOTED OTHERWISE, ALL LINE VOLTAGE WIRING, CONDUIT, FINAL CONNECTIONS, DISCONNECTS, STARTERS, AND OVER CURRENT PROTECTION DEVICES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THESE MECHANICAL DRAWINGS AND/OR ELECTRICAL DRAWINGS AND/OR ELECTRICAL SECTION OF THE SPECIFICATIONS.

14. INSTALL ALL LOW VOLTAGE HVAC CONTROL WIRE AND DEVICES PER PLAN. ALL WIRE SHALL BE IN CONDUIT PROVIDED AND INSTALLED BY THE ELECTICAL CONTRACTOR UNLESS NOTEDED OTHERWISE.

15. PROVIDE OWNER WITH THREE COPIES OF A CERTIFIED AIR BALANCE REPORT PREPARED IN BY A THIRD PARTY CERTIFIED BY THE AABC OR NEBB. TEST, ADJUST AND BALANCE THE HVAC SYSTEM IN ACCORDANCE WITH AABC OR NEBB PROCEDURES. PROVIDE START-UP/TEST REPORTS FOR ALL AIR HANDLING EQUIPMENT, FANS, AND REFRIGERATION EQUIPMENT. TEST AND VERIFY PROPER OPERATION OF ALL MAKE-UP AIR/EXHAUST AIR INTERLOCK SYSTEMS AND THIER SEQUENCES OF OPERATION. BALANCE ALL AIR FLOWS WITHIN 5% OF DESIGN VALUES. PERMANENTLY MARK BALANCE POSITION OF ALL REGULATING DEVICES.

16. PROVIDE OWNER WITH THREE SETS OF AS-BUILT PLANS AND OPERATIONS AND MAINTENANCE MANUALS. CLEARLY IDENTIFY ALL EQUIPMENT WITH PERMANENT PLASTIC OR METAL LABELS/TAGS (PEN MARKING NOT ACCEPTABLE).

17. PROVIDE ONE YEAR WARRANTY ON ALL LABOR, PARTS AND MATERIALS.

18. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE WRITTEN APPROVAL OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.

19.0

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

b) DUCTS FOR KITCHEN COOKTOPS OR RANGES SHALL BE SHOWN OF METAL WITH A SMOOTH INTERIOR. [CMC 504.3].

1) IDENTIFY THE DETAILED REQUIREMENTS OF CMC DRYER DUCTS. SPECIFY--

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

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

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

LEGEND

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

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 REPRESNENTATIVE 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.

CLIENT:

ADDRESS:

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:
MECH. LIST OF SYMBOLS AND GENERAL NOTES.

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

PROJECT

DATE
AUGUST, 2022

SHEET
M0.0

CALIFORNIA MECHANICAL CODE CHECKING:

DUCT SIZING, THICKNESS & INSULATION

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

604.0 Insulation of Ducts.

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

Exceptions:

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

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

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

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

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

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

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

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

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

CONDENSATE DRAIN:

310.0 Condensate Wastes and Control.

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

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

TABLE 310.3
MINIMUM CONDENSATE WASTE PIPE SIZE

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

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

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

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

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

AIR INTAKE AND EXHAUST:

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

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

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

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

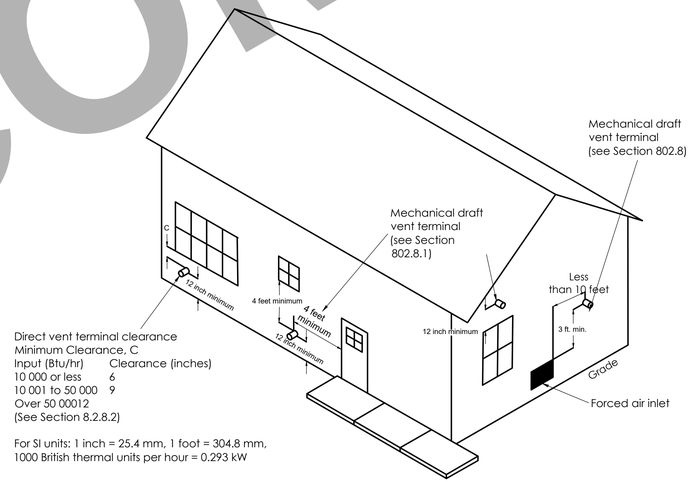
Exception: *Airborne infection isolation rooms shall comply with Section 414.1.*

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

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

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

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



Direct vent terminal clearance
Minimum Clearance, C

Input (Btu/hr)	Clearance (inches)
10 000 or less	6
10 001 to 50 000	9
Over 50 00012	

(See Section 8.2.8.2)

For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1000 British thermal units per hour = 0.293 kW

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 ¼ of an inch (6.4 mm) openings, and shall have not more than ½ of an inch (12.7 mm) openings.
Exception: Clothes dryers.

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

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

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

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

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

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

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

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

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

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

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

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 11/2 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 THE MASTIC 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.

CLIENT:

ADDRESS:

NOTES:

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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:

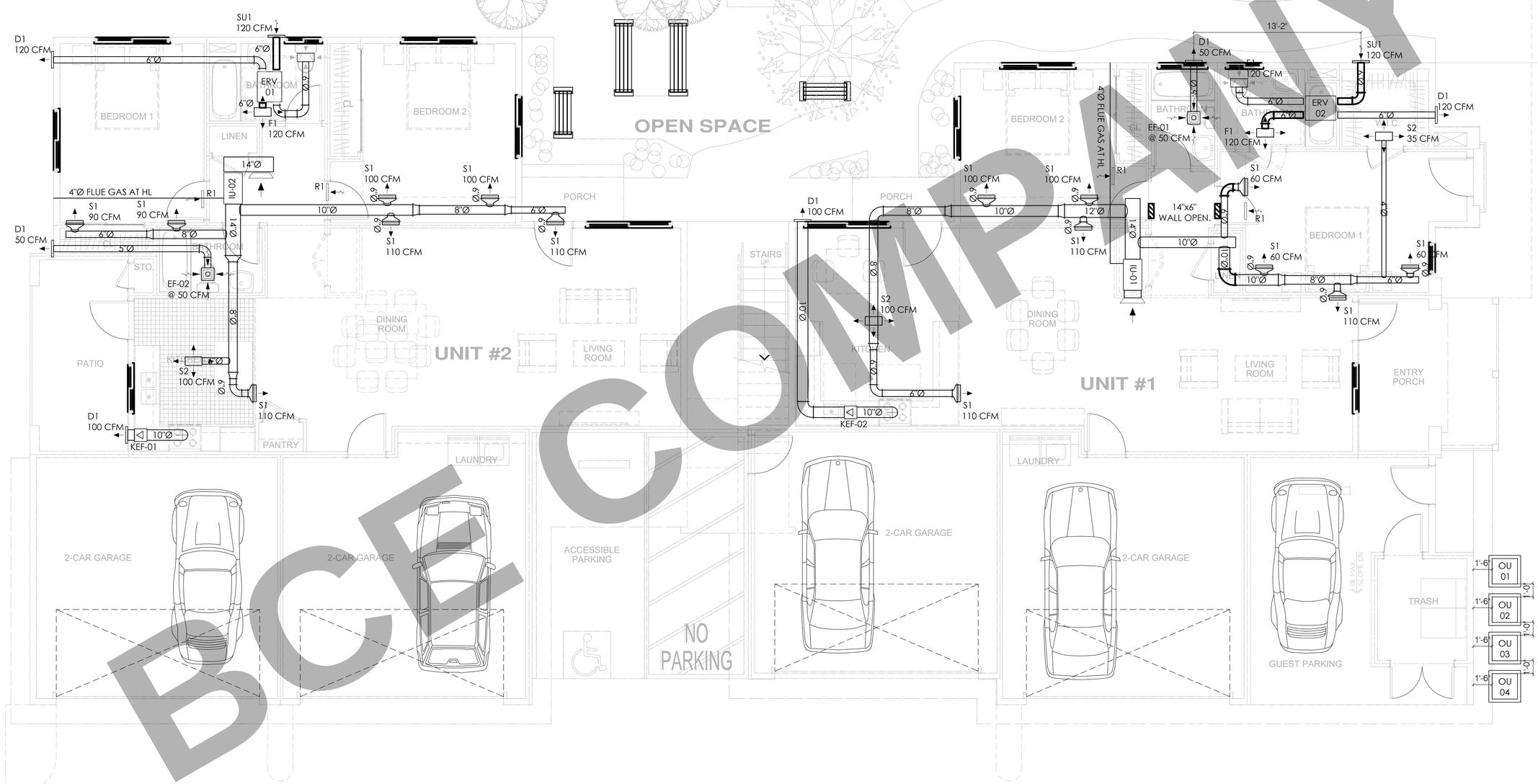
TITLE:
MECHANICAL CODE CHECKING

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

PROJECT

DATE
AUGUST, 2022

SHEET
M0.1



FIRST FLOOR

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.

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
FIRST FLOOR MECHANICAL LAYOUTS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

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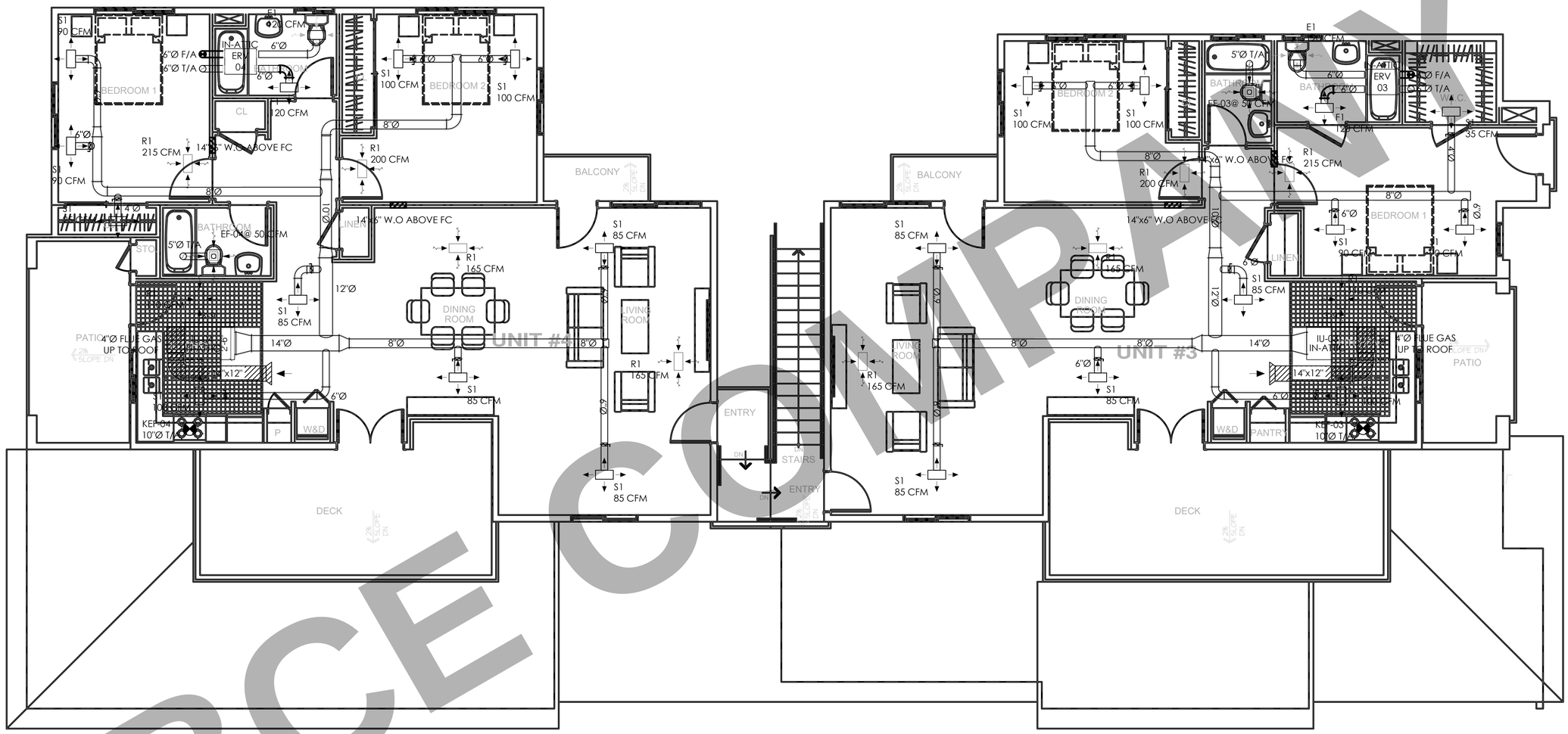

SECOND FLOOR

GENERAL NOTES:

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

CLIENT:

ADDRESS:

NOTES:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
SECOND FLOOR MECHANICAL LAYOUTS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
M1.2

SCHEDULE No. 1

GAS/ELECTRIC - INDOOR & OUTDOOR UNIT

TAG	IU-1,2,3,4 & OU-1,2,3,4
SERVING	UNITS 1 TO 4
MANUFACTURER	CARRIER
INDOOR MODEL	59TN6A-06014
COOLING COIL MODEL	CNPV-6124
POWER SUPPLY	115/1/60
MAXIMUM CURRENT (A)	9.7
UNIT AMPACITY (A)	12.7
AIR FLOW (CFM) - MEDIUM SPEED	855.0
EXTERNAL STATIC PRESSURE (INCHES OF WATER)	0.50
COOLING CAPACITY (BTU/H)	60,000
HEATING CAPACITY (BTU/H)	58,000
INDOOR DIMENSIONS (H x W x D) (inch)	35 x 17.5 x 29.5
OUTDOOR MODEL	24VNA9-24
POWER SUPPLY	208/230 / 1 / 60
MINIMUM CIRCUIT AMPACITY	13.5
COMPRESSOR RLA	10.3
MAX OVERCURRENT DEVICE	20.0
FREQUENCY (HZ)	1500 RPM
125	63.0
250	57.0
500	51.5
1000	47.5
2000	41.5
4000	38.0
8000	45.5
SOUND RATING (dBA)	55

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. 2

ERV SCHEDULE

TAG	ERV-01 TO 04
MANUFACTURER	PANASONIC
MODEL	INTELLI-BALANCE 100
LOCATION	MASTER BED. TOILETS
DESIGN SUPPLY VOLUME (CFM)	120
DESIGN PRESSURE DROP (in. W.G)	0.6
ELECTRICAL (V / PH / HZ)	115 / 1 / 60
POWER (WATTS)	100
MAXIMUM EFFICIENCY	84%

SCHEDULE No. 3

FAN SCHEDULE

TAG	EF-01 TO EF-04	KEF-01 TO KEF-04
LOCATION	TOILETS	KITCHEN
SELECTED FLOW (CFM)	50	100
SELECTED PRESSURE DROP (IN. H2O)	0.15"	0.375"
ELECTRICAL (V / PH / HZ)	120 / 1 / 60	115 / 1 / 60
POWER / Amps	3.1 W / 0.2 A	20 W / 0.2 A
MOTOR SPEED (RPM)	722	1356
FAN TYPE	CEILING FANS	CEILING FANS
MANUFACTURER	PANASONIC	FANTECH
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. 4

AIR OUTLETS

TAG	DESCRIPTION	MANUFACTURER	MODEL	MOUNTING
S1/R1	SUPPLY / RETURN DIFFUSER	TITUS	14in. x 6in.	Duct Mounted
F1/E1	FRESH AIR / EXT. AIR DIFFUSER	TITUS	14in. x 6in.	Duct Mounted
SC2/D2	SUCTION / DISCHARGE GRILLE	TITUS	14in. x 6in.	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.

CEC 2019 -TABLE 150.2-A:
DUCT INSULATION R-VALUE

Climate Zone	1 through 10, 12 & 13	11, 14 through 16
Duct R-Value	R-6	R-8

ALL DUCTS INSULATION SHALL NOT BE LESS R6 | CEC2019-150.2A
ALL DUCTS ARE GALVANIZED STEEL G90.

CMC 2019 - 603.4.1 Length Limitation:

[Not permitted for OSHPD 1, 1R, 2, 3, 4 & 5] Factory-made flexible air ducts and connectors shall be not more than 5 feet (1524 mm) in length and shall not be used in lieu of rigid elbows or fittings. Flexible air ducts shall be permitted to be used as an elbow at a terminal device.

CMC 2019 -603.10.1 Duct Leakage Tests:
Ductwork shall be leak-tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual. Representative sections totaling not less than 10 percent of the total installed duct area shall be tested. Where the tested 10 percent fail to comply with the requirements of this section, then 40 percent of the total installed duct area shall be tested. Where the tested 40 percent fail to comply with the requirements of this section, then 100 percent of the total installed duct area shall be tested. Sections shall be selected by the building owner or designated representative of the building owner. Positive pressure leakage testing shall be permitted for negative pressure ductwork. The permitted duct leakage shall be not more than the following:

Lmax = CLx(P)^0.65 (Equation 603.10.1)
Where:
Lmax = maximum permitted leakage, (ft3/min)/100 square feet [0.0001 (m3/s)/m2] duct surface area.
CL = six, duct leakage class, (ft3/min)/100 square feet [0.0001 (m3/s)/m2] duct surface area at 1 inch water column (0.2 kPa).
P = test pressure, which shall be equal to the design duct pressure class rating, inch water column (kPa).

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 drainage 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.

penetrations of the garage wall or ceiling, add a note for all ducting to be a minimum of 26gage sheet metal approved ducting with noopenings in the garage per section R302.5.2 CRC.

the installation of the attic air-handler portion of the heat-pump(s) shall comply with section 903.2 CMC. The appliance shall be installed per the manufacturer's installation requirements. Include details on the plans showing access point. The access point shall not be located more than 20' from the unit and not located within a closet with shelving below the access hole. Include and detail access to the unit (24" wide walkway), a light, switch and receptacle on the plans as required by 304.4 through 304.4.4 CMC.

CPC 2016 - TABLE 814.3:
MINIMUM CONDENSATE PIPE SIZE
EQUIPMENT CAPACITY IN

TONS OF REFRIGERATION	MINIMUM CONDENSATE PIPE (inches)
Up to 20	3/4"
21 - 40	1"
41 - 90	1-1/4"
91 - 125	1-1/2"
126 - 250	2"

502.2.2 Product Conveying Ducts:

Ducts conveying explosive or flammable vapors, fumes, or dusts shall terminate not less than 30 feet (9144 mm) from a property line, 10 feet (3048 mm) from openings into the building, 6 feet (1829 mm) from exterior walls or roofs, 30 feet (9144 mm) from combustible walls or openings into the building that are in the direction of the exhaust discharge, and 10 feet (3048 mm) above adjoining grade.

Other product-conveying outlets shall terminate not less than 10 feet (3048 mm) from a property line, 3 feet (914 mm) from exterior walls or roofs, 10 feet (3048 mm) from openings into the building, and 10 feet (3048 mm) above adjoining grade.

Installed filters shall be clearly labeled by the manufacturer indicating the MERV 13 rating.
CMC 2019 - 401.2.1

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
MECHANICAL EQUIPMENT SCHEDULE AND CODE NOTES.

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

PROJECT

DATE
AUGUST, 2022

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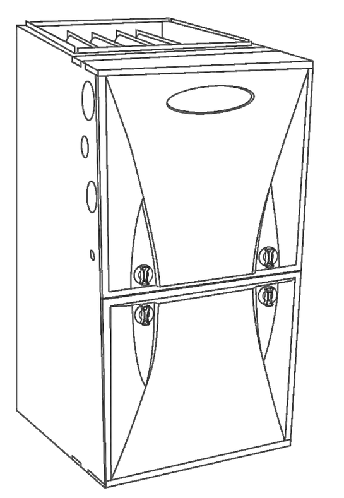
59TN6A Infinity® Two–Stage, Variable Speed 4–Way Multipoise Condensing Gas Furnace Series 100

Carrier turn to the experts

Product Data



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The 59TN6A Multipoise Variable-Speed Condensing Gas Furnace features the two-stage Infinity® System. The Comfort Heat Technology® two-stage gas system is at the heart of the comfort provided by this furnace, along with the variable-speed ECM blower motor, and two-speed inducer motor. With an Annual Fuel Utilization Efficiency (AFUE) of up to 96.7%, the Infinity two-stage gas furnace provides exceptional savings when compared to a standard furnace. This Infinity Gas Furnace also features 4-way multipoise installation flexibility, and is available in four model sizes. The 59TN6A can be vented for direct vent/two-pipe, ventilated combustion air, or single-pipe applications. A Carrier Infinity Control and Infinity Air Conditioner or Heat Pump can be used to form a complete Infinity System. All units meet California Air Quality Management District emission requirements. All sizes are design certified in Canada.

STANDARD FEATURES

- Infinity® System; compatible with single- and multiple-zone Infinity systems
- Quiet operation. Compare for yourself at HVACpartners.com
- Ideal height 35-in. (889 mm) cabinet: short enough for taller coils, but still allows enough room for service
- Infinity Features—match with the Infinity Control for Infinity System benefits
- Integral part of the Ideal Humidity System® Technology
- Silicon Nitride Power Heat™ Hot Surface Igniter
- SmartEvap™ technology helps control humidity levels in the home when used with a compatible humidity control system
- ComfortFan™ technology allows control of continuous fan speed from a compatible thermostat
- External Media Filter Cabinet included
- 4-way multipoise design for upflow, downflow or horizontal installation, with unique vent elbow and optional through-the-cabinet downflow venting capability
- Variable-Speed blower motor, two-speed inducer motor, and two-stage gas valve
- Self-diagnostics and extended diagnostic data through the Advanced Product Monitor (APM) accessory or Infinity User Interface
- Adjustable blower speed for cooling, continuous fan, and dehumidification
- Aluminized-steel primary heat exchanger
- Stainless-steel condensing secondary heat exchanger
- Propane convertible (See Accessory list)
- Factory-configured ready for upflow applications
- Fully-insulated casing including blower section
- Convenient Electronic Air Cleaner and Humidifier connections
- Direct-vent/sealed combustion, single-pipe venting or ventilated combustion air
- Installation flexibility: (sidewall or vertical vent)
- Residential installations may be eligible for consumer financing through the Retail Credit Program

LIMITED WARRANTY*

- 10 year parts and lifetime heat exchanger limited warranty to the original purchaser upon timely registration.
- Limited warranty period is five years for parts and twenty years for the heat exchanger if not registered within 90 days of installation.†

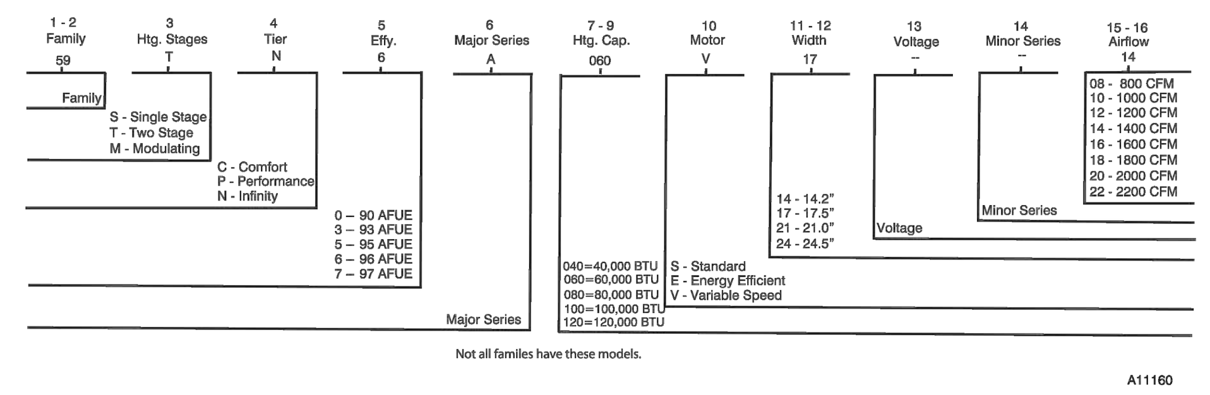
* For owner occupied, residential applications.
†Jurisdictions where warranty benefits cannot be conditioned on registration will receive registered limited warranty benefits.

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org.

SPECIFICATIONS

Heating Capacity and Efficiency			060-14	080-14	100-20	120-22
Input	High Heat	(BTUH)	60,000	80,000	100,000	120,000
	Low Heat	(BTUH)	39,000	52,000	65,000	78,000
Output	High Heat	(BTUH)	58,000	78,000	98,000	117,000
	Low Heat	(BTUH)	37,000	50,000	63,000	76,000
Efficiency	AFUE % (ICS)		96.3	96.2	96.7	96.7
Certified Temperature Rise Range °F (°C)		High Heat	35 - 65 (19-36)	40 - 70 (21-38)	45 - 75 (25-41)	45 - 75 (25-41)
		Low Heat	30 - 60 (17-33)	30 - 60 (17-33)	30 - 60 (17-33)	30 - 60 (17-33)
Airflow Capacity and Blower Data			**060-14**	**080-14**	**100-20**	**120-22**
Certified External Static Pressure (in. w.c.)		Heating	0.12	0.15	0.20	0.20
		Cooling	0.5	0.5	0.5	0.5
Airflow Delivery @ Rated ESP (CFM)		High Heat	1075	1500	1515	1820
		Low Heat	855	1060	1335	1640
		Cooling	1335	1375	2030	2185
Cooling Capacity (tons) @ 400, 350 CFM/ton		400 CFM/ton	3	3.5	5	5.5
		350 CFM/ton	3.5	4	5.5	6
Direct-Drive Motor Type			Electronically Commutated Motor (ECM)			
Direct-Drive Motor HP			1/2	1/2	1	1
Motor Full Load Amps			7.7	7.7	12.8	12.8
RPM Range			300 - 1300			
Speed Selections			Variable (Communicating)			
Blower Wheel Dia x Width		in.	11 x 8	11 x 8	11 x 10	11 x 11
Air Filtration System			Factory Supplied Media Cabinet Field Supplied Filter			
Filter Used for Certified Watt Data			KGAWF1306UFR	KGAWF1306UFR	KGAWF1406UFR	KGAWF1506UFR
Electrical Data			**060-14**	**080-14**	**100-20**	**120-22**
Input Voltage		Volts-Hertz-Phase	115-60-1			
Operating Voltage Range		Min-Max	104-127			
Maximum Input Amps		Amps	9.7	9.7	14.8	14.8
Unit Ampacity		Amps	12.7	12.7	19.2	19.2
Minimum Wire Size		AWG	14	14	12	12
Maximum Wire Length @ Minimum Wire Size		Feet	29	29	30	30
		(M)	(8.8)	(8.8)	(9.1)	(9.1)
Maximum Fuse/Ckt Bkr (Time-Delay Type Recommended)		Amps	15	15	20	20
Transformer Capacity (24vac output)			40 VA			
External Control Power Available		Heating	24.3 VA			
		Cooling	34.6 VA			
Controls			**060-14**	**080-14**	**100-20**	**120-22**
Gas Connection Size			1/2" - NPT			
Burners (Monoport)			3	4	5	6
Gas Valve (Redundant)		Manufacturer	White Rogers™			
		Minimum Inlet Gas pressure (in. W.C.)	4.5			
		Maximum Inlet Gas pressure (in. W.C.)	13.6			
Gas Conversion Kit - Natural to Propane			KGANP5201VSP			
Gas Conversion Kit - Propane to Natural			KGAPN4401VSP			
Manufactured (Mobile) Home Kit			*not approved for MH use*			
Ignition Device			Silicon Nitride			
Limit Control			180	170	160	160
Heating Blower Control (Heating Off-Delay)			Adjustable: 90, 120, 150, 180 seconds			
Cooling Blower Control (Time Delay Relay)			90 seconds			
Communication System			Infinity; Infinity Zoning			
Thermostat Connections			W2, Y1, DHUM, G, COM 24V, W/W1, Y/Y2, R			
Accessory Connections			EAC (115vac); HUM (24vac); 1-stg AC (via Y/Y2)			

MODEL NUMBER NOMENCLATURE



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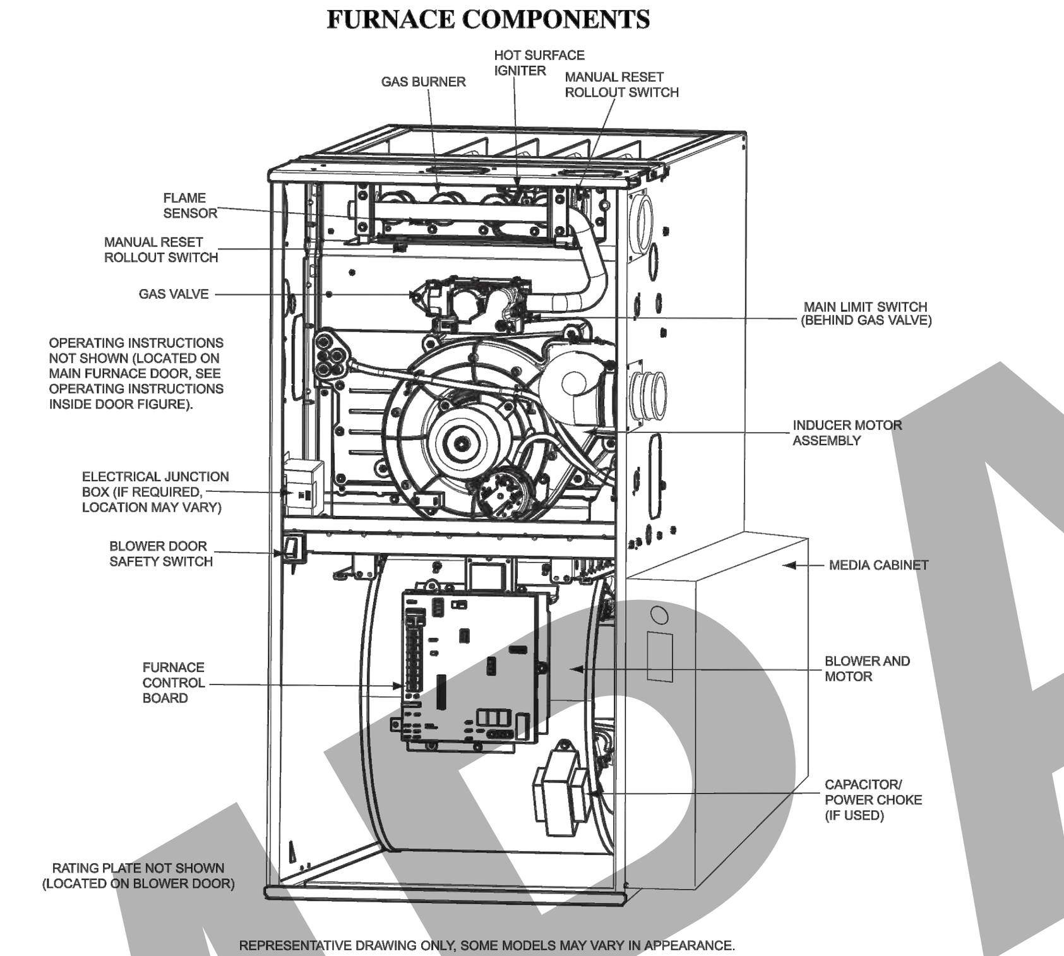
FURNACE COMPONENTS



REPRESENTATIVE DRAWING ONLY, SOME MODELS MAY VARY IN APPEARANCE.

A11408

ACCESSORIES

DESCRIPTION	PART NUMBER	060-14	080-14	100-20	120-22
Venting, Drainage and Installation					
Vent Kit - Through the Cabinet	KGADC0101BVC	X	X	X	X
Vent Terminal - Concentric - 2" (51 mm)	KGAVT0701CVT	X	X	X	N/A
Vent Terminal - Concentric - 3" (76 mm)	KGAVT0801CVT	X	X	X	X
Vent Terminal Bracket - 2" (51 mm)	KGAVT0101BRA	X	X	X	N/A
Vent Terminal Bracket - 3" (76 mm)	KGAVT0201BRA	X	X	X	X
CPVC to PVC Drain Adapters - 1/2" CPVC to 3/4" PVC	KGAAD0110PVC	X	X	X	X
Horizontal Trap Grommet - Direct Vent	KGACK0101HCK	X	X	X	X
Freeze Protect Kit - Heat Patch for Drain Trap	KGAHT0201CFP	X	X	X	X
Freeze Protect Kit - Heat Tape	KGAHT0101CFP	X	X	X	X
Furnace Base Kit for Combustible Floors	KGASB0201ALL	X	X	X	X
Gas Conversion					
Gas Cnv Kit - Nat to LP; Var-spd Products	KGANP5201VSP	X	X	X	X
Gas Cnv Kit - LP to Nat; Var-spd Products	KGAPN4401VSP	X	X	X	X
Gas Orifice Kit - #42 (Nat Gas)	KGAHA0150N42	X	X	X	X
Gas Orifice Kit - #43 (Nat Gas)	KGAHA0250N43	X	X	X	X
Gas Orifice Kit - #44 (Nat Gas)	KGAHA0350N44	X	X	X	X
Gas Orifice Kit - #45 (Nat Gas)	KGAHA0450N45	X	X	X	X
Gas Orifice Kit - #46 (Nat Gas)	KGAHA0550N46	X	X	X	X
Gas Orifice Kit - #47 (Nat Gas)	KGAHA1550N47	X	X	X	X
Gas Orifice Kit - #48 (Nat Gas)	KGAHA1650N48	X	X	X	X
Gas Orifice Kit - #54 (LP)	KGAHA0650P54	X	X	X	X
Gas Orifice Kit - #55 (LP)	KGAHA0750P55	X	X	X	X
Gas Orifice Kit - #56 (LP)	KGAHA0850P56	X	X	X	X
Gas Orifice Kit - 1.25mm (LP)	KGAHA5750125	X	X	X	X
Gas Orifice Kit - 1.30mm (LP)	KGAHA5750130	X	X	X	X
Indoor Air Quality					
Carrier Infinity Air Purifier - 16x25 (406x635 mm)	GAPAAXCC1625-A08	X	X	X	X
Carrier Infinity Air Purifier - 20x25 (508x635 mm)	GAPAAXCC2025-A08	X	X	X	X
Carrier Infinity Air Purifier Repl. Filter- 16x25 (406x635 mm)	GAPACCCAR1625-A05	X	X	X	X
Carrier Infinity Air Purifier Repl. Filter- 20x25 (508x635 mm)	GAPACCCAR2025-A05	X	X	X	X
EZ Flex Cabinet 16" (406 mm)	EZXCABCC1016-A20	X	X	X	X
EZ Flex Cabinet 20" (508 mm)	EZXCABCC1020-A20	X	X	X	X
Cartridge Media Filter - 16" (406 mm)	FILXXCAR0016	X	X	X	X
Cartridge Media Filter - 20" (508 mm)	FILXXCAR0020	X	X	X	X
Cartridge Media Filter - 24" (610 mm)	FILXXCAR0024	X	X	X	X
EZ-Flex Filter - 16" (406 mm)	EXPXXFIL0016	X	X	X	X
EZ-Flex Filter - 20" (508 mm)	EXPXXFIL0020	X	X	X	X
EZ-Flex Filter - 24" (610 mm)	EXPXXFIL0024	X	X	X	X
EZ-Flex Filter with End Caps - 16" (406 mm)	EXPXXUNV0016	X	X	X	X
EZ-Flex Filter with End Caps - 20" (508 mm)	EXPXXUNV0020	X	X	X	X
EZ-Flex Filter with End Caps - 24" (610 mm)	EXPXXUNV0024	X	X	X	X
Filter Pack (6 pack) - Washable - 16x25x1 (406x635x25 mm)	KGAWF1306UFR	X	X	X	X
Filter Pack (6 pack) - Washable - 24x25x1 (610x635x25 mm)	KGAWF1506UFR	X	X	X	X
Controls					
Infinity™ Control User Interface	SYSTXCCUID01-V	X	X	X	X
Infinity™ Control Zoning User Interface	SYSTXCCUIZ01-V	X	X	X	X
Service Tools					
Advanced Product Monitor - APM (CBP, Only)	KGASD0301APM	X	X	X	X
ECM Motor Simulator Kit	KGASD0301FMS	X	X	X	X

X – Used with this model furnace
N/A – Not used with this model furnace

24VNA9 Infinity® 19VS Variable Speed Air Conditioner with Puron® Refrigerant 1 – 5 Tons

Carrier turn to the experts

Product Data

INFINITY 19VS

The Infinity® 19VS air conditioner offers high-efficiency variable speed performance in a remarkably small cabinet and provides up to 19 SEER cooling efficiency. The variable speed inverter capacity control delivers up to 5 stages of operation for exceptional load matching, dehumidification and zoning performance.

This product has been designed and manufactured to provide flexible system matching and work with a wide variety of indoor units and controls.

NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.

INDUSTRY LEADING FEATURES / BENEFITS

Energy Efficiency
- Up to 19 SEER / 13 EER
- Microtube Technology™ refrigeration system

Sound
- Sound level as low as 55 dBA in low speed (Silencer System II).
- Soft start and smooth ramp to operating speeds

Comfort
- Variable speed compressor operates at 5 stages with capacity range from as wide as 25-100%
- Air cooled Inverter variable speed drive
  - — System requires Infinity® Touch Control with version 11 software or newer for 5 stage operation on sizes 24 - 60 and version 12 or higher on size 13.
  - — Ratings provided with 2-stage thermostats and suitable non-communicating indoor products for 2-stage operation.

Reliability
- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Front-seating service valves
- Inverter control drives compressor and fan motor
- No control module attached to fan motor
- Infinity intelligence monitors critical system parameters
- Pressure equalizer valve for easy compressor starting
- High pressure switch
- Suction pressure transducer
- Compressor discharge temperature sensor
- Suction temperature sensor
- Filter drier (field installed)
- Internal crankcase heater standard

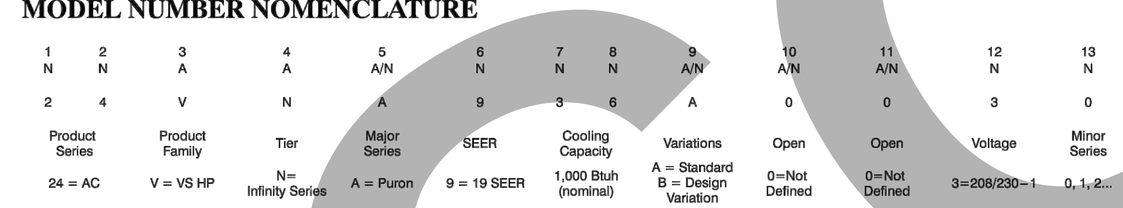
Flexibility and installation:
- 2 control wires to outdoor unit in complete Infinity system and Touch Control
- Energy Tracking capability with the Infinity® Touch Control (Energy Tracking has the ability to monitor and estimate the energy consumption of your Infinity® system.)
- Smaller and lighter than 2-stage units
- Minimum and Maximum adjustments with Infinity® Touch Control
- Compatible with non-communicating thermostats

Durability

WeatherArmor Ultra™ protection package:
- Solid, Durable sheet metal construction
- Steel louver coil guard
- Baked-on, complete outer coverage, powder paint

Applications
- Line sets up to 100 ft (30.5 m) equivalent length
- No long-line accessories required.

MODEL NUMBER NOMENCLATURE



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

ENERGY STAR Qualifying Models Only

STANDARD FEATURES

FEATURES	13	24B	25	36	37	48	49	60
	Unit Size – Voltage, Series							
Puron Refrigerant	X	X	X	X	X	X	X	X
Variable Speed Rotary Compressor	X	X	X	X	X	X	X	X
Air–Cooled Integrated Inverter Drive	X	X	X	X	X	X	X	X
Louvered Coil Guard	X	X	X	X	X	X	X	X
Field Installed Filter Drier	X	X	X	X	X	X	X	X
Front Seating Service Valves	X	X	X	X	X	X	X	X
Internal Pressure and Temperature Protection	X	X	X	X	X	X	X	X
Suction Pressure Transducer	X	X	X	X	X	X	X	X
High Pressure Switch	X	X	X	X	X	X	X	X
Internal Crankcase Heater	X	X	X	X	X	X	X	X
Enhanced Diagnostics with Infinity® Touch Control (version 11 software or newer for 5 stage operation on sizes 24 – 60 and version 12 or higher on size 13.)	X	X	X	X	X	X	X	X
Deluxe Sound Blanket	X	X	X	X	X	X	X	X
Outdoor Air Temperature Sensor	X	X	X	X	X	X	X	X

X = Standard

PHYSICAL DATA

UNIT SIZE SERIES	13–30	24B–30	25–31	36–31	37–30	48–30	49–30	60–30
Compressor Type	Variable Speed Rotary							
REFRIGERANT	Puron® (R–410A)							
Control	TXV (Puron® Hard Shutoff)							
Charge lb (kg)	4.6 (2.09)	4.80 (2.18)	5.5 (2.50)	6.0 (2.72)	7.5 (3.40)	7.5 (3.40)	9.6 (4.35)	8.30 (3.76)
COND FAN	Forward Swept Propeller Type, Direct Drive							
Air Discharge	Vertical							
Air Qty (CFM)	1600	2500	2500	2500	4500	4500	4800	4500
Motor HP	1/5	1/5	1/3	1/3	1/3	1/3	1/3	1/3
Motor RPM	650	825	1050	1050	850	850	850	900
COND COIL								
Face Area (Sq ft)	11.12	11.12	13.90	13.90	21.50	21.50	27.53	23.65
Fins per In.	20	20	20	20	20	20	25	20
Rows	1	1	1	1	1	1	1	1
Circuits	6	5	6	6	8	8	8	8
VALVE CONNECT. (In. ID)								
Vapor	5/8	5/8	3/4	3/4	7/8	7/8	7/8	7/8
Liquid	3/8							
REFRIGERANT TUBES (In. OD)								
Rated Vapor*	3/4	3/4	7/8	7/8	1–1/8	1–1/8	1–1/8	1–1/8
Max Liquid Line	3/8							

* Units are rated with 25 ft (7.6 m) of lineset length. See Vapor Line Sizing and Cooling Capacity Loss table when using other sizes and lengths of lineset.
Note: See unit Installation Instruction for proper installation.

REFRIGERANT PIPING LENGTH LIMITATIONS

Maximum Line Lengths:

The maximum allowable total equivalent length for air conditioners can vary depending on the vertical separation. See the tables below for allowable lengths depending on whether the outdoor unit is on the same level, above or below the outdoor unit.

Maximum Line Lengths for Air Conditioner Applications

	MAXIMUM ACTUAL LENGTH ft (m)	MAXIMUM EQUIVALENT LENGTH† ft (m)	MAXIMUM VERTICAL SEPARATION ft (m)
Units on equal level	100 (30.5)	100 (30.5)	N/A
Outdoor unit ABOVE indoor unit	100 (30.5)	100 (30.5)	100 (30.5)
Outdoor unit BELOW indoor unit	See Table *'Maximum Total Equivalent Length: Outdoor Unit BELOW Indoor Unit'*		

† **Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.**

Maximum Total Equivalent Length† - Outdoor Unit BELOW Indoor Unit

Size	Liquid Line Diameter w/ TXV	AC with Puron® Refrigerant – Maximum Total Equivalent Length† Vertical Separation ft (m) Outdoor unit BELOW indoor unit;						
		0–20 (0 – 6.1)	21–30 (6.4 – 9.1)	31–40 (9.4 – 12.2)	41–50 (12.5 – 15.2)	51–60 (15.5 – 18.3)	61–70 (18.6 – 21.3)	71–80 (21.6 – 24.4)
1–Ton	3/8	100*	100*	100*	100*	100*	100*	100*
2–Ton	3/8	100*	100*	100*	100*	100*	100*	100*
3–Ton	3/8	100*	100*	100*	100*	100*	100*	100*
4–Ton	3/8	100*	100*	100*	100*	100	100	––
5–Ton	3/8	100*	100*	100*	100*	100	100	––

*** Maximum actual length not to exceed 100 ft (30.5 m)**
† Total equivalent length accounts for losses due to elbows or fitting.
–– = outside acceptable range

LONG LINE APPLICATIONS

Unit is approved for up to 100 ft (30.5 m) equivalent length and vertical separations shown above with no additional accessories. Longer line set applications are not permitted.

COOLING CAPACITY LOSS TABLE

Nominal Size (Btuh)	Line OD (in.)	24VNA9 Cooling Capacity Loss (%) Total Equivalent Line Length (ft)				
		25	50	75	80	100
13	5/8	0.5	1.2	1.8	1.9	2.4
	3/4	**0.1**	**0.4**	**0.6**	**0.7**	**0.8**
24B	5/8	0.5	1.2	1.8	1.9	2.4
	3/4	**0.1**	**0.4**	**0.6**	**0.7**	**0.8**
25	5/8	0.5	1.2	1.8	1.9	2.4
	3/4	0.1	0.4	0.6	0.7	0.8
	7/8	0.0	0.1	0.3	0.3	0.4
36	5/8	1.1	2.4	3.7	4.0	5.0
	3/4	0.3	0.8	1.3	1.4	1.8
	7/8	0.0	0.3	0.5	0.6	0.8
37 48 49	3/4	0.7	1.6	2.4	2.6	3.2
	7/8	0.3	0.7	1.1	1.2	1.6
	1 1/8	0.0	0.1	0.2	0.3	0.4
60	3/4	1.0	2.3	3.5	3.8	4.8
	7/8	0.4	1.0	1.7	1.8	2.3
	1 1/8	0.0	0.1	0.3	0.4	0.5

Rating Line Size in **BOLD**

MIN/MAX AIRFLOW TABLES

The indoor airflow delivered by this system varies significantly based on outdoor temperature, indoor unit combination, and system demand. The airflows on these tables are for duct design considerations. Duct systems capable of these ranges will ensure the system will deliver full capacity at all outdoor temperatures. Minimum and maximum airflows can be adjusted from these numbers in the Infinity Control Setup screen.

Cooling – Comfort Mode			Minimum Cooling (Dehum or Zoning)
Size	Max Stage 5 Airflow	Max Stage 1 Airflow	
1–Ton	420	300	300
2–Ton	739	300	300
3–Ton	990	300	300
4–Ton	1389	542	457
5–Ton	1600	700	600

Cooling – Efficiency Mode		
Size	Max Stage 5 Airflow	Max Stage 1 Airflow
1–Ton	420	300
2–Ton	825	585
3–Ton	1050	600
4–Ton	1400	875
5–Ton	1800	975

Cooling Max Mode		
Size	Max Stage 5 Airflow	Max Stage 1 Airflow
1–Ton (550 cfm/ delivered ton)	780	434
2–Ton (24)	850	585
2–Ton (25) (550 cfm/ delivered ton)*	1350	510
3–Ton	1200	600
4–Ton	1600	875
4–Ton–49	1450	875
5–Ton	2000	975

* Serial number beginning with 0115E and newer

LEGEND::

Max Capacity Airflow – Stage 5 airflow varies depending on conditions. This is the highest airflow the system will attempt to deliver in this particular mode. Ductwork for non–zoned systems should be sized for this airflow to ensure the system can deliver full capacity when needed. Improper duct design may result in excessive airflow noise and/or cutback occurrences at max airflow conditions.

Highest Min. Capacity Airflow – Stage 1 airflow also varies depending on conditions. In zoned systems, each zone must be capable of delivering this airflow for the system to deliver full capacity into the zone. Otherwise, airflow may be diverted to other zones or cutback may occur.

Min Cooling (Dehum or Zoning) – Lowest airflow the system will deliver. May operate down to this airflow in dehumidification mode or in zoning applications where ductwork restrictions have caused the blower to cut–back.

ELECTRICAL DATA

UNIT SIZE–VOLTAGE, SERIES	V/PH	OPER VOLTS*		COMPR		FAN	MCA	MAX FUSE ** or CKT BRK AMPS
		MAX	MIN	LRA	RLA	FLA		
13–30	208–230–1	253	197	N/A	10.3	0.58	13.5	20
24B–30				N/A	10.3	0.58	13.5	20
25–31				N/A	17.7	1.20	23.6	40
36–31				N/A	18.4	1.20	24.2	40
37–30				N/A	19.6	1.20	26.0	40
48–30				N/A	20.9	1.20	27.3	40
49–30				N/A	19.6	1.40	26.0	40
60–30				N/A	30.9	1.40	40.0	60

* Permissible limits of the voltage range at which the unit will operate satisfactorily
** Time–Delay fuse.
FLA – Full Load Amps
LRA – Locked Rotor Amps
MCA – Minimum Circuit Amps
RLA – Rated Load Amps
NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.
Complies with 2010 requirements of ASHRAE Standards 90.1

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	
13–30	If a Touch Control is installed, subcooling recommendation displayed in Charging Mode must be followed. If not, subcooling chart shown on the charging label must be followed
24B–30	
25–31	
36–31	
37–30	
48–30	
49–30	
60–30	

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:
MECHANICAL EQUIPMENT CATALOGS-1

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS
PROJECT		SHEET
DATE AUGUST, 2022		M 4 . 1

Panasonic

WhisperGreen® Select™ Connected Ventilation Fans

WhisperGreen Select

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

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

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

KEY FEATURES

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

ADDITIONAL BENEFITS

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

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

reinventingventing.com

Most Efficient 2021 ENERGY STAR www.energystar.gov

One Connected Fan. Endless Possibilities.

The customizable IAQ solution for virtually any space

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

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

Step 1: Select a Base Fan Model

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

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

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

Step 2: Select Value Added Features

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

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

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

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

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

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

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

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

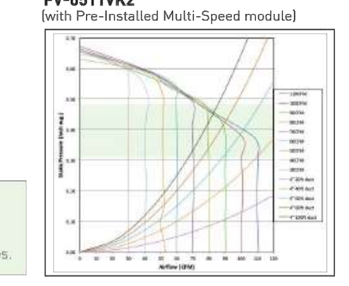
Superior Installed Performance up to 0.375" and Certified Quiet Operation at 0.25" Static Pressure

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

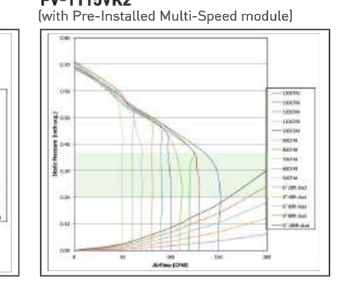
WhisperGreen® Select™ Connected Ventilation Fans

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

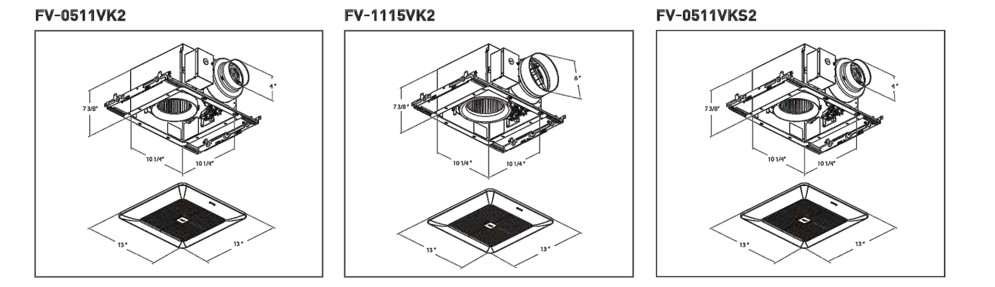
FV-0511VK2 (with Pre-Installed Multi-Speed module)



FV-1115VK2 (with Pre-Installed Multi-Speed module)



FV-0511VK2 | FV-1115VK2 | FV-0511VKS2



Specifications		WhisperGreen® Select™ (Fan Only) Base Fan: FV-0511VK2	FV-1115VK2	WhisperGreen® Select™ (Fan Only) Base Fan with Pre-Installed Multi-Speed: FV-0511VKS2	WhisperGreen® Select™ (Fan Only) Base Fan with Multi-speed Plug 'N Play Module: FV-0511VK2 + FV-VS15VK1
Characteristics (HVI tested data for 0.1" S.P.)	Static Pressure in inches w.g.	[illegible]	[illegible]	[illegible]	[illegible]
	Air Volume (CFM)	[illegible]	[illegible]	[illegible]	[illegible]
	Noise (sones)	[illegible]	[illegible]	[illegible]	[illegible]
	Power Consumption (watts)	[illegible]	[illegible]	[illegible]	[illegible]
	Energy Efficiency (CFM/Watt)	[illegible]	[illegible]	[illegible]	[illegible]
	Speed (RPM)	[illegible]	[illegible]	[illegible]	[illegible]
	Amps (Current)	[illegible]	[illegible]	[illegible]	[illegible]
	MAX. Amps (Current)	0.20	0.24	0.20	0.20
	Power Rating (V/Hz)	120/60	120/60	120/60	120/60
Specifications	Motor Type	ECM	ECM	ECM	DC
	Type of Motor Bearing	Ball	Ball	Ball	Ball
	Thermal Fuse Protection	Yes	Yes	Yes	Yes
	Blower Wheel Type	Sirocco	Sirocco	Sirocco	Sirocco
	ENERGY STAR Qualified	Yes	Yes	Yes	Yes
Installation	Duct Diameter (inches)	4 & 6	6	4 & 6	4" or 6"
	Mounting Opening (inches sq.)	10-1/2	10-1/2	10-1/2	10-1/2"
	Grille Size (inches sq.)	13	13	13	13"
Light Specifications	Lamp Watts	N/A	N/A	N/A	N/A
	Lumens (lm)	N/A	N/A	N/A	N/A
	Lumens Per Watt (LPW)	N/A	N/A	N/A	N/A
	Color Rendering Index	N/A	N/A	N/A	N/A
	Color Temperature (Kelvin)	N/A	N/A	N/A	N/A
	Rated Life (hours)	N/A	N/A	N/A	N/A
	Lamp Model #	N/A	N/A	N/A	N/A
	Type of Lamp Socket	N/A	N/A	N/A	N/A
Night Light Specs	Night Light Watts	N/A*	N/A*	N/A*	N/A*
Shipping	Gross Weight (lbs)	11.80	11.95	11.90	11.9
Approved Code/ Standard/ Regulation	UL tub/Shower Enclosure	Yes	Yes	Yes	Yes
	Washington VIAQ Code	Yes	Yes	Yes	Yes
	Wall installation	No	No	No	No
	California Title 24 Compliant	Yes	Yes	Yes	Yes
	Mfg in ISO 9001 Certified Facility	Yes	Yes	Yes	Yes

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

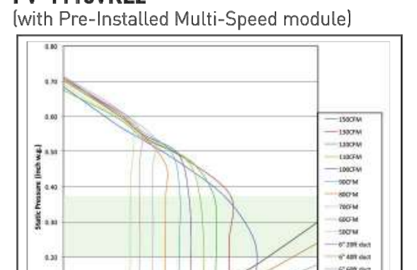
ECM Motor with SmartFlow™ Technology
WhisperGreen® Select™ is designed to perform as rated. When the fan senses static pressure, its speed is automatically increased to ensure optimal CFM output. This feature provides peace of mind, as the installer doesn't have to worry about compromising the fan's performance.

LED Lighting
Includes a 10 Watt dimmable LED chip panel/3000 Kelvin Warm White/90CRI/700 lumens/70 LPW/ENERGY STAR® 2.0 certified/JA-8 compliant for CA Title 24/50,000 hours rated average life / <1W LED night light.

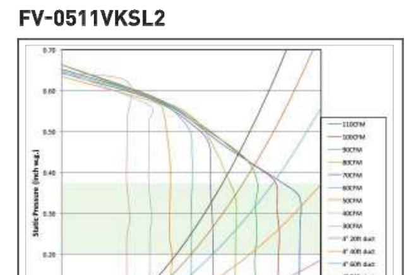
WhisperGreen Select

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

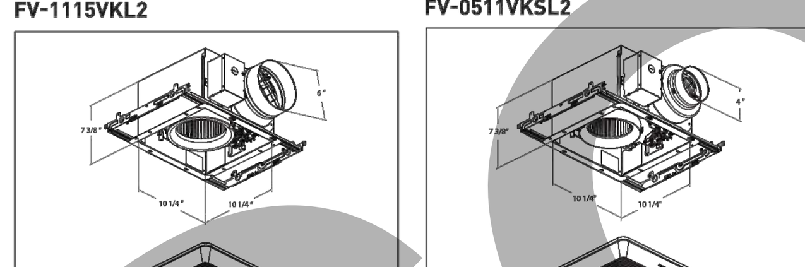
FV-1115VKL2 (with Pre-Installed Multi-Speed module)



FV-0511VKSL2



FV-1115VKL2 | FV-0511VKSL2



Specifications		WhisperGreen® Select™ (Fan/LED Light) Base Fan with LED Light: FV-0511VKL2	FV-1115VKL2	WhisperGreen® Select™ (Fan/LED Light) Base Fan with LED Light and Pre-Installed Multi-Speed: FV-0511VKSL2	WhisperGreen® Select™ (Fan/LED Light) Base Fan with LED Light and Multi-speed Plug 'N Play Module: FV-0511VKL2 + FV-VS15VK1
Characteristics (HVI tested data for 0.1" S.P.)	Static Pressure in inches w.g.	[illegible]	[illegible]	[illegible]	[illegible]
	Air Volume (CFM)	[illegible]	[illegible]	[illegible]	[illegible]
	Noise (sones)	[illegible]	[illegible]	[illegible]	[illegible]
	Power Consumption (watts)	[illegible]	[illegible]	[illegible]	[illegible]
	Energy Efficiency (CFM/Watt)	[illegible]	[illegible]	[illegible]	[illegible]
	Speed (RPM)	[illegible]	[illegible]	[illegible]	[illegible]
	Amps (Current)	[illegible]	[illegible]	[illegible]	[illegible]
	MAX. Amps (Current)	0.19	0.23	0.19	0.19
	Power Rating (V/Hz)	120/60	120/60	120/60	120/60
Specifications	Motor Type	ECM	ECM	ECM	DC
	Type of Motor Bearing	Ball	Ball	Ball	Ball
	Thermal Fuse Protection	Yes	Yes	Yes	Yes
	Blower Wheel Type	Sirocco	Sirocco	Sirocco	Sirocco
	ENERGY STAR Qualified	Yes	Yes	Yes	Yes
Installation	Duct Diameter (inches)	4 & 6	6	4 & 6	4" or 6"
	Mounting Opening (inches sq.)	10-1/2	10-1/2	10-1/2	10-1/2"
	Grille Size (inches sq.)	13	13	13	13"
Light Specifications	Lamp Watts	10	10	10W	10.0
	Lumens (lm)	700lm per lamp*	700lm per lamp*	700lm per lamp*	700
	Lumens Per Watt (LPW)	70LPW	70LPW*	70LPW*	70
	Color Rendering Index	90	90	90	90
	Color Temperature (Kelvin)	3,000K	3,000K	3,000K	3,000
	Rated Life (hours)	50,000	50,000	50,000	50,000
	Lamp Model #	N/A	N/A	N/A	N/A
	Type of Lamp Socket	LED Chip	LED chip	LED chip	LED chip
Night Light Specs	Night Light Watts	0.2	0.2	0.2	0.2
Shipping	Gross Weight (lbs)	12.4	12.55	12.5	12.5
Approved Code/ Standard/ Regulation	UL tub/Shower Enclosure	Yes	Yes	Yes	Yes
	Washington VIAQ Code	Yes	Yes	Yes	Yes
	Wall installation	No	No	No	No
	California Title 24 Compliant	Yes	Yes	Yes	Yes
	Mfg in ISO 9001 Certified Facility	Yes	Yes	Yes	Yes

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

CALGreen

Scan code to view SelectCycler animation

Panasonic Life Solutions Company of America
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102
us.panasonic.com/ventfans

For Order Information
PHONE: 866-292-7299
FAX: 888-553-0723
ventfans@us.panasonic.com

Design and specifications subject to change without notice.

IAQ20170SS-r2

Intelli-Balance™ 100 Energy Recovery Ventilator

FV-10VE2
Temperate Climate ERV

Specification Submittal Data / Panasonic ERV

Description
Ceiling or wall mount Cold Climate Energy Recovery Ventilator (ERV) provides a tempered air supply, humidity control, and a balanced amount of exhaust to help maintain balanced, positive or negative pressure throughout the home. The Panasonic Intelli-Balance ERV is engineered for use in any North America climate zone. Version 2 includes new Hi/Lo Occupant Controlled Boost Capability. Built-in ASHRAE 62.2 Timing function helps ensure code compliance.

Motor/Blower:

- ERV shall have Hi/Lo Speed Occupant Controlled Boost Capability
- Two (2) enclosed DC brushless motors rated for continuous run.
- ERV Supply and Exhaust ventilation rates shall be manually adjustable for 50-60-70-80-90-100 CFM.
- Power rating shall be 120 volts and 60 Hz.
- Motor equipped with thermal cut-off fuse control.
- Removable, permanently lubricated, plug–in motor.

Housing:

- 22 gauge galvanized steel body.
- Four 4" or 6" intake and exhaust ducts.
- Built in damper on Outdoor Air (OA) closes during defrost function when the outdoor temperature is too cold.
- Filters on supply and exhaust air extend the life of the ERV core.
- (4) Pressure ports allow for easy airflow verification.
- Pre-drilled mounting bracket can accommodate 16", 19", or 24" on center.

Maintenance:

- MERV 8 filter included; MERV 8 (FV-FL0810VE1) and optional MERV 13 (FV-FL1310VE1) replacements available.
- Unobtrusive alarm notifies owner for filter check and maintenance.

Warranty:

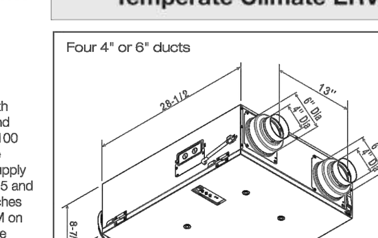
- DC Motors: 6 years from original purchase date
- All Parts: 3 Years from original purchase date.

Architectural Specifications:
ERV shall be ceiling or wall mount type with built-in speed selectors for both Supply and Exhaust air. Select from 50/60/70/80/90/100 CFM. ERV shall have 100 Net CFM on the exhaust ports and 100 Net CFM on the supply ports as tested in accordance with HVI 915 and 916 standards at 0.1 static pressure in inches water gauge. ERV shall have 100 Net CFM on the exhaust ports and Net 100 CFM on the supply ports at 0.4" w.g. static pressure. ERV shall have Hi/Lo Speed Occupant Controlled Boost Capability. Power consumption shall be no greater than 81 watts at 0.1" w.g. and 100 watts at 0.4" w.g. static pressure. Apparent Sensible Effectiveness for heating shall be no less than 84% at 53 CFM net air flow under 32°F (0°C) as tested in accordance with CSA-C439. Total Recovery Efficiency for cooling shall be no less than 60% at 49 CFM net air flow under 95°F (35°C). The supply port damper shall close when outdoor temperatures are < 14°F (-10°C) to prevent freezing of the core. The (2) motors shall be totally enclosed DC brushless motors rated for continuous run. DC motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. ERV shall incorporate an ASHRAE 62.2 Intermittent Timing function for code compliance. ERV shall have standby/low speed to high speed control airflow capability as desired by occupant. Power rating shall be 120v/60Hz. Duct diameters shall be no less than 4". ERV can be used to comply with ASHRAE 62.2, LEED, IAP, California Title-24, and WA Energy Code

ERV Core Technology:

- Indoor and outdoor air passes through Panasonic's capillary core technology. This process tempers supply air while transferring moisture and energy.
- Built in Frost Prevention Mode prevents the core from freezing. Frost Prevention Mode is intuitive and operates without homeowner intervention.
- Core material permeated with anti-mold treatment.

Four 4" or 6" ducts



FV-10VE2 Optional Exterior Wall Cap (see next page)

DC Motor Technology
When the ERV senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised.

For complete Installation Instructions visit **us.panasonic.com/ventfans**

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Panasonic Life Solutions Company of America
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102
us.panasonic.com/ventfans

Panasonic

IAQ19203ST r7

Intelli-Balance™ 100 Energy Recovery Ventilator

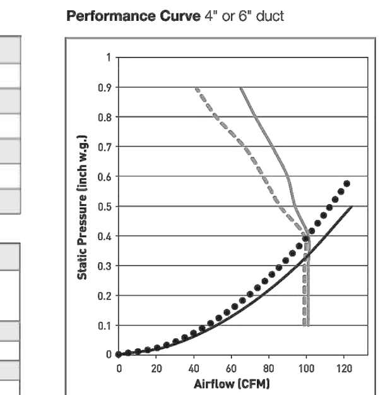
FV-10VE2
Temperate Climate ERV

Specification Submittal Data / Panasonic ERV
(Continued)

Specifications: Intelli-Balance 100 FV-10VE2		
Static Pressure in inches w. g.	0.1	0.4
Net Exhaust Air Volume (CFM)	100	100
Net Supply Air Volume (CFM)	100	100
Power Consumption (watts)	81	100
Power Rating (V/Hz)	120/60	
ENERGY STAR® Certified	Yes	

Energy Performance: Intelli-Balance 100 FV-10VE2							
Supply Temperature °C	Supply Temperature °F	Net Air Flow L/S	Net Air Flow CFM	Power Consumed (Watts)	Sensible Recovery Efficiency	Apparent Sensible Effectiveness	Net Moisture Transfer
Heating							
0	32	25	53	29	81	84	81
0	32	31	66	39	77	81	75
0	32	40	85	68	75	80	74
Cooling					Total Recovery Efficiency		
35	95	23	49	32	60		

Performance Curve 4" or 6" duct



Panasonic Life Solutions Company of America
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Panasonic

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NOTES:

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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:
MECHANICAL EQUIPMENT CATALOGS-2

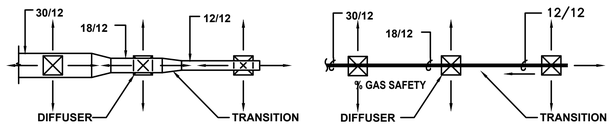
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS
PROJECT		SHEET
DATE AUGUST, 2022		M4.2

GENERAL NOTES

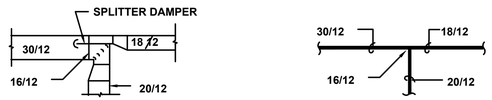
1. MECHANICAL CONTRACTOR SHALL EXAMINE ALL OTHER SPECIFICATIONS, DRAWINGS AND ALL FEATURES OF BUILDING CONSTRUCTION WHICH MAY AFFECT HIS WORK AND SHALL B GOVERNED BY THESE AND OTHER SPECIFICATIONS, INCLUDIN THE GENERAL CONDITIONS AND PARTICULAR INSTRUCTIONS T ALL BIDDER AND SUPPLIERS .
2. ALL WORK SHALL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

DUCTWORK SYMBOLS LEGEND

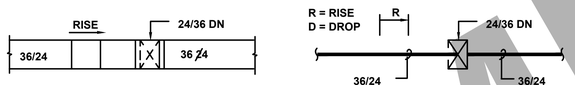
TRANSITIONS



MAIN BRANCH TAKE-OFFS

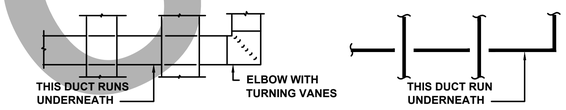


RISERS

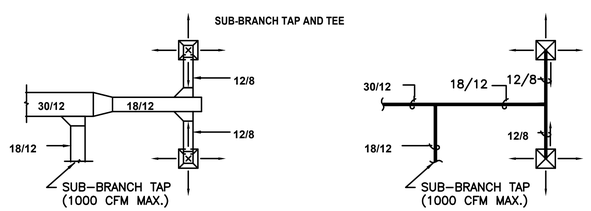


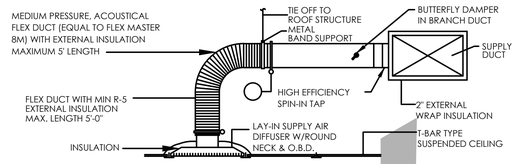
SIDEWALL REGISTERS

DUCT CROSSOVERS

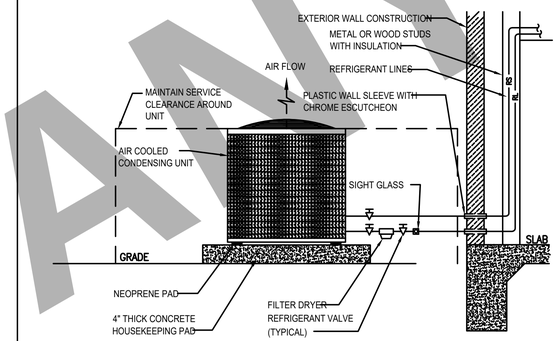


SUB-BRANCH TAP AND TEE

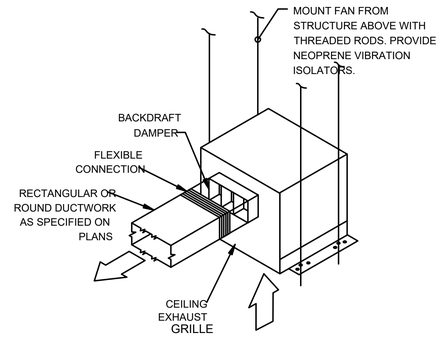




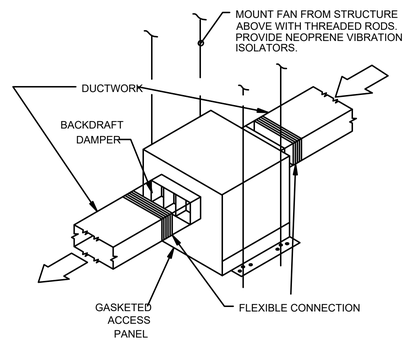
SUPPLY AIR DIFFUSER CONNECTION



OUTSIDE AIR CONDITIONER



CEILING EXHAUST FAN DETAIL



IN-LINE FAN DETAIL

CLIENT:

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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

PROJECT:

TITLE:
MECHANICAL GENERAL DETAILS.

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

PROJECT

DATE
AUGUST, 2022

SHEET
M 6 . 0

LIST OF SYMBOLS AND SERVICES

	WALL MOUNTED LED LIGHTING FIXTURE WITH POWER 15VA
	EXTERIOR WALL MOUNTED LED LIGHTING FIXTURE WITH POWER 15VA
	RECESSED MOUNTED ROUND LED LIGHTING FIXTURE SIMILAR TO PHILIPS DN130B D165 1xLED10S/840
$S_?	LIGHT SWITCH - WALL MOUNTED @ +48" AFF UNLESS NOTED SUBSCRIPTS: S2 = 2-POLE SWITCH S3 = 3 WAY SWITCH S4 = 4 WAY SWITCH D = DIMMER SWITCH K = KEY OPERATED SWITCH M = MOMENTARY CONTACT SWITCH P = SWITCH WITH PILOT LIGHT T = THERMAL OVERLOAD SWITCH
	120/240V, 1PH, 3W LOAD CENTER
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED
J	JUNCTION BOX - WALL MOUNTED - HEIGHT AS INDICATED
J	JUNCTION BOX
YxXXA	NON-FUSED DISCONNECT SWITCH - SIZE AS INDICATED
	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

SD	SELF CONTAINED SMOKE DETECTOR/ANNUNCIATOR (120 W/BATTERY BACKUP) - CEILING MOUNTED SPECIFIED UL217
C	SELF CONTAINED SMOKE/CARBON MONOXIDE (120 W/BATTERY BACKUP) - CEILING MOUNTED SPECIFIED UL2034/2075

GENERAL NOTES:

1. ALL WORK AND EQUIPMENT UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE WITH THE CODES, STANDARDS AND PRACTICES LISTED HEREIN, AND THEIR RESPECTIVE DATES ARE FURNISHED AS THE MINIMUM LATEST REQUIREMENTS.

A. LIFE SAFETY CODE
B. NATIONAL FIRE PROTECTION ASSOCIATION
C. NATIONAL ELECTRICAL CODE
D. AMERICAN NATIONAL STANDARDS INSTITUTE
E. INSTITUTE IF ELECTRICAL AND ELECTRONIC ASSOCIATION
F. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
G. REQUIREMENTS OF LOCAL POWER COMPANY
H. BUILDING CODE

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

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

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

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

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

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

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

ELECTRICAL ABBREVIATIONS

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

CLIENT:

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

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GENERAL NOTES AND ABBREVIATIONS

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

PROJECT

DATE: AUGUST, 2022

SHEET: E0.01

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 75ºc COPPER CONDUCTORS INSTALLED IN EMT WITH 16AMP LOAD @ 85% P.F.

21. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND SHALL PROVIDE LIGHTS, SWITCHES, RECEPTACLES, EQUIPMENT CONNECTIONS, ETC., AND ASSOCIATED CIRCUITING IN NEW AND REMODELED AREAS, EVEN IF SUCH AREAS ARE NOT SHOWN ON ELECTRICAL DRAWINGS. LAYOUTS, FIXTURE TYPES, QUANTITIES AND SPACING SHALL BE IN ACCORDANCE WITH SIMILAR AREAS ON THIS PROJECT. CONTRACTOR SHALL INCLUDE COSTS FOR THE ABOVE IN HIS BID. IN ADDITION, CONTRACTOR SHALL PROVIDE LAYOUT DRAWINGS FOR WORK IN SUCH AREAS AND SUBMIT FOR APPROVAL PRIOR TO ROUGH-IN.
22. WIRE SHALL BE COPPER, 75 DEGREES C RATED FOR GENERAL USE. FOR WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS WIRE SHALL BE COPPER, MINIMUM 90 DEGREES C RATED. SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30 DEGREES C AMBIENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS. 600 VOLT COMPACT ALUMINUM WIRE AND CABLE IN SIZES 1/0 AND LARGER MAY BE SUBSTITUTED FOR COPPER ON SERVICES AND FEEDERS IF AMPACITY IS EQUIVALENT TO OR GREATER
23. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
24. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS, EQUIPMENT OR INSTALLATION METHODS.
25. ELECTRICAL SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION AT COMPLETION OF PROJECT.
26. RECEPTACLES WHICH ARE SHOWN WALL MOUNTED ON THE ELECTRICAL DRAWINGS ON WALLS WHICH, ON THE ARCHITECTURAL DRAWINGS AND ELEVATIONS ARE SHOWN AS GLASS OR PARTITIONS, SHALL BE FLUSH FLOOR DUPLEX RECEPTACLES MOUNTED ADJACENT TO BAS OR WALLS.
27. RECEPTACLES AT COUNTER SHALL BE MOUNTED WITH THEIR LONG AXIS HORIZONTAL AT +46" UNLESS NOTED.
28. FLUSH FLOOR RECEPTACLE OUTLETS SHALL BE WIREMOLD 862 SERIES. PROVIDE CARPET OR TILE FLANGE TO MATCH FLOOR FINISH.
29. THE COLOR OF THE DEVICES AND COVER PLATES SHALL BE AS DIRECTED BY ARCHITECT. IN DAMP OR WET LOCATIONS COVER PLATES SHALL BE STAINLESS STEEL. IN DRY LOCATIONS COVER PLATES SHALL BE SMOOTH HIGH ABUSE NYLON OR EQUIVALENT. PROVIDE COVER PLATES FOR SWITCHES, RECEPTACLES, TELEPHONE, TELEVISION, COMPUTER AND J-BOX OUTLETS AS REQUIRED.
30. ROMEX CABLE WITH A GROUNDING CONDUCTOR MAY BE USED WHERE PERMITTED BY BOTH THE N.E.C. AND LOCAL ORDINANCES.
31. DISCONNECT SWITCHES SHALL BE GENERAL DUTY TYPE. FUSIBLE SWITCHES SHALL ACCEPT CLASS 'R' FUSES ONLY AND REJECT ALL OTHERS.
32. FINAL CONNECTIONS TO VIBRATING EQUIPMENT SHALL BE WITH FLEX (LIQUIDTIGHT FOR EXTERIOR APPLICATIONS) AND APPROVED FITTINGS. DO NOT SECURE CONDUITS, DISCONNECTS OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT.
33. THE ENGINEER OF RECORD HAS PERFORMED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS INDICATED FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.
34. THE ENGINEER OF RECORD HAS PERFORMED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUITS AND FEEDERS COMPLY WITH NEC 210-19(A) FPN NO4.
35. THE CONTRACTOR SHALL PROVIDE 120V CONNECTION TO NEAREST MAINTENANCE RECEPTACLE WHERE REQUIRED FOR CONDENSATE PUMPS ASSOCIATED WITH FAN COIL UNITS. COORDINATE WITH MECHANICAL CONTRACTOR.
36. THE CONTRACTOR SHALL COORDINATE THE SPECIFIC LOCATION, MOUNTING HEIGHT, ROTATION, TYPE, COLOR, ETC. OF ALL DEVICES PRIOR TO INSTALLATION.
37. CONNECTIONS TO HYDROMASSAGE BATHTUBS, JACCUZZI TUBS OR SIMILAR EQUIPMENT SHALL BE MADE IN ACCORDANCE WITH ARTICLE 680.70 OF THE 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 WITH ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS. (IRC SECTION R3143 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.

LIGHTING SCHEDULE

ID	SYMBOL	DESCRIPTION	MANUF.	MODEL	LUMINAIRE TYPE	COLOR / FINISH	REMARKS
L1	○	4" RECESSED LED CAN LIGHT	Klus	LOTOS	LED	WHITE	RATED IC / AT FOR FLAT CEILING;
L2	○	4" RECESSED LED CAN LIGHT	Klus		LED	WHITE	RATED IC / AT FOR FLAT CEILING; WET LOCATION LISTED
L3	○	5" FLUSH MOUNT LED LIGHT	WAC LIGHTINGS	FM-05RN-930-BZ	LED	BRONZE	FOR EXTERIOR CEILING; SUITABLE FOR COASTAL LOCATIONS
L4	▽	EXTERIOR WALL LED SCONCE	WAC LIGHTINGS	6" TUBE ARCHITECTURAL DS-WS06-S27S-BK	LED	BLACK	CLEAR SKY COMPLIANT DOWNLIGHT; NO LIGHT TOWARDS NEIGHBORS

NOTES:
1. THIS PLAN SHALL BE USED IN CONJUNCTION WITH THE ELECTRICAL, MECHANICAL AND PLUMBING PLANS. COORDINATION REQUIRED. NOTIFY ARCHITECT IN CASE OF DISCEPANCIES FOUND. MANUFACTURERS AND MODELS ARE SHOWN FOR CODE COMPLIANCE AND BIDDING PURPOSES ONLY. PRIOR ORDERING / INSTALLING ANY LIGHT FIXTURES CONTRACTOR SHALL PROVIDE SAMPLES AND CUT SHEETS TO OWNER FOR APPROVAL AND CONFIRM MANUFACTURER, MODEL, COLOR AND BUDGET / COSTS.

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-IC 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 GASKETING, 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 PENSIONS BEFORE SERVICING OR MAINTAINING THE BALLAST.
18. ALL FLUORESCHENT LAMPS SHALL BE OF A LOW MERCURY DESIGN, HAVE A MINIMUM CRI RATING OF 85 AND 3500K COLOR TEMPERATURE UNLESS NOTED OTHERWISE.

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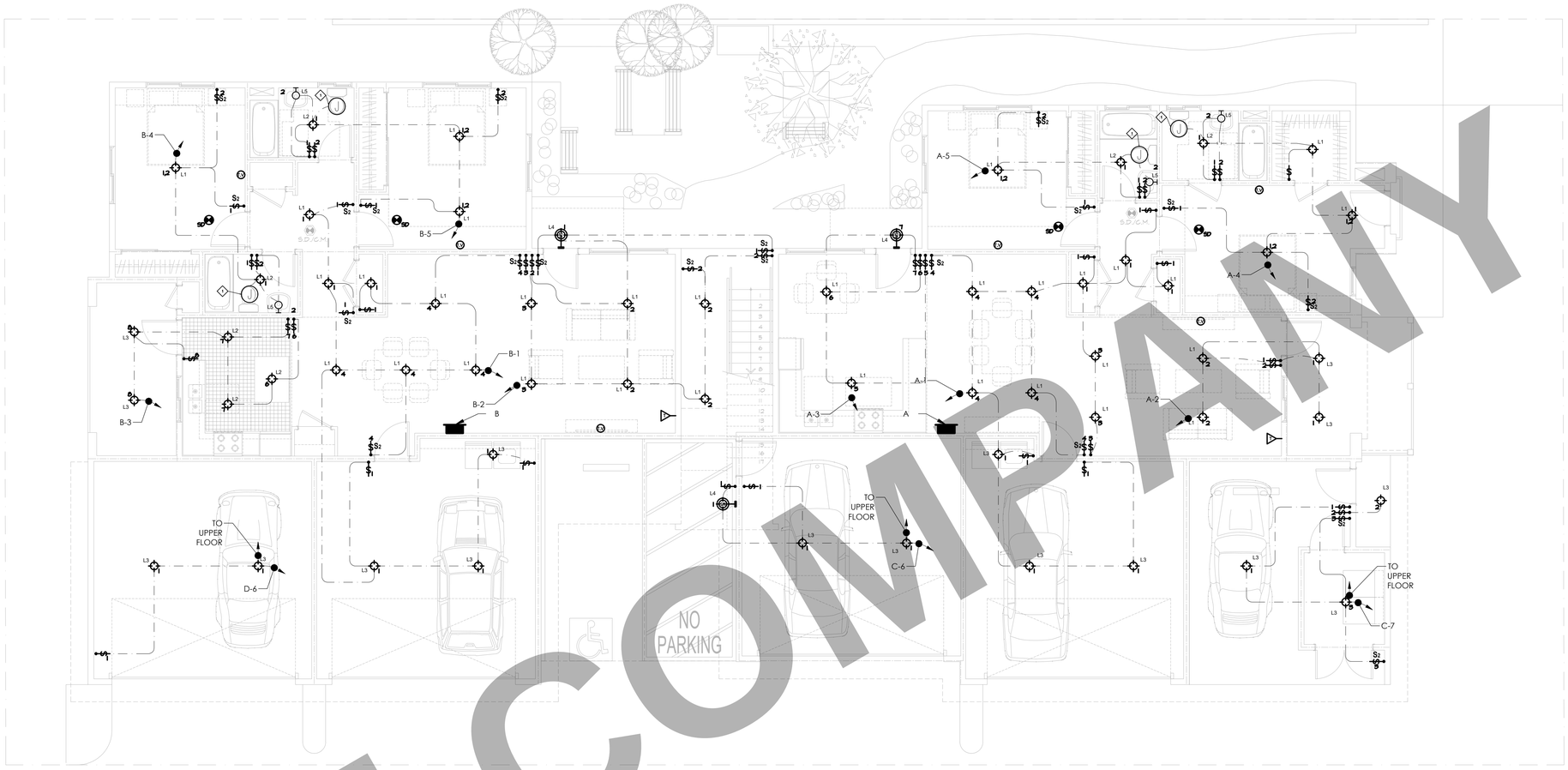
		NTS

PROJECT

SHEET
E1.01

DATE
AUGUST, 2022



FIRST FLOOR

GENERAL NOTES

1. 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))

2. 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.

a. 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.

b. 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.

c. NEC ARTICLE 210.52(A) (3) AS AMENDED FLOOR RECEPTACLES.

3. 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)

SHEET NOTES:

1. JUNCTION BOX FOR EXHAUST FAN
2. JUNCTION BOX FOR KITCHEN EXHAUST FAN
3. DISCONNECT SWITCH FOR GAS FURNACE
4. JUNCTION BOX FOR ENERGY RECOVERY VENTILATOR
5. DISCONNECT SWITCH FOR GAS WATER HEATER
6. APPROXIMATE LOCATION OF AUTOMATIC GARAGE DOOR SENSOR COORDINATE SPECIFIC STUB OUT LOCATION IN FIELD INSTALLED ON CEILING
7. APPROXIMATE LOCATION OF AUTOMATIC GARAGE DOOR PUSH BUTTON +42". COORDINATE SPECIFIC STUB LOCATION FIELD

InnoDez

CLIENT:

ADDRESS:
2215 N NAOMI ST.
BURBANK, CA 91504

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:

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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:
BURBANK APARTMENT 4 UNITS.

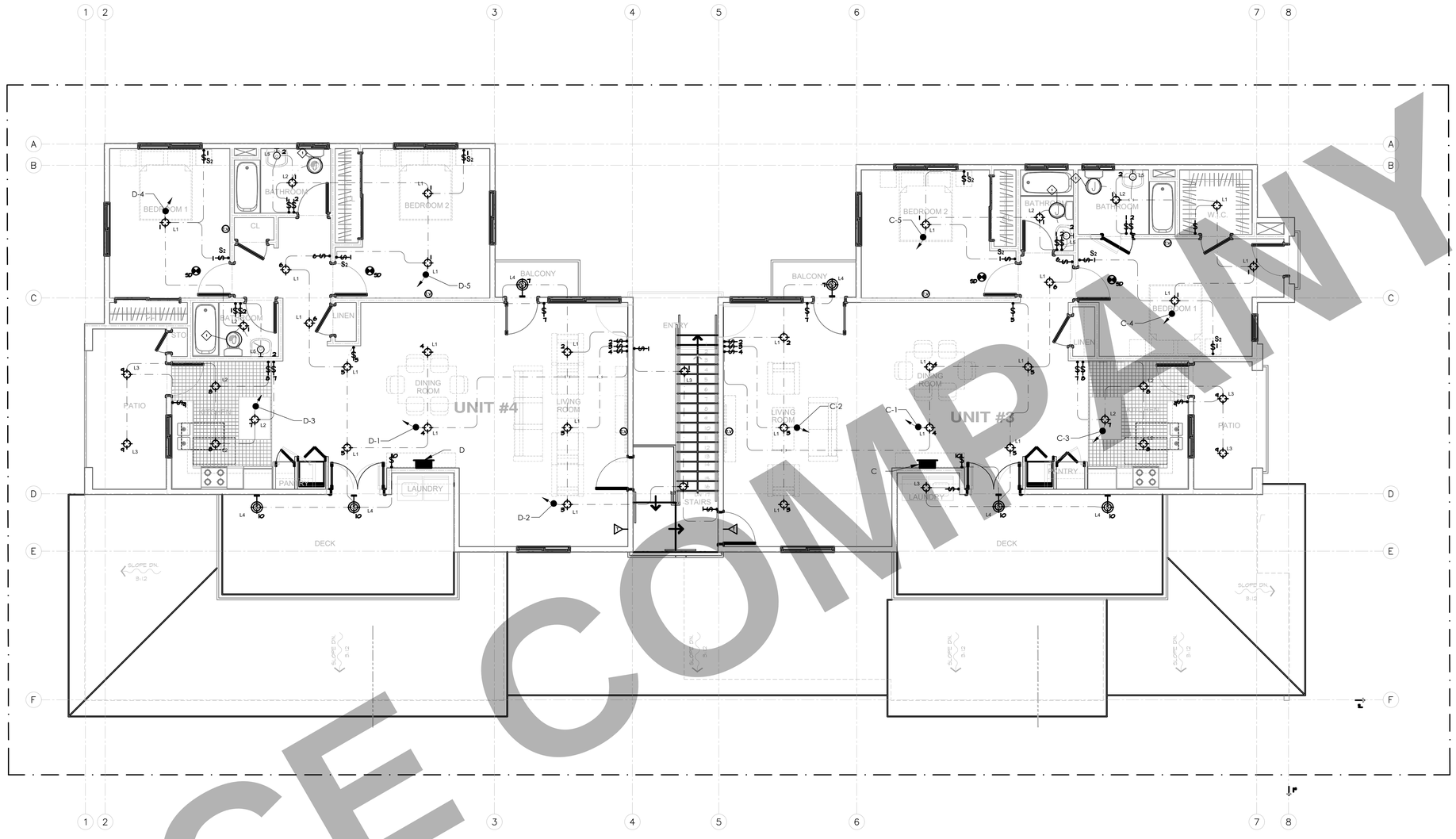
FIRST FLOOR PLAN
LIGHTING LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
E2.01



SECOND FLOOR

GENERAL NOTES

1. 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))

2. 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.
   a. 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.
   b. 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:

1. JUNCTION BOX FOR EXHAUST FAN
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CLIENT:

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

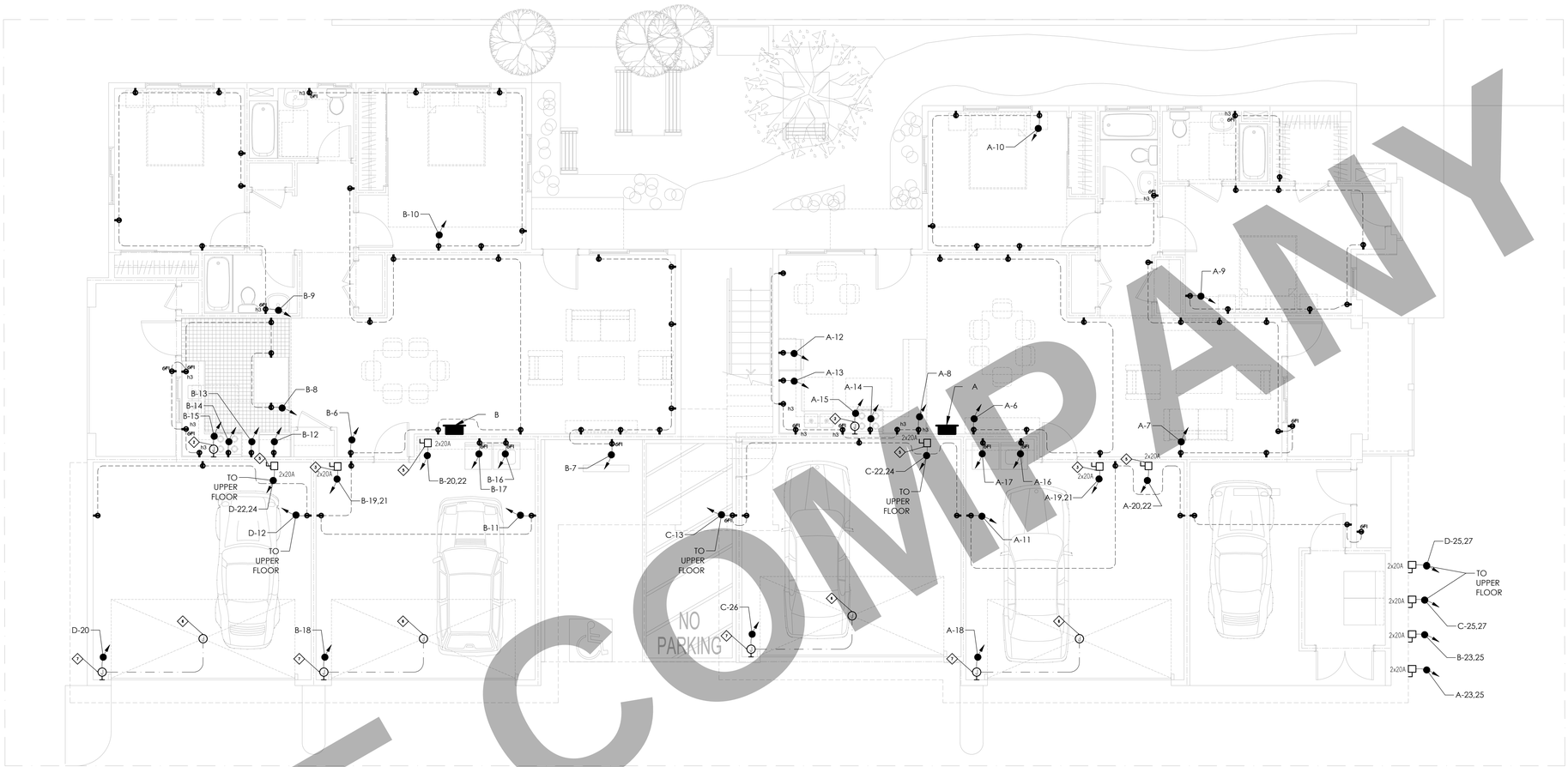
TITLE:
SECOND FLOOR PLAN LIGHTING LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

SHEET
E2.02

DATE
AUGUST, 2022



FIRST FLOOR

GENERAL NOTES

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
BURBANK APARTMENT 4 UNITS.

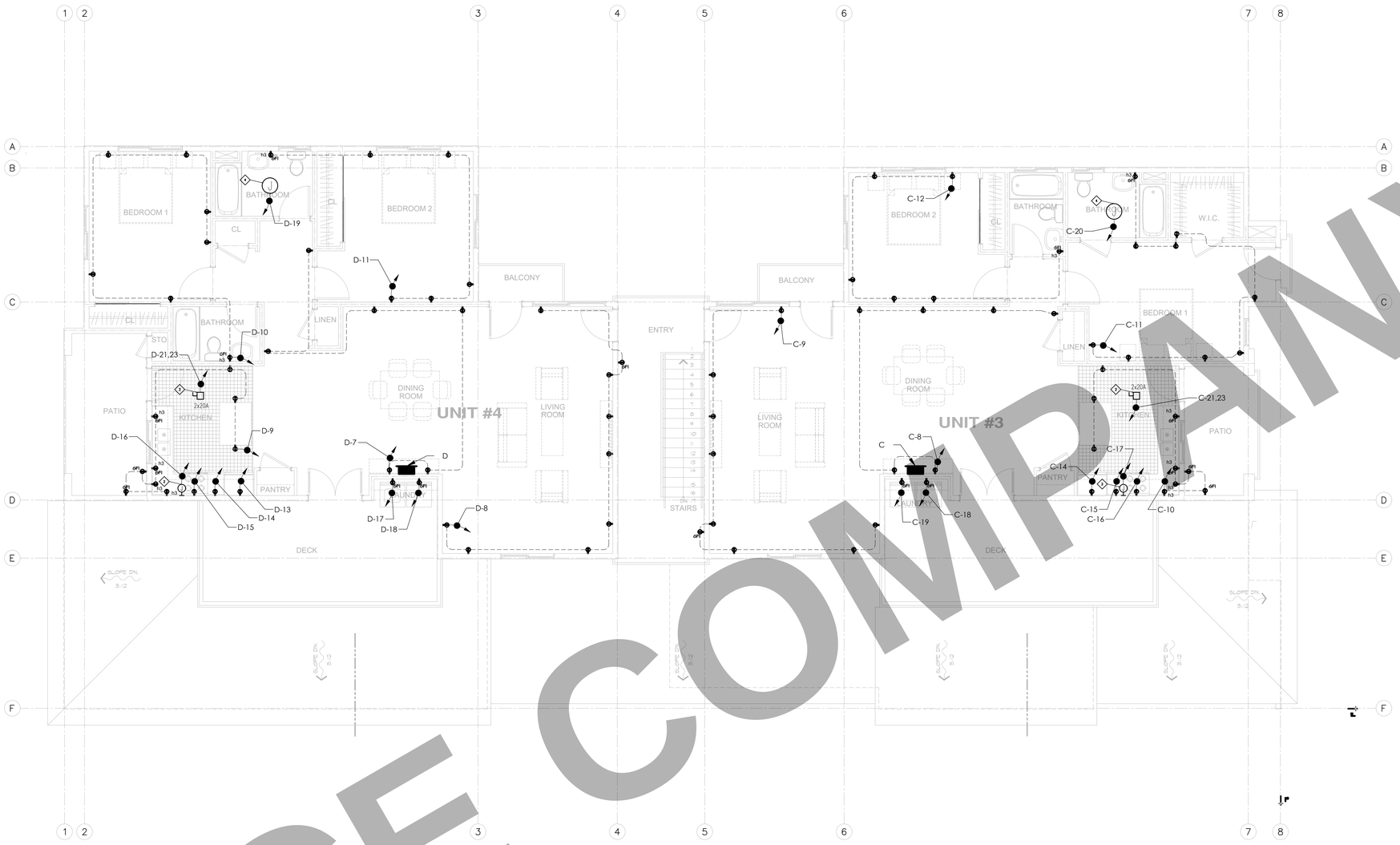
POWER LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
E3.01



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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
BURBANK APARTMENT 4 UNITS.

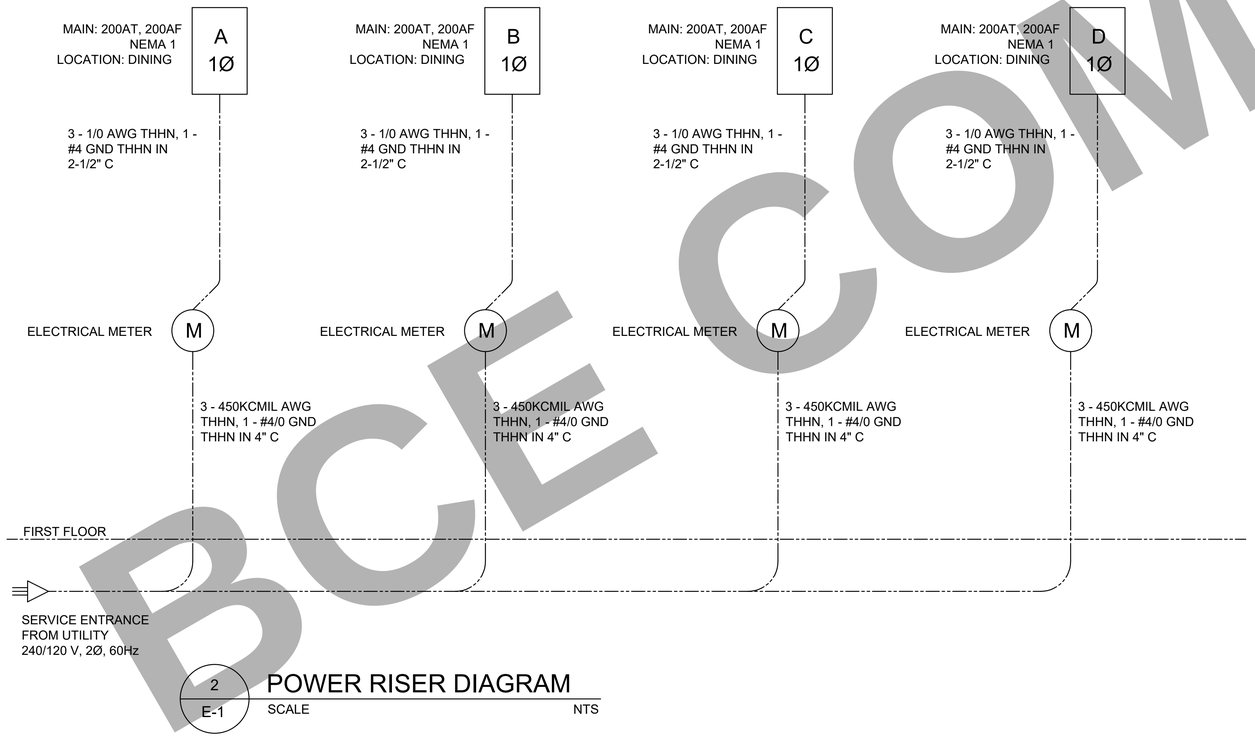
SECOND FLOOR PLAN POWER LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
E3.02



2
E-1

POWER RISER DIAGRAM

SCALE NTS

Branch Panel: A
Location: DINING
Supply From: Utility Meter
Mounting:Surface
Enclosure Type 1

Volts: 120/240 Single
Phases: 2
Wires: 3+1
Feeder Size: 3-#1/0 AWG THHN, 1-#4 GND THHN IN 2-1/2" PVC

A.I.C Rating: 36kA
Mains Type: MCCB
Mains Rating: 100A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A			B		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	LIGHTING DINING ROOM + GARAGE	15A	1	300	350				1	15A	LIGHTING LIVING ROOM + ENTRY PORCH	2
3	LIGHTING KITCHEN + PORCH	15A	1			400	450		1	15A	LIGHTING BEDROOM 1 + W.I.C + BATHROOM	4
5	LIGHTING BEDROOM 2 + BATHROOM	15A	1	330	300				1	20A	SOCKETS DINING ROOM	6
7	SOCKETS LIVING ROOM	20A	1			300	300		1	20A	SOCKETS KITCHEN	8
9	SOCKETS BEDROOM 1 + WIC + BATHROOM	20A	1	300	300				1	20A	SOCKETS BEDROOM 2 + BATHROOM	10
11	SOCKETS GARAGE	20A	1			500	600		1	20A	FRIDGE	12
13	DISHWASHER	20A	1	1500	1500				1	20A	GAS OVEN	14
15	KITCHEN EXHAUST FAN	20A	1			400	1200		1	20A	WASHING MACHINE	16
17	DRYER	20A	1	1500	600				1	20A	GARAGE AUTOMATIC DOOR	18
19	FCU-02	20A	2			600	500		2	20A	GWH-04	20
21				600	500							22
23	OU-04	20A	2			1500	500		1	20A	SPARE	24
25				1500	500				1	20A	SPARE	26
27	SPARE	20A	1			500	-		1	20A	SPARE	28
29	SPARE	20A	1	500					1	20A	SPARE	30
31	SPARE	20A	1			900	900		1	20A	SPARE	32
	TOTAL CONNECTED LOAD (VA)			10580			9550					
	TOTAL CONNECTED CURRENT (A)			96			87					

Legend:

Load Classification	Connected Load (VA)	Demand Factor	Estimated Demand (VA)	Panels Totals	
Lighting - Dwelling Unit	3330	100.00%	3330		
Receptacle	10000	60.00%	6000	**Total Conn. Load (kVA):**	20.13
Kitchen Equipment Non Dwelling Unit	4500	70.00%	3150	**Total Est. Demand (kVA):**	14.09
Mechanical Equipment	2300	70.00%	1610	**Total Conn. Current Per Phase(A):**	91.5
				Total Est. Demand Current Per Phase (A):	64.04545

Notes

Branch Panel: B
Location: DINING
Supply From: Utility Meter
Mounting:Surface
Enclosure Type 1

Volts: 120/240 Single
Phases: 1
Wires: 3+1
Feeder Size: 3-#1/0 AWG THHN, 1-#4 GND THHN IN 2-1/2" PVC

A.I.C Rating: 36kA
Mains Type: MCCB
Mains Rating: 100A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A			B		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	LIGHTING DINING ROOM + GARAGE	15A	1	300	350				1	15A	LIGHTING LIVING ROOM + PORCH + STAIRS	2
3	LIGHTING KITCHEN + PATIO	15A	1			400	450		1	15A	LIGHTING BEDROOM 1 + BATHROOM	4
5	LIGHTING BEDROOM 2 + BATHROOM	15A	1	350	300				1	20A	SOCKETS DINING ROOM	6
7	SOCKETS LIVING ROOM	20A	1			300	300		1	20A	SOCKETS KITCHEN + PATIO	8
9	SOCKETS BEDROOM 1 + BATHROOM	20A	1	500	500				1	20A	SOCKETS BEDROOM 2 + BATHROOM	10
11	SOCKETS GARAGE	20A	1			300	600		1	20A	FRIDGE	12
13	DISHWASHER	20A	1	1500	1500				1	20A	GAS OVEN	14
15	KITCHEN EXHAUST FAN	20A	1			400	1200		1	20A	WASHING MACHINE	16
17	DRYER	20A	1	1500	600				1	20A	GARAGE AUTOMATIC DOOR	18
19	FCU-01	20A	2			600	500		2	20A	GWH-02	20
21				600	500							22
23	OU-03	20A	2			1500	500		1	20A	SPARE	24
25				1500	500				1	20A	SPARE	26
27	SPARE	20A	1			500			1	20A	SPARE	28
29	SPARE	20A	1	500					1	20A	SPARE	30
31	SPARE	20A	1			900	900		1	20A	SPARE	32
	TOTAL CONNECTED LOAD (VA)			11000			9350					
	TOTAL CONNECTED CURRENT (A)			109			85					

Legend:

Load Classification	Connected Load (VA)	Demand Factor	Estimated Demand (VA)	Panels Totals	
Lighting - Dwelling Unit	3750	100.00%	3750		
Receptacle	5800	60.00%	5800	**Total Conn. Load (kVA):**	20.35
Kitchen Equipment Non Dwelling Unit	4500	70.00%	3150	**Total Est. Demand (kVA):**	14.39
Mechanical Equipment	2300	70.00%	1610	**Total Conn. Current Per Phase(A):**	92.5
				Total Est. Demand Current Per Phase (A):	65.40909

Notes

Branch Panel: C
Location: DINING
Supply From: Utility Meter
Mounting:Surface
Enclosure Type 1

Volts: 120/240 Single
Phases: 2
Wires: 3+1
Feeder Size: 3-#1/0 AWG THHN, 1-#4 GND THHN IN 2-1/2" PVC

A.I.C Rating: 36kA
Mains Type: MCCB
Mains Rating: 100A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A			B		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	LIGHTING DINING ROOM + DECK	15A	1	300	300				1	15A	LIGHTING LIVING ROOM + BALCONY	2
3	LIGHTING KITCHEN + PATIO	15A	1			300	350		1	15A	LIGHTING BEDROOM 1 + W.I.C + BATHROOM	4
5	LIGHTING BEDROOM 2 + BATHROOM	15A	1	300	300				1	15A	LIGHTING GARAGE	6
7	LIGHTING GUEST GARAGE	15A	1			300	300		1	20A	SOCKETS DINING ROOM	8
9	SOCKETS LIVING ROOM	20A	1	265	300				1	20A	SOCKETS KITCHEN + PATIO	10
11	SOCKETS BEDROOM 1 + W.I.C + BATHROOM	20A	1			300	600		1	20A	SOCKETS BEDROOM 2 + BATHROOM	12
13	SOCKETS GARAGE	20A	1	600	800				1	20A	FRIDGE	14
15	DISHWASHER	20A	1			1500	1500		1	20A	GAS OVEN	16
17	KITCHEN EXHAUST FAN	20A	1	400	1200				1	20A	WASHING MACHINE	18
19	DRYER	20A	1			1500	250		1	20A	ERV-02	20
21	AH-02	20A	2	1400	500				2	20A	GWH-03	22
23						1400	500					24
25	OU-1	20A	2	1500	500				1	20A	GARAGE AUTOMATIC DOOR	26
27						1500	500		1	20A	SPARE	28
29	SPARE	20A	1	500					1	20A	SPARE	30
31	SPARE	20A	1			900	900		1	20A	SPARE	32
33	SPARE	20A	1	900	900				1	20A	SPARE	34
	TOTAL CONNECTED LOAD (VA)			10965			12600					
	TOTAL CONNECTED CURRENT (A)			100			115					

Legend:

Load Classification	Connected Load (VA)	Demand Factor	Estimated Demand (VA)	Panels Totals	
Lighting - Dwelling Unit	3015	100.00%	3015		
Receptacle	10550	60.00%	6330	**Total Conn. Load (kVA):**	23.565
Kitchen Equipment Non Dwelling Unit	5900	70.00%	4130	**Total Est. Demand (kVA):**	16.345
Mechanical Equipment	4100	70.00%	2870	**Total Conn. Current Per Phase(A):**	107.1136
				Total Est. Demand Current Per Phase (A):	74.29545

Notes

Branch Panel: D
Location: DINING
Supply From: Utility Meter
Mounting:Surface
Enclosure Type 1

Volts: 120/240 Single
Phases: 2
Wires: 3 + 1
Feeder Size: 3-#1/0 AWG THHN, 1-#4 GND THHN IN 2-1/2" PVC

A.I.C Rating: 36kA
Mains Type: MCCB
Mains Rating: 100A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A			B		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	LIGHTING DINING ROOM + DECK	15A	1	300	320				1	15A	LIGHTING LIVING ROOM + BALCONY + STAIRS	2
3	LIGHTING KITCHEN + PATIO	15A	1			350	400		1	15A	LIGHTING BEDROOM 1 + BATHROOM	4
5	LIGHTING BEDROOM 2 + BATHROOM	15A	1	330	300				1	15A	LIGHTING GARAGE	6
7	SOCKETS DINING ROOM	20A	1			300	300		1	20A	SOCKETS LIVING ROOM	8
9	SOCKETS KITCHEN + PATIO	20A	1	265	300				1	20A	SOCKETS BEDROOM 1 + BATHROOM	10
11	SOCKETS BEDROOM 2 + BATHROOM	20A	1			300	600		1	20A	SOCKETS GARAGE	12
13	FRIDGE	20A	1	600	1500				1	20A	DISHWASHER	14
15	GAS OVEN	20A	1			1500	400		1	20A	KITCHEN EXHAUST FAN	16
17	WASHING MACHINE	20A	1	1200	1500				1	20A	DRYER	18
19	ERV-01	20A	1			250	500		1	20A	GARAGE AUTOMATIC DOOR	20
21	AH-01	20A	2	1400	500				2	20A	GWH-01	22
23						1400	500					24
25	OU-2	20A	2	1500	500				1	20A	SPARE	26
27						1500	500		1	20A	SPARE	28
29	SPARE	20A	1	350					1	20A	SPARE	30
31	SPARE	20A	1			900	900		1	20A	SPARE	32
33	SPARE	20A	1	900	900				1	20A	SPARE	34
	TOTAL CONNECTED LOAD (VA)			12665			10600					
	TOTAL CONNECTED CURRENT (A)			115			96					

Legend:

Load Classification	Connected Load (VA)	Demand Factor	Estimated Demand (VA)	Panels Totals	
Lighting - Dwelling Unit	3165	100.00%	3165		
Receptacle	10250	60.00%	6150	**Total Conn. Load (kVA):**	23.265
Kitchen Equipment Non Dwelling Unit	5900	70.00%	4130	**Total Est. Demand (kVA):**	16.21
Mechanical Equipment	3950	70.00%	2765	**Total Conn. Current Per Phase(A):**	105.75
				Total Est. Demand Current Per Phase (A):	73.68182

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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

PROJECT:

TITLE:
SINGLE LINE DIAGRAM & PANEL BOARD SCHEDULE

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

PROJECT

SHEET
E4.01

DATE
AUGUST, 2022

PLUMBING SPECIFICATIONS

THE WORK INCLUDES MODIFICATION TO THE EXISTING PLUMBING SYSTEM AND PROVIDING NEW MATERIALS, FITTINGS AND ACCESSORIES NECESSARY FOR A COMPLETE FUNCTIONING PLUMBING SYSTEM. THE WORK ALSO INCLUDES ROUGH-IN AND FINAL CONNECTIONS TO FOOD SERVICE EQUIPMENT AND BEVERAGE DISPENSING EQUIPMENT PROVIDED BY OTHERS. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND/OR ORDINANCES AND IS SUBJECT TO INSPECTION.

HOOK-UP CHARGES, PERMITS AND ALL OTHER EXPENSES RELATED TO A COMPLETE AND FUNCTIONING PLUMBING SYSTEM ARE INCLUDED AS A PART OF THIS SECTION.

WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION.

THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR PLUMBING WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, FIXTURES AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURER'S STANDARD ROUGH-IN DRAWINGS FOR PLUMBING FIXTURE INSTALLATION REQUIREMENTS. COMPLY WITH ALL APPLICABLE ADA INSTALLATION REQUIREMENTS.

COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

PIPING SYSTEMS - GENERAL: ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK SUCH AS DUCTS AND ELECTRICAL CONDUIT. AT ALL CONNECTIONS BETWEEN FERROUS PIPING AND NONFERROUS PIPING, PROVIDE AN ISOLATING DIALECTIC UNION. ALL HANGERS SHALL BE COMPATIBLE WITH PIPING MATERIAL TO PREVENT CORROSION.

PROVIDE ALL FITTINGS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY TO FACILITATE THE PLUMBING SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED.

FIXTURES/EQUIPMENT FURNISHED BY OTHERS: PLUMBING CONTRACTOR SHALL PROVIDE UTILITY CONNECTIONS REQUIRED SUCH AS WATER, GAS, AIR, SUPPLIES, WASTE OUTLET, TRAPS, ETC. AT ALL PLUMBING TYPE FIXTURES OR EQUIPMENT FURNISHED BY OWNER, GENERAL CONTRACTOR, FOOD SERVICE CONTRACTOR, EQUIPMENT SUPPLIER, ETC. INCLUDED ARE STOP VALVES, ESCUTCHEONS, AND CHROME PLATED BRASS TUBING WITH COMPRESSION FITTINGS.

SEWER AND WASTE PIPING: PROVIDE ALL DRAINS AND SEWERS WITHIN THE SPACE WITH CONNECTION TO THE EXISTING DRAINAGE SYSTEMS ON-SITE. SANITARY DRAINAGE PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. SANITARY DRAINAGE PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS MAY BE USED (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES). ALL DRAINAGE PIPING SHALL BE UNIFORMLY PITCHED, 1/4" PER FOOT UNLESS OTHERWISE REQUIRED BY EXISTING CONDITIONS, OR INDICATED ON THE DRAWINGS.

VENTS: PROVIDE A COMPLETE SYSTEM OF STANDARD WEIGHT CAST IRON NO-HUB VENT RISERS WHERE THE CEILING SPACE IS USED AS A RETURN AIR PLENUM OR USE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES) WHERE THERE IS A DUCTED RETURN AIR SYSTEM. DO NOT USE PVC PIPE IN RETURN AIR PLENUM SPACES. THE VENT SYSTEM SHALL BE CARRIED THROUGH THE ROOF WITH APPROPRIATE FLASHING.

CONDENSATE AND INDIRECT DRAIN PIPING:PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV(SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS.

CLEANOUTS: PROVIDE CLEANOUTS AT THE END OF EACH HORIZONTAL RUN, AND AT THE BASE OF ALL VERTICAL WASTE AND DRAIN PIPES. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPES THEY SERVE, CONFORMING TO CODE REQUIREMENTS. PROVIDE SUITABLE WALL OR FLOOR CLEANOUTS WITH ACCESSORIES TO OBSCURE FROM VIEW.

WATER DISTRIBUTION PIPING: LAYOUT WATER PIPING SO THAT THE ENTIRE SYSTEM CAN BE DRAINED. HOT AND COLD WATER PIPING SHALL BE 1/2" MIN. CPVC PIPE WITH SOLVENT FITTING. PROVIDE WATER HAMMER ARRESTERS AT EACH FIXTURE OR GROUP OF FIXTURES AS REQUIRED. INSTALL CHROME PLATED BRASS ESCUTCHEON PLATES AT ALL PENETRATIONS THROUGH FINISHED SURFACES (INCLUDING CABINET INTERIORS).

PIPE INSULATION: INSULATE (AS ALLOWED BY CODE) ALL LISTED SERVICE PIPING AS FOLLOWS. DOMESTIC COLD/HOT WATER, HOT WATER RETURN, STORM WATER PIPING. PROVIDE 1" PREFORMED FIBERGLASS, ASJ/SS-11, FLAME SPREAD 25, SMOKE DEVELOPED 50, ASTM C-547. FOR CONDENSATE PIPING PROVIDE 1/2" THICK INSULATION OF SAME CHARACTERISTICS AS LISTED FOR 1" ABOVE. WHERE PERMITTED BY LOCAL CODES, PROVIDE 1/2" SELF-ADHESIVE UNICELLULAR FOAM PIPE INSULATION WITH PRE-FORMED PVC FITTING COVERS - EQUAL TO SELF-ADHESIVE ARMSTRONG 2000 WITH K FACTOR OF 0.27 AT 75 DEGREES MEAN TEMPERATURE. INSULATE ANY EXPOSED CONDENSATE PIPING WITH WASTE TEMPERATURE BELOW 60 DEGREES F.

SHUTOFF VALVES, WITH UNIONS SHALL BE PROVIDED FOR SERVICE TO EACH PLUMBING FIXTURE, FOOD SERVICE EQUIPMENT ITEM OR OTHER EQUIPMENT ITEM, TO FACILITATE ISOLATION FOR REPAIR OR REPLACEMENT. VALVES SHALL BE EQUAL TO JENKINS #902-T BALL VALVE, CHROME-FINISHED BRONZE, TEFLON SEATS AND PACKING, 400 LB. W.O.G., SOLDER END.

ACCESS PANELS SHALL BE PROVIDED WHERE CONCEALED CONTROL DEVICES, VALVES, ETC. ARE CONCEALED WITHIN WALLS. WHERE ACCESS FOR ADJUSTMENT AND MAINTENANCE IS POSSIBLE THROUGH LAY-IN SUSPENDED CEILINGS, ACCESS PANELS ARE NOT REQUIRED.

PIPING SYSTEM- PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPE WITH SOLVENT FITTINGS SHALL BE USED WHERE PEMITTED BY CODE/LOCAL AUTHORITIES.

INSTALLATION: THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. PROCEED AS RAPIDLY AS CONSTRUCTION WILL PERMIT. SET FIXTURES LEVEL AND IN PROPER ALIGNMENT. INSTALL SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES. INSTALL SILICONE SEALANT BETWEEN FIXTURES AND ADJACENT MATERIAL, FOR SANITARY JOINT, AND OMIT ESCUTCHEONS.

REPAIR EXISTING PLUMBING SYSTEM COMPONENTS DAMAGED BY CONSTRUCTION OPERATIONS AND RESTORE TO ORIGINAL CONDITIONS.

TEST WATER SYSTEM UNDER 150 PSIG HYDROSTATIC PRESSURE, FOR FOUR (4) HOURS MINIMUM. WHEN TESTING INDICATES MATERIALS OR WORKMANSHIP IS DEFICIENT, REPLACE OR REPAIR AS REQUIRED, AND REPEAT TEST UNTIL STANDARDS ARE ACHIEVED.

ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOFING WARRANTY.

GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE PLUMBING INSTALLATION AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2006 UNIFORM PLUMBING CODE, 2006 INTERNATIONAL BUILDING CODE, 2006 INTERNATIONAL ENERGY CONSERVATION CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. COORDINATE ENTIRE INSTALLATION OF THE PLUMBING SYSTEM WITH THE WORK OF OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS. REPORT ANY DISCREPANCIES, IN WRITING, TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS.
5 PROVIDE ONE YEAR WARRANTY ON ALL PARTS AND LABOR.
6. THE DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW SCOPE. CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES TO PROVIDE THE BEST ARRANGEMENT OF ALL DUCT, PIPE, CONDUIT, ETC.
7. ALL CUTTING AND PATCHING OF THE EXISTING STRUCTURE SHALL BE PROVIDED UNDER OTHER SECTIONS OF THE WORK. PROVIDE NECESSARY REQUIREMENTS TO THE PROJECT SUPERINTENDENT.
8. ALL HOT WATER PIPING AND RECIRCULATION PIPING (EXCEPT RUNOUTS 12 FT. OR SHORTER TO INDIVIDUAL FIXTURES) SHALL BE INSULATED TO MEET THE REQUIREMENTS OF THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE
9. CONDENSATE DRAINS SHALL BE PROVIDED FOR EACH AIR CONDITIONING UNIT. HORIZONTAL CONDENSATE DRAINS ABOVE ANY CEILING SHALL BE INSULATED WITH MIN. 3/8" THICK CLOSED CELL INSULATION.
10. PIPING:
   A. WASTE, VENT, AND STORM DRAIN PIPING SHALL BE CO-EXTRUDED PVC SCHEDULE 40) PIPE
   B. WATER PIPE SHALL BE CPVC PIPE
   C. CONDENSATE PIPING SHALL BE CO-EXTRUDED PVC (SCHEDULE 40) PIPE
   D. INSIDE GAS PIPING SHALL BE BLACK IRON SCHEDULE 40 WITH MALLEABLE IRON FITTINGS. OUTSIDE SHALL BE GALVANIZED IRON SCHEDULE 40 WITH GALVANIZED FITTINGS. GAS LINE TO BE PAINTED GRAY IN COLOR. A 24 HOUR METERED GAS TEST SHALL BE REQUIRED.
   E. ALL PIPING NOT ENCLOSED IN CONDITION SPACE OR AT EXTERIOR WALLS SHALL BE INSULATED.
   F. PIPING: PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPING WITH SOLVENT WELD FITTINGS SHALL BE USED WHERE PERMITTED BY CODE/LOCAL AUTHORITIES
11. ALL VENTS OR EXHAUSTS SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. ABOVE ANY WINDOW, DOOR, OPENING, OR AIR INTAKE.
12. CLEANOUTS SHALL BE INSTALLED PER THE UNIFORM PLUMBING CODE.
13. PROVIDE WATER TIGHT FLASHINGS WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOFS, OR FLOORS.
14. PROVIDE ISOLATION FOR ALL PIPES THAT COME IN CONTACT WITH THE STRUCTURE.
15. LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICES PRIOR TO STARTING WORK OF THIS SECTION. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.
16. VALVES SHALL BE NIBCO, JENKINS, HAMMOND, RED & WHITE OR APPROVED EQUAL. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. THE MAIN WATER SHUT OF VALVE SHALL BE A FULL PORT BALL TYPE AND APPROVED FOR SERVICE INTENDED.
17. CONTRACTOR SHALL PROVIDE ALL SHUT OFF VALVES AS NECESSARY TO ISOLATE ANY EQUIPMENT, PLUMBING ITEMS, OR FIXTURES, THAT MAY NEED SERVICING OR ARE SUBJECT TO FAILURE WHETHER OR NOT SUCH VALVES ARE SHOWN ON THE DRAWINGS.
18. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.
19. CONTRACTOR IS RESPONSIBLE FOR HIS OWN TRENCHING, BACKFILL, AND COMPACTION OF TRENCHES NECESSARY TO COMPLETE HIS SCOPE OF WORK. BACKFILLED TRENCHES SHALL BE RETURNED TO THEIR ORIGINAL GRADE UNLESS NOTED OTHERWISE.
20. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE MAINTENANCE AND OPERATIONAL MANUALS IN ACCORDANCE WITH THE SPECIFICATIONS.
21. ALL EQUIPMENT THAT REQUIRES KEYS OR SPECIAL TOOLS TO OPERATE SHALL SUPPLY THE OWNER WITH TWO OF ANY SUCH KEYS OR TOOLS FOR EACH PIECE OF EQUIPMENT THAT REQUIRE THE SAME.
25. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE APPROVAL, IN WRITING, OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.
26. ALL PLUMBING, ELECTRICAL, AND GAS LINES SHALL BE CONCEALED WITHIN THE THE BUILDING STRUCTURE TO AS GREAT EXTENT AS POSSIBLE. ALL LINES NOT CONCEALED SHALL BE SECURED 6" OFF THE FLOOR AND 3/4" FROM THE WALLS USING STANDOFF BRACKETS
27. AN APPROVED BACKFLOW PREVENTOR SHALL BE PROPERLY INSTALLED UPSTREAM OF ANY POTENTIAL HAZARD BETWEEN THE POTABLE WATER SUPPLY AND SOURCE OF 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	ABBREV	DESCRIPTION
	SS or W	NEW SEWER OR WASTE
	V	NEW VENT
	CW	NEW COLD WATER
	HW	NEW HOT WATER
	G	NEW GAS
	CD	NEW CONDENSATE DRAIN
CA	CA	COMPRESSED AIR
	FCO	FLOOR CLEANOUT
	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	TP	TRAP PRIMER & TRAP PRIMER PIPING
	SOV	SHUT-OFF VALVE
	CV	CHECK VALVE
	PRV	BACKFLOW PREVENTER W SOV'S
	T & P	
	DN	PIPE DOWN
	UP	PIPE UP
	POC	POINT OF CONNECTION
7	-	PLUMBING NOTE CALL-OUT
	ABV	ABOVE
	AFF	ABOVE FINISH FLOOR
	AP	ACCESS PANEL
	BEL	BELOW
	BLDG	BUILDING
	CLG	CEILING
	CONT	CONTINUATION
	EL	ELEVATION
	FIN	FINISH
	FL	FLOOR
	GR	GRADE
	NTS	NOT TO SCALE
	OC	ON CENTER
	S= %	SLOPE AT A PERCENTAGE
	SHT	SHEET
	TYP	TYPICAL
	VTR	VENT THRU ROOF

PLUMBING / GENERAL NOTES

BATHTUBS AND WHIRLPOOL BATHTUBS. THE MAX. HOT WATER TEMPERATURE DISCHARGING SHALL BE LIMITED TO 120 DEGREES. CPC 414/2019
BATHTUBS WASTE OPENING IN FLOOR OVER CRAWL SPACES SHALL BE PROTECTED BY A METAL SCREEN NOT EXCEEDING 12" OR SOLID COVER. CPC 313.12.4 2019
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. 418.0 CPC/2019
VERIFY AND WHERE WATER PRESSURE EXCEEDS 80 PSI AN APPROVED PRESSURE REGULATOR PRECEDED BY AN ADEQUATE STRAINER SHALL BE INSTALLED 608.2 CJC / 2019
1-INSTALL TEMPERATURE AND PRESSURE RELIEF VALVE WITH MINIMUM 34" DRAIN PIPE AND TERMINATE TO THE EXTERIOR OF THE BUILDING OVER WINDOW, DOOR OR VISIBLE LOCATION. DISCHARGE FROM A RELIEF VALVE INTO A WATER HEATER PAN SHALL BE PROHIBITED CPC 608.5, 510.8.
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.
(2019 CPC 906) IF WATER PRESSURE EXCEEDS 80 PSI, AND EXPANSION TANK AND AN APPROVED PRESSURE REGULATOR SHALL BE INSTALLED. (2019 CPC608.2)
NON-REMOVABLE BACK FLOW PRE-VENTER OR BIBB-TYPE VACUUM BREAKER WILL BE INSTALLED ON ALL EXTERIOR HOSE BIBS. (2019 CPC603.4.7)
HOT WATER RE-CIRCULATING SYSTEM IS INSTALLED, THE ENTIRE LENGTH OF HOT WATER PIPES SHALL BE INSULATED. (2008 CALIFORNIA ENERGY REGULATIONS 150 (J)) HOT WATER PIPE FROM THE WATER HEATER TO THE KITCHEN WILL BE INSULATED. (2008 CALIFORNIA ENERGY REGULATIONS 151(F)8 D)

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 OR THE FOLLOWING STANDARDS, WHICHEVER ARE THE MORE RESTRICTIVE
1.THE MAXIMUM FLOW FROM A SINK OR LAVATORY FAUCET OR A FAUCET AERATOR SHALL NOT EXCEED 0 5 GALLONS OF WATER PER MINUTE AT A PRESSURE OF 60 POUNDS PER SQUARE INCH WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES
2.THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A TOILET SHALL NOT EXCEED AN AVERAGE OF 1 28 GALLONS WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES
3. THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A URINAL AND THE ASSOCIATED FLUSH VALVE, IF ANY, SHALL NOT EXCEED AN AVERAGE OF ONE GALLON WHEN TESTED
IN ACCORDANCE WITH ANSI TESTING PROCEDURES

SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTOR SHALL BE 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.

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:
PLUMBING LIST OF SYMBOLS AND GENERAL NOTES.

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

PROJECT

DATE
AUGUST, 2022

SHEET
P0.0

CALIFORNIA PLUMBING CODE CHECKING:

PIPE SUPPORTS:

TABLE 313.3
HANGERS AND SUPPORTS

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

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

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

DRAINAGE:

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

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

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

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

706.0 Changes in Direction of Drainage Flow.

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

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

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

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

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

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

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

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

WATER CONVERSION & WATER CONSUMPTION:

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

407.3 Limitation of Hot water Temperature for Public Lavatories. Hot water delivered from public-use lavatories shall be limited to a maximum temperature of 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 ¼ 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 (⅓) and lower one-third (⅓) of its vertical dimensions. At the lower point, a minimum distance of four (4) inches (102 mm) shall be maintained above the controls with the strapping.*

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

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

507.13 Installation in Residential Garages. Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 549.1.10.1]

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

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

VENT:

906.0 Vent Termination.

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

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

909.0 Special Venting for Island Fixtures.

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

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

WATER SUPPLY:

TABLE 611.4
SIZING OF RESIDENTIAL WATER SOFTENERS[4]

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

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

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

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

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

FIRESTOP PROTECTION

1404.0 Combustible Piping Installations.

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

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

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

1405.0 Noncombustible Piping Installations.

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

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

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

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

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm
Notes:
[1] Excluding trap arm.
[2] Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.
[3] Except for six-unit traps or water closets.
[4] Only four water closets or six-unit traps allowed on a vertical pipe or stack, and not to exceed three water closets or six-unit traps on a horizontal branch or drain.
[5] Based on ¼ inch per foot (20.8 mm/m) slope, For ⅛ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
[6] The diameter of an individual vent shall be not less than 1 ¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2(2). Not to exceed one third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

CLIENT:

ADDRESS:

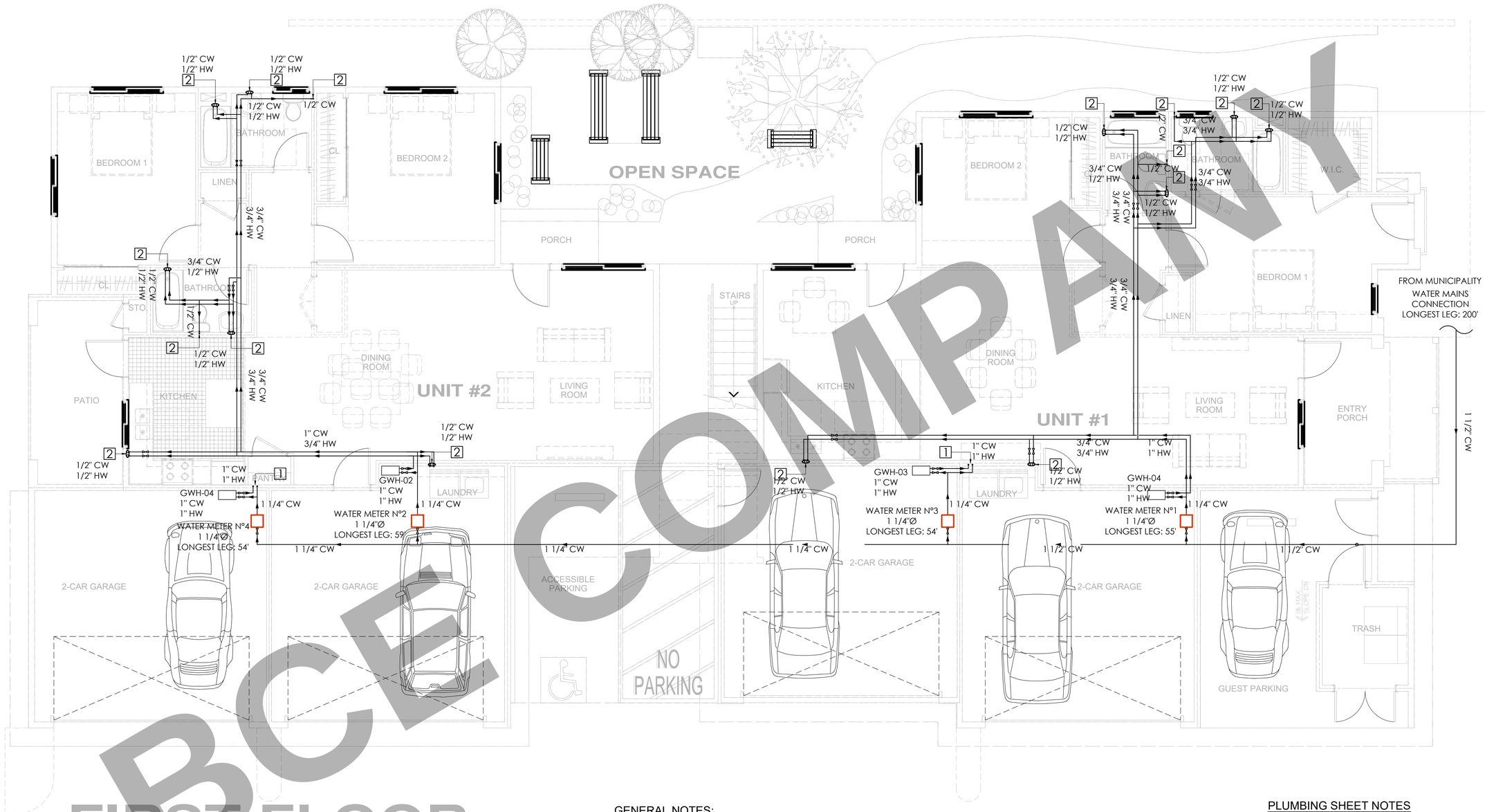
NOTES:
1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS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

REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
PLUMBING CODE CHECKING

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: NTS
PROJECT		SHEET P0.1
DATE AUGUST, 2022		



FIRST FLOOR

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. 1" PER FOOT. PIPING 4" AND 10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT 1/4" PER FOOT. LARGER SHALL BE SLOPED AT 1/8" PER FOOT AND PROVIDE ACCESSIBLE 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8 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.

PLUMBING SHEET NOTES

SHEET NOTES:

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

CLIENT:

ADDRESS:

NOTES:

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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

PROJECT:

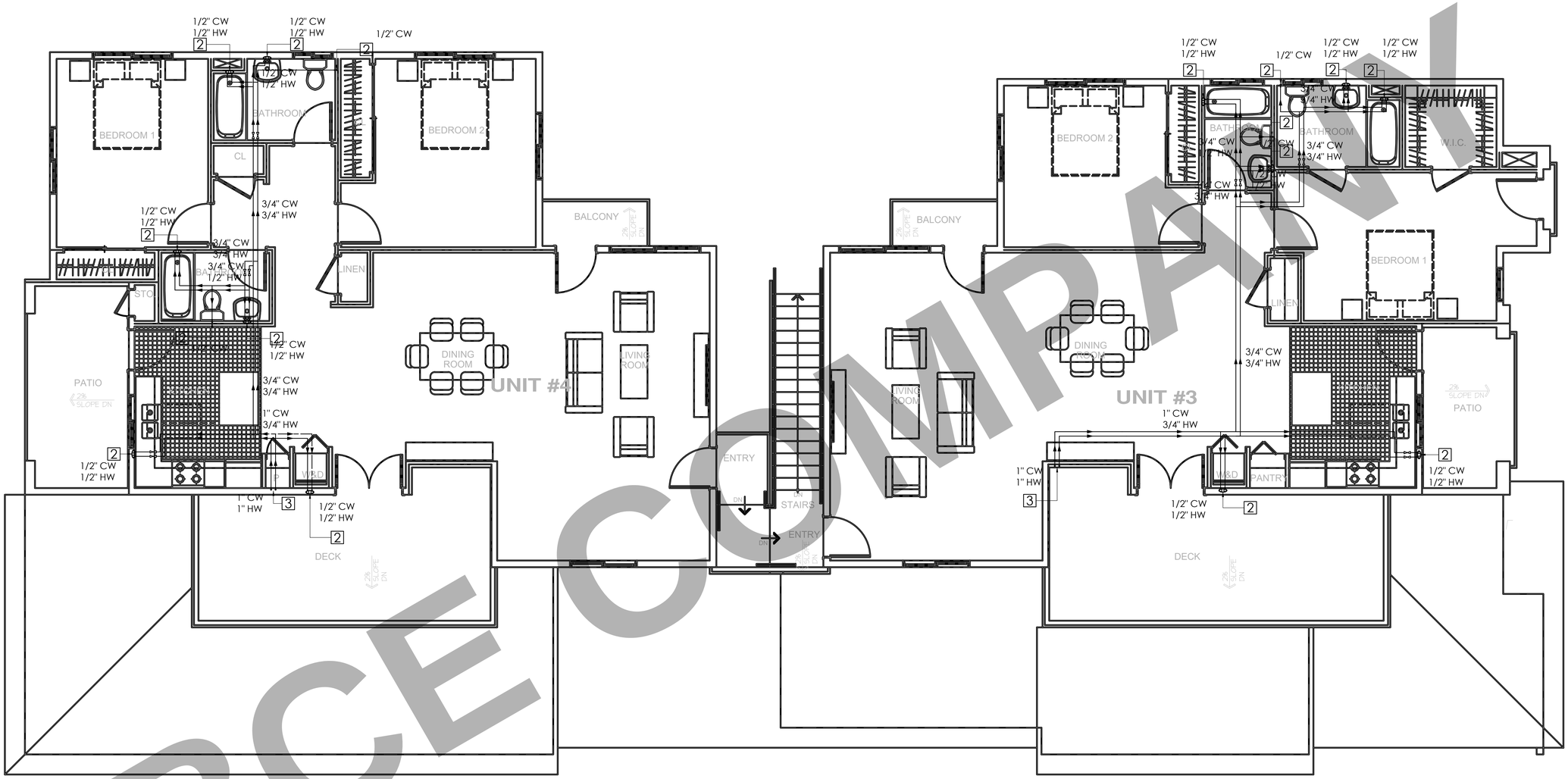
TITLE:
FIRST FLOOR
WATER SUPPLY LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

SHEET
P 1 . 1

DATE
AUGUST, 2022



SECOND FLOOR

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. $\frac{1}{8}$" PER FOOT. PIPING 4" AND 10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT $\frac{1}{4}$" PER FOOT. LARGER SHALL BE SLOPED AT $\frac{1}{8}$" PER FOOT AND PROVIDE ACCESSIBLE 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$ 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.

PLUMBING SHEET NOTES

SHEET NOTES:

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

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
SECOND FLOOR WATER SUPPLY LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 1 . 2

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.
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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.

MINIMUM PIPE SIZE PER FIXTURE

FIXTURE UNIT	CWP (INCH)	HWP (INCH)	FU - PRIVATE
SHOWER	1/2	1/2	2.0
WATER CLOSET	1/2	-	2.5
LAVATORY	1/2	1/2	1.0
KITCHEN SINK	1/2	1/2	1.5
DISHWASHER	-	1/2	1.5
BATHTUB	1/2	1/2	4.0
LAUNDRY MACHINE	1/2	1/2	4.0

WATER LOAD PER UNIT (1 TO 4 TYPICAL)			
DESCRIPTION	LOAD		PIPE SIZE
	FU	GPM	PEX
DCW	20.5	19.6	1-1/4"
DHW	15.5	17.5	1"
TOT. COMBINED	36.0	24.9	1-1/4"

DOMESTIC WATER PIPE SIZING TABLE

BC PLUMBING CODE (2018) SECTION 2.6.3.1
DOMESTIC WATER PIPE SIZING IN ACCORDANCE WITH ASPE PLUMBING ENGINEERING DESIGN HANDBOOK VOL. 2.
BC PLUMBING CODE (2018) SECTION 2.6.3.2.
THIS TABLE IS TO BE USED IN CONJUNCTION WITH THE HYDRAULIC LOAD REQUIREMENTS FOR EACH FIXTURE.
BC PLUMBING CODE (2018) SECTION 2.6.3.5.
DOMESTIC WATER PIPE SIZING IN ACCORDANCE WITH THE MAXIMUM PERMITTED WATER VELOCITIES AS RECOMMENDED BY THE PIPE AND FITTING MANUFACTURER.
* PEX VALUES ARE BASED UPON UPONOR AQUAPEX.

PIPE MATERIAL		PEX*			PEX*		DUCTILE IRON & STAINLESS STEEL			COPPER (TYPE L)			COPPER (TYPE K)			COPPER (TYPE K)	
POTABLE WATER SYSTEM		DCW / DHW			DHWR		DCW / DHW			DCW			DHW			DHWR	
MAXIMUM ALLOWABLE VELOCITY		2.4 m/s (8 ft/s)			0.6 m/s (8 ft/s)		2.4 m/s (8 ft/s)			1.5 m/s (5 ft/s)			1.2 m/s (4 ft/s)			0.9 m/s (3 ft/s)	
[MM]	[INCH]	L/S	GPM	FU	L/S	GPM	L/S	GPM	FU	L/S	GPM	FU	L/S	GPM	FU	L/S	GPM
15 MM	1/2"	0.28	4.4	4.5	0.07	1.1	0.36	5.7	7	0.23	3.6	3.5	0.18	2.9	2.5	0.06	1
20 MM	3/4"	0.55	8.8	11.5	0.14	2.2	0.77	12.2	17	0.48	7.6	9	0.38	6.0	7.5	0.32	5
25 MM	1"	0.92	14.5	20.5	0.23	3.6	1.26	20.0	30	0.81	12.8	18	0.65	10.3	14	0.60	9.5
32 MM	1-1/4"	1.36	21.8	34	0.34	5.4	1.80	28.5	54	1.24	19.7	29	0.99	15.7	22	1.01	16
40 MM	1-1/2"	1.91	30.3	55	0.48	7.5	2.80	44.4	102	1.75	27.7	46	1.40	22.2	34	1.51	24
50 MM	2"	3.27	51.9	138	0.82	12.9	4.92	78.0	265	3.04	48.2	120	2.43	38.5	81	2.59	41

PLUMBING FIXTURE SCHEDULE

FIXT. ID	DESCRIPTION	MANUFACTURER	MODEL	ROUGH-IN W	V	CW	HW	REMARKS
3CS-1	3-COMPARTMENT SINK	SELECT BY ARCH/OWNER	-	3"	2"	3/4"	3/4"	SELECTED BY ARCHITECT/OWNER. VERIFY FOR EXACT SPECIFICATION AND MODEL NUMBER OF PLUMBING FIXTURE WITH ARCHITECT AND OWNER PRIOR TO ORDERING AND INSTALLATION
HS-1	HAND SINK	SELECT BY ARCH/OWNER	-	2"	2"	1/2"	1/2"	SELECTED BY ARCHITECT/OWNER. VERIFY FOR EXACT SPECIFICATION AND MODEL NUMBER OF PLUMBING FIXTURE WITH ARCHITECT AND OWNER PRIOR TO ORDERING AND INSTALLATION
TP-1	TRAP PRIMER	WATTS	LFTP300-DR	-	-	1/2"	-	WATTS DRAINAGE LFTP300-DR PRESSURE DROP ACTIVATED LEAD FREE*BRASS TRAP PRIMER WITH EPDM SEALS, INTEGRAL AIR GAP, AND 1/2 SWEAT OR NPT THREADED CONNECTIONS. OPERATING PRESSURE 25 PSI - 125 PSI. TESTED AND APPROVED IN CONFORMANCE WITH ASSE STANDARD 1018. SPECIFY MODEL LFTP300-DU-DR FOR DISTRIBUTION UNIT.
FCO	FLOOR CLEANOUT	WATTS	CO-200-S	PIPE SIZE	-	-	-	WATTS DRAINAGE CO-200-S EPOXY COATED CAST IRON FLOOR CLEANOUT WITH 5'X5' SQUARE ADJUSTABLE GASKETED NICKEL BRONZE TOP, REMOVABLE GAS TIGHT GASKETED BRASS CLEANOUT PLUG, AND NO HUB (STANDARD) OUTLET.
WCO	WALL CLEANOUT	WATTS	CO-380	PIPE SIZE	-	-	-	WATTS DRAINAGE CO-380 CAST IRON CLEANOUT WITH GASKETED BRASS COUNTERSUNK PLUG, AND NO HUB CONNECTION.
FS-1	FLOOR SINK	WATTS	FS-780	2"	2"	-	-	WATTS DRAINAGE FS-780 12" SQUARE X 6" DEEP 14 GA. TYPE 304 STAINLESS STEEL SANITARY FLOOR SINK WITH LOOSE SET CAST STAINLESS STEEL GRATE, DOME BOTTOM STRAINER, AND NO HUB (STANDARD) OUTLET.
FD-1	FLOOR DRAIN	WATTS	FD-320-Y	2"	2"	-	-	WATTS DRAINAGE FD-320-Y EPOXY COATED CAST IRON AREA DRAIN WITH ANCHOR FLANGE, WEEPHOLES, 8"DIAMETER FIXED TOP WITH HEEL PROOF DUCTILE IRON GRATE, AND NO HUB (STANDARD) OUTLET
WC-1	WATER CLOSET (ADA APPROVED)			4"	2"	3/4"	-	DELTA MODEL # C41908-WH4.5547(411) TURNER 2-PIECE 1.28 GPF SINGLE FLUSH ROUND FRONT TOILET IN WHITE. TOILET SHALL BE ADA AND ASME A112.19.1 COMPLIANT (OR APPROVED EQUAL).
LAV-1	LAVATORY (ADA APPROVED)			2"	2"	1/2"	1/2"	"KOHLER" HUDSON MODEL K-2849 WHITE VITREOUS CHINA WALL MOUNTED LAVATORY WITH 4" CENTERS OR APPROVED EQUAL. INCLUDE MODEL K-7401-5A FAUCET WITH STANDARD AERATOR AND WRISTBLADE HANDLES. LAVATORY AND FAUCETS SHALL BE ADA AND ASME A112.19.1M COMPLIANT (OR APPROVED EQUAL)

SCHEDULE No. 1
GAS WATER HEATER SCHEDULE

TAG	GWH-01 T0 04
LOCATION	OUTDOOR
MANUFACTURER	NAVIEN
MODEL	NPE-150S2
TYPE	GAS
GPM (@ 76°F RISE)	3.4
MAX. NATURAL GAS (BTU/hr)	120,000
UEF	0.93
APPROX. WEIGHT (lbs)	62
WIDTH x DEPTH (in.)	17.3" x 13.2"
HEIGHT (in)	27.4"
CW/HW CONNECTION SIZE	3/4"
GAS INLET CONNECTION	3/4"

WATER CONSERVING PLUMBING FIXTURES AND FITTINGS

Plumbing fixtures and fittings shall comply with the following:

(2019 CGBSC, California Plumbing Code (CPC) and Table 1401.1 of the CPC)

4303.1.1	All Water closets: ≤1.28 gal/flush Tank type water closet shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.
4303.1.2	Urinals: ≤0.5 gal/flush
4303.1.3.1	Single showerheads: ≤1.8 gpm @ 80 psi
4303.1.3.2	Multiple showerheads: combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gpm @ 80 psi or only one shower outlet is to be in operation at a time.
4303.1.4.1	Residential Lavatory Faucets: 0.8 gpm @ 20 psi ≤ **Flow Rate** ≤1.2 gpm @ 60 psi
4303.1.4.2	Lavatory Faucets in common and Public Use Areas (outside of dwellings or sleeping units) in residential buildings: ≤0.5 gpm @ 60 psi
4303.1.4.3	Metering Faucets: ≤0.25 gallons per cycle
4303.1.4.4	Kitchen Faucets: ≤1.8 gpm @ 60 psi; Maximum Flow Rate of 1.8 gpm

PLUMBING FIXTURE CERTIFICATION REQUIRED:
A plumbing fixture certification must be completed and signed by either a licensed general contractor, or a plumbing subcontractor, or the building owner certifying the flow rate of the fixtures installed. A copy of the certification can be obtained from the development services department.

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

PROJECT:

TITLE:
WATER SUPPLY GENERAL NOTES AND EQUIP. SCHED.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36: 3/16"=1'-0"
PROJECT		SHEET P 2 . 0
DATE AUGUST, 2022		

Design calculation sheet

Project no:	Date: 24.05.2022	Sheet no.: 1 of 1	Computed by: M.J.
Subject: Burbank - One-ADU			Checked by: M.N.
Hot Water Calculation			Approved by: M.N.

Application Type: Private Residence

Water Temperature

Tin	=	50	ºF	=	10	ºC
Tout	=	140	ºF	=	60	ºC
⌂T	=	90	ºF	=	50	ºC

Fixture	GPH		QTY.			
Basin, Private lavatory	2	x	2	=	4	gph
Bathtub	20	x	2	=	40	gph
Kitchen Sink	10	x	1	=	10	gph
Laundry, Stationary Tub	20	x	1	=	20	gph

Showers	GPH		Shower Factor		GPH		QTY.			
Showers	30	x	1	=	30	x		=	0	gph

Other	GPH	QTY.

Maximum Possible Demand	=	74	gph
Demand Factor **(Custom)**	=	0.25	gph
Maximum Probable Demand	=	18.5	gph
Maximum Probable Demand	=	0.31	gpm
	=	0.02	L/s
Heater Recovery Capacity	=	0.31	gpm
Storage Factor **(Custom)**	=	0.6	
Storage Tank Capacity	=	11.1	gal
		42	liters
Actual Selection		42	Liters

Heater or Coil	=	500	x	gpm	x	⌂T	/	Efficiency			
Capacity	=	500	x	0.31	x	90	/	0.9	=	15,500	btu/hr
									=	4.6	kW
								Actual Selection	=	5	kW

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE: **WATER HEATER SIZING SHEET.**

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

PROJECT

DATE: AUGUST, 2022

SHEET: P 3 . 0

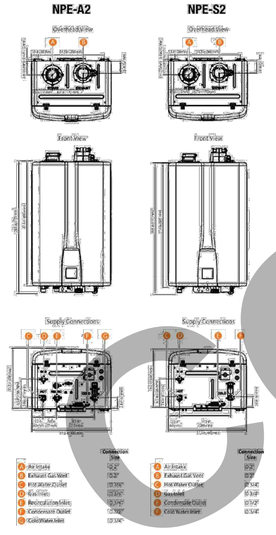
NPE-Advanced NPE-Standard

NPE-A2 Advanced
NPE-S2 Standard

NAVIEN PREMIUM EFFICIENCY CONDENSING TANKLESS WATER HEATERS

Dimensions

NPE-A2 NPE-S2



Specifications

Item		NPE-150S2	NPE-180A2	NPE-180S2	NPE-210A2	NPE-210S2	NPE-240A2	NPE-240S2
Heat capacity (input)	Natural gas	18,000– 120,000 BTU/H	10,000–150,000 BTU/H		12,000–180,000 BTU/H		13,300–199,900 BTU/H	
Energy factor	UEF (for NG & LP)	0.93	0.95	0.96	0.95	0.96	0.95	0.96
Flow rate (DHW)	35°F (19°C) temp rise	6.8 GPM (26 L/m)	8.4 GPM (32 L/m)		10.1 GPM (38 L/m)		11.2 GPM (42 L/m)	
	45°F (25°C) temp rise	5.3 GPM (20 L/m)	6.5 GPM (25 L/m)		7.8 GPM (30 L/m)		8.7 GPM (33 L/m)	
	67°F (36°C) temp rise	3.4 GPM (13 L/m)	4.3 GPM (16 L/m)	4.4 GPM (17 L/m)	5.1 GPM (19 L/m)	5.3 GPM (20 L/m)	5.6 GPM (21 L/m)	5.8 GPM (22 L/m)
Dimensions		17.3" (W) x 27.4" (H) x 13.2" (D)						
Weight		62 lbs (28 kg)	73 lbs (33 kg)	68 lbs (31 kg)	77 lbs (35 kg)	73 lbs (33 kg)	77 lbs (35 kg)	73 lbs (33 kg)
Installation type		Indoor or outdoor wall-hung						
Venting type		Forced draft direct-vent						
Ignition		Electronic ignition						
Water pressure		15–150 PSI						
Natural gas supply pressure (from source)		3.5" WC–10.5" WC						
Propane gas supply pressure (from source)		8" WC–13" WC						
Natural gas manifold pressure (min-max)		-0.04" WC– -0.40" WC	-0.03" WC– -0.55" WC		-0.03" WC– -0.76" WC		-0.03" WC– -0.96" WC	
Propane gas manifold pressure (min-max)		-0.03" WC– -0.40" WC	-0.02" WC– -0.55" WC		-0.02" WC– -0.76" WC		-0.02" WC– -0.96" WC	
Minimum flow rate		0.5 GPM (1.9 L/m), < 0.01 GPM (0.04 L/m) option for "A2" models*						
Connection sizes	Cold water inlet	3/4" NPT						
	Hot water outlet	3/4" NPT						
	Gas inlet	3/4" NPT						
Power supply	Main supply	120V AC, 60 Hz						
	Maximum power consumption	200 W (max 2 A), 350 W (max 4 A) with external pump connected						
Materials	Casing	Cold rolled carbon steel						
	Heat exchangers	Primary heat exchanger: stainless steel Secondary heat exchanger: stainless steel						
Venting	Exhaust	2" or 3" PVC, CPVC, approved polypropylene and stainless steel 2" or 3" special gas vent type BH (Class II, A/B/C)						
	Intake	2" or 3" PVC, CPVC, approved polypropylene and stainless steel 2" or 3" special gas vent type BH (Class II, A/B/C)						
	Vent clearances	0" to combustibles						
High elevations		10,100 feet for both NG or LP gas. Please refer to Installation Manual for additional details and instructions.						
Safety devices		Flame rod, APS, ignition operation detector, water temperature high limit switch, exhaust temperature high limit sensor, power surge fuse, burner high limit fuse, Vent Installation Detector (VID)						

*Available for NPE-A2 models configured in an optional ComfortFlow® recirculation mode. Energy consumption will increase when the system is configured for recirculation.

Navien reserves the right to change specifications at any time without prior notice.
Please refer to www.Navienlnc.com to verify you have the most current information.

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.

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

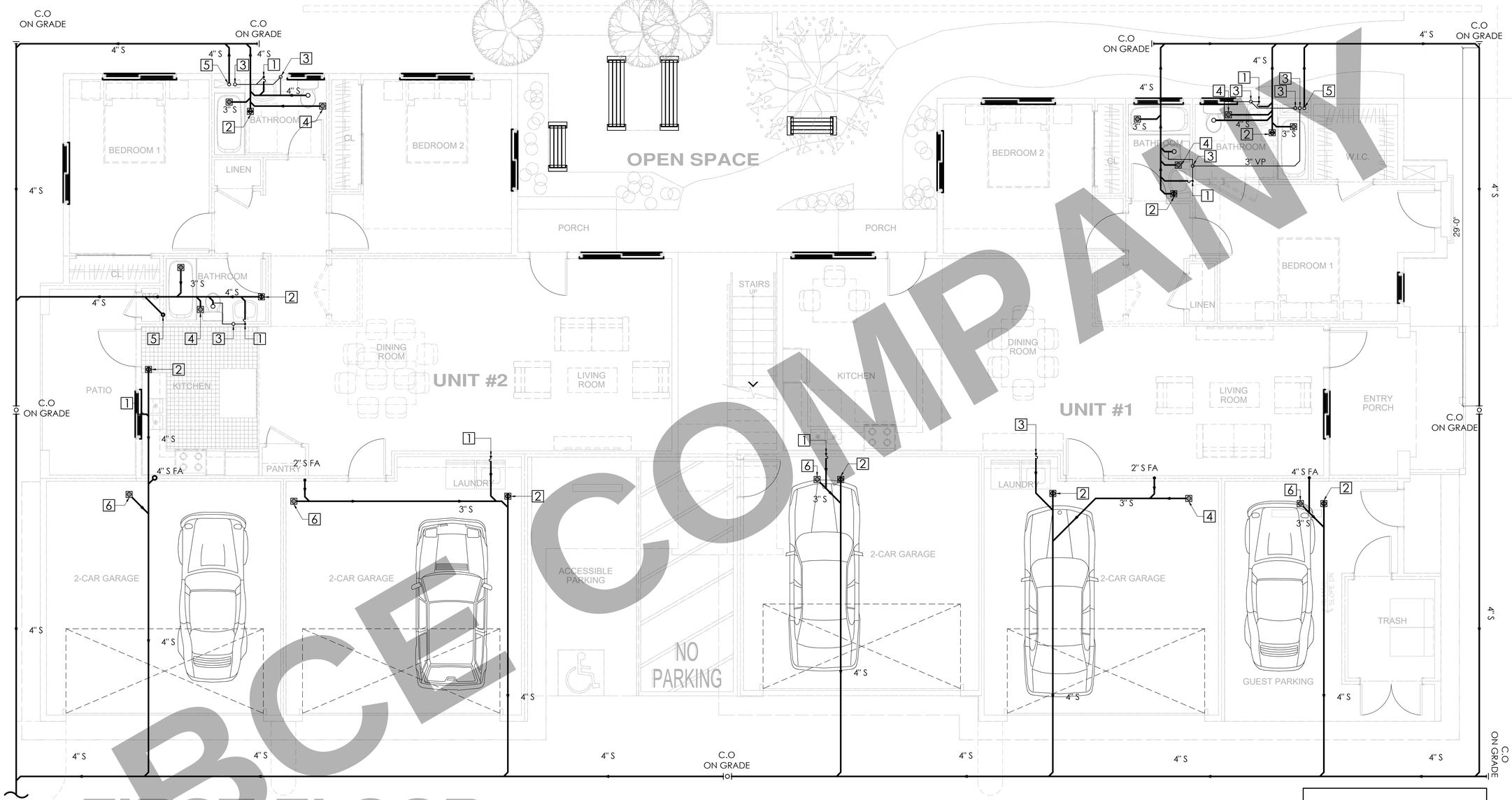
TITLE:
WATER HEATERS CALCULATION SHEETS.

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

PROJECT

DATE
AUGUST, 2022

SHEET
P 4.0



FIRST FLOOR

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. 1" PER FOOT. PIPING 4" AND 10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT 1/4" PER FOOT. LARGER SHALL BE SLOPED AT 1/8" PER FOOT AND PROVIDE ACCESSIBLE 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8 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.

PLUMBING SHEET NOTES

SHEET NOTES:

1. WASTE DROP AND 2" VENT RISE
2. 4" FLOOR CLEAN-OUT.
3. 3" VENT STACK TO ABOVE.
4. 3" FLOOR DRAIN.
5. 4" SOIL DROP FROM ABOVE.
6. 3" GARAGE DRAIN.
7. SOIL DROP AND 4"VENT RISE.

CLIENT:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

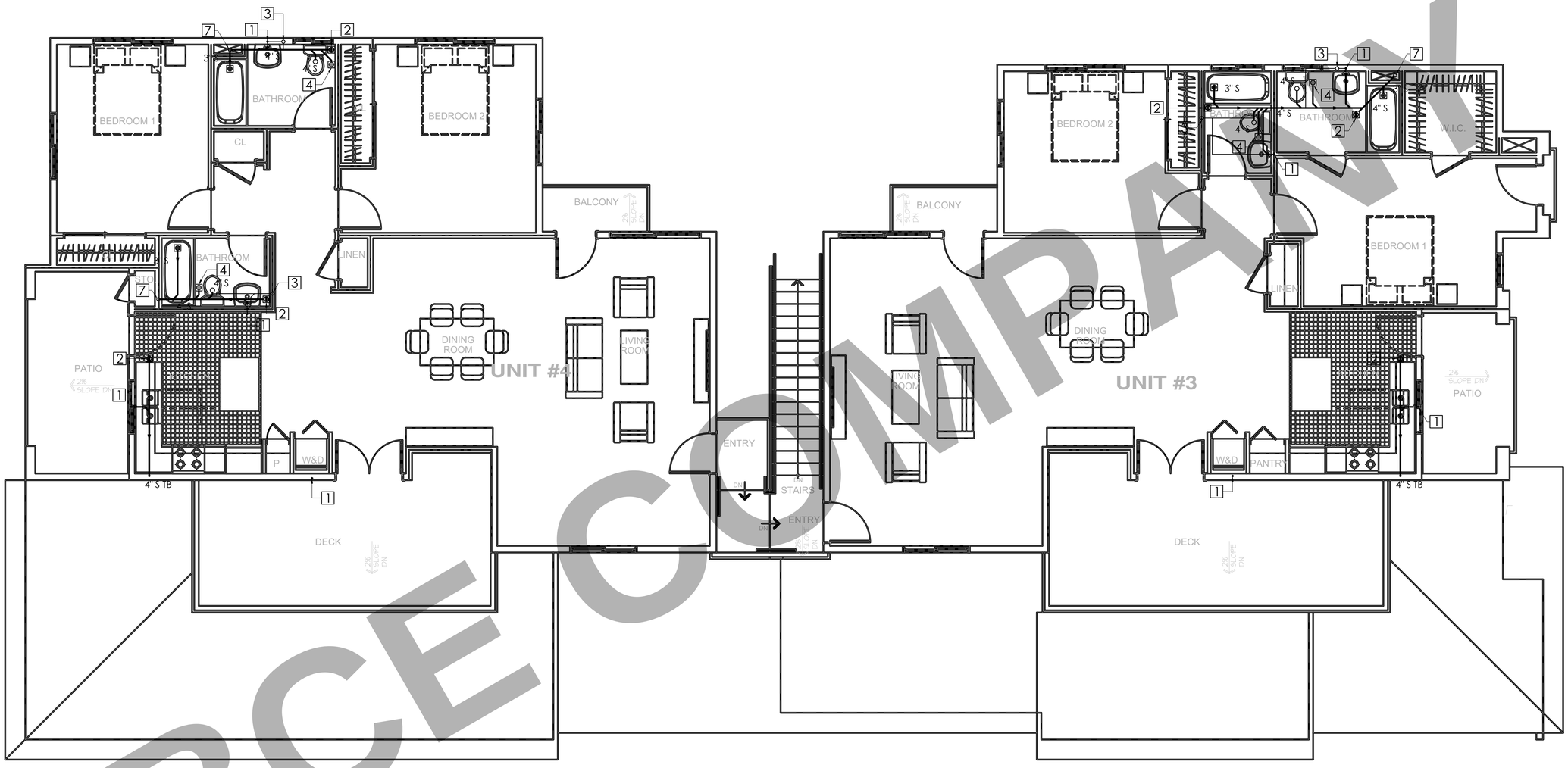
TITLE:
FIRST FLOOR SANITARY LAYOUT.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 5 . 1



SECOND FLOOR

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. 1" PER FOOT. PIPING 4" AND 10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT 1/4" PER FOOT. LARGER SHALL BE SLOPED AT 1/8" PER FOOT AND PROVIDE ACCESSIBLE 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8 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.

PLUMBING SHEET NOTES

SHEET NOTES:

1. WASTE DROP AND 2" VENT RISE
2. 4" FLOOR CLEAN-OUT.
3. 3" VENT STACK TO ABOVE.
4. 3" FLOOR DRAIN.
5. 4" SOIL DROP FROM ABOVE.
6. 3" GARAGE DRAIN.
7. SOIL DROP AND 4"VENT RISE.

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
SECOND FLOOR SANITARY LAYOUTS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 5 . 2

PLUMBING PIPING MATERIAL SCHEDULE

PIPING SYSTEM	LOCATION	ACCEPTABLE PIPING MATERIAL
WASTE & VENT	BELOW AND ABOVE GRADE	ASTM D 2665 PVC SCHEDULE 40, SOCKET FITTINGS DWV
	FROM SECOND TO FIRST FLOOR	ASTM A 888 CAST IRON, NO HUB SYSTEM
DOMESTIC WATER	BELOW GRADE	ASTM B 88 TYPE K SOLDERED COPPER
	ABOVE GRADE	PEX A COMPRESSION JOINT

Dia of Pipe (Inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)			
		Stacks		
	Total for Horizontal Branch	Total Discharge into one branch interval	Total for stack of three branch Intervals or less	Total for stack greater than three branch intervals
1 1/2	3	2	4	8
2	6	6	10	24
2 1/2	12	9	20	42
3	20	20	48	72
4	160	90	240	500
5	360	200	540	1,100
6	620	350	960	1,900

AS PER CPC 708.1
ALL PIPE BELOW 4"Ø PIPE SIZE TO BE SLOPED 2%.
ALL PIPES GREATER THAN 4"Ø PIPE SIZE SHALL BE SLOPED 1%.

As per CPC 906.1, ABS/PVC vent terminations up through the roof exposed to sunlight are required to be protected by water based synthetic latex paints."

Cleanouts are required at the upper most terminals of all horizonal waste lines. Please provide cleanouts location within the floor plan. CPC 707.4.

All Plumbing Works shall comply with 2019 California Plumbing Code, 2019 California Green Building Code and 2019 California Energy Code.

FIXTURE TYPE	MAXIMUM FLOW RATE
Water closets	1.28 gallons/flush
Urinals (wall mounted)	0.125 gallons/flush
Showers	1.8 gpm @ 80 psi
Lavatory faucets-nonresidential	0.5 gpm @60 psi
Kitchen faucets	1.8 gpm @ 60 psi
Metering faucets	gallons/cycle

Cleanouts are required at the upper most terminals of all horizonal waste lines. Please provide cleanouts location within the floor plan. CPC 707.4

POTABLE WATER SUPPLY TO BEVERAGE DISPENSERS CORBONATED BEVERAGE DISPENSERS, OR COFFEE MACHINES MUST BE PROTECTED BY AN AIR GAP OR VENTED BACK-FLOW PREVENTER. (CPC 603.5.12)

the water heater thermostat shall not be considered a control for meeting this provision" Also see CRFC section 113953 (c) :Handwashing facilities shall be equipped to provide warm water under pressure for a minimum of 15 seconds through a mixing valve or combination faucet. If the Temperature of water provided to a handwashing sink is not readily adjustable at the faucet, the temperature of the water shall be at least 100*F, but not greater than 108*F.

CPC 609.11 & ES 150.0(j):
Hot Water Piping will have a Minimum Insulation for the following pipe sizes:
- ½" pipe (½" insulation)
- ¾" pipe (1" insulation)
- 1"- 1 ½" pipes (1 ½" insulation)
- 2" pipes are larger (2" insulation)

Water Heater will be adequately braced to resist seismic forces. Provide two straps. One strap at top 1/3 of the tank and one strap at bottom 1/3 of the tank. CPC 507.2

CPC 408.3, 409.4.
- Public use lavatories limited to 110 degrees F
- Bathtubs, bidets, and showers 120 degrees F

MINIMUM PIPE SIZE PER FIXTURE

FIXTURE UNIT	DR (INCH)	VENT (INCH)
SHOWER	3	2
WATER CLOSET	4	2
LAVATORY	1-1/2	2
KITCHEN SINK	2	2
HAND SINK	2	2
MOP SINK	2	2
DISHWASHER	1-1/2	2
BATHTUB	3	2
LAUNDRY MACHINE	1-1/2	2

MINIMUM PIPE SIZE PER FIXTURE

FIXTURE UNIT	CWP (INCH)	HWP (INCH)
SHOWER	1/2	1/2
URINAL	3/4	-
WATER CLOSET	1	-
LAVATORY	1/2	1/2
KITCHEN SINK	3/4	3/4
DISHWASHER	-	3/4
BATHTUB	1/2	1/2
LAUNDRY MACHINE	1/2	1/2

FIXTURE TYPE	DRAINAGE F.U VALUE AS LOAD FACTORS
LAVATORY	1
TOILET, PRIVATE	3
BATHTUB	2
LAUNDRY TRAY	2
FLOOR DRAIN 3 INCH TRAP SIZE	3
KITCHEN SINK, DOMESTIC	2

BUILDING WATER LOAD			
DESCRIPTION	LOAD		PIPE SIZE PEX
	FU	GPM	
DCW	20	14.3	1"
DHW	3	3	3/4"
TOT. COMBINED	21.2	14.8	1"

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

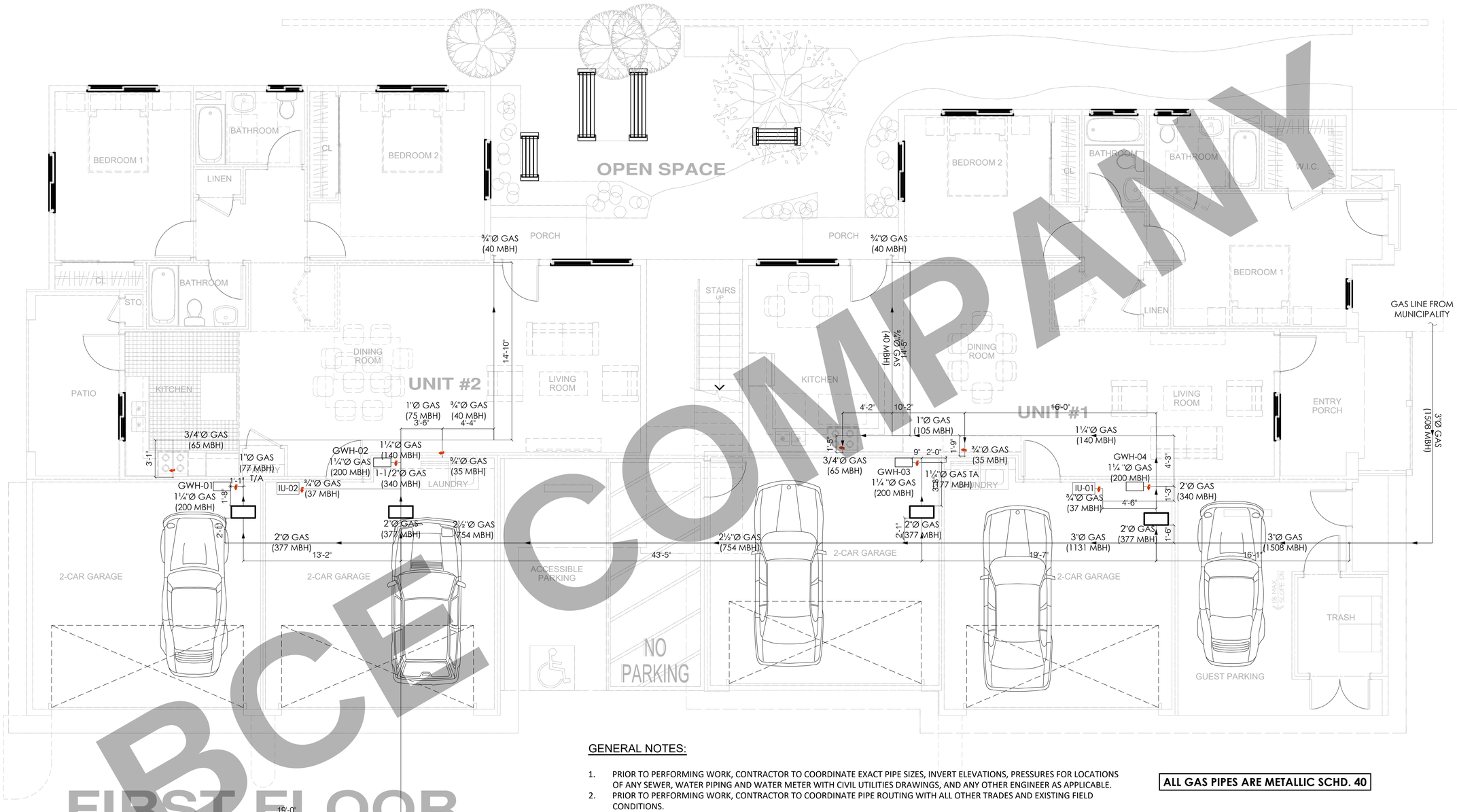
TITLE:
PLUMBING CODE NOTES.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 6 . 0



FIRST FLOOR

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.
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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.

ALL GAS PIPES ARE METALLIC SCHD. 40

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

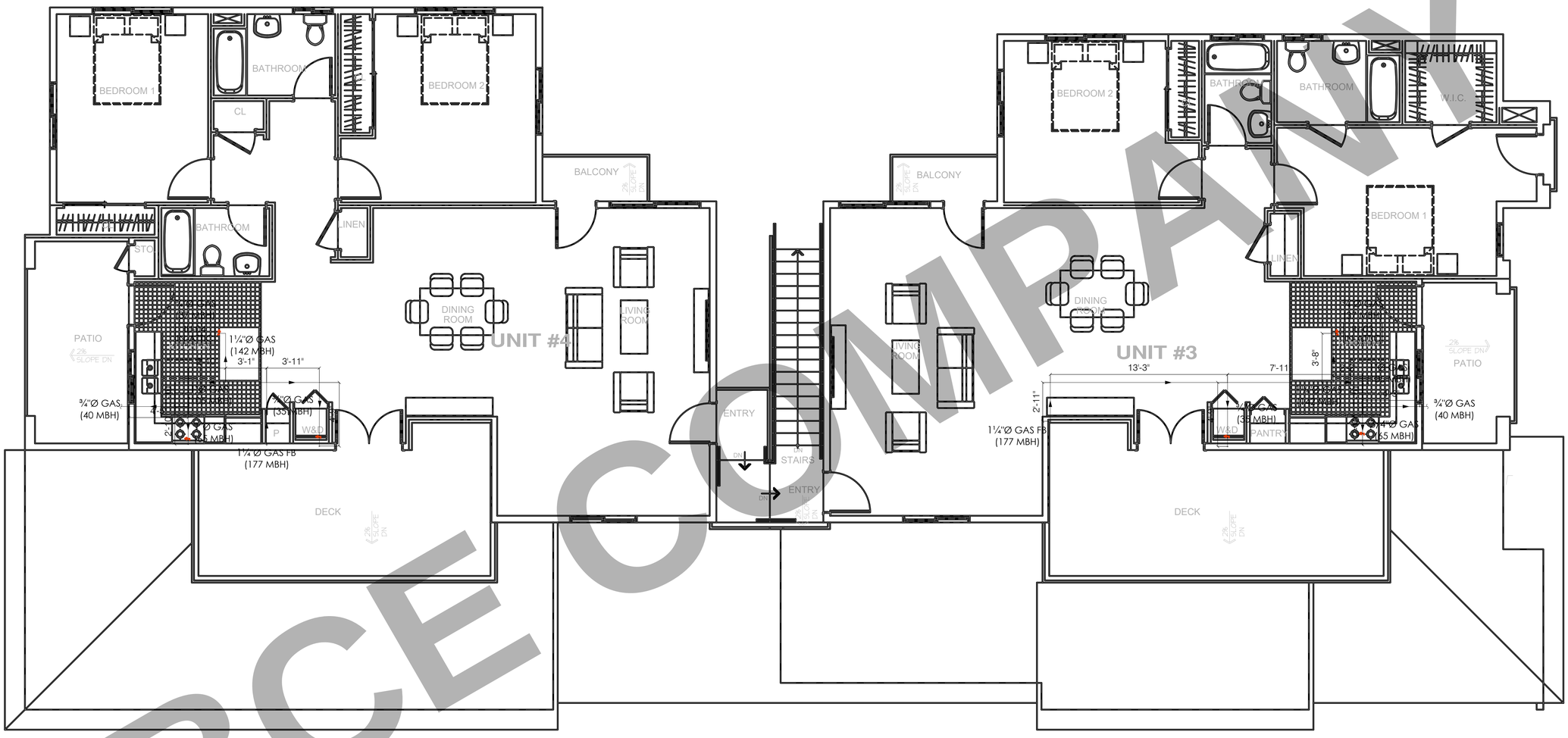
TITLE:
FIRST FLOOR GAS LAYOUTS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 7 . 1



SECOND FLOOR

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ALL GAS PIPES ARE METALLIC SCHD. 40

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

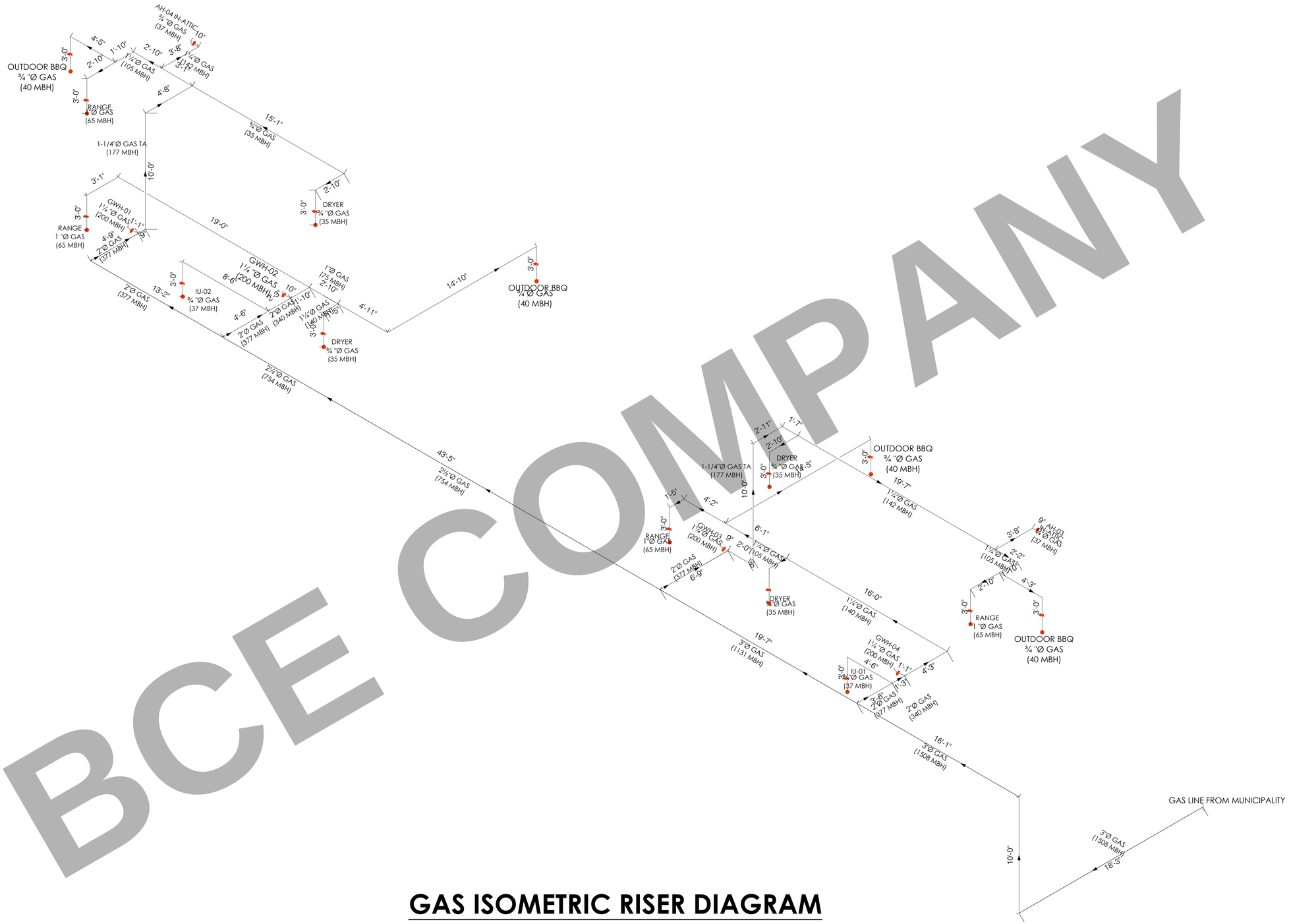
TITLE:
SECOND FLOOR GAS LAYOUTS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 7 . 2



GAS ISOMETRIC RISER DIAGRAM

CLIENT:

ADDRESS:

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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

TITLE:
GAS ISOMENTRIC RISER DIAGRAM.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

PROJECT

DATE
AUGUST, 2022

SHEET
P 7 . 3

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ALL GAS PIPES ARE METALLIC SCHD. 40

ONE-ADU	
ITEM	MBH
GWH-01	200
IU-xx	37
RANGE	65
DRYER	35
BBQ	40
TOTAL =	377

TOTAL GAS DEMAND FOR FOUR-ADUs = 377 x 4 = 1,508 MBH

THE LONGEST GAS PIPE LENGTH FROM THE MAIN GAS METER TO THE FARTHEST DWELLING UNIT GAS METER IS APPRX. 180 FT.
THE LONGEST GAS PIPE LENGTH FROM THE DWELLING GAS METER TO THE FARTHEST GAS APPLIANCE IS APPRX. 105 FT.

TABLE 402.4(1)
SCHEDULE 40 METALLIC PIPE

Gas	Natural
Inlet Pressure	Less than 2 psi
Pressure Drop	0.3 in. w.c.
Specific Gravity	0.60

PIPE SIZE (inch)														
Nominal	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Actual ID	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026	5.047	6.065	7.981	10.020	11.938
Length (ft)	Capacity in Cubic Feet of Gas Per Hour													
10	131	273	514	1,060	1,580	3,050	4,860	8,580	17,500	31,700	51,300	105,000	191,000	303,000
20	90	188	353	726	1,090	2,090	3,340	5,900	12,000	21,800	35,300	72,400	132,000	208,000
30	72	151	284	583	873	1,680	2,680	4,740	9,660	17,500	28,300	58,200	106,000	167,000
40	62	129	243	499	747	1,440	2,290	4,050	8,270	15,000	24,200	49,800	90,400	143,000
50	55	114	215	442	662	1,280	2,030	3,590	7,330	13,300	21,500	44,100	80,100	127,000
60	50	104	195	400	600	1,160	1,840	3,260	6,640	12,000	19,500	40,000	72,600	115,000
70	46	95	179	368	552	1,060	1,690	3,000	6,110	11,100	17,900	36,800	66,800	106,000
80	42	89	167	343	514	989	1,580	2,790	5,680	10,300	16,700	34,200	62,100	98,400
90	40	83	157	322	482	928	1,480	2,610	5,330	9,650	15,600	32,100	58,300	92,300
100	38	79	148	304	455	877	1,400	2,470	5,040	9,110	14,800	30,300	55,100	87,200
125	33	70	131	269	403	777	1,240	2,190	4,460	8,080	13,100	26,900	48,800	77,300
150	30	63	119	244	366	704	1,120	1,980	4,050	7,320	11,900	24,300	44,200	70,000
175	28	58	109	224	336	648	1,030	1,820	3,720	6,730	10,900	22,400	40,700	64,400
200	26	54	102	209	313	602	960	1,700	3,460	6,260	10,100	20,800	37,900	59,900
250	23	48	90	185	277	534	851	1,500	3,070	5,550	8,990	18,500	33,500	53,100
300	21	43	82	168	251	484	771	1,360	2,780	5,030	8,150	16,700	30,400	48,100
350	19	40	75	154	231	445	709	1,250	2,560	4,630	7,490	15,400	28,000	44,300
400	18	37	70	143	215	414	660	1,170	2,380	4,310	6,970	14,300	26,000	41,200
450	17	35	66	135	202	389	619	1,090	2,230	4,040	6,540	13,400	24,400	38,600
500	16	33	62	127	191	367	585	1,030	2,110	3,820	6,180	12,700	23,100	36,500
550	15	31	59	121	181	349	556	982	2,000	3,620	5,870	12,100	21,900	34,700
600	14	30	56	115	173	333	530	937	1,910	3,460	5,600	11,500	20,900	33,100
650	14	29	54	110	165	318	508	897	1,830	3,310	5,360	11,000	20,000	31,700
700	13	27	52	106	159	306	488	862	1,760	3,180	5,150	10,600	19,200	30,400
750	13	26	50	102	153	295	470	830	1,690	3,060	4,960	10,200	18,500	29,300
800	12	26	48	99	148	285	454	802	1,640	2,960	4,790	9,840	17,900	28,300
850	12	25	46	95	143	275	439	776	1,580	2,860	4,640	9,530	17,300	27,400
900	11	24	45	93	139	267	426	752	1,530	2,780	4,500	9,240	16,800	26,600
950	11	23	44	90	135	259	413	731	1,490	2,700	4,370	8,970	16,300	25,800
1,000	11	23	43	87	131	252	402	711	1,450	2,620	4,250	8,720	15,800	25,100
1,100	10	21	40	83	124	240	382	675	1,380	2,490	4,030	8,290	15,100	23,800
1,200	NA	20	39	79	119	229	364	644	1,310	2,380	3,850	7,910	14,400	22,700
1,300	NA	20	37	76	114	219	349	617	1,260	2,280	3,680	7,570	13,700	21,800
1,400	NA	19	35	73	109	210	335	592	1,210	2,190	3,540	7,270	13,200	20,900
1,500	NA	18	34	70	105	203	323	571	1,160	2,110	3,410	7,010	12,700	20,100
1,600	NA	18	33	68	102	196	312	551	1,120	2,030	3,290	6,770	12,300	19,500
1,700	NA	17	32	66	98	189	302	533	1,090	1,970	3,190	6,550	11,900	18,800
1,800	NA	16	31	64	95	184	293	517	1,050	1,910	3,090	6,350	11,500	18,300
1,900	NA	16	30	62	93	178	284	502	1,020	1,850	3,000	6,170	11,200	17,700
2,000	NA	16	29	60	90	173	276	488	1,000	1,800	2,920	6,000	10,900	17,200

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895kPa, 1-inch water column = 0.2488 kPa,
1 British thermal unit per hour = 0.2931 W, 1 cubic foot per hour = 0.0283 m3/h, 1 degree = 0.01745 rad.

Notes:
1. NA means a flow of less than 10 cfh.
2. All table entries have been rounded to three significant digits.

2009 INTERNATIONAL FUEL GAS CODE®

1315.1 Pipe Sizing Methods:

Where the pipe size is to be determined using a method in Section 1315.1.1 through Section 1315.1.3, the diameter of each pipe segment shall be obtained from the pipe sizing tables in Section 1315.2 or from the sizing equations in Section 1315.3. [NFPA 54:6.1]

1314.4 Size of Piping Outlets

The size of the supply piping outlet for a gas appliance shall be not less than 1/2 of an inch (15 mm).

The size of a piping outlet for a mobile home shall be not less than 3/4 of an inch (20 mm).

1313.6.2 Piping Systems Allowed to Be Purged Indoors or Outdoors

The purging of piping systems shall be in accordance with the provisions of Section 1313.6.2.1 where the piping system meets both of the following:
The design operating pressure is 2 psig (14 kPag) or less.
The piping being purged is constructed entirely from pipe or tubing not meeting the size and length criteria of Table 1313.6.1 [NFPA 54:8.3.2]

1313.6.14 Combustible Gas Indicator

Combustible gas indicators shall be listed and calibrated in accordance with the manufacturer's instructions. Combustible gas indicators shall numerically display a volume scale from 0 percent to 100 percent in 1 percent or smaller increments. [NFPA 54:8.3.1.4]

1313.3 Test Pressure

This inspection shall include an air, CO2, or nitrogen pressure test, at which time the gas piping shall stand a pressure of not less than 10 psi (69 kPa) gauge pressure. Test pressures shall be held for a length of time satisfactory to the Authority Having Jurisdiction but in no case less than 15 minutes with no perceptible drop in pressure. For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be not less than 60 psi (414 kPa) and shall be continued for a length of time satisfactory to the Authority Having Jurisdiction, but in no case for less than 30 minutes. For CSST carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be 30 psi (207 kPa) for 30 minutes. These tests shall be made using air, CO2, or nitrogen pressure and shall be made in the presence of the Authority Having Jurisdiction. Necessary apparatus for conducting tests shall be furnished by the permit holder. Test gauges used in conducting test shall be in accordance with Section 1303.3.3.1 through Section 1303.3.3.4.

1313.5 Piping System Leak Test

Leak checks using fuel gas shall be permitted in piping systems that have been pressure-tested in accordance with Section 1313.3. [NFPA 54:8.2.1]

1313.5.1 Turning Gas On

During the process of turning gas on into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends and that all valves at unused outlets are closed and plugged or capped. [NFPA 54:8.2.2]

1313.5.2 Leak Check

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made. [NFPA 54:8.2.3]

1313.4 Detection of Leaks and Defects

The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gauges shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause. [NFPA 54:8.1.5.1]

1313.4.1 Detecting Leaks

The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods. [NFPA 54:8.1.5.2]

1313.4.2 Repair or Replace

Where leakage or other defects are located, the affected portion of the piping system shall be repaired or replaced and retested. [NFPA 54:8.1.5.3]

1313.2.4 Designed for (Less Than) Operating Pressures

Where the piping system is connected to appliances or equipment designed for operating pressures of less than the test pressure, such appliances or equipment shall be isolated from the piping system by disconnecting them and capping the outlets. [NFPA 54:8.1.3.4]

1313.1.5 Regulators and Valves

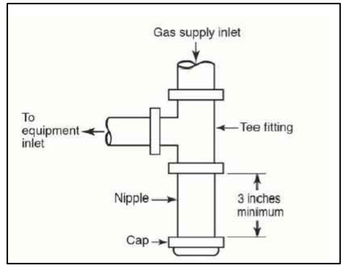
Regulator and valve assemblies fabricated independently of the piping system in which they are to be installed shall be permitted to be tested with inert gas or air at the time of fabrication. [NFPA 54:8.1.1.6]

1313.1.6 Test Medium

The test medium shall be air, nitrogen, carbon dioxide, or an inert gas. OXYGEN SHALL NEVER BE USED. [NFPA 54:8.1.2]

1312.9 Sediment Trap

Where a sediment trap is not incorporated as a part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical, but before the flex connector, where used at the time of appliance installation. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet, as illustrated in Figure 1312.9 or other device recognized as an effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills shall not be required to be so equipped.



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REV. NO	DESCRIPTION	DATE	BY

PROJECT:

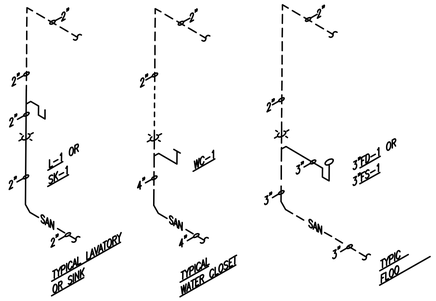
TITLE:
GAS SIZING TABLE AND CODE NOTES.

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

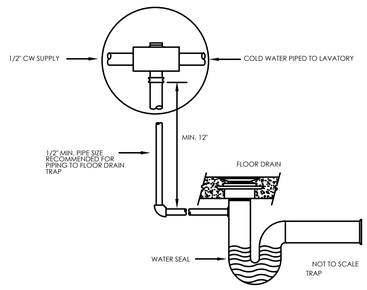
PROJECT

DATE
AUGUST, 2022

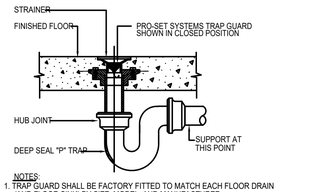
SHEET
P 8.0



1 **TYPICAL WASTE AND VENT RISERS**
SCALE: NONE

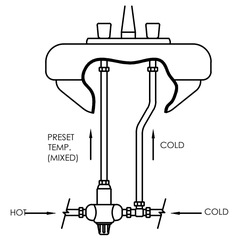


2 TRAP PRIMER

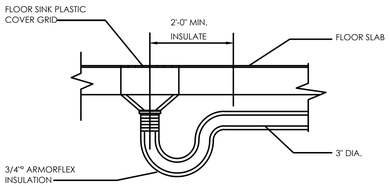


NOTES:
1. TRAP GUARD SHALL BE FACTORY FITTED TO MATCH EACH FLOOR DRAIN (AND FLOOR SINK) BY SIZE, MODEL, AND MANUFACTURER.
2. FLOOR SINK/HUB DRAIN TRAP GUARD INSTALLATION IS SIMILAR.
3. INSTALLATION OF TRAP GUARD TO BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INSERT TRAP GUARD ONLY AFTER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

3 **FLOOR DRAIN WITH TRAP SEAL PROTECTION**
SCALE: NONE



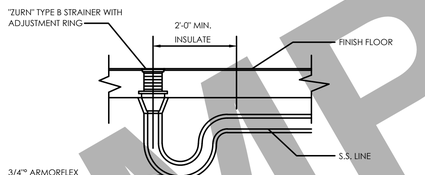
ANTI-SCALD MIXING VALVE
NO SCALE



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

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

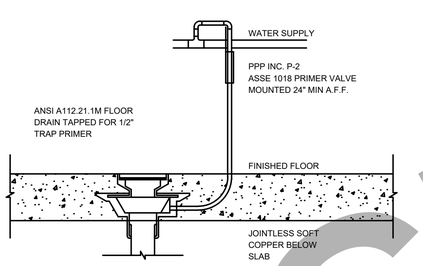
FLOOR SINK DETAIL
NO SCALE



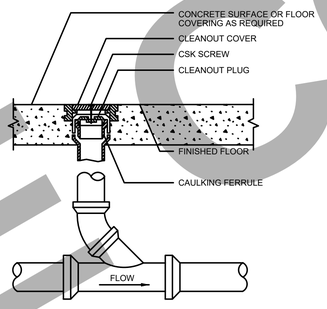
CONTRACTOR TO REFER TO PLUMBING DRAWINGS FOR SIZE AND LOCATION OF SANITARY SEWER LINE.

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

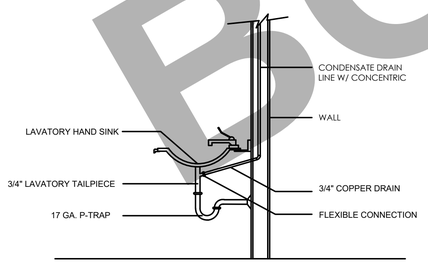
FLOOR DRAIN DETAIL
NO SCALE



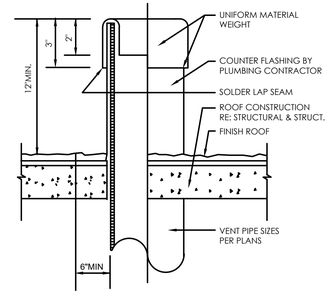
TRAP PRIMER DETAIL
NO SCALE



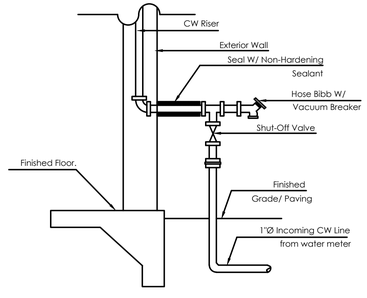
FLOOR CLEANOUT DETAIL
NO SCALE



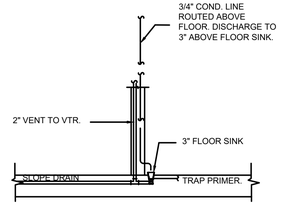
CONDENSATE DETAIL
NO SCALE



VENT THRU ROOF DETAIL
NO SCALE



WATER ENTRY DETAIL
NO SCALE



COND. ON FLOOR SINK DETAIL
NO SCALE

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:
PLUMBING GENERAL DETAILS.

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

PROJECT

DATE
AUGUST, 2022

SHEET
P 7.0