

**PLUMBING GENERAL NOTES:**

**WATER EFFICIENT PLUMBING FIXTURES (CALGREEN 301.1.1, 4.303):**

All existing non-compliant plumbing fixtures (based on water efficiency) throughout the house shall be upgraded whenever a building permit is issued for an addition, alteration, or improvement. The following table shows the fixtures that are considered to be non-compliant and the type of water-conserving plumbing fixture that shall be installed in place of non-compliant fixtures:

Plumbing Fixture	Non-Compliant Plumbing	Fixture Required (Water-Conserving Plumbing Fixture (Minimum Flowrate))
Water Closet (Toilet)	Greater than 1.6 gallons/flush	1.28 gallons/flush
Showertub	Greater than 2.5 gallons/minute	1.8 gallons/minute at 80 psi
Faucet - Bathroom	Greater than 2.2 gallons/minute	1.2 gallons/minute at 80 psi
Faucet - Kitchen	Greater than 2.2 gallons/minute	1.8 gallons/minute at 80 psi (average)

Residential building constructed after January 1, 1994 are exempt from this requirement. Smoke and Carbon Monoxide Alarms (CBC 907.2.10, CRC 314 and 315):

- Smoke alarms shall be installed on the ceiling or wall (between 4" and 12" of the ceiling) in all sleeping rooms, each area/hallway adjacent to sleeping rooms, each story of the building, and in any basement. Smoke alarms shall be replaced 10 years after the date of manufacture listed on the alarm (if no date is listed the alarm shall be replaced). Newly installed smoke alarms shall have a 10-year battery.
- Carbon monoxide (CO) alarms shall be installed on the ceiling or wall (above the door header) in each area/hallway adjacent to sleeping rooms, each occupiable story, and within a bedroom if the bedroom or attached bathroom contains a fuel-burning appliance. CO alarms are not required if there is no fuel burning appliance or fireplace in the house and where the garage is detached from the house.

**PLUMBING REQUIREMENTS:**

**Tub/Shower Requirements:**

The mixing valve in a shower (including over a tub) shall be pressure balancing set at a maximum 120° F. The water-filler valve in bathtubs/whirlpools shall have a temperature limiting device set at a maximum of 120° F. The water heater thermostat cannot be used to meet these provisions. (CPC 408.3, 409.4)

New or reconfigured shower stalls shall be a minimum finished interior of 1,024 square inches, be capable of encompassing a 30 inch diameter circle. Any doors shall swing out of the enclosure have a clear opening of 22 inches minimum. (CPC 408.5, 408.6)

Showers stalls and bathtubs with shower heads installed, shall have walls finished with a nonabrasive surface for a minimum of 6 feet above the floor. (CBC 1209 and CRC R307.2)

Hydro-massage tubs (i.e. Jacuzzi tubs) shall have access to the motor, be supplied by a GFCI protected dedicated circuit, and be listed by a recognized testing agency (i.e. UL). All metal cables, fittings, piping, or other metal surfaces, within 5 feet of the inside wall of the Hydromassage tub shall be properly bonded. Hydro-massage tubs shall be bonded with a minimum #8 AWG bare copper wire and the bonding shall be accessible. (CEC 680.70)

Underlayment material used as backers for wall tile or solid surface material in tub and shower enclosures shall be either glass mat/fiber-reinforced gypsum backing panels (i.e. DensShield, Dens Armor Plus), non-asbestos fiber-cement/fiber mat back board (i.e. Hardibacker, cement board). All material shall be installed in accordance with the manufacturer's recommendations. Water-resistant gypsum board (i.e. purple board) may be used when attached directly to studs, overlaid with minimum Grade B building paper and wire lath. Tile shall be attached to the wire lath. (CBC 2509 and CRC R702.4)

Showers floors shall be lined with an approved shower pan or an on-site built watertight approved lining (i.e. hot mop). On-site built shower linings shall extend a minimum of 3 inches vertically up the wall and shall be sloped 1/4" per foot to weep holes. (CPC 408.7)

When a curb is provided at a shower, it shall be a minimum of 1 inch above the shower floor and between 2 inches and 3 inches above the top of the drain. A watertight railing flange that extends a minimum of 1 inch high shall be installed where the shower floor meets the vertical surface of the shower compartment. The finished floor of the shower compartment shall be uniformly sloped between 1/4" and 1/2" per foot towards to the drain. (CPC 408.5)

Where a curb is not provided at the shower compartment, the entire bathroom shall be considered a wet location. The flooring in the entire bathroom shall comply with the water proofing Rev. 11-2019 requirements described above for shower floors (previous bullet) and all lighting fixtures shall be approved for wet locations.

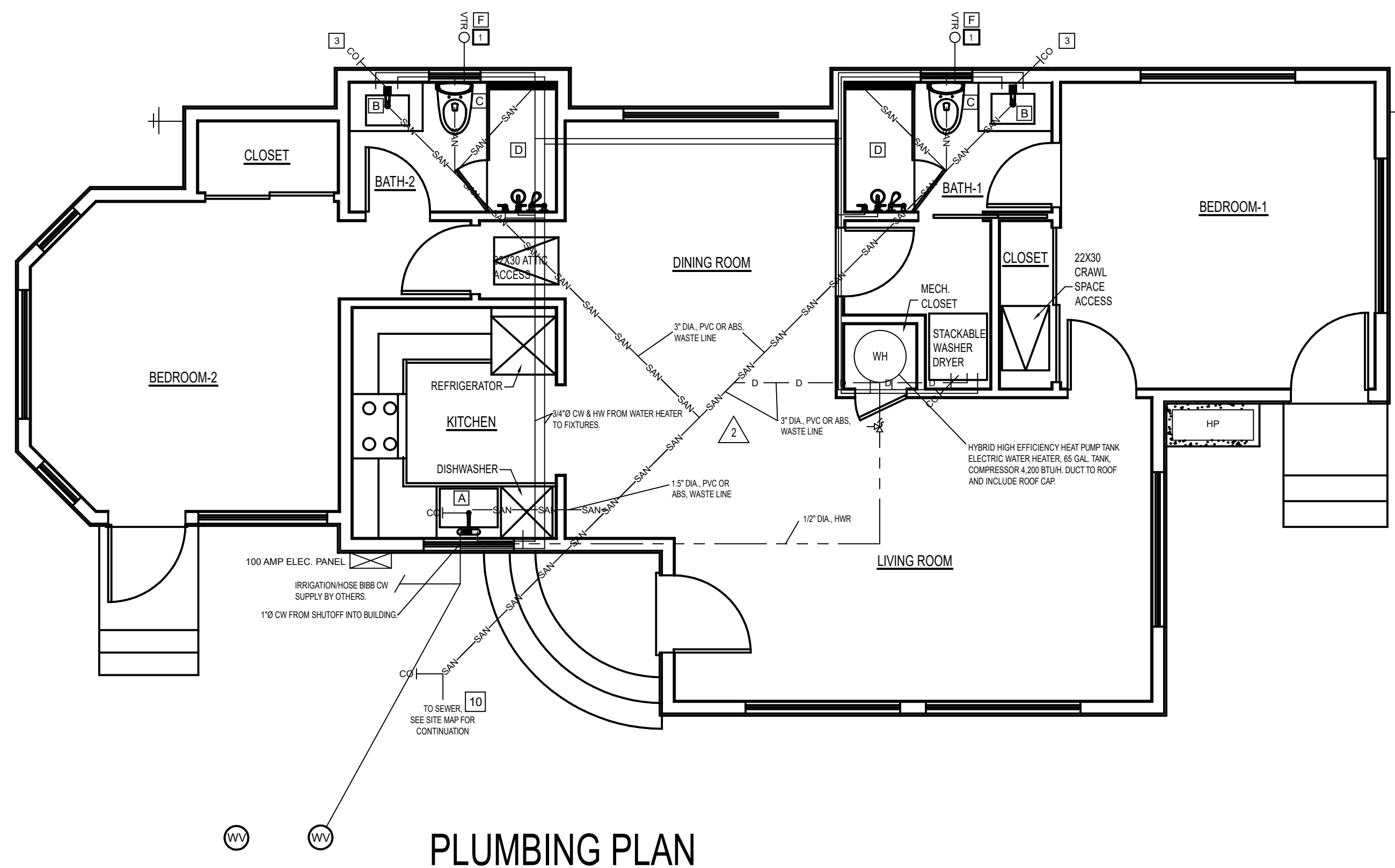
If installing a tub next to an existing fire rated wall/walls (i.e. between apartment units or townhomes, etc.) the integrity of the fire rated wall/walls construction shall be maintained (i.e., fire-blocking shall be installed in the wall/walls per R302.11 and R302.11.1 of the CRC and shall be constructed per CRC 302 Fire-Resistant Construction. Continuity of such fire-resistance rated wall/walls shall be per R302.2.3 of the CRC. (i.e., continuity of protection shall be full height from floor to ceiling, etc.)

Lavatory sinks require a minimum of 24 inches front clearance. (CPC 402.5)

Showers require a minimum 2 inch drain and trap. (CPC Table 702.1)

All piping 3/4-inch or more in diameter and all not water pipes associated with the recirculation system must be insulated with min. 1-inch thick insulation. Existing inaccessible piping does not require insulation. (CNC 150.0)(2)

Newly installed plumbing fixtures shall be water-conserving in compliance with the California Plumbing Code and Green Building Standards. All existing plumbing fixtures not included in the scope of new work shall be replaced if necessary to comply with SB407 Plumbing Fixtures Replacement requirements.



**PLUMBING PLAN**



SCALE: 1/4" = 1'-0"

**SHEET NOTES:**

- Group all vents where practical and terminate at faux chimney. Plumbing waste vents shall terminate not less than 10 feet from, or not less than 3 feet above, an openable window, door, opening, air intake, or vent shaft, or not less than 3 feet in every direction from a lot line, alley and street excepted. CPC 906.2. Plumbing contractor shall obtain approval from architect for all vent terminations.
- Provide trap primers at all floor drains & floor sinks.
- Under-floor cleanouts shall be extended to the exterior of the building if located more than 5 feet from the under-floor access. CPC 707.4, 707.9.
- Coordinate all piping layouts with duct system and all trades.
- Coordinate foundation penetrations with structural engineer.
- The drain, waste, and vent (DWV) piping and fittings shall be Schedule 40 PVC or Schedule 40 ABS per CPC Table 701.2. The size of vent to roof (VTR) shall not be less than 1.5" per CPC Table 904.1.
- The sanitary drain line is required to be 4 inches in size at the point of connection from the fourth water closet at the main drain line, to the outside of the building per CPC Table 703.
- The water distribution system piping and fittings shall be either copper or PEX per CPC Table 604.1.
- The Drainage Fixture Unit Values (DFU) are provided per CPC Table 702.1 and the Water Supply Fixture Units (WSFU) are provided per CPC Table 610.3.
- The ADU sanitary drainage system will be separate and independent from that of any other building. The connection (tie-in) should be downstream from the main residence sanitary lateral to the street. The point of connection location of the sanitary line is per CPC Table 311.1. The sizing of the sanitary line is per CPC Table 717.1.

DRAINAGE FIXTURE UNITS (DFU)				
FIXTURE TYPE	SERVING	DRAINAGE FIXTURE UNIT VALUE	TOTAL FIXTURE UNIT VALUE	MINIMUM SIZE TRAP AND TRAP ARM (INCHES)
LAVATORY	BATH-1/BATH-2	1	2	1-1/4
WATER CLOSET	BATH-1/BATH-2	3	6	3
SHOWER STALL	BATH-1/BATH-2	2	4	2
CLOTHES WASHER STANDPIPE	BATH-1	3	3	2
DISHWASHER	KITCHEN	2	2	1-1/2
KITCHEN SINK	KITCHEN	2	2	1-1/2

WATER SUPPLY FIXTURE UNITS (WSFU)				
FIXTURE TYPE	SERVING	DRAINAGE FIXTURE UNIT VALUE	TOTAL FIXTURE UNIT VALUE	MINIMUM FIXTURE BRANCH PIPE SIZE (INCHES)
LAVATORY	BATH-1/BATH-2	1	2	1/2
WATER CLOSET	BATH-1/BATH-2	2.5	5	1/2
SHOWER STALL	BATH-1/BATH-2	2	4	1/2
CLOTHES WASHER STANDPIPE	BATH-1	4	4	1/2
DISHWASHER	KITCHEN	1.5	1.5	1/2
KITCHEN SINK	KITCHEN	1.5	1.5	1/2

For a continuous or intermittent flow into a drainage system, such as from a pump or similar device, 1.5 fixture units shall be allowed per gpm of flow.

WATER HEATER SCHEDULE																							
SYMBOL	DESCRIPTION	MANUF & MODEL	NOMINAL CAPACITY (GAL)	RATED CAPACITY (GAL)	UNIFORM ENERGY FACTOR	FIRST HOUR RATING (GPH)	RECOVERY IN GPH @ 120°F RISE	WATER TEMP MIN TO MAX (DEG.F)	COMPRESSOR (BTU/H)	NUMBER OF ELEMENTS	ELEMENT WATTAGE (WATTS)	TOTAL UNIT WATTAGE (WATTS)	REFRIGERANT TYPE	POWER WATTAGE (WATTS)	BREAKER SIZE (AMPS)	MAX CIRCUIT AMPACITY (AMPS)	TANK LINING MATERIAL	TANK VALVE CONN. SIZE (INCHES)	CONDENSATE DRAIN CONN. SIZE (INCHES)	WATER CONN. SIZE (INPT INCHES)	UNIT WEIGHT (LBS)	DIMENSIONS (HxWxL) (INCHES)	REMARKS
WH	PROTHERA HYBRID HEAT PUMP TANK ELECTRIC WATER HEATER	PROTHERA PROPRIETARY (21-BR05750)	65	59	405	75	27	110 TO 150	4200	2	4500	5000	R134A	240/601	30	21	GLASS	3/4	3/4	3/4	225	65 x 24 x 4	1,2,3,4,5

- Adhere to manufacturer's requirements for connecting equipment. Maximum length including vertical separation is 66 feet and the maximum vertical separation is 23 feet.
- The warranty is 10-year on water storage tank, 10-year on parts, and 1-year on labor when installed by a licensed professional.
- The installation should comply with all applicable local, state, and national building codes, regulations, and standards, as well as the manufacturer's installation guidelines and recommendations. 2" clearance needed for T&P release.
- Confirm equipment is ENERGY STAR rated, Title 24 Compliant (JA13 Ready), and UL listed.
- Heat pump water heater outlet shall be ducted to the outside and terminate at roof with factory roof cap per manufacturer's guidelines.

**WATER EFFICIENT PLUMBING FIXTURES (CALIFORNIA CIVIL CODE 1101.4(a))**

The California Civil Code requires that all existing non-compliant plumbing fixtures (based on water efficiency) throughout the house be upgraded whenever a building permit is issued for remodeling improvements. Residential building constructed after January 1, 1994 are exempt from this requirement. The following table shows the fixtures that are considered to be non-compliant and type of water-conserving plumbing fixture that should be installed:

KEY DESCRIPTION	
A	KITCHEN FAUCET - 1.8 GPM @80 PSI
B	LAVATORY FAUCET - 1.2 GPM @60 PSI
C	WATER CLOSET - 1.28 GALLON/FLUSH
D	SHOWER HEAD - 1.8 GPM @80 PSI
E	8" DIA. SS PIPE DIRECT VENT TO ROOF
F	1.5" DIA. OR MORE, SCHD. 40 PVC OR SCHD. 40 ABS, DIRECT VENT TO ROOF

**LEGEND**

	HOSE BIB
	WATER VALVE
	HYBRID HIGH EFFICIENCY HEAT PUMP TANK ELECTRIC WATER HEATER (65 GAL. TANK)
	CLEAN OUT (4" PVC)
	VENT TO ROOF (1.5" PVC)
	PRESSURE RELIEF VALVE
	PRESSURE REGULATING VALVE

**PLUMBING PIPING SYMBOLS**

	DOMESTIC COLD WATER, COLD WATER
	DOMESTIC HOT WATER, HOT WATER
	DOMESTIC HOW WATER RETURN, HOT WATER RETURN
	DRAIN
	VENT (SANITARY)
	SOIL, WASTE, OR SANITARY SEWER
	SANITARY SEWER, BELOW GRADE
	STORM WATER
	STORM WATER, BELOW GRADE

PIPE INSULATION THICKNESS TABLE							
FLUID TEMPERATURE RANGE (DEG. F)	CONDUCTIVITY RANGE (BTU-INCH PER HOUR-SQ. FT.-DEG. F)	INSULATION MEAN RATING TEMPERATURE (DEG. F)	NOMINAL PIPE DIAMETER (INCHES)				
			< 1	1 TO < 1.5	1.5 TO < 4.5	4 TO < 8	8 AND LARGER
SPACE HEATING, HOT WATER SYSTEMS (STEAM, STEAM CONDENSATE AND HOT WATER) AND SERVICE WATER HEATING SYSTEMS							
ABOVE 350	0.32-0.34	250	4.5	5.0	5.0	5.0	5.0
251-350	0.29-0.31	200	3.0	4.0	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	2.5	2.5	3.0	3.0
141-200	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
105-140	0.22-0.28	100	1.0	1.5	1.5	1.5	1.5

SPACE COOLING SYSTEMS (CHILLED WATER, REFRIGERANT AND BRINE)							
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0
BELOW 40	0.20-0.26	50	1.0	1.5	1.5	1.5	1.5

FROM TABLE 120.3-A 2013 CEC

FIXTURE CONNECTION						
DESCRIPTION	MIN BRANCH SIZE				TRAP	COMMENTS
	W	V	CW	HW		
WATER CLOSET	3"	2"	1/2"	NA	3"	1
KITCHEN/LAUNDRY SINK	1-1/2"	1-1/2"	1/2"	1/2"	1-1/2"	5
TUB/SHOWER COMBO	2"	1-1/2"	3/4"	3/4"	1-1/2"	2, 3
BATH TUB ONLY	2"	1-1/2"	3/4"	3/4"	1-1/2"	
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"	1-1/2"	4
CLOTHES WASHER	2"	1-1/2"	3/4"	3/4"	2"	
SHOWER	2"	1-1/2"	3/4"	3/4"	2"	2

- NOTES:**
1. Dual-Flush or equal to or less than 1.28 gallon per flush.
  2. Individual control valves of the pressure balance or thermostatic mixing valve type shall be provided.
  3. Showerheads not to exceed 1.8 GPM @ 80PSI.
  4. Faucets not to exceed 1.2 GPM @ 60PSI.
  5. Kitchen Faucets not to exceed 1.8 GPM @ 60PSI.
  6. Plumbing fixtures shall meet the standard referenced in CEC Table 4.303.3.

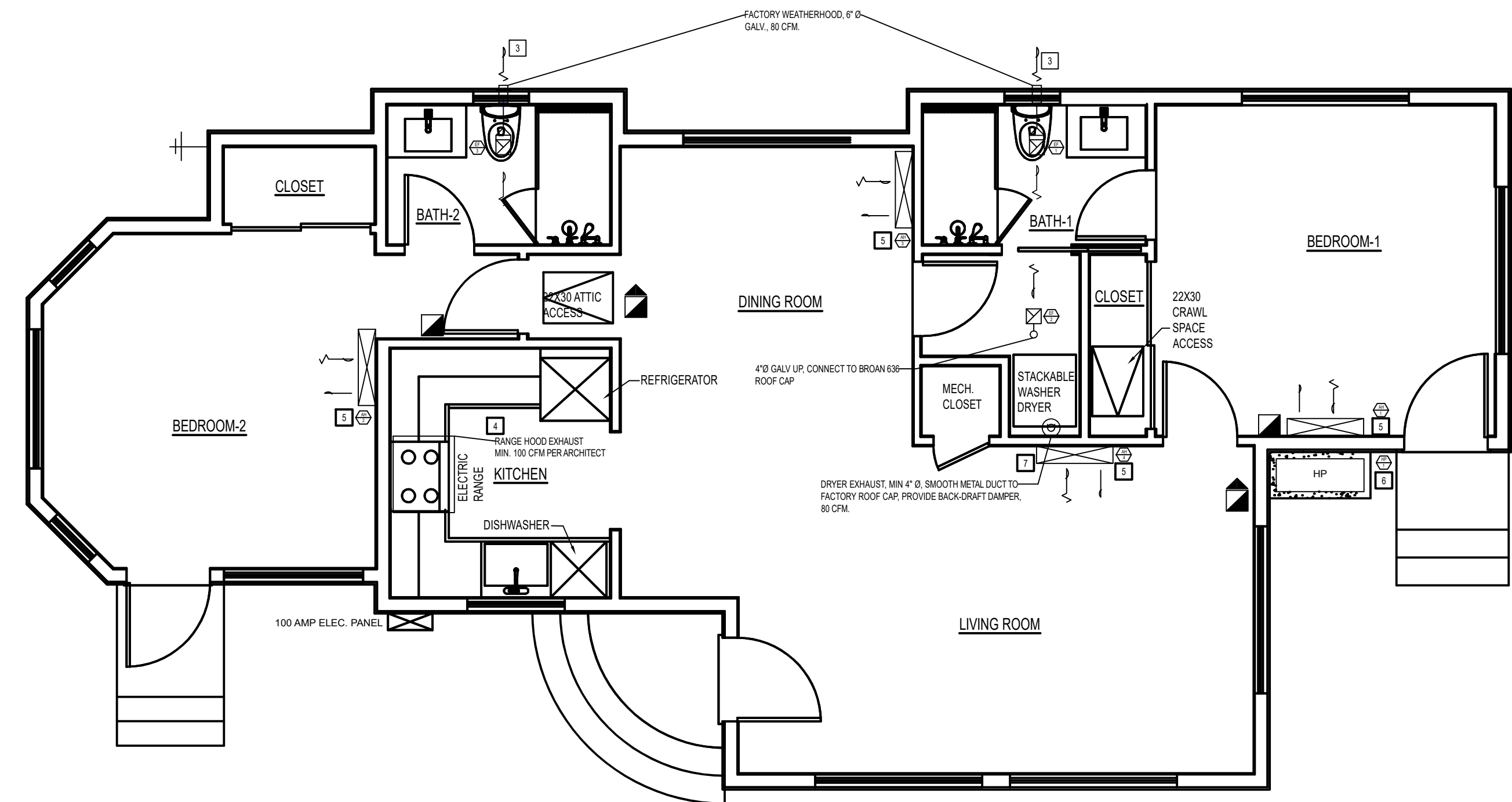
PLUMBING ABBREVIATIONS	
ARCH — ARCHITECT	KBTUH — 1000 BTUH
AFS — AUTOMATIC FIRE SPRINKLERS	LAV — LAVATORY
BTUH — BRITISH THERMAL UNITS PER HOUR	LBS — POUNDS
CD — CONDENSATE DRAIN	LRA — LOCKED ROTOR AMPS
CIRC — CIRCULATION	MAX — MAXIMUM
CLG — CEILING	MPG — MEDIUM PRESSURE GAS
CONC — CONCRETE	MFR — MANUFACTURER
CONT — CONTINUATION	MIN — MINIMUM
COORD — COORDINATION	(N) — NEW
COTG — CLEAN-OUT TO GRADE	NC — NORMALLY CLOSED
CW — COLD WATER	NIC — NOT IN CONTRACT
Ø — DIAMETER	NO — NORMALLY OPEN
DF — DRINKING FOUNTAIN	POC — POINT OF CONNECTION
DN — DOWN	PSI — POUNDS PER SQUARE INCH
DWGS — DRAWINGS	REQS — REQUIREMENTS
(E) — EXISTING	RM — ROOM
ELECT — ELECTRICAL	RPM — REVOLUTIONS PER MINUTE
*F — DEGREES FAHRENHEIT	SH — SHOWER
FCW — FILTERED COLD WATER	STM — STEAM
FLA — FULL LOAD AMPS	STRUCT — STRUCTURAL
FLEX — FLEXIBLE	\$SW — SWITCH
FPM — FEET PER MINUTE	SS — SANITARY SEWER
FS — FLOOR SINK	TYP — TYPICAL
FTR — FLUE THRU ROOF	UL — UNDERWRITERS LABORATORY
G — GAS	UN — UNLESS OTHERWISE NOTED
GALV — GALVANIZED	V — VENT
GPM — GALLONS PER MINUTE	YTR — VENT THRU ROOF
HB — HOSE BIBB	W — WASTE
HP — HORSE POWER	WI — WITH
HPG — HIGH PRESSURE GAS	WC — WATER CLOSET
HW — HOT WATER	WT — WEIGHT
HWR — HOT WATER RETURN	

SYMBOLS		
SYMBOL	ABBREVIATION	IDENTIFICATION
		MANIFOLD
	WCO	WALL C.O.
	GOO/FOO	GRADE C.O./FLOOR C.O.
	GC	GAS COCK
		PRESSURE/TEMPERATURE PLUG
	BV	BALL VALVE
	CHVA	CHECK VALVE
	OS&Y	OUTSIDE SCREW & YOKE GATE VALVE
	BVISOV	BALANCING/SHUT-OFF VALVE
	GV	GATE VALVE
	T&PRV	TEMP & PRESS RELIEF VALVE
	WHA	WATER HAMMER ARRESTOR
		SOLENOID VALVE
	DCBP	DOUBLE CHECK BACKFLOW PREVENTER
		UNION
		PRESSURE GAUGE
		CENTRIFUGAL WATER PUMP
	FC	FLEXIBLE CONNECTION
		HYDROSTATIC RELIEF VALVE
	RPBP	REDUCE PRESS BACKFLOW PREVENTER
	HB	HOSE BIB
	MH	MANHOLE
		THERMOMETER
	P.O.C.	POINT OF CONNECTION
		CENTERLINE
	GPR	GAS REDUCING VALVE

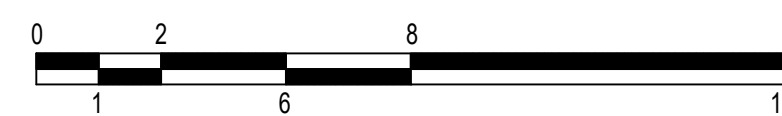
PLUMBING SPECIFICATIONS		
<b>A. General Conditions:</b>		
1. All work shall be in conformance with the 2019 CPC, NFPA and all applicable codes, local jurisdictional amendments and agencies.		
2. Work included: A. Domestic hot and cold water systems. B. Fuel gas piping. C. Complete waste and vent piping system.		
3. It shall be the contractor's responsibility to visit the project site and acquaint himself with all existing conditions, as well as ascertain the extent of the work involved. By submitting a bid, the contractor shall be deemed to have made such an examination, to have accepted such conditions and to have made all necessary allowances in preparing his proposal.		
4. A structural member weakened or impaired by cutting, notching, or otherwise shall be reinforced, repaired, or replaced so as to be left in a safe structural condition in accordance with the requirements of the building code.		
5. All work and materials shall comply with governing codes, safety orders and regulations.		
6. Plumbing contractor shall deliver to the architect a written 1-year guarantee on all workmanship, equipment and materials; repair or replace any such defective items during this period.		
7. Provide Hanger and supports per table 313.1 2019 CPC		
Material	Horizontal Vertical	
Cast iron	18" of joint	Each Floor max 15'
Copper Pipe	< 1-1/2" at 6'; > 2" at 10'	Each Floor max 10'
PVC and ABS	All sizes, max 4'	Base, each floor, mid story guideline
PEX	< 1" at 30'; > 1-1/4" at 4'	Base, each floor, mid story guideline
Steel for gas	1/2" at 6'; 3/4" & 1" at 8'; > 1-1/4" at 10'	Same
<b>B. Utilities and Site Work:</b>		
8. Prior to commencing work, plumbing contractor shall consult representatives of local utilities concerning locations and availability of utilities. Plumbing contractor shall be responsible for any damage to existing utility lines.		
9. Plumbing contractor shall reroute any existing utility lines in conflict with new construction.		
10. Plumbing contractor shall confirm locations and elevations of all existing new and rerouted mains and meters on job record drawings.		
11. Piping in the ground shall be laid on a firm bed for its entire length.		
12. Backfilling trenches with piping shall be made with clean earth, no stones, boulders, cinder fill, frozen earth, construction debris, or other materials that will damage or cause corrosion.		
<b>C. Drain, Waste and Vent:</b>		
13. Cleanouts shall be installed at upper terminals of all horizontal waste runs as per CPC.		
14. All waste piping below 1st floor shall be schedule 40 ABS or schedule 40 PVC DWV.		
15. All waste piping serving 2nd floor fixtures shall be no-hub cast-iron. (Note: p-trap and trap-arm shall be cast-iron. Note: transitions from ABS to no-hub piping for upstairs baths shall be beneath floor at 1st floor and transitions back to ABS shall be above 2nd floor plate line.)		
16. All vent piping shall be schedule 40 ABS or schedule 40 PVC DWV.		
17. Vents shall be combined to minimize roof penetration where possible. Confirm roof penetration locations with architect prior to installing.		
18. Plumber shall provide waste for softener location.		
19. Domestic dishwashing machines shall discharge indirectly through an air gap fitting in accordance with section 807.4 into a waste receptor; a wye branch fitting on the balance of a kitchen sink, or dishwashing food waste grinder.		
20. Cleanouts are required at drainage piping upper terminal; each branch line over 5 feet from main, no greater than 100 feet in developed length from each cleanout; Over 135 degrees in horizontal change of direction.		
21. Sinks and urinals shall require cleanouts.		
22. Cleanout clearances in front shall be < 2" - 12", < 2" - 12". Cleanouts shall extend to finished floor or outside the building.		
23. No clothes washer standpipe shall extend more than 30 inches or not less than 18 inches above its trap. The trap shall be roughed in not less than 6 inches nor greater than 18 inches above the floor.		
24. Condensate waste from air conditioning coils discharges by direct connection to a lav or approved bathtub overflow, the connection shall be located in the area controlled by the same person controlling the air conditioning space.		
25. No domestic dishwashing machines shall be direct connected to the drainage system or a food waste disposer without the use of an approved dishwasher air gap fitting on the discharge side of the dishwashing machine. Listed air gaps shall be installed with the flood level marking at or above the flood level of the sink or drain board whichever is higher.		

PLUMBING SPECIFICATIONS	
<b>D. Water Supply Piping:</b>	
1. Water service line to dwelling shall be buried at a minimum depth of 18 inches. Where service enters building, service shall have a stop (ball valve), waste (drain cock), and pressure regulating valve if necessary.	
2. Plastic and copper piping penetrating framing members within 1 inch of the exposed framing shall be protected by a steel nail plated not less than 18 gauge in thickness. Extend nail plate 1 1/2 inches beyond the outside diameter of the pipe.	
3. Plumber shall provide water treatment loop.	
4. All water supply piping within building shall be approved PEX.	
5. Hot and cold supplies to all tubs shall be 3/4" minimum.	
6. The maximum hot water temperature of discharging from the bathtub and whirlpool bathtub filler shall be limited to 120 degrees F by a device that is in accordance with ASSE 1070 or CSA B 125.3. Water heater thermostats do not comply.	
7. Discharge from a relief valve into a water heater pan shall be prohibited.	
8. Plastic water supply piping, underground outside a building, shall have a blue insulated copper tracer wire installed adjacent to the piping. The tracer wire shall terminate above grade and be not less than 18 in.	
9. All underground water supply piping shall be schedule 40 PVC. Provide tracer wire at all underground utilities.	
10. PEX piping shall not be installed within the first 18 inches of piping connected to a water heater. Water heater flexes shall not be greater than 24 inches.	
11. Where water pressure exceeds 80 Psi an approved type pressure regulator shall be installed. An approved expansion shall be installed in the cold water distribution piping downstream of each regulator.	
12. All piping in hot water system shall be insulated per CEC insulation schedule.	
13. All copper tubing shall be isolated from framing members with polyethylene isolators or 1/4" felt.	
14. Water supply to refrigerators shall be 1/2" PEX.	
15. Shut out height for water closet supplies to be coordinated with baseboard detail, confirm with architect before installation.	
16. No 20/40s shall be served with 1/2" supply piping.	
17. Water supply system mains and branches shall be properly sized to deliver adequate water pressure and volume as per the CPC, and to minimize friction generated noise; no 1/2" ID piping shall be installed in walls or ceilings adjacent to living or sleeping areas; piping shall be sized so that flow velocities do not exceed 6/second.	
18. All building water systems in which quick acting valves are installed shall be provided with water hammer arrestors per 609.10. Arrestors shall be installed as close as possible to these valve types.	
19. Automatic fire sprinkler demand has not been included in sizing of the site main domestic water supply. Coord WIFS contractor for up sizing requirements for combination feed from single meters.	
<b>E. Gas Piping:</b>	
20. Underground natural gas piping from meter shall be run in polyethylene pipe with tracer wire.	
21. Gas piping within house shall be run in black iron pipe with galvanized fittings.	
22. Threaded joints shall be made up with teflon paste, teflon tape or other approved joint compound material (Note: no pipe dope shall be applied to female threads).	
23. All gas piping shall be fully reamed as per CPC.	
<b>F. Tub, Shower and Pan Installation:</b>	
24. Plumbing contractor shall receive written specification for tile & float thickness for tubs and showers; rough-in valve accordingly.	
25. Shower drains shall be Frank Pattern #20SD.	
26. Roman tub shall be set in mortarbase with 15# paper beneath mortar with 6 mil visqueen between mortar and tub.	
27. Plumbing contractor shall provide Tri-Temp raised templates for the deck installations; all template installation shall be coordinated with job site supervisor.	
<b>G. Trim:</b>	
28. Plumbing contractor shall be responsible for protection of all finished work by other trades; plumbers working on finished floors shall use clean quilted drops.	
29. Hot and cold water stubouts beneath sinks shall have brass T's and separate stops when supplies are to be run to dishwasher, refrigerator or other accessory.	
30. Recirc system shall be properly balanced with Nibco globe valves; circulation return shall have a check valve installed in the line, before its connection back to the hot water source.	
31. Water heaters: indirect by radiant heating contractor.	
32. Plumbing contractor shall thoroughly flush all water supply lines.	

LEGEND	
	HARD-WIRED CARBON MONOXIDE DETECTOR IF MORE THAN ONE INSTALLED, THEN INTERCONNECT
	SMOKE DETECTOR
	MINI-SPLIT AIR HANDLING UNIT, INDOOR WALL MOUNT
	MINI-SPLIT DUCTLESS MULTI-ZONE HEAT PUMP AIR CONDITIONER CONDENSER
	MINI-SPLIT CASSETTE
	EXHAUST FAN



### MECHANICAL PLAN



SCALE: 1/4" = 1'-0"

#### SHEET NOTES:

- 1 Contractor shall label whole-house ventilation system clearly and provide detailed instructions on its proper use.
- 2 Contractor shall ensure that a completed Form CF2R-MCH-27-H is available on-site during the inspection.
- 3 All environmental air ducts, vents, and exhaust ducts shall not terminate less than 3 feet from the property line or openings in the building, as per CMC 502.2.1.
- 4 The range hood must vent to the outside in accordance with the manufacturer's requirements. For range hoods above 400 cfm, make-up air is required. Contractor shall confirm the range hood's specification.
- 5
  - a. Install an access panel and follow clearance requirements per manufacturer's installation requirements.
  - b. The refrigerant circuit access port for the condenser must be secured with a locking tamper-resistant cap to prevent unauthorized access, as per CMC 1105.11.
  - c. The suction line (cooling refrigerant line) that connects to the outdoor compressor unit shall be insulated and protected from physical damage or exposure to sunlight, moisture, wind, and equipment maintenance using a metal shroud, painted canvas, or plastic cover, as per Energy 150.0(m).
- 6 The combined horizontal and vertical length of the dryer exhaust must not exceed 14 feet, including two 90-degree elbows (subtract 2 feet for each additional 90-degree elbow in excess of two), unless permitted or required by the dryer manufacturer's terms of listing and approved by the AHJ, as per CMC 504.4.2.1.

SPLIT SYSTEM HEATING & COOLING UNIT SCHEDULE																	
SYMBOL	DESCRIPTION	SERVING	MANUF & MODEL	HEATING CAPACITY (BTU/H)	COOLING CAPACITY (BTU/H)	SENSIBLE COOLING (BTU/H)	AIRFLOW RATE (CFM)	HPSP	SEER	GAS LINE SIZE (INCHES)	LIQUID LINE SIZE (INCHES)	POWER VOLTAGE/PHAS (V/1/2/3PH)	MIN CIRCUIT AMPS (AMPS)	MAX CIRCUIT AMPS (AMPS)	UNIT WEIGHT (LBS)	UNIT DIMENSIONS (WxHxD) (INCHES)	REMARKS
HP1	SINGLE ZONE OUTDOOR HEAT PUMP UNIT	-	LG LMS300HV	32,000	30,000	-	-	9.7	18.2	3/8	1/4	230/0/1	33	38	137	17-13 3/4x13 0/16x4 3/16	1,2,3
AH1	SINGLE ZONE INDOOR WALL MOUNT UNIT	BEDROOM 1	LG LSN90HV3	10,900	9,000	7,500	439	8.7	17	3/8	1/4	230/0/1	14	9.2	19.2	12-15 1/4x12 1/8x7 1/8	4,5
AH2	SINGLE ZONE INDOOR WALL MOUNT UNIT	BEDROOM 2	LG LSN90HV3	10,900	9,000	7,500	439	8.7	17	3/8	1/4	230/0/1	14	9.2	19.2	12-15 1/4x12 1/8x7 1/8	4,5
AH3	SINGLE ZONE INDOOR WALL MOUNT UNIT	DINING ROOM	LG LSN90HV3	10,900	9,000	7,500	439	8.7	17	3/8	1/4	230/0/1	14	9.2	19.2	12-15 1/4x12 1/8x7 1/8	4,5
AH4	SINGLE ZONE INDOOR WALL MOUNT UNIT	LIVING ROOM	LG LSN90HV3	10,900	9,000	7,500	439	8.7	17	3/8	1/4	230/0/1	14	9.2	19.2	12-15 1/4x12 1/8x7 1/8	4,5

1. Mount outdoor unit per manufacturer's guidelines & clearance requirements.
2. Coordinate the exact location of the condenser unit with architect and ensure clearances per manufacturer's requirements. The condenser unit shall rest on a concrete or other approved base extending not less than 3 inches above the adjoining ground level, as per CMC 1105.2.
3. Decibel - 57 - 55 - refer to sheet A.H.I. for specification. Decibel not to exceed 66 db. AHRI-8111355.
4. Provide condensate drain line for each indoor unit.
5. Connect indoor air handler refrigerant lines to refrigerant header per manufacturer's guidelines.

VENTILATION FANS										
SYMBOL	SERVING	MANUF & MODEL	AIRFLOW RATE (CFM)	EXTERNAL STATIC PRESS (INCHES OF WG)	SOUND LEVEL (SONES)	POWER CONSUMPTION (WATTS)	ENERGY EFFICIENCY (CFM/WATT)	SPEED (RPM)	MAX CURRENT (AMPS)	DUCT DIAMETER (INCHES)
EF1	BATH1	PANASONIC FV-05-11VKS1	110	0.1	<8.3	9.8	11.5	931	0.27	120/0/1
EF2	BATH1	PANASONIC FV-05-11VKS1	110	0.1	<8.3	9.8	11.5	931	0.27	120/0/1
EF3	BATH2	PANASONIC FV-05-11VKS1	110	0.1	<8.3	9.8	11.5	931	0.27	120/0/1

1. CEC IAQ required ventilation-do not modify. Provide multi-speed and time delay module.
2. Provide optional Lutron occupancy sensor model # MS-OPSSAM or equivalent if acceptable to the architect, and LED night light.
3. Provide condensation sensor module to satisfy humidity control per CAL Green Code Section 4.506.
4. Confirm fan has a built-in backdraft damper, is ENERGY STAR rated, and is certified by the Home Ventilating Institute (HVI).
5. Whole house indoor air quality (IAQ) ventilation provided by continuously operated bathroom exhaust fan per ASHRAE standard 62.2. See T24 for continuous exhaust ventilation calculation.



ABBREVIATIONS	GENERAL NOTES:	4.505.3 MOISTURE CONTENT OF BUILDING MATERIALS:	1. BATHROOM MECHANICAL REQUIREMENTS:	CHAPTER 7 INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS (702 QUALIFICATIONS):
<p>AH AIR HANDLER  B BOILER  CD CEILING DIFFUSER  CR CEILING RETURN  CWC CHILLED WATER COIL  CWR CHILLED WATER RETURN  CU CONDENSOR UNIT  CC COOLING COIL  D DAMPER  DHW DOMESTIC HOT WATER  EF EXHAUST FAN  FC FAN COIL  FD FLOOR DIFFUSER  F FURNACE  HE HEAT EXCHANGER  HP HEAT PUMP  HC HEATING COIL  HRV HEATING RECOVERY AND VENTILATION UNIT  HSR HIGH SIDE RETURN  HSR HIGH SIDE SUPPLY  HWC HOT WATER COIL  HWR HOT WATER RETURN  KW KILOWATTS  LAT LEAVING AIR TEMPERATURE  LWT LEAVING WATER TEMPERATURE  LV LOUVER  LSR LOW SIDE SUPPLY  OA OUTSIDE AIR  P PUMP  RA RETURN AIR  SA SUPPLY AIR  T THERMOSTAT  TK TOE KICK  WH WATER HEATER</p>	<p><b>GENERAL NOTES:</b></p> <p><b>MAJOR EQUIPMENT INSTALLATION:</b></p> <ol style="list-style-type: none"> <li>Installation shall meet all local and national codes pertaining to the installation and operation of plumbing equipment. Unless otherwise required by these standards, the equipment shall be installed in accordance with the equipment manufacturer's recommendations.</li> <li>If "or equal" equipment is to be used, it must meet the performance specifications for the equipment listed, and shall receive prior approval from the mechanical engineer. All requests for substitution shall be furnished with sufficient engineering data to demonstrate that the proposed equipment full meets all the performance levels of the equipment originally specified. The contractor shall be responsible for all costs associated with the engineering for structural, electrical, etc. caused by any substitution.</li> <li>Units shall be installed to provide the clearance or clearances specified by the manufacturer or required by the authority having jurisdiction.</li> <li>Units shall have suitable support to prevent transmission of objectionable noise or vibration generated by the equipment to the structure. Outdoor, ground mounted, units shall be located on a level, one piece concrete pad.</li> <li>Provide and install low voltage control wiring in conduit installed by the mechanical or plumbing contractor using methods contained in the electrical specifications. All wiring of line voltage controls to be accomplished by the electrical contractor.</li> <li>Contractors shall co-ordinate with the electrical contractor to ensure that all electrical accessories such as motor starters, control relays, circuit breakers, etc. required to make a fully functional systems are provided.</li> </ol> <p><b>4.505.2 CONCRETE SLAB FOUNDATIONS:</b></p> <p>Concrete slab foundations required to have a vapor retarder by California Building Code, Chapter 19, or concrete slab-on-ground floors required to have a vapor retarder by the California Residential Code, Chapter 5, shall also comply with this section.</p> <p>4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following:</p> <ol style="list-style-type: none"> <li>A 4-inch (101.6 mm) thick base of 1/2 inch (12.7mm) or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curing, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.</li> <li>Other equivalent methods approved by the enforcing agency.</li> <li>A slab design specified by a licensed design professional.</li> </ol>	<p><b>4.505.3 MOISTURE CONTENT OF BUILDING MATERIALS:</b></p> <p>Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent moisture content. Moisture content shall be verified in compliance with the following:</p> <ol style="list-style-type: none"> <li>Moisture content shall be determined with either a probe-type or contact-type moisture meter. Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements found in Section 101.8 of this code.</li> <li>Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece verified.</li> <li>At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.</li> </ol> <p>Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Wet-applied insulation products shall follow the manufacturers' drying recommendations prior to enclosure.</p> <ol style="list-style-type: none"> <li>Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control. <ol style="list-style-type: none"> <li>Humidity controls shall be capable of adjustment between a relative humidity range less than or equal to 50% to a maximum of 80%. A humidity control may utilize manual or automatic means of adjustment.</li> <li>A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in).</li> </ol> </li> </ol> <p>Notes:</p> <ol style="list-style-type: none"> <li>For the purposes of this section, a bathroom is a room which contains a bathtub, shower or tub/shower combination.</li> <li>Lighting integral to bathroom exhaust fans shall comply with the California Energy Code.</li> </ol> <p>Heating and air conditioning systems shall be sized, designed and have their equipment selected using the following methods:</p> <ol style="list-style-type: none"> <li>The heat loss and heat gain is established according to ANSI/ACCA2 Manual J - 2011 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.</li> <li>Duct systems are sized according to ANSI/ACCA 1 Manual D - 2014 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods.</li> <li>Select heating and cooling equipment according to ANSI/ACCA3 Manual S - 2014 (Residential Equipment Selection), or other equivalent design software or methods.</li> </ol> <p>Exception: Use of alternate design temperatures necessary to ensure the system functions are acceptable.</p>	<p><b>1. BATHROOM MECHANICAL REQUIREMENTS:</b></p> <p>Mechanical ventilation is required in all bathrooms with tubs or showers. The fan must move a minimum 50 CFM of air and be separately switched from the lighting. Fans that operate continuously can be 20 CFM. The duct must terminate on the exterior not less than 3 feet from the openings into the building. (CMC 502.2.1)</p> <p>Baths with no tub or shower (half baths) do not require mechanical ventilation if they are provided with a window at least 3 sq.ft. half of which is operable. (CRC R303.3)</p> <p><b>TEMPERED GLAZING REQUIREMENTS: (CBC 2406.4, 2403.1 and CRC 308.1, R308.4)</b></p> <p>Tempered glazing shall be permanently identified by a manufacturer marking that is permanently applied and cannot be removed without being destroyed (e.g. sand blasted, acid etched, ceramic fired, laser etched, or embossed).</p> <p>Within a portion of wall enclosing a tub/shower where the bottom exposed edge of the glazing is less than 60 inches above the standing surface and drain inlet.</p> <p>Within 60 inches of a tub/shower where the glazing is less than 60 inches above the walking surface.</p> <p>Glazing within 24 inches of either side of the door in the plane of the door in a closed position.</p> <p>Glazing on the hinge-side of an in-swinging door that is installed perpendicular to a door in a closed position and within 24 inches of the door.</p> <p><b>WATER CLOSET REQUIREMENTS:</b></p> <p>The water closet shall have a clearance of 30 inches wide (15 inches on center) and 24 inches in front. (CPC 402.5).</p> <p>Where the water closet (or other plumbing fixture) comes into contact with the wall or floor, the joint shall be caulked and sealed to be watertight. (CPC 402.2).</p>	<p><b>CHAPTER 7 INSTALLER &amp; SPECIAL INSPECTOR QUALIFICATIONS (702 QUALIFICATIONS):</b></p> <p>When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:</p> <ol style="list-style-type: none"> <li>Certification by a national or regional green building program or standard publisher.</li> <li>Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.</li> <li>Successful completion of a third party apprentice training program in the appropriate trade.</li> <li>Other programs acceptable to the enforcing agency.</li> </ol> <p>Notes:</p> <ol style="list-style-type: none"> <li>Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.</li> <li>HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).</li> </ol> <p>[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.</p> <p>Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.</p> <p>Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.</p>