NOTE:
New buildings and existing buildings that undergo alterations or additions that exceed $10,000 construction valuation shall be provided with arthquake-actuated gas shut-off valves designed to automatically shut-off the gas at the location of the valve in the event of a seismic disturbance and listed by UPC and certified by the Division of the State Architect. Show at location of gas meter. FMC 15.20.050

GENERAL NOTES

1. All work shall be in compliance with all applicable local building codes and regulations. Contractor shall be responsible for permits applicable to specific trades or subcontractor's work.
2. Contractor will have examined the premises and site so as to compare them with the drawings and will be satisfied as to the condition of existing work and adjacent property prior to submission of bid. No allowances will subsequently be made in behalf of the contractor by reason of any omission on his/her part to include the costs of all items of work, either labor or materials, whether they are or are not especially or particularly shown or noted but which are implied or required to attain the completed conditions proposed in the drawings.
3. All subcontractors to the general contractor shall inspect the site and shall convey any questions regarding design intent and scope of work to the architect prior to submitting bid and prior to commencing work.
4. Contractor shall coordinate the work of the various trades and subcontractors and shall be responsible for any acts, omissions, or errors of the subcontractors and of persons directly or indirectly employed by them.
5. Contractor to assume sole responsibility for job site conditions including safety of persons and property for the duration of the project.
6. Contractor to notify architect prior to ordering of all long lead items and of approximate delivery dates.
7. All construction materials and supplies to be stored, handled, and installed, according to manufacturers' recommendations.
8. If errors or omissions are found in the drawings they shall be brought to the attention of the architect before proceeding with the work.
9. Drawings schematically indicate new construction. The contractor should anticipate, based on experience, a reasonable number of adjustments to be necessary to meet the design objectives and should consider such adjustments as included in the scope of work.
10. When specific features of construction are not fully shown on the drawings or called for in the General Notes, their construction shall be of the same character as similar conditions.
11. All dimensions to be taken from numeric designations only; dimensions are not to be scaled off drawings.
12. These notes to apply to all drawings and govern unless more specific requirements are indicated applicable to particular divisions of the work.See specifications and general notes in the subsections of the drawings.
13. All dimensions are to face of framing, unless otherwise noted.
14. Weatherstrip all doors leading from heated to unheated areas.Provide vinyl bead type weatherstripping at these doors and windows. All sides of the door must be weatherstripped, including the threshold.
15. Caulk and seal openings in building exterior 1/8" or greater to prevent air infiltration.
16. Windows to be made operable and cleaned, U.O.N.
17. All wall framing to be 2x4 @ 16" o.c. minimum, U.O.N.
18. 5/8" gypsum wall board on walls.
19. All gypsum and/or plaster surfaces shall be smooth, continuous, free of imperfections, and with no visible joints, U.O.N.
20. Stucco over wood sheathing shall include two layers of grade D building paper.
21. Structural wood members adjacent to concrete or earth to be pressure treated Douglas fir.
22. All wall and floor insulation to be R-19. All roof insulation to be R-23 min.
23. All users of these drawings agree by using these drawings to hold the architect harmless for any and all work that does not conform to requirements and minimum standards of the uniform building code, local ordinances and acceptable standards.
24. The architect has no control or charge of and shall not be responsible for construction means, methods, techniques, sequences or procedures for any safety precautions and programs in connection with the work.
25. The architect assumes no responsibility for the performance of products or materials not specified in these drawings.
26. Items required by title 24 "Energy Conservation Standards" shall be certified by California Energy Commission (CEC). Equipment which requires preventative maintenance for efficient operation shall be furnished with the complete and necessary maitenance information.

ABBREVIATIONS

&	AND	FLUOR.	FLUORESCENT
/	ANGLE	FIXT.	FIXTURE
@	AT	F.O.C.	FACE OF CONCRETE
	CENTERLINE	F.O.F.	FACE OF FINISH
Ø	DIAMETER OR	F.O.S.	FACE OF STUDS
#	ROUND	F.R.	FIRE RATED
(D)	POUND OR NUMBER	F.S.	FULL SIZE
(E)	DEMOLISH	FT.	FOOT OR FEET
(N)	EXISTING	FTG.	FOOTING
(R)	NEW	FURR.	FURRING
	REMOVE		
A.B.		G.S.M.	GALVANIZED SHEET METAL
ADJ.	ANCHOR BOLT	GA.	GAGE
AGGR.	ADJUSTABLE	G.F.I.	GROUND FAULT
ALUM.	AGGREGATE	GL.	INTERCEPTOR
APPROX.	ALUMINUM	GND.	GLASS
ARCH.	APPROXIMATE	GR.	GROUND
A.S.	ARCHITECTURAL	GYP.	GRADE
	AIR SPACE		GYPSUM
BD.			
BLDG.	BOARD		HIGH
BLK.	BUILDING	H.	HOSE BIB
BLKG.	BLOCK	H.B.	HOLLOW CORE
BM.	BLOCKING	H.C.	HARDWOOD
BOT.	BEAM	HDWD.	HARDWARE
	BOTTOM	HDWR.	HEIGHT
CAB.		HGT.	HORIZONTAL
CEM.	CABINET	HORIZ.	HOUR
CER.	CEMENT	HR.	
CLG.	CERAMIC		INSIDE DIAMETER (DIM.)
CLKG.	CEILING	I.D.	INSULATION
CL.	CAULKING	INSUL.	INTERIOR
CLR.	CLOSET	INT.	
CNTR.	CLEAR		LAMINATE
COL.	COUNTER	LAM.	LAVATORY
CONC.	COLUMN	LAV.	LINE OF
CONT.	CONCRETE	L.O.	LIGHT
CTR.	CONTINUOUS	LT.	
	CENTER		MAXIMUM
DBL.		MAX.	MEDICINE CABINET
DET.	DOUBLE	M.C.	MECHANICAL
DIA.	DETAIL	MECH.	MEMBRANE
DIM.	DIAMETER	MEMB.	METAL
DISP.	DIMENSION	MTL.	MOUNTED
DN.	DISPENSER	MTD.	MANUFACTURER
D.O.	DOWN	MFR.	MINIMUM
DR.	DOOR OPENING	MIN.	MIRROR
DS.	DOOR	MIR.	MISCELLANEOUS
DWG.	DOWNSPOUT	MISC	
DWR.	DRAWING		NORTH
	DRAWER	N.	NOT IN CONTRACT
E.		N.I.C.	NUMBER
EA.	EAST	NO.	NOMINAL
EL.	EACH	NOM.	NOT TO SCALE
ELEC.	ELEVATION	N.T.S.	
ELEV.	ELECTRICAL		OVERALL
ENCL.	ELEVATOR	O.A.	OBSCURE
EQ.	ENCLOSURE	OBS.	ON CENTER
EQUIP.	EQUAL	O.C.	OUTSIDE DIAMETER (DIM.)
EXST.	EQUIPMENT	O.D.	OPENING
EXT.	EXISTING	OPNG.	OPPOSITE
	EXTERIOR	OPP	
F.D.	FLOOR DRAIN	P.G.	PAINT GRADE
FDN.	FOUNDATION	PL.	PLATE
FIN.	FINISH	P.LAM.	PLASTIC LAMINATE
FLR.	FLOOR	PLYWD.	PLYWOOD
FLASH.	FLASHING		

PR.	PAIR
PROP.LN.	PROPERTY LINE
P.T.	PRESSURE TREATED
R.	RISER
RAD.	RADIUS
RDWD.	REDWOOD
REF.	REFERENCE
REFR.	REFRIGERATOR
REINF.	REINFORCED
REQ.	REQUIRED
RESIL.	RESILIENT
RM.	ROOM
R.O.	ROUGH OPENING
S.	SOUTH
S.C.	SOLID CORE
SCHED.	SCHEDULE
S.D.	SOAP DISPENSER
SECT.	SECTION
SH.	SHELF
SHR.	SHOWER
SHT.	SHEET
SIM.	SIMILAR
SL.	SLOPE
SPEC.	SPECIFICATION
SQ.	SQUARE
S.S.D.	SEE STRUCTURAL DRAWINGS
S.ST.	STAINLESS STEEL
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRUC.	STRUCTURAL
SYM.	SYMMETRICAL
	TREAD
T.	TOWEL BAR
T.B.	TOP OF CURB
T.C.	TELEPHONE
TEL.	TONGUE AND GROOVE
T.&G.	THICK
THK.	TEMPERED
TMPR.	TOP OF PAVEMENT
T.O.P.	TOP OF WALL
T.O.W.	TOILET PAPER DISPENSER
T.P.D.	TUBULAR STEEL
T.S.	TELEVISION
T.V.	TYPICAL
TYP.	
	VINYL COMPOSITION TILE
	VERTICAL
V.C.T.	VERIFY IN FIELD
VERT.	
V.I.F.	WEST
	WITH
	WOOD
W.	WITHOUT
W/	WEIGHT
WD.	
W/O	
WT.	

CODE RELATED NOTES

1) FIRE-STOPS SHALL BE PROVIDED IN THE FOLLOWING SPACES;

A) CONCEALED SPACES OF STUD WALLS AND PARTITIONS, INCLUDING FURRED SPACES AT THE CEILING AND FLOOR LEVELS, AND AT TEN-FOOT INTERVALS BOTH VERTICAL AND HORIZONTAL.
B) AT ALL INTERSECTIONS BETWEEN VERTICAL AND HORIZONTAL SPACES SUCH AS SOFFITS, DROP AND COVE CEILINGS.
C) IN CONCEALED SPACES BETWEEN STAIR STRINGERS AT THE TOP AND BOTTOM OF THE RUN, AND BETWEEN STUDS ALONG AND IN LINE WITH THE RUN OF THE STAIRS IF THE WALLS UNDER THE STAIRS ARE UNFINISHED.
D)IN OPENINGS AROUND VENTS, PIPES, DUCTS, CHIMNEYS, FIREPLACES AND SIMILAR OPENINGS WHICH AFFORD A PASSAGE FOR FIRE AT THE FLOOR AND CEILING LEVELS WITH COMBUSTIBLE MATERIALS.
E)AT OPENINGS BETWEEN ATTIC SPACES AND CHIMNEY CHASES FOR FACTORY-BUILT CHIMNEYS.

2) PRE-MANUFACTURED ITEMS, INCLUDING BUT NOT LIMITED TO, FIREPLACES,WOOD-BURNING STOVES, FIXTURES, EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS AND REQUIREMENTS.

3) ATTIC SPACE SHALL BE PROVIDED WITH ACCESS 22 INCHES BY 30 INCHES.MINIMUM HEAD-ROOM CLEARANCE SHALL BE 30 INCHES.

4) ATTIC SPACES SHALL BE PROVIDED WITH CROSS-VENTILATION. MINIMUM VENTILATION EQUAL TO 1/150 OF THE AREA OF THE ATTIC.

5) ALL HABITABLE ROOMS SHALL BE PROVIDED WITH NATURAL LIGHT BY MEANS OF EXTERIOR WINDOWS OR SKYLIGHTS WITH AN AREA NOT LESS THAN 1/10 OF THE FLOOR AREA OF SUCH A ROOM WITH A MINIMUM OF TEN SQUARE FEET.

6) ALL HABITABLE ROOMS SHALL BE PROVIDED WITH NATURAL VENTILATION BY MEANS OF EXTERIOR OPENINGS WITH AN AREA OF NOT LESS 1/20 OF THE FLOOR AREA OF SUCH ROOMS WITH A MINIMUM OF FIVE SQUARE FEET.

7) BARS, GRILLES, GRATES OR SIMILAR DEVICES MAY BE INSTALLED ON AN EMERGENCY ESCAPE OR RESCUE WINDOWS AND DOORS PROVIDED;

A) SUCH DEVICES ARE EQUIPPED WITH APPROVED RELEASE MECHANISMS WHICH CAN BE OPERATED FROM THE INSIDE WITHOUT USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT; AND
B) THE BUILDING IS EQUIPPED WITH SMOKE DETECTORS IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE.

8) ALL BATHROOMS, WATER CLOSET COMPARTMENTS, LAUNDRY ROOMS AND SIMILAR ROOMS SHALL BE PROVIDED WITH NATURAL VENTILATION BY MEANS OF AN OPERATING EXTERIOR OPENING WITH AN AREA OF NOT LESS THAN 1/20 OF THE FLOOR AREA OF SUCH ROOMS WITH A MINIMUM OPENING OF 1.5 SQUARE FEET. IN LIEU OF NATURAL VENTILATION, A MECHANICAL VENTILATION SYSTEM CONNECTED TO THE OUTSIDE MAY BE PROVIDED. THE MECHANICAL VENTILATION SYSTEM SHALL BE CAPABLE OF FIVE AIR CHANGES PER HOUR & EQUIPPED WITH A BACKDRAFT DAMPER. THE POINT OF DISCHARGE SHALL BE A MINIMUM OF 3' CLEAR FROM ANY OPENING INTO THE BUILDING.

9) ALL PLATFORMS AND OPEN SIDES OF STAIRWAYS, LANDINGS, RAMPS BALCONIES OR PORCHES WHICH ARE MORE THAN 30 INCHES ABOVE GRADE OR FLOOR BELOW, SHALL BE PROTECTED BY A GUARDRAIL. GUARDRAILS SHALL BE 36 INCHES IN HEIGHT WITH INTERMEDIATE RAILINGS SPACED TO PREVENT A 4 INCH SPHERE FROM PASSING THROUGH.

10) THE MINIMUM WIDTH OF STAIRWAYS SHALL NOT BE LESS THAN 36 INCHES. THE MINIMUM RUN SHALL BE 9 INCHES AND THE MAXIMUM RISER HEIGHT SHALL BE 8 INCHES. THERE SHALL NOT BE A VARIATION OF GREATER THAN 3/8 INCH BETWEEN ANY RISER. THE MINIMUM HEAD-ROOM CLEARANCE SHALL BE 6'-8" INCHES AS MEASURED PLUMB FROM THE STAIR TREAD NOSING.

ZOE PRIVATE RESIDENCE
1705 E LINCOLN AVE, ANAHEIM, CA

SYMBOLS

- SECTION HEAD FILLED (SIM, 1, A101)
- SECTION - HEAD OPEN (SIM, 1, A101)
- SECTION - HEAD NO ARROW (SIM, 1, A101)
- CALLOUT - HEAD (SIM, 1, A101)
- LEVEL HEAD -CIRCLE (Name, Elevation)
- NORTH ARROW (N)
- ROOM TAG (Room name, 101)
- ROOM TAG WITH AREA (Room name, 4, 96 SF)
- ROOM TAG WITH VOLUME (Room name, 101, Volume)
- REVISION CLOUD WITH No. TAG
- AREA TAG (Room name, 150 SF)
- VIEW TITLE (1, View Name, SCALE: 1/16" = 1'-0")
- CENTER LINE
- KEYNOTE (00)
- EQUIPMENT TYPE ON SCHEDULE (00)
- DOOR TAG (1)
- WINDOW TAG (1i)
- EXTERIOR ELEVATION TAG (Ref, 1, A101)
- INTERIOR ELEVATION TAG (1Ref, A101)
- GRID-HEAD (0)
- SPOT ELEVATION
- VIEW REFERENCE (1, A101)
- WALL TAG (1i)
- NEW WALL
- DEMO WALL

TEAM

ARCHITECT:
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PE ON BOARD:
Barrett Croock PE
barrettcrook@kittyhawkengineering.com

OWNER:
Zoe Peoples

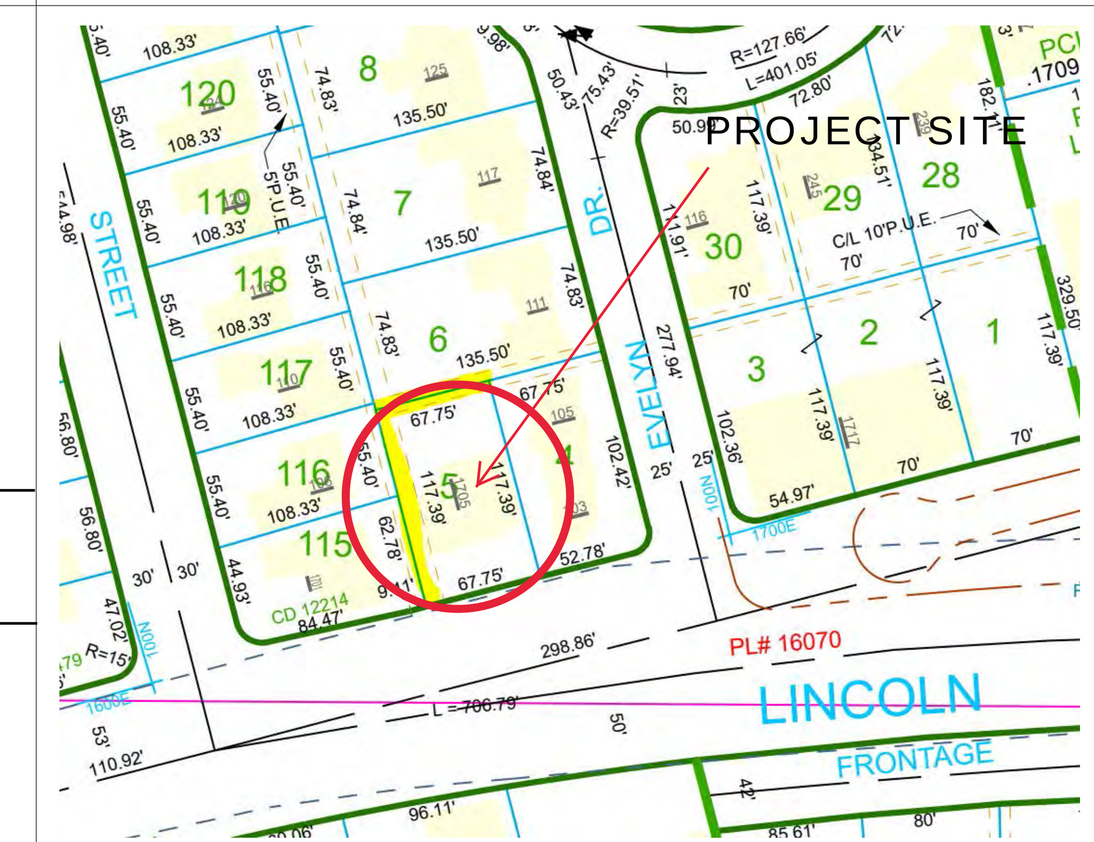
ENERGY CONCULT LLC:
www.title24ez.com

BUILDING CODE REQUIREMENTS

THE GENERAL CONTRACTOR SHALL FULLY COMPLY WITH THE FOLLOWING INTERNATIONAL CODES, 2019 CALIFORNIA BUILDING STANDARDS CODE (CAL. CODE REGS., TITLE 24)
COMPLIANCE WITH CITY OF ANAHEIM AMENDMENTS.
CALGREEN CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11 OF TITLE 24
CBC CALIFORNIA BUILDING CODE (PART 2 OF TITLE 24)
CCR CALIFORNIA CODE OF REGULATIONS
CEBC CALIFORNIA EXISTING BUILDING CODE (PART 10 OF TITLE 24)
CEC CALIFORNIA ELECTRICAL CODE (PART 3 OF TITLE 24)
CEC CALIFORNIA ENERGY COMMISSION
CMC CALIFORNIA MECHANICAL CODE (PART 4 OF TITLE 24)
CPC CALIFORNIA PLUMBING CODE (PART 5 OF TITLE 24)
IFC INTERNATIONAL FIRE CODE
NFPA NATIONAL FIRE PROTECTION ASSOCIATION

SHEET INDEX

VICINITY MAP



PROJECT DATA

PROJECT LOCATION: 1705 E Lincoln Ave, Anaheim, CA
PARCEL NUMBER: 03528122
OCCUPANCY TYPE: Residential
PARCEL SIZE: 0.18 acres
CONSTRUCTION TYPE: V- B
ZONING: RM-3
GENERAL PLAN: Residential-Low
PROPOSED HEIGHT: 14'1"
PROPOSED BUILDING AREA: 695 + 695 = 1,390 SF

PROJECT DESCRIPTION

PROPOSING TWO ATTACHED ACCESSORY DWELLING UNITS
(2 BEDROOMS & 2 BATHROOMS)

ROOF TRUSS DESIGN IS DEFERRED SUBMITTAL

DISCLOSURE STATEMENT

THIS SET OF DRAWINGS IS TO COMMUNICATE TO THE GENERAL CONTRACTOR AND THE INDIVIDUAL SUB-CONTRACTORS THE GENERAL INTENT OF THE DESIGN.

A CONTRACTOR'S BID THAT IS BASED ON THESE DRAWINGS SHALL BE UNDERSTOOD TO INDICATE THAT THE CONTRACTOR UNDERSTANDS THE INTENT OF THE DRAWINGS, FINDS THEM SUFFICIENTLY EXPLICIT FOR THEIR USE IN IMPLEMENTATION OF THE CONSTRUCTION, IS THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS AND ACCEPTS THE REQUIREMENTS FOR FIRST QUALITY MATERIALS, WORKMANSHIP & FINISHES TO SATISFACTION OF THE ARCHITECT.

IT IS THE CONTRACTOR'S RESPONSIBILITY THAT ALL WORK CONFORM WITH EACH AND EVERY APPLICABLE CODE, ORDINANCE AND REGULATION ISSUED BY ANY ENTITY OR GOVERNMENTAL AGENCY HAVING AUTHORITY OR JURISDICTION THEREOF.
THE CONTRACTOR SHALL FILE FOR ANY AND ALL PERMITS AND PAY FOR ANY FEES CONNECTED THEREWITH.

IT IS THE CONTRACTOR, NOT THE ARCHITECT WHO SHALL BE RESPONSIBLE FOR SUPERVISION AND COORDINATION OF ALL PHASES OF THE WORK FROM START TO FINISH. THESE DRAWINGS SHALL NOT BE SCALED FOR ANY REASON. NOTIFY THE ARCHITECT IF ADDITIONAL DIMENSIONS ARE REQUIRED FOR ANY REASON.

RIGHT, TITLE AND INTEREST IN THE DESIGN, THE DRAWINGS AND ANY SPECIFICATIONS. WHETHER OR NOT THE PROJECT IS COMMENCED, EXECUTED OR COMPLETED. DESIGN, DRAWINGS AND SPECIFICATIONS CONTAINED IN THIS SET SHALL NOT BE MADE AVAILABLE TO OR USED BY ANY PERSON OR ENTITY EXCEPT IN FURTHERANCE OF THIS PROJECT WITHOUT PRIOR WRITTEN CONSENT OF PIXEL ARCH LTD.

CODE RELATED NOTES

11) All stairs with 3 or more risers shall have at least one handrail. the handrail shall be between 34 and 38 inches above the nosing of the tread and be continuous the full length of the stairs.

12) Water closets shall be provided in a minimum 30 inch wide space and have a minimum of 24 inches clear in front of the fixture. water closets to be "ultra-low flush" type and provide a maximum flush volume of 1.6 gallons per flush.

13) Shower heads, lavatory and sink faucets shall have a maximum flow rate of 2.5 gallons per minute.

14) Under-floor access shall be given by a minimum 18" x 24" clear opening, typ.

15) Under-floor ventilation shall be provided by openings into the under-floor areas not less than 1-1/2 sq. ft. for each 25 linear ft. of exterior wall. openings shall be located to optimize cross ventilation while respecting structural shear walls.

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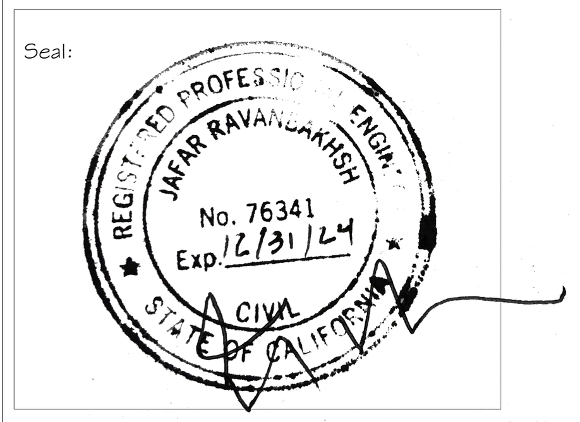
Project Name and Address:
ZOE PRIVATE RESIDENCE
1705 E LINCOLN AVE, ANAHEIM, CA

Seal:



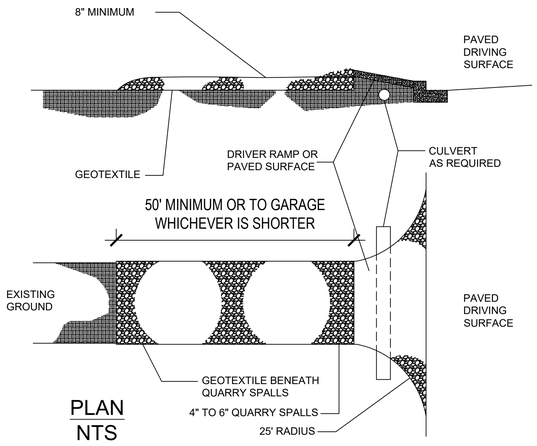
Revision Notes:

Date	Description

Drawing Title:
TITLE SHEET

Scale:
Date: 5/14/2023
Page No. :
A.000

TEMP. CONSTRUCTION ENTRANCE DETAIL



PLAN
NTS

NOTES:

1. PAD SHALL BE REMOVED AND REPLACED WHEN SOIL IS EVIDENT ON THE SURFACE OF THE PAD OR AS DIRECTED BY THE CITY.

2. PAD SHALL BE INSTALLED IN PLANTING STRIP AS APPROPRIATE.

3. PAD THICKNESS SHALL INCREASED IF SOIL CONDITIONS DICTATE OR PER DIRECTION OF THE CITY.

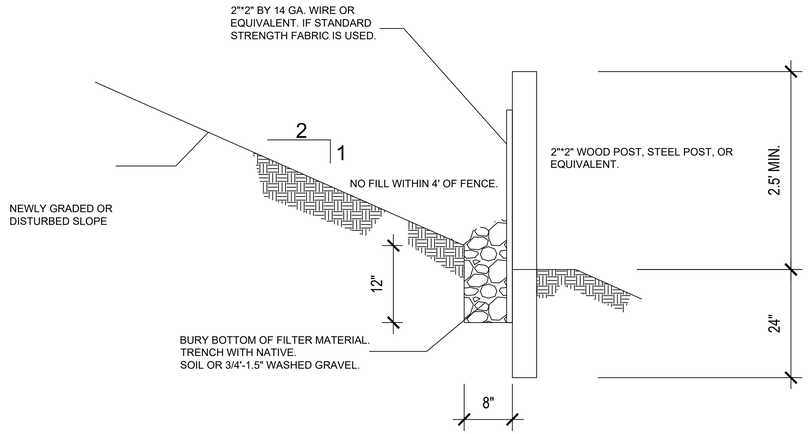
4. MINIMUM DIMENSIONS MAY BE MODIFIED AS REQUIRED BY SITE CONDITIONS UPON APPROVAL OF THE CITY.

IMPERVIOUS SURFACE AREA TABLE

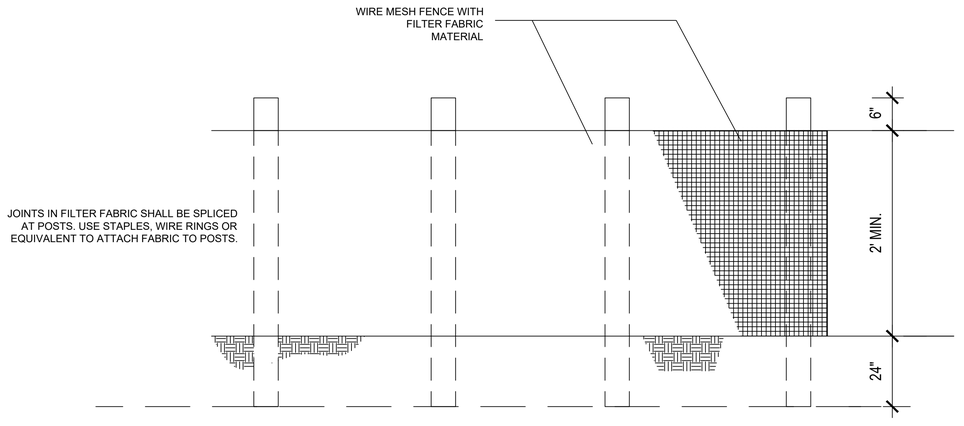
IMPERVIOUS SURFACE AREA (SQUARE FEET)	EXISTING	NEW
MAIN HOUSE	2230 SF	
ADU		1390 SF
DRIVEWAY	562 SF	
CONCRETE WALKWAY	2261 SF	
CONCRETE WALKWAY		541 SF
TOTAL(S)	5053 SF	1931 SF

4.106.2 Storm water drainage and retention during construction. Newly constructed projects which disturb less than one acre of land shall prevent the pollution of storm water runoff from the construction activities by complying with lawfully enacted storm water management and/or erosion control ordinances.

SITE FENCE DETAIL

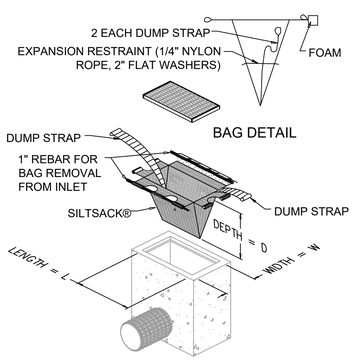


TYPICAL CROSS SECTION
NTS



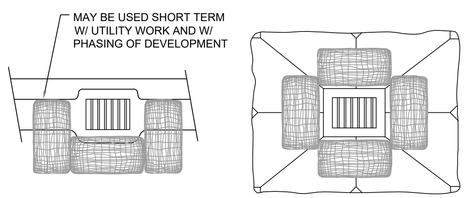
ELEVATION
NTS

NOTES:
1. FENCE SHALL NOT BE INSTALLED ON SLOPES STEPPER THAN 2:1
2. JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 6" AT POST.
3. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO WIRE FENCE.
4. REMOVE SEDIMENT WHEN IT REACHES $\frac{1}{3}$ FENCE HEIGHT.



Regular Flow Only
Do not use High Flow Insert Bags.

FILTER BAG INLET
N.T.S.



CATCH BASIN
N.T.S.

AREA DRAIN
N.T.S.

BIOFILTER BAGS - TEMPORARY
N.T.S.

General Erosion and Sediment Control Notes

1. Control Measures shall be installed before any earth disturbing activities commence.
2. The Owner/Contractor shall notify the City inspector once all initial control measures have been installed for an initial inspection at least Forty Eight (48) hours prior to the inspection. Construction activity cannot begin until a passing initial inspection has occurred.
3. Storm water discharges from construction activities shall not cause, have the reasonable potential to cause, or measurably contribute to exceed any water quality standard.
4. Construction shall be phased in a manner to limit earth disturbing activities (i.e. the entire project site should not be disturbed if construction will only be occurring in one particular section).
5. Sediment caused by accelerated soil erosion shall be removed from runoff water before it leaves the construction site.
6. Bulk storage structures for petroleum products and any other chemicals shall have secondary containment or equivalent protection to contain all spills and prevent any spilled material from entering the MS4 or State waters.
7. A copy of the SWMP and Erosion and Sediment Control (ESC) Plans must be available at all times on the construction site.
8. The SWMP and EC plan shall be continuously updated to reflect new or revised Control Measures (CM) due to changes in design, construction, operation, or maintenance of the construction site. Updates must be made within 72-hours following the change in Control Measures.
9. The Owner/Contractor shall inspect the construction site (including all Control Measures, storage containers, and construction equipment) at a minimum of every 7 calendar days or every 14 calendar days. If on the 14 day frequency a 24-hour post storm inspection must be conducted after a precipitation event or snow melt. Inspections shall continue until an Inactivation Notice is filed .
10. The Owner/Contractor shall keep a record of all inspections on site and available for review by City staff. Inspection reports must identify any incidents of non-compliance with the terms and conditions of the Permit.
11. Control Measures requiring maintenance or adjustment shall be repaired immediately after observation of the failing Control Measure.
12. Silt fence patching: patching is only allowed on the top half of the fence. Not more than two (2) patches per section of fence. Silt fence with holes or deterioration on the lower half of the fence must be replaced. Repair typically involves replacing the silt fence to maintain the CMs effectiveness to drain slowly and function as originally designed.
13. For all instances of noncompliance based on environmental hazards and chemical spills and releases, all needed information must be provided orally to CDPHE spill reporting line (24-hour number for environmental hazards and chemical spills and releases: 1-877-518-5608) within 24-hours from the time the Owner/Contractor becomes aware of the circumstances.
14. Straw bales shall not be used for primary erosion or sediment control (i.e. straw bales may be used for reinforcement behind another BMP such as silt fence).
15. Control measures referred to as “Cutback Curb” are not allowed. The cutback curb may become ineffective and may also compromise the integrity of the curb and in most cases does not provide any water quality benefit for filtering out sediment.
16. Inlet Protection and Vegetative Buffer Control Measures shall not be used as standalone CMs. These methods must be utilized with at least one additional CM.
17. Control Measures intended for sheet flow sediment runoff shall be placed parallel to the slope.
18. All Control Measures shall be cleaned when sediment levels accumulate to half the design of the CM unless otherwise specified.
19. A Vehicle Tracking Control (VTC) shall be placed at all entrances/exits from the site as well as any egress from exposed dirt to paved areas to prevent track-out onto streets. If track-out does occur, the Owner/Contractor shall immediately sweep the street of debris. Recycled crushed concrete or asphalt shall not be used for vehicle tracking pads.
20. For residential projects, back of curb protection is required along all interior lots.
21. All sediment collected in Control Measures shall be removed upon initial acceptance.
22. Wind Erosion and Dust Control Measures must be utilized to minimize airborne particulate dust. Control Measures may include minimizing disturbed areas, watering, and/or providing temporary stabilization.
23. Permanent erosion control measures for slopes, channels, ditches, or any disturbed land area shall be completed within 14 calendar days after final grading or the final earth disturbance has been completed. When it is not possible to permanently stabilize a disturbed area after an earth disturbance has been completed or where significant earth disturbance activity ceases, temporary soil erosion control measures shall be implemented within 14 calendar days. Temporary erosion control measures shall be maintained until permanent soil erosion measures are implemented.
24. Final stabilization has been achieved when all earth disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed.
25. All temporary Control Measures shall be removed from the site upon submitting the Inactivation Notice.

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1705 E LINCOLN AVE, ANAHEIM, CA

Seal:
REGISTERED PROFESSIONAL ENGINEER JAFAR RAVANBAKHSH No. 76341 Exp 12/31/24 CIVIL STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
Erosion and Sediment Control

Scale:
03/05/2023

Date:

Page No. :
C.001

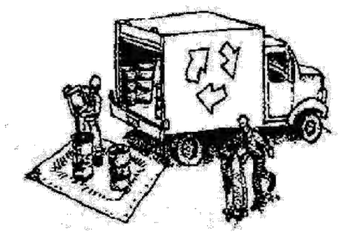
Water Pollution Prevention Program

Clean Water. Healthy Community.

Construction Best Management Practices (BMPs)

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

Hazardous Materials

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.

Construction Entrances and Perimeter

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

Equipment Management & Spill Control

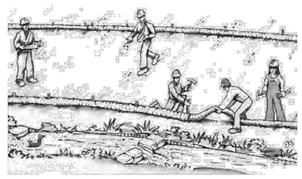
Maintenance and Parking

- ❑ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Earthmoving

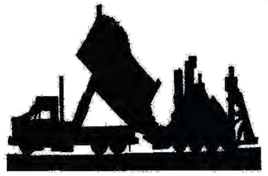


- ❑ Schedule grading and excavation work during dry weather.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Remove existing vegetation only when absolutely necessary, and seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.
- ❑ Prevent sediment from migrating offsite and protect storm drain inlets, gutters, ditches, and drainage courses by installing and maintaining appropriate BMPs, such as fiber rolls, silt fences, sediment basins, gravel bags, berms, etc.
- ❑ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

Contaminated Soils

- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells
  - Buried barrels, debris, or trash.

Paving/Asphalt Work



- ❑ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

Sawcutting & Asphalt/Concrete Removal

- ❑ Protect nearby storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, abosorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

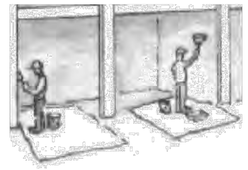
Concrete, Grout & Mortar Application

- ❑ Store concrete, grout, and mortar away from storm drains or waterways, and on pallets under cover to protect them from rain, runoff, and wind.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and in a manner that will prevent leaching into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ When washing exposed aggregate, prevent washwater from entering storm drains. Block any inlets and vacuum gutters, hose washwater onto dirt areas, or drain onto a bermed surface to be pumped and disposed of properly.

Landscaping

- ❑ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ❑ Stack bagged material on pallets and under cover.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

Painting & Paint Removal



Painting Cleanup and Removal

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

Dewatering

- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

Storm drain polluters may be liable for fines of up to $10,000 per day!

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1705 E LINCOLN AVE, ANAHEIM, CA

Seal:

Revision Notes:

Date	Description

Drawing Title:

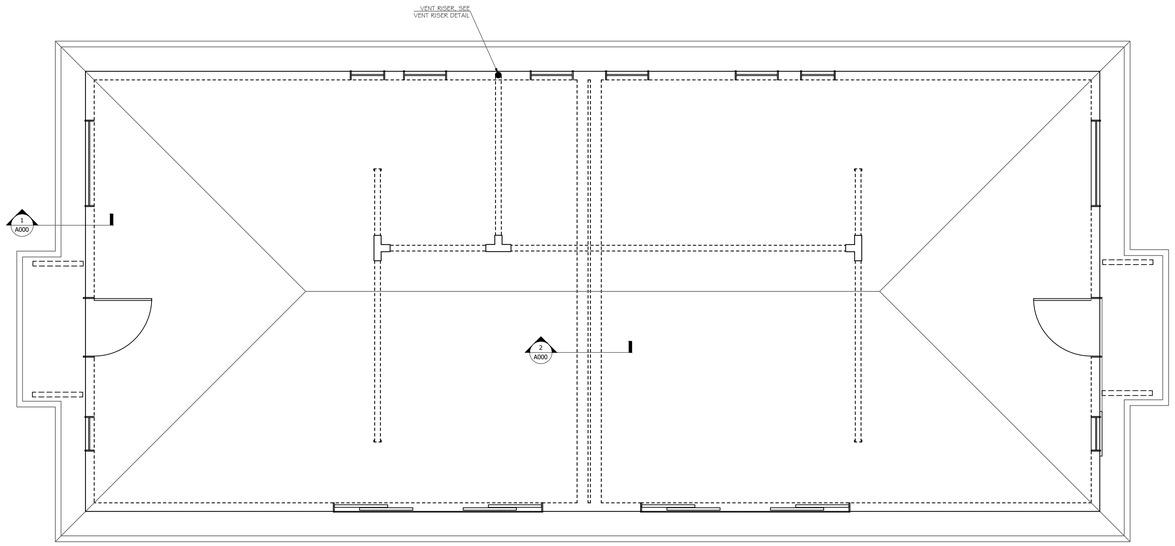
BMP
(BEST MANAGEMENT PRACTICES

Scale: -

Date: 5/14/2023

Page No. :

C.002

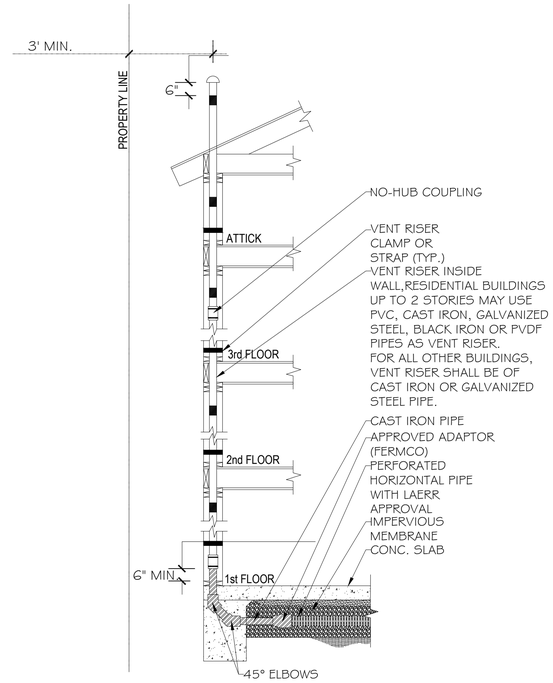


Proposed below slab Methane Mitigation Plan

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

NORTH

BASED ON CITY MAPS, THIS PROJECT IS LOCATED WITHIN THE METHANE ZONE/METHANE BUFFER ZONE. IT SHALL COMPLY WITH MINIMUM METHANE MITIGATION REQUIREMENTS OF CHAPTER 71, TABLE 71 AND SECTION 91.7103.
PRIOR TO BUILDING PERMIT ISSUANCE, CLEARANCE FROM THE LOS ANGELES FIRE DEPARTMENT IS REQUIRED FOR THE GAS DETECTION AND MECHANICAL VENTILATION SYSTEMS. 91.7106



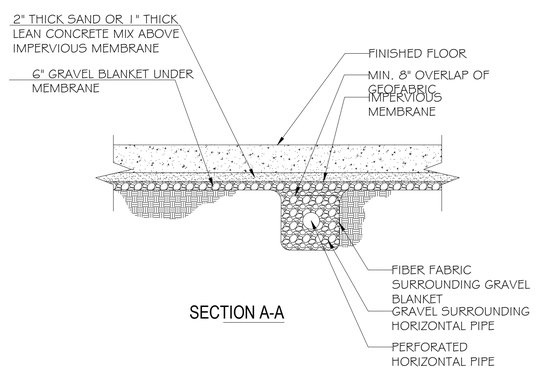
VENT RISER

NOTES:
1. TERMINATION OF PASSIVE VENT RISER SHALL BE AS FOLLOWS (LAMC 94.906.0):
   a. 10" MIN. AWAY FROM, OR AT LEAST 3' ABOVE ANY OPENABLE WINDOW, DOOR, OPENING OR AIR INTAKE, OR VENT SHAFT.
   b. 3' MIN. IN EVERY DIRECTION FROM ANY LOT LINE, ALLEY, AND STREET.
   c. EXTEND THROUGH THE VENT FLASHING, 6" MIN. ABOVE THE ROOF, AND 1' MIN. FROM ANY PARAPET OR BUILDING WALL.
2. WRAP ALL PIPING WITH APPROVED MATERIAL THROUGH CONCRETE SLAB OR FLOOR.
3. SUPPORT ALL PIPING PER TABLE 3-2 OF LOS ANGELES PLUMBING CODE.
4. THE PIPING OF THE VENTING SYSTEM SHALL BE TESTED WITH AIR IN ACCORDANCE WITH SECTION 94.712.3 OF THE LOS ANGELES PLUMBING CODE.

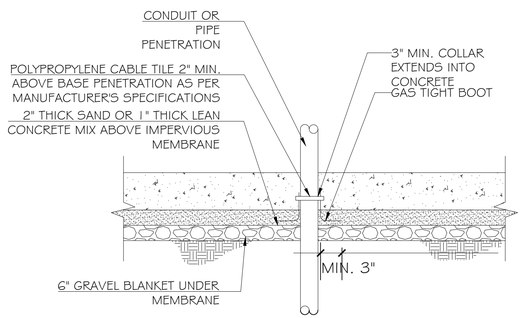
MINIMUM CONDITIONS OF APPROVAL FOR ALL CASES WHEN MITIGATION IS REQUIRED

NOTE:
CONDITION OF APPROVAL FOR THE ***RFM*** SHALL BE AS FOLLOWS:
1. INSTALL A 6 MIL. VISQUENE SHEET INSTALLED BELOW THE FLOOR SLAB.
2. INSTALL A 2" THICK GRAVEL LAYER BELOW THE VISQUENE.
3. INSTALL TWO 2" DIAMETER VENT RISERS IN EXTERIOR WALLS LOCATED AS FAR APART AS POSSIBLE.
4. INSTALL ONE 4" DIAMETER PERFORATED HORIZONTAL VENT PIPE BELOW THE VISQUENE TO CONNECT THE TWO VENT RISERS.

THESE COMPONENTS SHALL BE CONSTRUCTED USING THE DETAILS SHOWN IN THE LADBS INFORMATION BULLETIN P-B/C 2017-102 TITLED: "METHANE HAZARD MITIGATION STANDARD PLAN, SIMPLIFIED METHOD FOR SMALL ADDITIONS"



SECTION A-A



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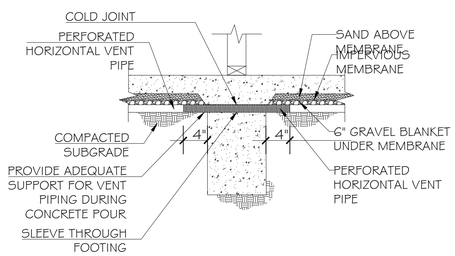

SECTION 2

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Seal:

Revision Notes:

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Drawing Title:

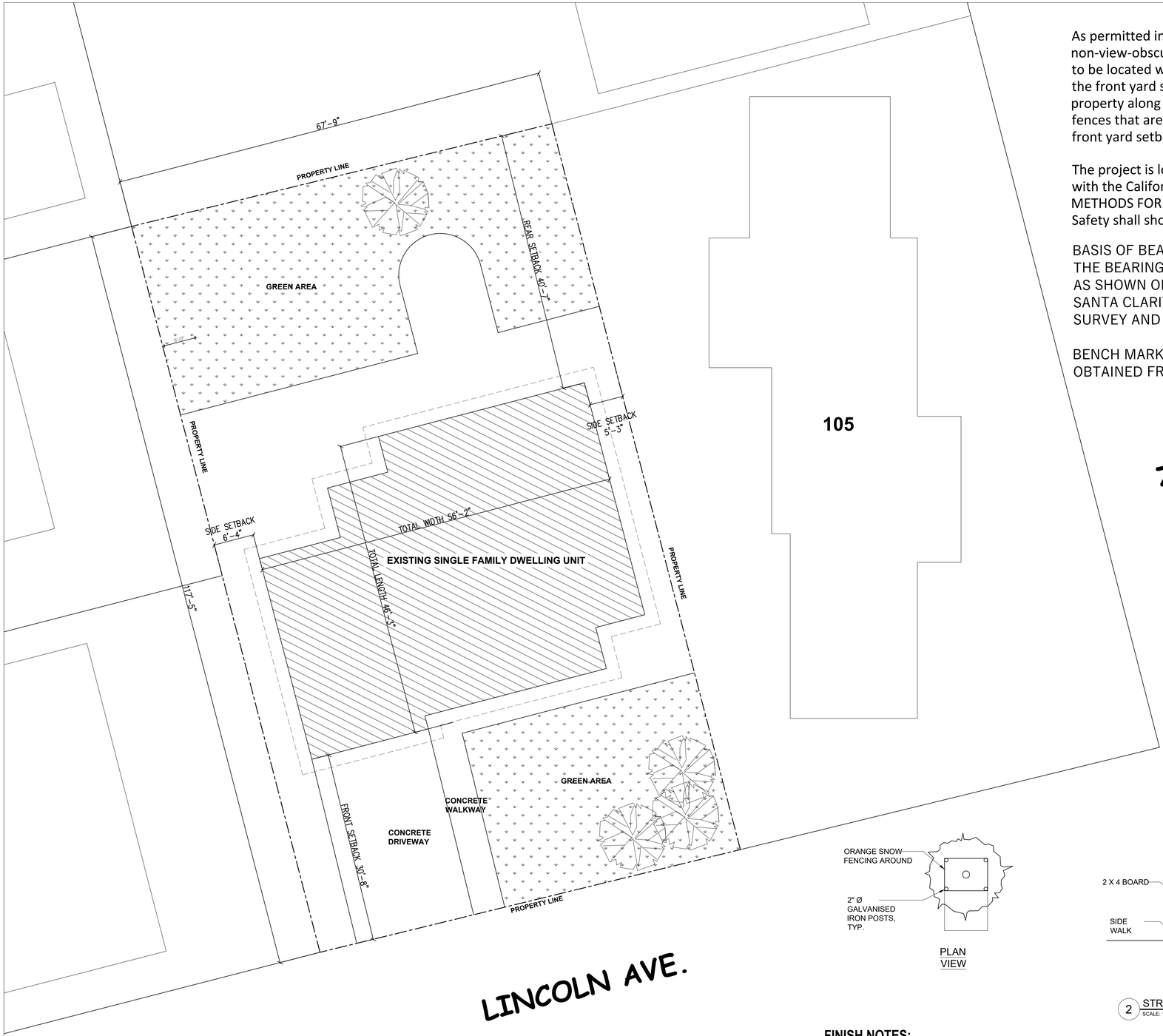
PROPOSED METHANE HAZARD MITIGATION PLAN

Scale:

Date: 6/1/2023

Page No. :

C.003



EXISTING SITE PLAN

SCALE: 1/8" = 1'-0"

NORTH

As permitted in the Sand Canyon Special Standards District (Section 17.39.03 ofthe UDC), non-view-obscuring fences, not to exceed five feet in height, shall be permitted to be located within the front yard setback. Where a non-view-obscuring fence is constructed within the front yard setback, and is five feet in height, the applicant shall landscape the frontage of their property along the property line that abuts the adjacent right of-way. View-obscuring walls or fences that are higher than three feet six inches shall not be permitted to be located within the front yard setback.

The project is located within the City's Fire Hazard Zone. New buildings shall comply with the California Building Code Chapter 7A: MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE. The submitted plans to Building Safety shall show all Fire Zone requirements.

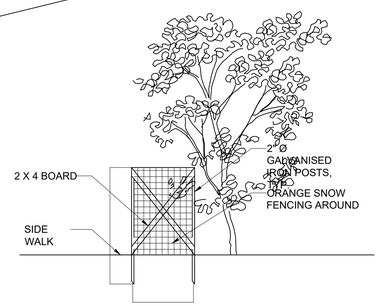
BASIS OF BEARINGS:
THE BEARING OF NORTH 00° 07' 21" EAST ALONG THE EASTERLY LINE OF TRACT NO. 6310, AS SHOWN ON THE MAP OF SAID TRACT FILED IN BOOK 439 OF MAPS AT PAGES 24-26, SANTA CLARITA COUNTY RECORDS, WAS TAKEN AS THE BASIS OF BEARINGS FOR THIS SURVEY AND WAS ESTABLISHED BETWEEN FOUND MONUMENTS.

BENCH MARK: SET MAG NAIL FLUSH IN AC CURB WITH ASSUMED ELEVATION OF 608.00 AS OBTAINED FROM GOOGLE EARTH.

SITE LEGEND

- WOOD FENCE
- TREES
- SHRUBS
- CONCRETE WALL

PLAN VIEW



2 STREET TREE PROTECTIVE FENCE
SCALE: 1/4" = 1'-0"

FINISH NOTES:

RENDERINGS ARE NOT TO SCALE; ALL RENDERINGS ARE FOR ARTISTIC DEPICTION ONLY. PLAN UPDATES MAY NOT BE REFLECTED IN RENDERINGS. RENDERINGS SHALL NOT BE USED FOR CONSTRUCTION.

BASE BOARDS SHALL BE 6" IN ALL ROOMS, UNO.
FINAL FINISHES SHALL BE CONFIRMED WITH THE HOME OWNER PRIOR TO APPLICATION.

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Seal:
JAFAR RAVANMANESH
No. 76341
Exp. 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
EXISTING SITE PLAN

Scale: 1/8" = 1'-0"

Date: 5/14/2023

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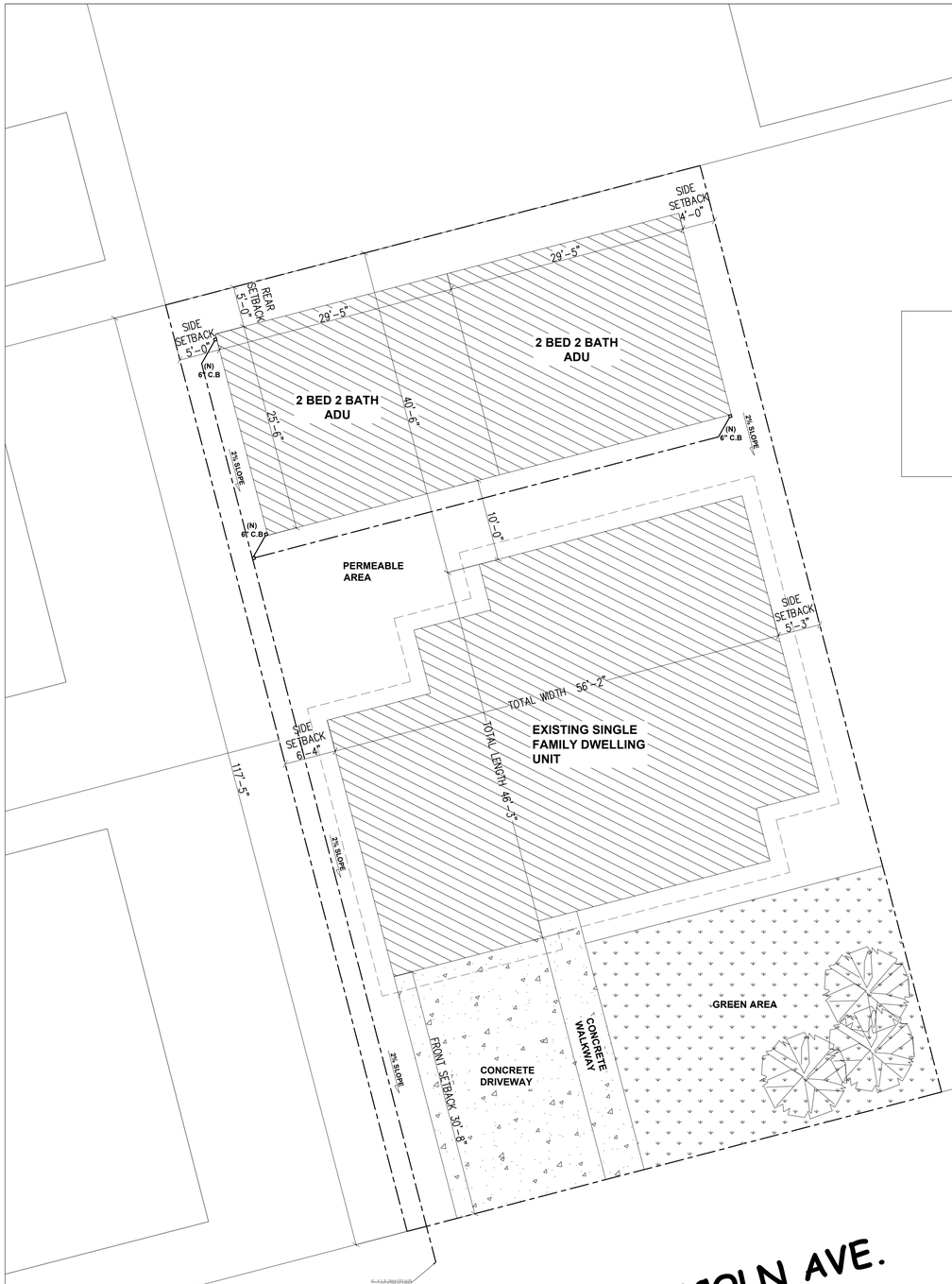
A.101



PROPOSED SITE PLAN

SCALE: 1/8" = 1'-0"

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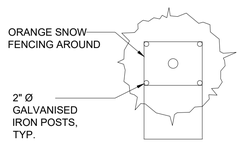
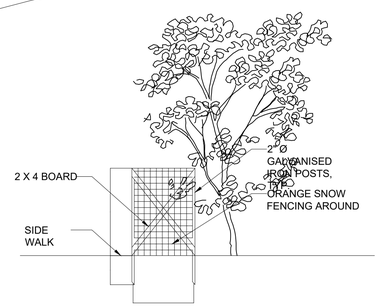
SITE LEGEND

- WOOD FENCE
- TREES
- SHRUBS
- CONCRETE WALL



PLAN VIEW



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STATE OF CALIFORNIA

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Date	Description

Drawing Title:
PROPOSED SITE PLAN

Scale: 1/8" = 1'-0"

Date: 5/14/2023

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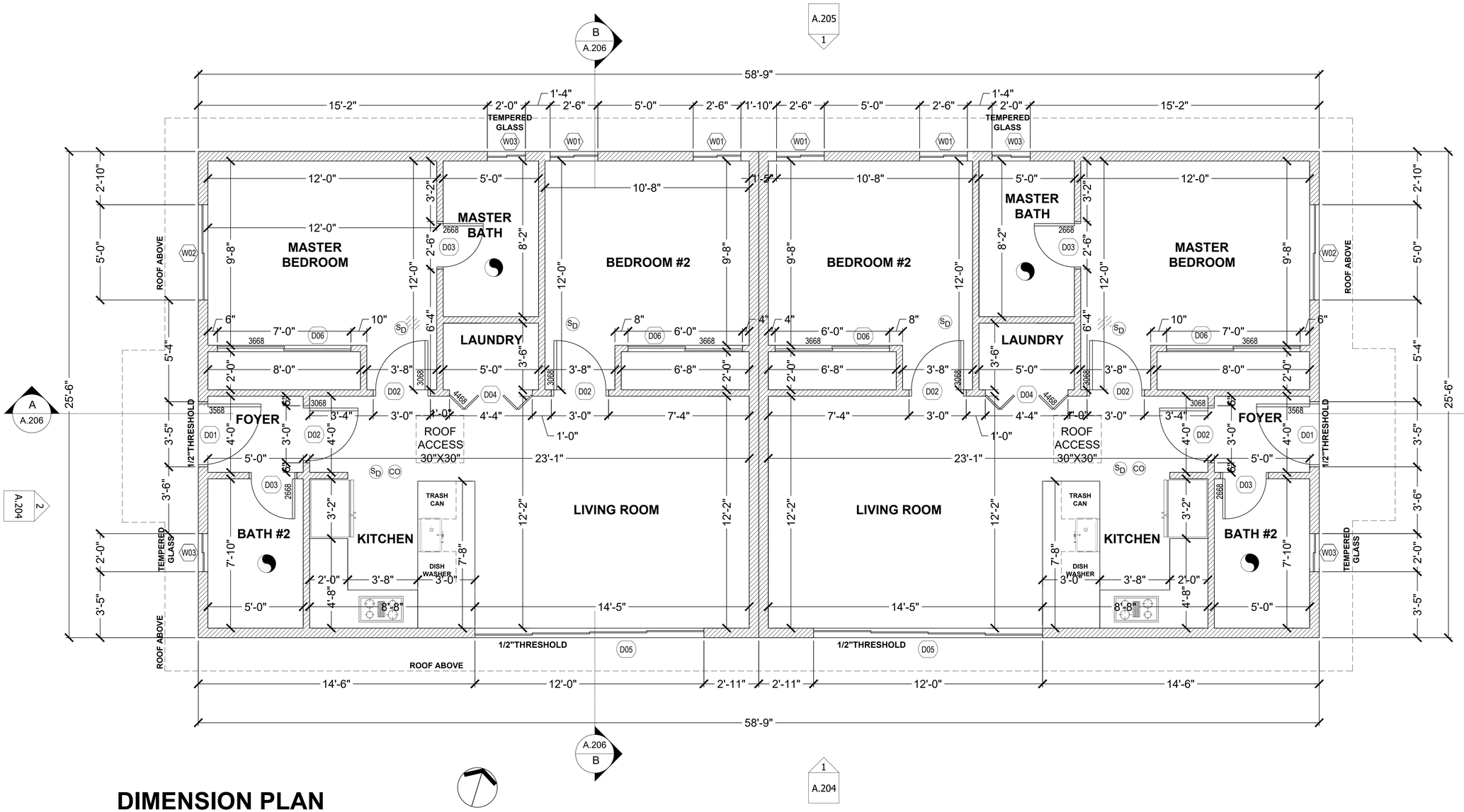

DIMENSION PLAN

SCALE: 3/8" = 1'-0"

NORTH

SYMBOLS

- BATHROOM FAN (MAY INCLUDE LIGHT UNIT).
- (SD) SMOKE DETECTOR - HARD WIRED TO ELECTRICAL SYSTEM W/BATTERY BACKUP PROVIDED IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE, SECTION R314.
- (CO) COMBINATION SMOKE & CARBON MONOXIDE DETECTOR, HARD WIRED TO ELECTRICAL SYSTEM W/BATTERY BACKUP PROVIDED IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE, SECTION R315.

GENERAL RENOVATION NOTES:

1- CONTRACTORS TO VERIFY ALL EXISTING CONDITIONS PRIOR TO BIDDING AND CONSTRUCTION.
2- ALL NEW INTERIOR WALLS TO BE 2x4 STUDS (3 1/2") fa 16" O.C. W/ In" GYP. BRD. - USE MOISTURE RESISTANT GYP. BRD. e PLUMBING FIXTURES.
3- ALL AREAS DISTURBED BY CONSTRUCTION WHICH ARE TO REMAIN UNTOUCHED ARE TO BE RETURNED TO ORIGINAL CONDITION.
4- STRUCTURAL HEADERS & BEAMS (2) 2x10's (MIN) & POSTS 2-STUD (MIN) S.Y.P. #2 (UNLESS NOTED OTHERWISE)

FINISH NOTES:

1 - NEW CEILING TO BE 1/2" GYP. BRD.
2 - ALL GYP. BRD. TO BE PAINTED.
3 - FLOORING TO BE INSTALLED IN FINISH AREAS (PER OWNER)
4 - ALL FINISH SELECTIONS PER OWNER

SAFETY GLASS TO BE USED WITHIN 3' OF DOOR
ENTRY LOCKS, AT ENTRANCE DOORS AND SIDE LIGHTS
NEAR BATHTUBS AND JACUZZIS
ALL SOFFITS LESS THAN 3.94 ft FROM PROPERTY LINES
TO BE NON-VENTED SOLID MATERIAL CONSTRUCTION

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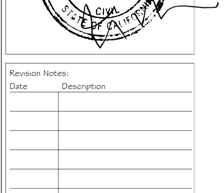


Revision Notes:

Date	Description

Drawing Title:

DIMENSION PLAN

Scale: 3/8" = 1'-0"

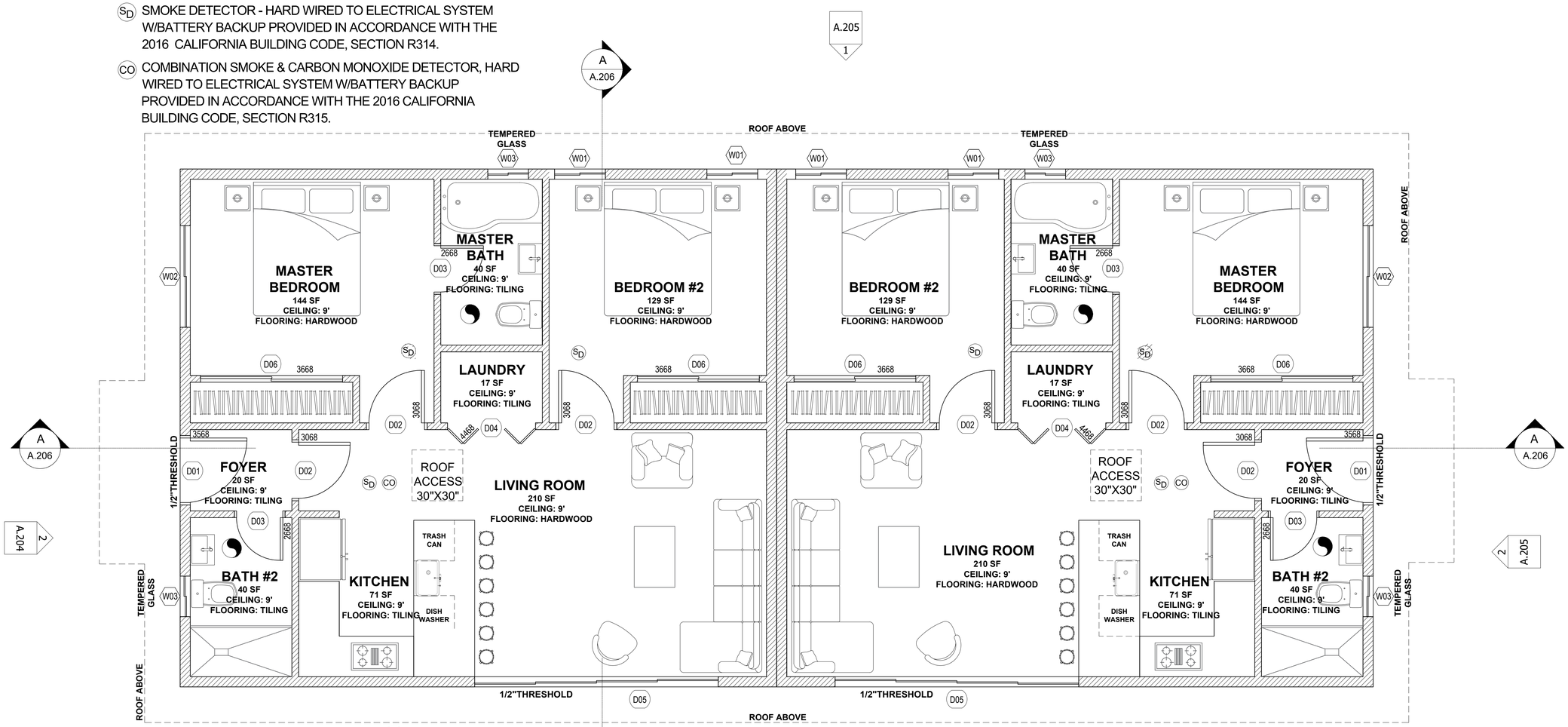
Date: 5/14/2023

Page No. :

A.201

SYMBOLS

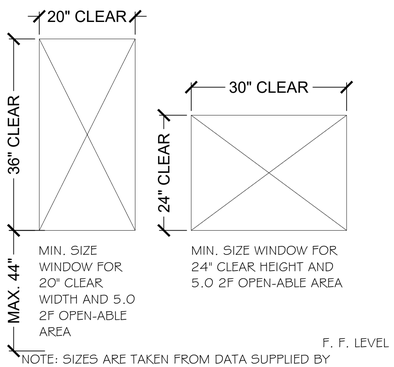
- BATHROOM FAN (MAY INCLUDE LIGHT UNIT).
- SD SMOKE DETECTOR - HARD WIRED TO ELECTRICAL SYSTEM W/BATTERY BACKUP PROVIDED IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE, SECTION R314.
- CO COMBINATION SMOKE & CARBON MONOXIDE DETECTOR, HARD WIRED TO ELECTRICAL SYSTEM W/BATTERY BACKUP PROVIDED IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE, SECTION R315.



FURNITURE PLAN

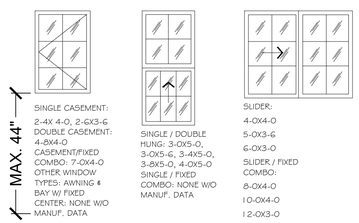
SCALE: 3/8" = 1'-0"

NORTH



NOTE: SIZES ARE TAKEN FROM DATA SUPPLIED BY WINDOW MANUFACTURES. HOWEVER, THESE ARE GENERAL DIMENSIONS AND MUST BE VERIFIED WITH ACTUAL WINDOWS INSTALLED TO MEET MIN. EGRESS REQUIREMENTS.

EMERGENCY ESCAPE / RESCUE OPENING (R310)



SECTION 1026 OF THE 2019 INTERNATIONAL BUILDING CODE /SECTION 310 OF THE 2019 INTERNATIONAL RESIDENTIAL CODE

BASEMENTS IN A DWELLING UNIT AND EVERY SLEEPING ROOM BELOW THE FOURTH STORY (INCLUDES ROOMS WHICH COULD BE USED FOR SLEEPING SUCH AS DENS, SEWING ROOMS, STUDY, ETC.) MUST HAVE A LEAST ONE OPERABLE WINDOW OR DOOR APPROVED FOR EMERGENCY ESCAPE OR RESCUE WHICH SHALL OPEN DIRECTLY INTO A PUBLIC STREET, PUBLIC ALLEY, YARD, OR EXIT COURT. THE UNITS MUST BE OPERABLE FROM THE INSIDE TO PROVIDE A FULL CLEAR OPENING WITHOUT THE USE OF SEPARATE TOOLS.

FOR FULL EGRESS, ESCAPE OR RESCUE WINDOWS ARE REQUIRED TO HAVE A MINIMUM NET CLEAR OPEN-ABLE AREA OF 5.7 SQ. FT. (820.8 SQ IN). EXCEPTION: MAY BE REDUCED TO 5.0 SF (720 SQ IN) IF 44" OR LESS FROM EXTERIOR GROUND LEVEL TO SILL. THE MINIMUM NET CLEAR OPEN-ABLE HEIGHT DIMENSION MUST BE 24 INCHES. THE MINIMUM NET CLEAR OPEN-ABLE WIDTH DIMENSION MUST BE 20 INCHES. THEY MUST ALSO HAVE A FINISHED SILL HEIGHT (CLEAR OPENING) OF NOT MORE THAN 44 INCHES ABOVE THE FLOOR. IN ORDER TO MEET THE REQUIRED NET-CLEAR OPEN AREA SQUARE-FOOT OPENING, EITHER THE WIDTH OR HEIGHT OR BOTH MUST EXCEED THE MINIMUM DIMENSIONS THEREOF.
WHEN REPLACING EXISTING NONCONFORMING WINDOWS REQUIRED FOR EMERGENCY ESCAPE AND RESCUE THE REPLACEMENT WINDOWS MUST MEET THE FOLLOWING:

EMERGENCY ESCAPE AND RESCUE REPLACEMENT WINDOW OPENINGS SHALL HAVE A MINIMUM NET CLEAR OPENING OF 4 SQ. FT.; MINIMUM NET CLEAR OPENING HEIGHT OF 22 INCHES; MINIMUM NET CLEAR OPENING WIDTH OF 20 INCHES. MINIMUM SILL HEIGHT OF NOT MORE THAN 48 INCHES ABOVE THE FLOOR OR THE INSTALLATION OF ONE OR MORE PERMANENTLY AFFIXED STEPS EXTENDING THE FULL WIDTH OF THE WINDOW OPENING, CONSTRUCTED TO THE CURRENT ADOPTED IRC RISE AND RUN DIMENSIONAL REQUIREMENTS, SO THAT THE TOP STEP IS NO GREATER THAN 44 INCHES TO THE TOP OF THE SILL WHERE THE EXISTING ROUGH OPENING DOES NOT ALLOW FOR REPLACEMENT WINDOW DIMENSIONAL REQUIREMENTS THE ROUGH OPENING SHALL BE ENLARGED AND THE REPLACEMENT WINDOW SHALL MEET THE FULL EMERGENCY ESCAPE AND RESCUE OPENINGS PER IRC SECTION R310.1 THROUGH R310.5 OR IBC SECTION 1026 AS APPLICABLE FOR SCOPE OF PROJECT.

ADDITIONAL GLAZING REQUIREMENTS:

FOR MINIMUM LIGHT, ALL SLEEPING ROOMS AND OTHER HABITABLE ROOMS REQUIRE GLAZING EQUAL TO AT LEAST 8% OF THE FLOOR AREA OF THE ROOM; MINIMUM VENTILATION OF 4% OF THE FLOOR AREA. SEE THE INTERNATIONAL BUILDING OR RESIDENTIAL CODES AS APPLICABLE FOR EXCEPTIONS AND A COMPLETE LIST OF LIGHT AND VENTILATION REQUIREMENTS.

SAFETY GLAZING IS REQUIRED IN DOORS, STORM DOORS, RAILINGS, WITHIN 24 INCHES OF A DOOR, OR WHEN PANES ARE OVER 9 SQUARE FEET AND WITHIN 18 INCHES OF THE FLOOR. SEE THE INTERNATIONAL BUILDING OR RESIDENTIAL CODES FOR EXCEPTIONS AND A COMPLETE LIST OF SAFETY GLAZING REQUIREMENTS.

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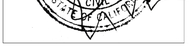


Revision Notes:

Date	Description

Drawing Title:

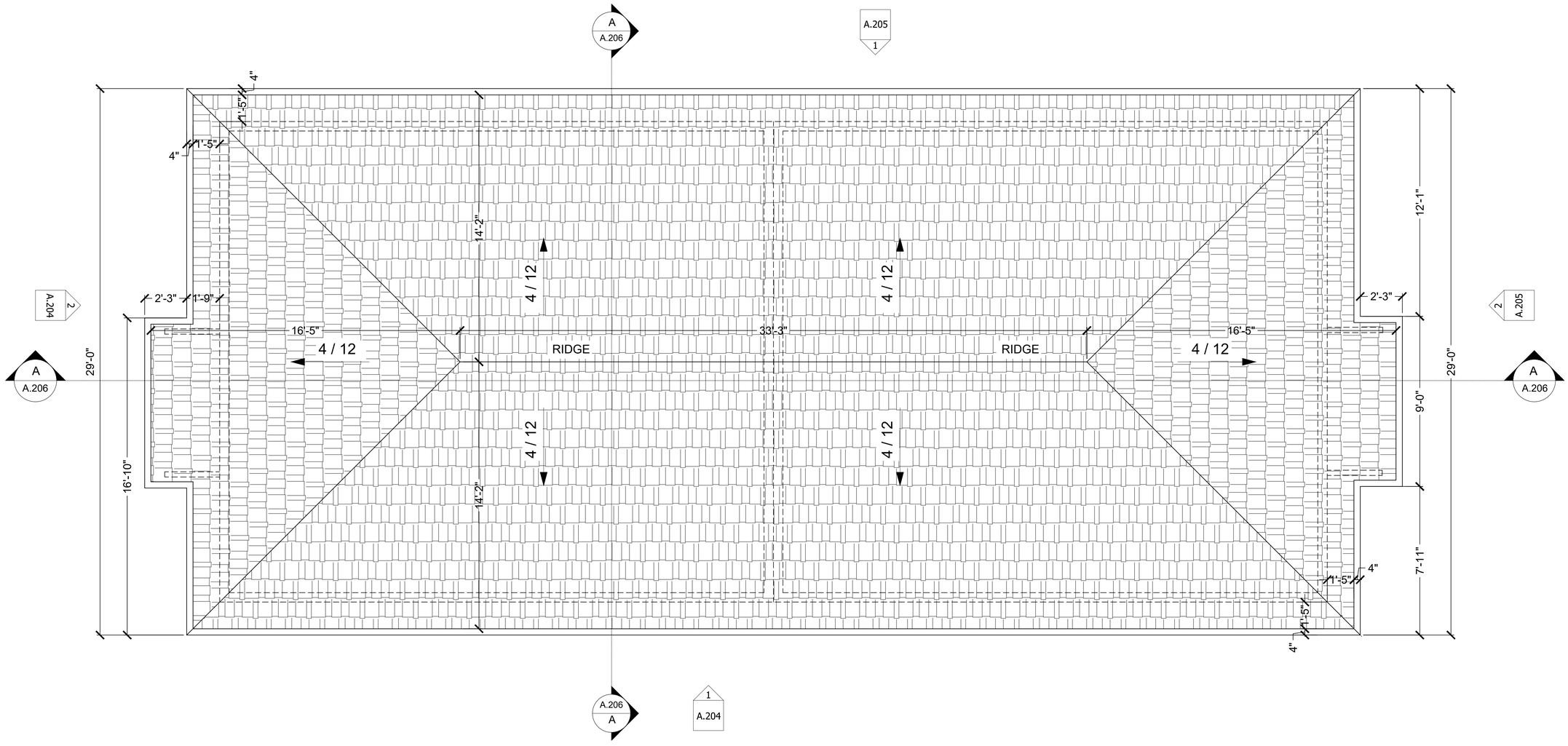
FURNITURE PLAN

Scale: 3/8" = 1'-0"

Date: 5/14/2023

Page No. :

A.202



ROOF PLAN

SCALE: 3/8" = 1'-0"

NORTH

THE MINIMUM ROOF PITCH IS 2:12. ROOF PLANS SHALL BE REVISED TO CLEARLY SHOW A MINIMUM 2:12 ROOF PITCH.

ROOF AREA VENTILATION NOTE:

CONTRACTOR TO PROVIDE NEW ROOF AREA VENTILATION .NOTE:

1. 50% OF VENTILATION MUST BE IN UPPER 1/3 OF ATTIC SPACE - USE ROOF MOUNTED GSM DORMER VENTS.
2. CONTRACTOR SHALL SUPPLY ALL VENTILATION AMOUNTS ABOVE AS A MINIMUM -EAVE VENTING SHALL BE (3) 2" DIA HOLES PER ROOF BAY (9 SQ IN PER BAY).
3. UPPER ATTIC VENTING SHALL BE ROOF MOUNTED GSM DORMER VENTS (150 SQ IN PER VENT).
4. ALL VENTS SHALL BE COVERED WITH CORROSION RESISTANT WIRE MESH WITH MAXIMUM OPENING OF 1/4" IN DIMENSION.
5. VAULTED CEILINGS SHALL HAVE A MINIMUM 1" AIR SPACE BETWEEN INSULATION AND ROOF SHEATHING.

ROOF AREA: 1,498 SF

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REGISTERED PROFESSIONAL ENGINEER
JAFAR RAVANBAKHSH
No. 76341
EXP. 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:

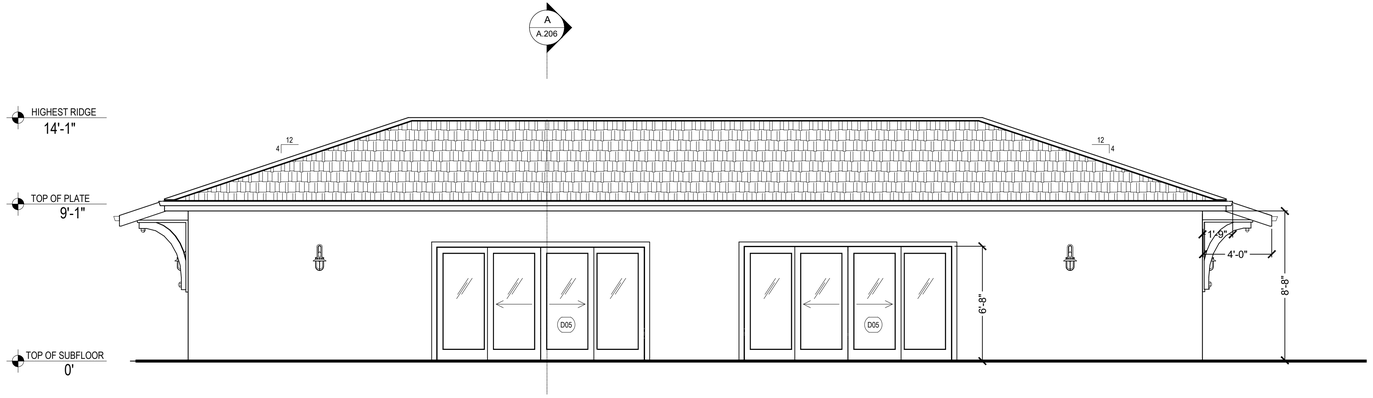
ROOF PLAN

Scale: 3/8" = 1'-0"

Date: 5/14/2023

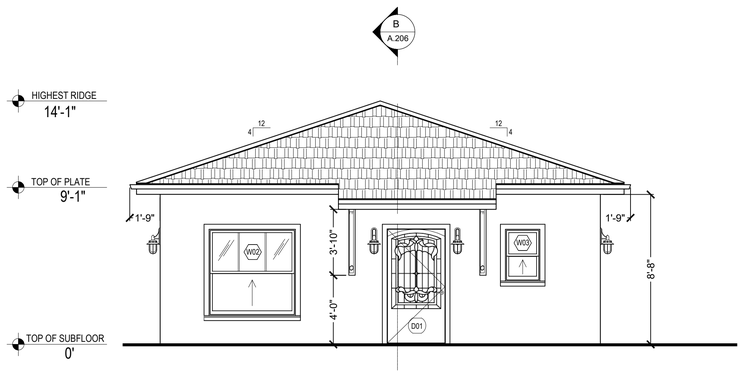
Page No. :

A.203



SOUTH ELEVATION

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



WEST ELEVATION

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

NOTES:

1. ATTICS; ACCESS PER CRC R807, DRAFTSTOPS PER CRC R302.10 & R502.12 AND VENTILATION PER R806 & R408.1.
2. WHERE EMERGENCY ESCAPE AND RESCUE OPENINGS ARE PROVIDED, THEY SHALL HAVE THE BOTTOM OF THE CLEAR OPENING NOT GREATER THAN 44" MEASURED FROM THE FLOOR.
3. PER CRC 310.1.
4. GLAZING IN ENCLOSURES FOR OR WALLS FACING HOT TUBS, WHIRLPOOLS, SAUNAS, STEAM ROOMS, BATHTUBS AND SHOWERS WHERE THE BOTTOM EXPOSED EDGE IS LESS THAN 60" MEASURED VERTICALLY ABOVE A STANDING OR WALKING SURFACE. PER CRC R308, R303.1 7 R301.2.1.2.
5. FACTORY-BUILT FIREPLACES AND CHIMNEYS PER CRC R1004, R1005, R1006, A.Q.M.D. RULE 445, AND CAL-GREEN SECTION 4.503.1.
6. COMBUSTION AIR TO FORCED AIR UNIT PER CMC CHAPTER 7.
7. COMBUSTION AIR TO WATER HEATER PER CPC SECTION 507.0.
8. ENVIRONMENTAL AIR DUCTS PER CMC SECTION 504.
9. MECHANICAL EQUIPMENT LOCATION AND PROTECTION AGAINST DAMAGE PER CMC 307.
10. PER THE BUILD IT GREEN PROGRAM'S "GREENPOINT RATING CHECKLIST" SECTION P(D)2, MOISTURE MATERIALS SHALL BE USED IN WET AREAS (i.e. KITCHEN, BATHROOM, UTILITY ROOMS, ETC.)EXTERIOR DOOR LANDING SHALL BE A MAX. OF 7-$\frac{3}{4}$" BELOW DOOR THRESHOLD PER CRC R311.3.2.
11. GRADE NEEDS TO FALL 6" WITHIN THE FIRST 10'
12. CONCRETE SLAB THICKNESS FOR PORCH AND PATIO SLAB SHALL BE 3 $\frac{1}{2}$" MIN. REQUIRED PER R506.1

EXTERIOR ELEVATION NOTES:

1. NOTES AND SYMBOLS ARE TO APPLY AT ALL AREAS OF SIMILAR GRAPHIC REPRESENTATION. SUCH INDICATIONS MAY BE LIMITED TO PROMOTE CLARITY OR AVOID REDUNDANCY.
2. SLOPE FINISH GRADE 2% MINIMUM AWAY FROM BUILDING FOR 5'-0" MINIMUM, DIRECT DRAINAGE AWAY FROM BUILDING WALLS TO ELIMINATE PONDING.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR GRILLES, REGISTERS, HORNS, SPEAKERS, PANELS, PULL STATIONS AND OTHER FEATURES NOT OTHERWISE SHOWN
4. FLASH AND SEAL ALL PENETRATIONS THROUGH EXTERIOR ROOFS AND WALLS, AND FLOORS WEATHER TIGHT AND WATERPROOF. PACK ALL PENETRATIONS THROUGH THE BUILDING INSULATION ENVELOPE WITH INSULATION.
5. FLASH ALL WINDOWS, DOORS, LOUVERS, ACCESS PANELS AND SIMILAR WALL OPENINGS PER DETAILS ON SHEET A500.
6. FIREBLOCKING, CBC 717.2.: PROVIDE MATERIALS COMPLYING WITH CBC 717.2.1 AT CONCEALED SPACES, FURRED SPACES, CEILING/FLOOR LEVELS AND 10'-0" INTERVALS ALONG LENGTH OF WALL, SOFFITS, DROP CEILINGS, AND COVE CEILINGS, CONCEALED PLACES BETWEEN STAIR STRINGERS & BETWEEN STUDS IN LINE WITH STAIR RUN, AND ALL LOCATIONS LISTED IN CBC 717.2.2 THROUGH 717.2.7.
7. FLOOR/CEILING DRAFTSTOPPING, CBC 717.3: PROVIDE MATERIALS COMPLYING WITH CBC 717.3.1. AT FLOOR/CEILING ASSEMBLIES AS REQUIRED BY CBC 717.3.2 THROUGH 717.3.3. -GROUP R-1, R-2, R-3, R-4

EXCEPTION: DRAFTSTOPPING NOT REQUIRED IN BUILDINGS SPRINKLERED PER CBC 903.3.1.1.

EXCEPTION: DRAFTSTOPPING NOT REQUIRED IN BUILDINGS SPRINKLERED PER CBC 903.3.2.1 WHEN SPRINKLERS ARE INSTALLED IN THE COMBUSTIBLE CONCEALED SPACES

8. ATTIC DRAFTSTOPPING, CBC 717.4: PROVIDE MATERIALS COMPLYING WITH CBC 717.3.1. IN ATTICS AND CONCEALED ROOF SPACES AS REQUIRED BY CBC 717.4.2 THROUGH 717.4.3. PROVIDE SELF-CLOSING DOORS WITH AUTOMATIC LATCHES CONSTRUCTED AS REQUIRED FOR DRAFTSTOPPING PARTITIONS.
9. REFER TO REFLECTED CEILING PLAN FOR LOCATION OF CLERESTORY WINDOWS, TYPICAL.
10. ELEVATIONS SHOWN ARE MEASURED FROM FINISHED FLOOR DATUM FOR THIS BUILDING.
11. NEW WORK PROVIDE BLOCKING, BACKING, FRAMING, SHEATHING, UTILITIES OR OTHER CONCEALED WORK, WHETHER SPECIFICALLY SHOWN OR INFERRED. REFER TO STRUCTURAL DRAWINGS FOR CONCEALED WORK NOT SHOWN ON ARCHITECTURAL DRAWINGS.
12. REMODEL/ADDITION WORK NEATLY CUT AND REMOVE SURFACES AND FINISHES AS REQUIRED OR TO A NATURAL POINT OF DIVISION TO ENABLE INSTALLATION OF BLOCKING, BACKING, FRAMING, SHEATHING, UTILITIES OR OTHER CONCEALED WORK, WHETHER SPECIFICALLY SHOWN OR INFERRED FOR SUPPORT OR RENOVATION. REFER TO STRUCTURAL DRAWINGS FOR CONCEALED WORK NOT SHOWN ON ARCHITECTURAL DRAWINGS.
13. REPAIR AND REPLACE ALL EXISTING SURFACES AND FINISHES TO MATCH EXISTING UNDISTURBED WORK.
14. ALL NEW ADDITION WORK FINISHES AND COLORS FOR SIDING, TRIM, WINDOWS, ROOFING, ETC. ARE TO MATCH EXISTING FINISHES AND COLORS.

FINISH NOTES:

RENDERINGS ARE NOT TO SCALE; ALL RENDERINGS ARE FOR ARTISTIC DEPICTION ONLY. PLAN UPDATES MAY NOT BE REFLECTED IN RENDERINGS. RENDERINGS SHALL NOT BE USED FOR CONSTRUCTION.

BASE BOARDS SHALL BE 6" IN ALL ROOMS, UNO.
FINAL FINISHES SHALL BE CONFIRMED WITH THE HOME OWNER PRIOR TO APPLICATION.

EXTERIOR FINISH NOTES:

EXTERIOR FINISH TO BE FIBER CEMENT SIDING OVER 5/8 CDX PLYWOOD.
WINDOW & DOOR TRIM CEDAR. MATERIAL AND COLOR BY OWNER.
ROOFING TO BE STANDING SEAM METAL ROOFING OVER 30#FELT 5/8 ,CDX PLYWOOD.
DECKING TO BE TREX OR WOOD .FINAL MATERIAL AND COLOR BY OWNER.
CHIMNEYS ARE DECORATIVE AND PROVIDE FOR VENTING OF GAS FIREPLACES ONLY.
DOWNSPOUTS TO BE COLLECTED AND ROOF RUN OFF TO BE DIRECTED AWAY FROM STRUCTURE PER THE SITE PLAN.
FINISH GRADE SHALL SLOPE AWAY FROM STRUCTURE MIN "1/2 .PER FOOT OF RUN FOR '4MIN.
BASALT RETAINING WALLS TO MATCH EXISTING RETAINING WALL.

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Revision Notes:

Date	Description

Drawing Title:

SOUTH & WEST ELEVATIONS

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

Date: 5/14/2023

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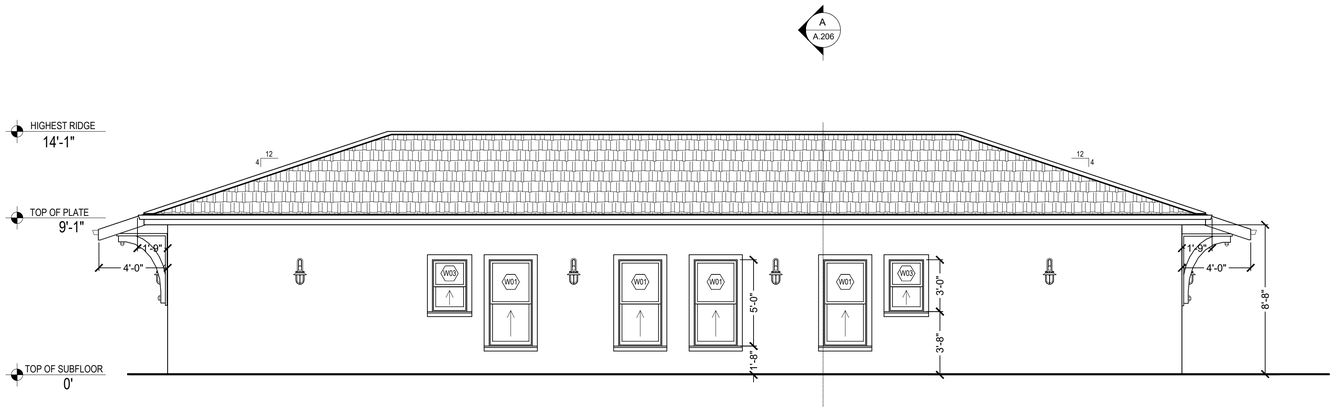
A.204

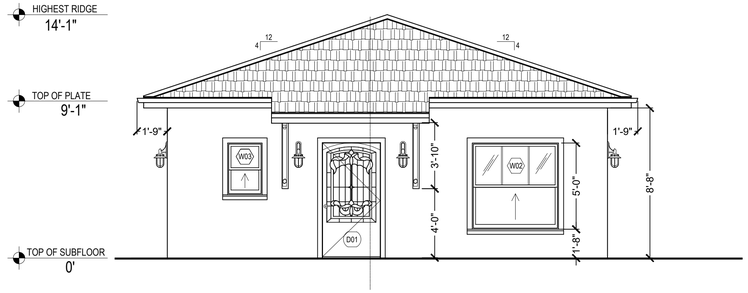


NORTH ELEVATION

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

B
A.206

EXTERIOR MATERIAL LEGEND

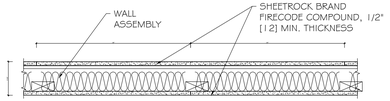


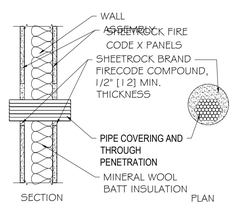
EAST ELEVATION

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

Cedar Shake,
match the existing house roof cover

Finishes smooth stucco,
match the existing house exterior finishes





1 HOUR FIRE RATED WALL DETAILS

Scale: NTS

FIRE RESISTANCE RATED CONSTRUCTION NOTES:

1. THROUGH PENETRATIONS OF FIRE-RESISTANCE-RATED WALL OR FLOOR ASSEMBLIES SHALL COMPLY WITH SECTION R302.4.1.1 OR R302.4.1.2. PROVIDE DETAIL AND COPY OF LISTING ON THE PLANS. (R302.4.1)
2. MEMBRANE PENETRATIONS SHALL COMPLY WITH SECTION R302.4.1. WHERE WALLS ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING, RECESSED FIXTURES SHALL BE INSTALLED SO THAT THE REQUIRED FIRE-RESISTANCE RATING WILL NOT BE REDUCED. (R302.4.2)
3. IN COMBUSTIBLE CONSTRUCTION, FIRE BLOCKING SHALL BE PROVIDED TO CUT OFF ALL CONCEALED DRAFT OPENINGS (BOTH VERTICAL AND HORIZONTAL) AND TO FORM AN EFFECTIVE FIRE BARRIER BETWEEN STORIES, AND BETWEEN A TOP STORY AND THE ROOF SPACE. (R302.11)
4. IN COMBUSTIBLE CONSTRUCTION WHERE THERE IS USABLE SPACE BOTH ABOVE AND BELOW THE CONCEALED SPACE OF A FLOOR/CEILING ASSEMBLY, DRAFT STOPS SHALL BE INSTALLED SO THAT THE AREA OF THE CONCEALED SPACE DOES NOT EXCEED 1,000 SQUARE FEET. DRAFT STOPPING SHALL DIVIDE THE CONCEALED SPACE INTO APPROXIMATELY EQUAL AREAS. (R302.12)

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NORTH & EAST
ELEVATIONS

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

Date: 5/14/2023

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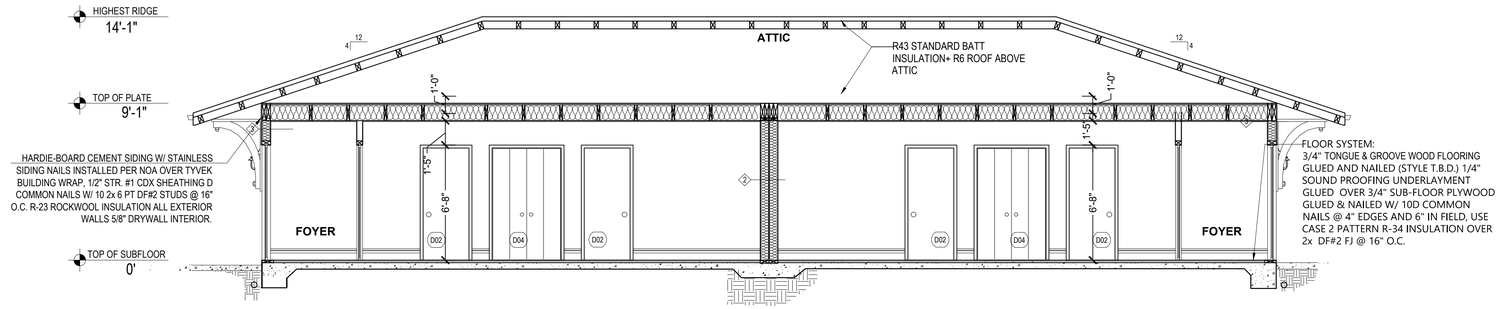
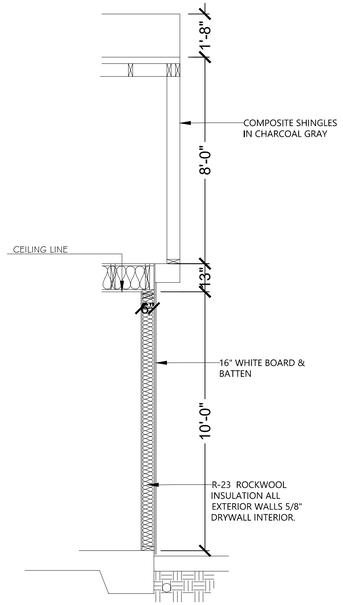
A.205

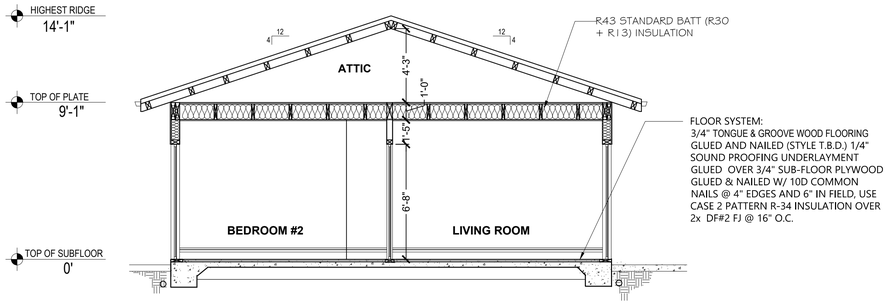


SECTION A

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



EXTERIOR WALL DETAIL



SECTION B

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

(R408.1), 2009 IRC- OPENINGS FOR UNDER-FLOOR VENTILATION:
THE MINIMUM NET AREA OF VENTILATION OPENINGS SHALL NOT BE LESS THAN 1 SQUARE FOOT (0.0929 M2) FOR EACH 150 SQUARE FEET (14 M2) OF UNDER-FLOOR SPACE AREA.
1849/150= 13.5F
(8"X16") VENT DIMENSION=.88 SF
13/.88= 14.7
15 VENTS NEEDED

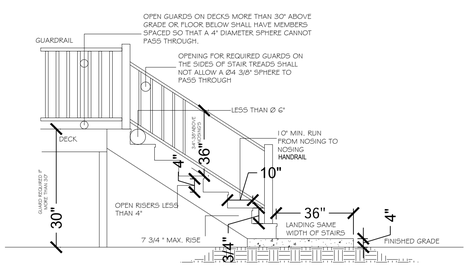
GARAGE EXTERIOR WALLS TO BE INSULATED WITH R-23 ROCKWOOL BATT INSULATION AND INTERIOR FINISHED WITH 5/8" DRYWALL.

BUILDING CODE REQUIREMENT

ANY ACCESS DOOR TO THE CRAWL SPACE MUST BE AT LEAST 18X24 INCHES (2015 INTERNATIONAL CONFORM TO SPECIFICATIONS RESIDENTIAL CODE (IRC) - SECTION R408.4).

ANY DRAIN LOCATED IN THE CRAWL SPACE MUST BE ALLOWED TO RUN OFF AND TERMINATE OUTDOORS OR NEED TO MEET SPECIFICATIONS TO AN INTERIOR CRAWL SPACE DRAIN OR SUMP PUMP. CRAWL SPACE DRAINS MAY NOT RUN OFF TO GUTTERS OR FOUNDATION PERIMETER DRAINS, AND DRYER VENTS MUST BE TERMINATED OUTDOORS (2015 IRC – SECTIONS R405 AND P2719).

CODE REQUIREMENTS BASED ON THE 2016 INTERNATIONAL RESIDENTIAL CODE



STAIRWAY NOTES:
STAIRWAYS SHALL BE NOT LESS THAN 36" IN WIDTH. STAIRWAY RISERS SHALL BE NO GREATER THAN 7 3/4 ". STAIRWAY TREADS SHALL HAVE A MINIMUM RUN OF 10". THE LENGTH OF RUN AND THE HEIGHT OF RISER SHALL NOT VARY MORE THAN 3/8" IN THE RUN OF THE STAIR. STAIRS ARE REQUIRED TO BE ILLUMINATED.
OPEN RISERS ARE PERMITTED IF THE OPENING IS LESS THAN 4". TREAD NOSING SHALL NOT LESS THAN 3/4" BUT NOT MORE THAN 1 1/4" ON STAIRWAYS WITH SOLID RISERS. EXCEPT WHEN TREADS ARE 11" OR MORE.
COMPOSITE MATERIALS MAY REQUIRE ADDITIONAL STRINGERS.

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SECTIONS

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

Date: 5/14/2023

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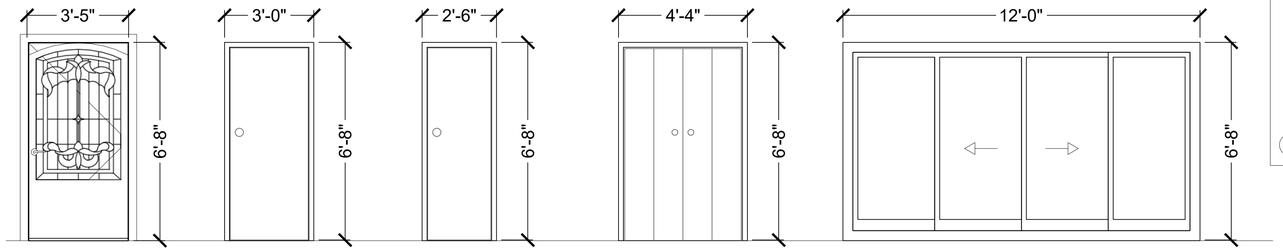
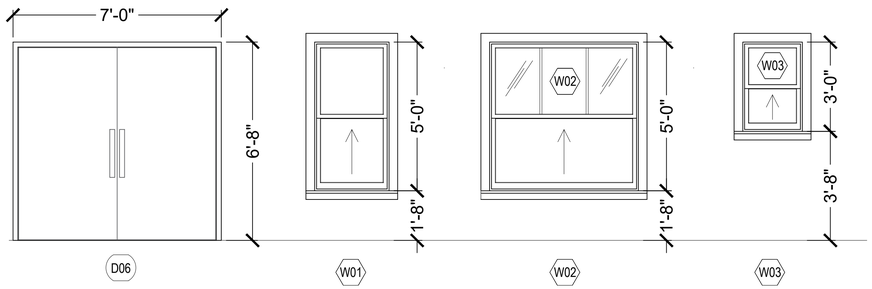
WINDOW SCHEDULE

Label	Qty	Floor	Width	Height	Egress	Description	Glazing Type	SHGC	U-Factor	Manufacturer	Comments
W 01	4	1	30"	60"	N/A	Hung	Double Pane	0.4	0.35	to be chosen by owner	
W 02	2	1	60"	60"	N/A	Hung	Double Pane	0.4	0.35	to be chosen by owner	
W 03	4	1	24"	36"	N/A	Hung	Double Pane	0.4	0.35	to be chosen by owner	

DOOR SCHEDULE

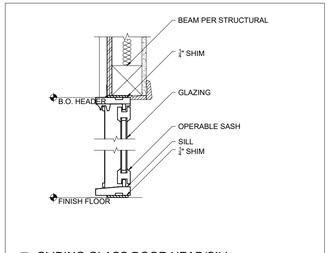
Number	Label	Qty	Floor	Width	Height	Description	Thickness	Manufacturer	Comments	EX/IN	Finish	SHGC	U-Factor
D 01	3568	2	1	41"	80"		1 3/8"	to be chosen by owner	Entrance	EX	Color - White	0.45	0.35
D 02	3068	4	1	36"	80"		1 3/8"	to be chosen by owner	Entrance/Bedrooms	IN	Color - White	0.45	0.35
D 03	2668	6	1	30"	80"		1 3/8"	to be chosen by owner	Bathrooms	IN	Color - White	0.45	0.35
D 04	4468	2	1	52"	80"		1 3/8"	to be chosen by owner	Laundry	IN	Color - White	0.45	0.35
D 05	12068	2	1	144"	80"		1 3/8"	to be chosen by owner	Living Room	EX	Color - White	0.45	0.35
D 06	7068	4	1	84"	80"	closet doors, wooden	1 3/4"	to be chosen by owner	Bedrooms	IN	Color - White	0.45	0.35



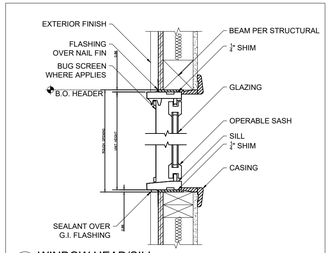


ENERGY NOTES

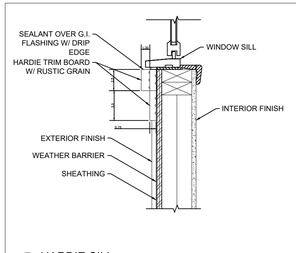
1. ALL OPENABLE WINDOWS AND SLIDING DOORS SHALL LIMIT AIR LEAKAGE AND BE CERTIFIED AND LABELED TO COMPLY WITH ANSI STANDARD AIS 4.2-1972.
2. FIXED WINDOWS SHALL BE SEALED TO LIMIT AIR INFILTRATION.
3. ALL EXTERIOR DOORS AND WINDOWS ARE TO BE WEATHERSTRIPPED.
4. SITE BUILT DOORS MOUNTED ON THE INSIDE OR THE OUTSIDE OF EXTERIOR WALLS SHALL HAVE A MIN. 1" LAP AT JAMPS.
5. OPEN EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES BETWEEN WALLS, FOUNDATIONS, ROOFS, PANELS, AND AT PENETRATION OF UTILITIES THRU THE ENVALOPE, SHALL BE SEALED, CAULKED, OR WEATHERSTRIPPED TO LIMIT AIR LEAKAGE.
6. PROVIDE A "CERTIFICATE OF COMPLIANCE" SIGNED BY THE OWNER, G.C., ARCHITECT, OR ENGINEER TO THE BLDG. DEPARTMENT STATING THAT THE WORK HAS BEEN PERFORMED AND MATERIALS INSTALLED ACCORDING TO THE PLANS AND SPECIFICATIONS AFFECTING NON-RESIDENTIAL ENERGY.
7. INSULATION SHALL BE INSTALLED TO MEET FLAME SPREAD AND SMOKE DENSITY REQUIREMENTS OF 5311 AND TITLE 24.
7.



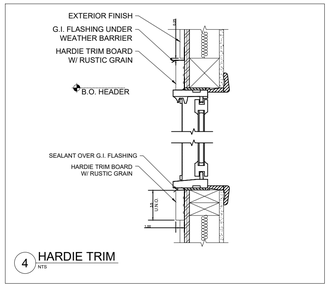
1 SLIDING GLASS DOOR HEAD/SILL NTS



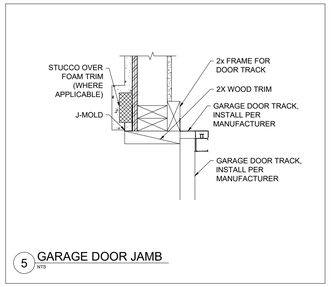
2 WINDOW HEAD/SILL NTS



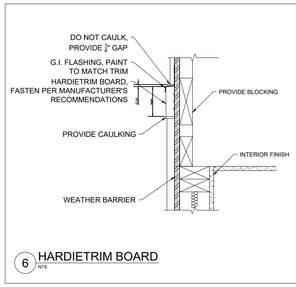
3 HARDIE SILL NTS



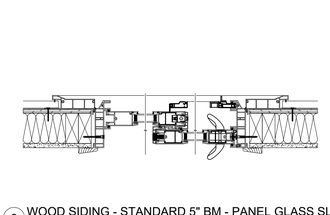
4 HARDIE TRIM NTS



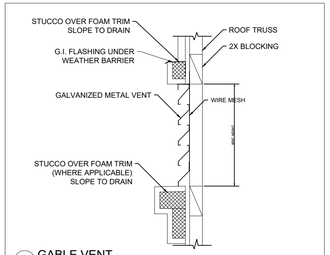
5 GARAGE DOOR JAMB NTS



6 HARDIETRIM BOARD NTS



8 WOOD SIDING - STANDARD 5" BM - PANEL GLASS SLIDER DOOR NTS



7 GABLE VENT NTS

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DOORS & WINDOWS SCHEDULE

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Date: 5/14/2023

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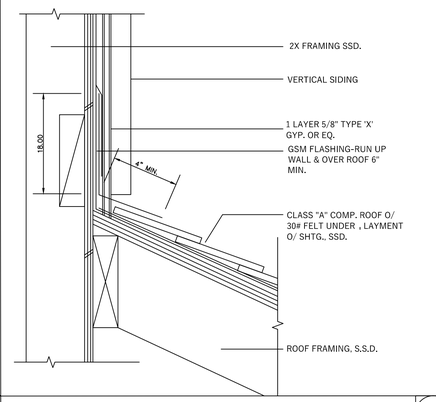
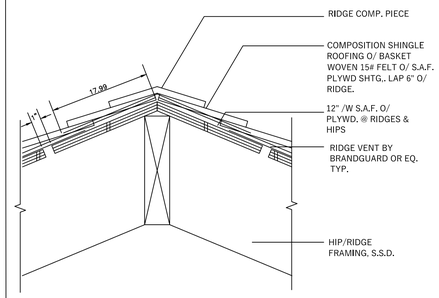
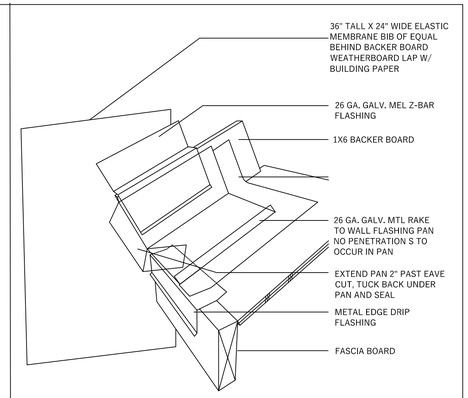


19 ROOF TO WALL PERP.

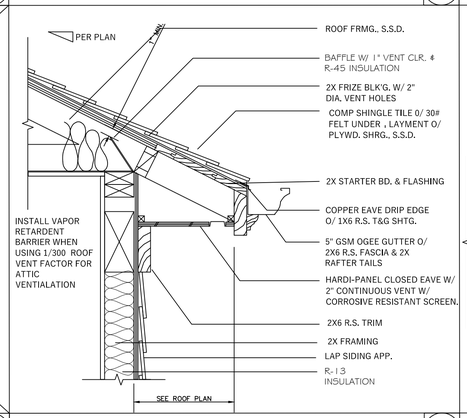


16 RIDGE

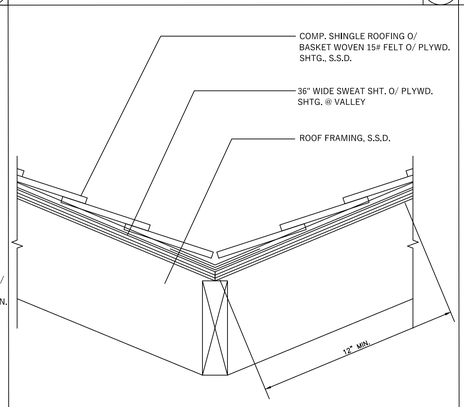


13 RAKE TO WALL DIVERTER

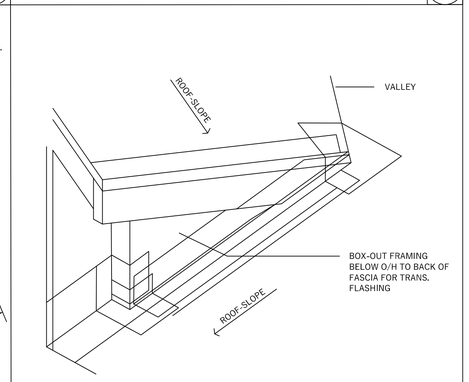
22



20 EAVE



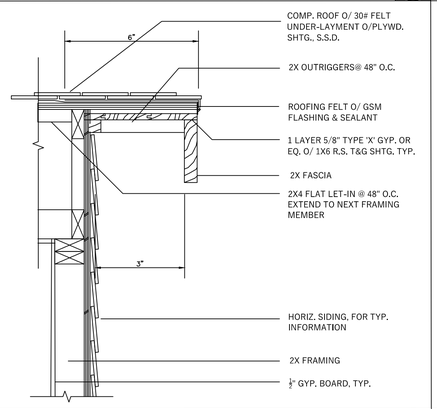
17 VALLEY



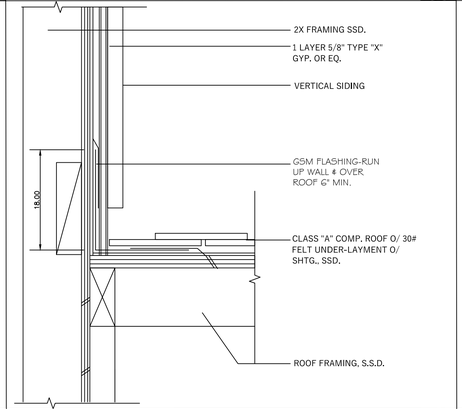
14 RAKE TO EAVE TRANSITION

11

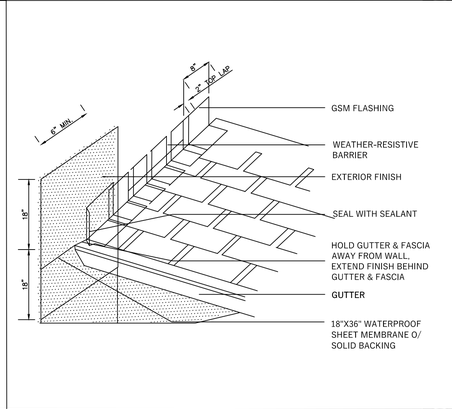
23



21 RAKE



18 ROOF TO WALL PARALLEL



15 ISOMETRIC EAVE PERP. TO WALL @ COMP.

12

24

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BUILDING PAPER/ HOUSE WRAP DETAILS AROUND WINDOWS

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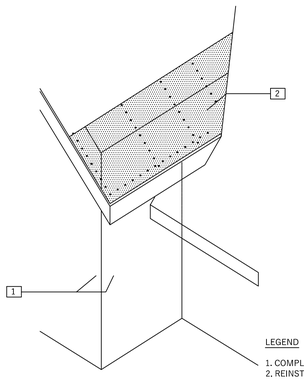
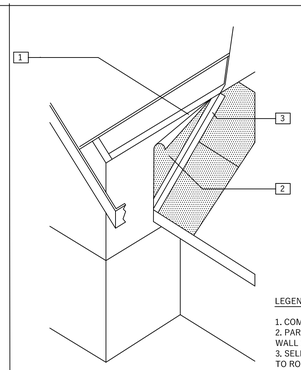


LEGEND

1. COMPLETE INSTALL OF STUCCO.
2. REINSTALL PLY AFTER STUCCO IS INSTALLED.

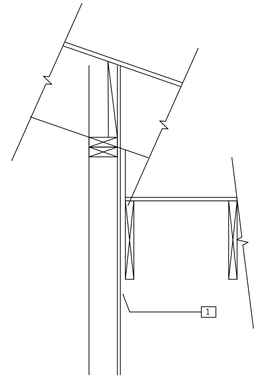
FINAL ROOF SHEATHING 7



LEGEND

1. COMPLETE PAPERING OF WALL.
2. PARTIAL INSTALL 30# ROOF FELT 18" UP WALL AND 24" ON ROOF TOP.
3. SELF-ADHERING MEMBRANE 3" ON WALL TO ROOF.

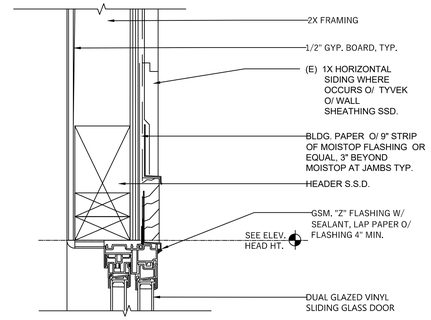
BUILDING PAPER TO WALL 4



LEGEND

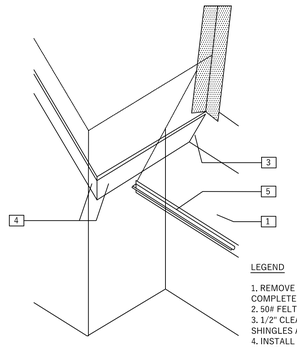
1. 1/2" CLEARANCE BETWEEN WALL AND ROOF SHEATHING.

ROOF TO WALL 1



SLIDING GLASS DOOR HEAD/JAMB 18

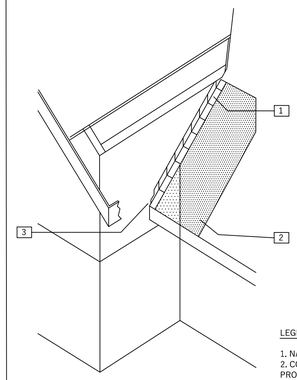
15



LEGEND

1. REMOVE PROTECTION BOARD & COMPLETE ROOFING FELT.
2. 50# FELT OVER WOVEN 30# VALLEY.
3. 1/2" CLEARANCE BETWEEN ROOF SHINGLES AND FASCIA.
4. INSTALL FINISH FASCIAS.
5. INSTALL GUTTERS.

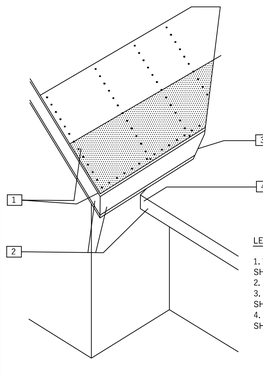
FINISH APPLICATION 8



LEGEND

1. NAIL G.I. FLASHING TO WALL.
2. COVER ROOF FELT WITH PROTECTION BOARD.
3. DIVERTER STEP FLASHING.

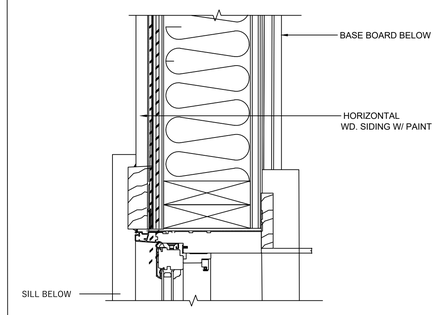
STEP FLASHING 5



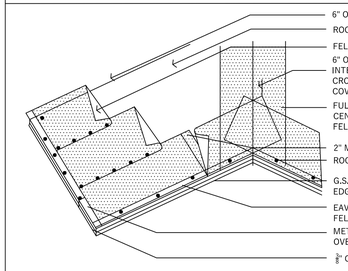
LEGEND

1. TACK NAIL LOWER EPIC OF ROOF SHEATHING.
2. 2X ROUGH FASCIA.
3. 1 1/2" CLEARANCE BETWEEN FASCIA AND SHEATHING.
4. 1 1/2" CLEARANCE BETWEEN WALL SHEATHING & ROOF RAFTER.

ROUGH FRAMING 2

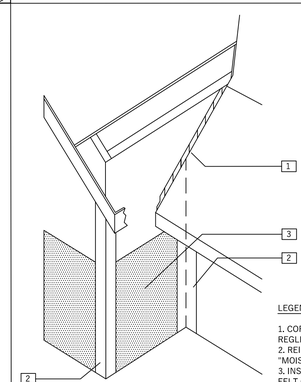


TYP. DOOR JAMB @ HORIZONTAL WD. SIDING 16



APPLICATION NOTES FOR LOW SLOPE, 2:12 TO LESS THAN 4:12 :
1. START W/ 1-19" WIDE SHEET OF FELT ALONG EAVE W/ ¾" OVERHANG.
2. TROWEL A CONTINUOUS LAYER OF ROOFING CEM. (@ A RATE OF 2 GAL. PER 100 SQ. FT) ON TO THE FELT.
3. PRESS 1-36" WIDE SHEET OF FELT FIRMLY ONTO THE CEM., & NAIL DOWN W/ GALV. ROOFING NAILS @ 12" O.C. ALONG A LINE 18" ABOUT THE BTM. EDGE OF THE FELT.
4. APPLY ROOFING CEM. TO THE UPPER 19" OF THE EXPOSED FELT.
5. COVER THE CEMENTED PORTION W/ THE NEXT SHEET OF FELT & NAILS.
6. REPEAT PROCESS UNTIL 24" INSIDE THE INTERIOR WALL LINE.
7. COVER THE REMAINING ROOF W/ DBL. LAYERS OF FELT, W/O CEM., UP TO THE RIDGE.

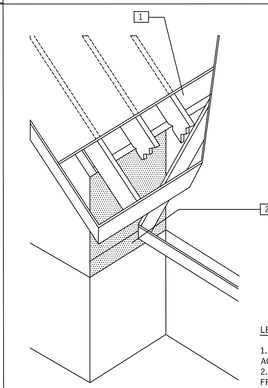
FELT UNDERLAYMENT 9



LEGEND

1. CORNER FLASH FLASHING WITH G.I. REGLET.
2. REINFORCE CORNERS WITH 12" "MOISTOP".
3. INSTALL SECOND COURSE OF 60 MINUTE FELT OVER REGLET AND STUCCO WEEP SCREED.

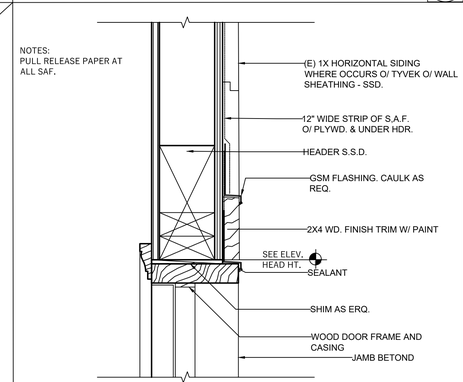
CORNER FLASHING 6



LEGEND

1. ROOF PLY TEMPORARILY MOVED FOR ACCESS.
2. INSTALL CONTINUOUS PIECE OF FELT FROM CORNER TO CORNER EXTENDING UP TO TOP PLATE.

FELT APPLICATION 3



DOOR HEAD/JAMB 17

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BUILDING PAPER/ HOUSE WRAP DETAILS AROUND WALL TO ROOF TRANSITION

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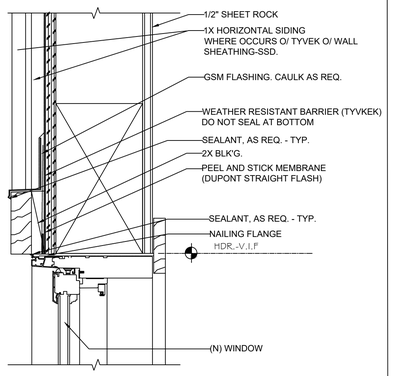
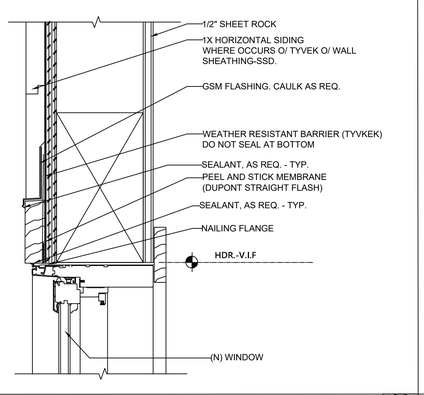
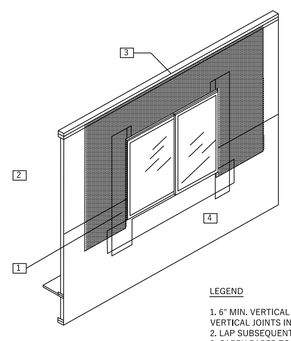


WINDOW HEAD @ WD. BOARD & BATTEN SIDING 12



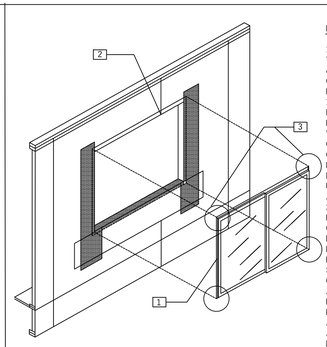
WINDOW HEAD @ HORIZONTAL SIDING 9



LEGEND

1. 6" MIN. VERTICAL LAP FOR ALL HORIZONTAL & VERTICAL JOINTS IN BUILDING PAPER.
2. LAP SUBSEQUENT COURSES OVER "MOISTOP".
3. CARRY PAPER TO UPPER EDGE OF TOP PLATE.
4. HOLD PAPER BACK 1" FROM WINDOW.

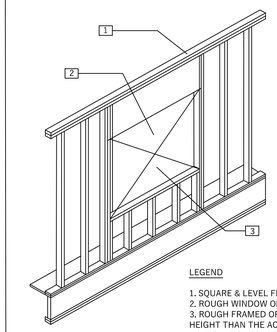
BUILDING PAPER-SECOND COURSE 7



LEGEND

1. SHIM & ADJUST WINDOW TO ACHIEVE SQUARE PLUMB & LEVEL CONDITION. USE CORROSION RESISTANT FASTENERS, FASTEN WITHIN 10" AND NO CLOSER THAN 3" IN EACH DIRECTION FROM EVERY CORNER. SECURE WINDOW AROUND FRAME OPENING WITH EQUIVALENT OF 64 FASTENERS AT 16" O.C. MAX. REFER TO MFG.'S INSTRUCTIONS REGARDING UPPER NAIL FIN ATTACHMENT.
2. TO SEAL THE WINDOW FRAME TO OPENING, APPLY CONTINUES SEALANT TO THE BACKSIDE OF THE MOUNTING FLANGE NEAR THE OUTER EDGE OR APPLY CONTINUES SEALANT TO PERIMETER OF OPENING AT A POINT TO ASSURE CONTACT WITH BACKSIDE OF MOUNTING FLANGE.
AFTER INSTALLATION, SEAL ALL CORNERS OF MECHANICALLY JOINT FRAMES TO SEAL FRAME SEAM JUNCTURE.

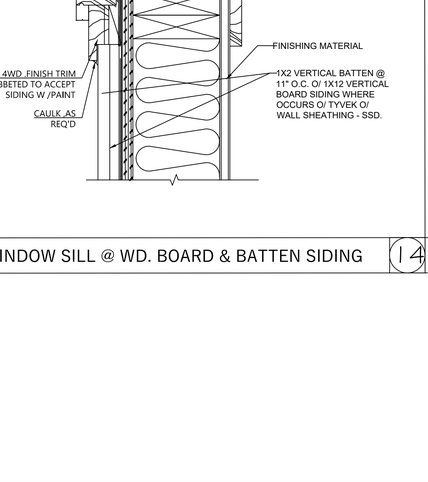
WINDOW INSTALLATION 4



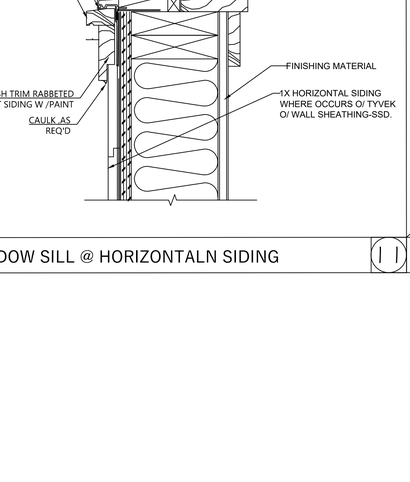
LEGEND

1. SQUARE & LEVEL FRAMING.
2. ROUGH WINDOW OPENING.
3. ROUGH FRAMED OPENING SUFFICIENTLY IN WIDTH & HEIGHT THAN THE ACTUAL FRAME DIMENSIONS OF THE WINDOW. TO ASSURE ADEQUATE CLEARANCE CONSULT THE WINDOW MANUFACTURED'S LITERATURE FOR THE RECOMMENDED ROUGH OPENING DIMENSIONS.

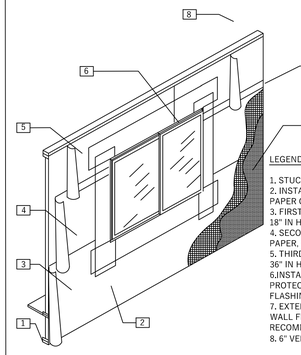
ROUGH WINDOW OPENING 1



WINDOW JAMB @ WD. BOARD & BATTEN SIDING 13



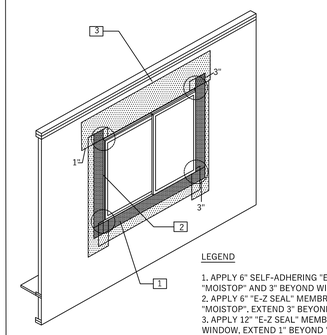
WINDOW JAMB@HORIZONTAL SIDING 10



LEGEND

1. STUCCO WEED
2. INSTALL SECOND LAYER OF 60 MIN. PAPER OVER EVERYTHING.
3. FIRST COURSE OF BUILDING PAPER, 18" IN HEIGHT.
4. SECOND COURSE OF BUILDING PAPER, 36" IN HEIGHT.
5. THIRD COURSE OF BUILDING PAPER, 36" IN HEIGHT.
6.INSTALL WINDOW HEAD FLASHING. PROTECTION LAYER LAPS OVER FLASHING FLANGE.
7. EXTERIOR WALL FINISH: INSTALL PER WALL FINISH MFG.'S RECOMMENDATION.
8. 6" VERTICAL/HORIZONTAL LAPS.

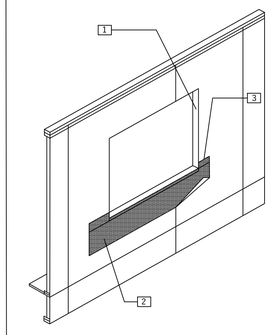
TRIM-FLASHING-PROTECTION COURSE 8



LEGEND

1. APPLY 6" SELF-ADHERING "E-Z SEAL" MEMBRANE OVER "MOISTOP" AND 3" BEYOND WINDOW FLANGE.
2. APPLY 6" "E-Z SEAL" MEMBRANE AT JAMBS OVER "MOISTOP", EXTEND 3" BEYOND WINDOW FLANGE.
3. APPLY 12" "E-Z SEAL" MEMBRANE AT HEADER OF WINDOW, EXTEND 1" BEYOND "MOISTOP".
4. APPLY FIRM PRESSURE TO SELF-ADHERING MEMBRANE TO ASSURE ADHERENCE TO WINDOW FINS.
5. CECH ALL CORNERS FOR PROPER SEAL OF SELF-ADHERING MEMBRANE.

SELF-ADHESIVE MEMBRANE 5



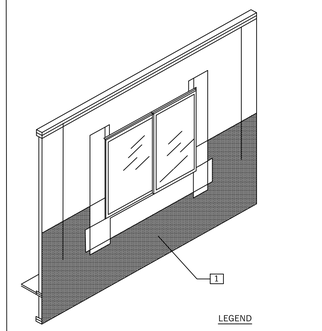
LEGEND

1. WALL SHEATHING (WHERE OCCURS). VERIFY SHEATHING EDGES FLUSH WITH FRAME OPENING AND COMPLETION OF STRUCTURAL NAILING & REINFORCEMENT BEFORE PROCEEDING.
2. APPLY 9" "MOISTOP" OR APPROVED EQUIVALENT SILL FLASHING HORIZONTALLY BELOW THE SILL. (WRAP FLASHING INTO ROUGH OPENING TO PROTECT FRAMING , AT RECESSED WINDOWS ONLY.) FASTEN THE TOP EDGE OF THE SILL FLASHING TO THE FRAMING, BUT DO NOT FASTEN THE LOWER EDGE, SO WEATHER RESISTANT BUILDING PAPER APPLIED LATER MAY BE SLIPPED UP & UNDERNEATH THE FLASHING IN WEATHER BOARD FASHION.
3. EXTEND "MOISTOP" OR APPROVED EQUIVALENT SILL FLASHING HORIZONTALLY 1" BEYOND VERTICAL JAMB FLASHING APPLIED LATER.

SILL FLASHING 2

WINDOW SILL @ WD. BOARD & BATTEN SIDING 14

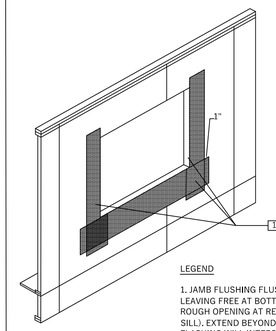
WINDOW SILL @ HORIZONTALN SIDING 11



LEGEND

1. INSERT FIRST COURSE 60 MIN. PAPER UNDER "MOISTOP" AND STAPLE "MOISTOP".

BUILDING PAPER- FIRST COURSE 6



LEGEND

1. JAMB FLUSHING FLUSH AT BOTH SIDES OF OPENING LEAVING FREE AT BOTTOM. (WRAP JAMB FLASHING INTO ROUGH OPENING AT RECESSED WINDOWS ONLY. SIMILAR AT SILL). EXTEND BEYOND SILL FLASHING ABOVE WHERE HEAD FLASHING WILL INTERSECT. LAP JAMB FLASHING OVER TOP SILL FLASHING. LEAVE PAPER FLASHING UNATTACHED FROM SILL DOWN.

JAMB FLASHING 3

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Seal:

Revision Notes:

Date	Description

Drawing Title:

BUILDING PAPER/ HOUSE WRAP DETAILS AT WALL TO ROOF TRANSITION

Scale:

Date: 5/14/2023

Page No. :

A.403

Low Impact Development (LID)
Post Construction Stormwater Mitigation
Best Management Practices (BMPs)

STORMWATER BMP(s) VERIFICATION

Upon installation of the approved stormwater BMPs, a Stormwater Observation Report (SOR) Form shall be submitted to Department of Public Works, Bureau of Sanitation. 201 N. Figueroa, 3rd floor, station 18. The SOR Form must be with filed and approved by the Bureau of Sanitation prior to the issuance of a Certificate of Occupancy.

Project Address: _____

RESIDENTIAL (4 UNITS OR LESS, <10,000SF, < 2,500 SF within a ESA)

Item #	Stormwater BMP	Description (Units, total)	Reference Sheet(s)* (Sheet #)
1	Rain Tank(s) – 55 to 130 gal each		
2	Rain Tank(s) – > 130 gal min	1 RAIN TANK 250 GAL.	DETAIL 1
3	Shade Tree - min 15 gal		
4	Flow thru Planter(s)		
5	Permeable pavers / Porous concrete (min 10% open space)	☐ Incidental; _____ total SF ☐ Infiltration; _____ total SF	
6	Rain Garden	☐ #____ - Lined; _____ total SF ☐ # ____ - Unlined; _____ total SF	
7	Dry Well		
8	SUMP Pump (modification was not required)		

ALL OTHER DEVELOPMENT
(Residential: 5 ≥ units, 10,000 ≥ SF, within a ESA and ≥2,500SF)

	Item #	Stormwater BMP	Description (Units, total)	Reference Sheet(s)* (Sheet #)
Infiltration	1	Infiltration Basin / Trench		
	2	Dry Well		
	3	Permeable pavers / Porous concrete (min 10% open space)	☐ Incidental; _____ total SF ☐ Infiltration; _____ total SF	
Capture & Use	4	Rain Tank(s) – 530 gal min		
	5	Cistern	☐ Above Grade ☐ Below Grade	
Treat & Discharge	6	Flow thru Planter(s)		
	7	Biofiltration	☐ #____ - Lined; _____ total SF ☐ # ____ - Unlined; _____ total SF	
	8	Vegetative Swale / Filter Strip		
	9	Catch Basin Filter(s)		
	10	Trench Drain Filter(s)		
	11	Down Spout Filter(s)		
	12	SUMP Pump (modification was not required)		

* At a minimum: Site Plan, Architectural Elevations, Roof Plan, Civil Sheets and Detail

Only to be used for Single Family Residences – 4 units or less
(Less than 1 acre and not in an ESA)

STORMWATER OBSERVATION REPORT FORM

LOW IMPACT DEVELOPMENT

STORMWATER OBSERVATION *means the visual observation of the stormwater related Best Management Practices (BMPs) for conformance with the approved LID Plan at significant construction stages and at completion of the project. Stormwater observation does not include or waive the responsibility for the inspections required by Section 108 or other sections of the City of Los Angeles Building Code.*

STORMWATER OBSERVATION *must be performed by the contractor responsible for the approved LID Plan or designated staff in their employment. Homeowner can also perform the Stormwater Observation if no licensed contractor was involved.* ***As part of the observation, printed photos of the BMPs taken during various construction phases.***

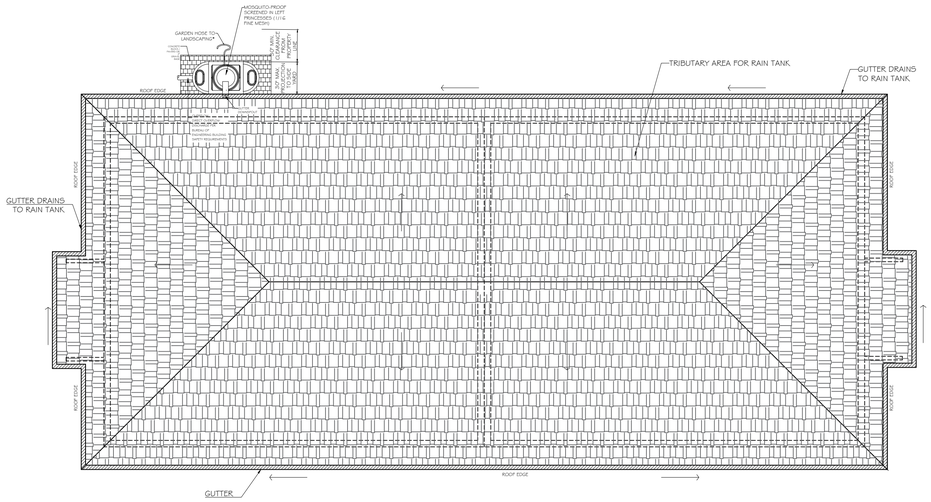
STORMWATER OBSERVATION REPORT (SOR) *must be signed by the contractor responsible for the approved LID Plan and submitted to the City prior to the issuance to the certificate of occupancy. Homeowner can sign the Stormwater Observation Report if no licensed contractor was involved.* ***PRIOR TO CERTIFICATE OF OCCUPANCY (C of O), SOR FORM, PRINTED PHOTOS OF THE BMPS TAKEN DURING VARIOUS CONSTRUCTION PHASES AND APPROVED STAMPED PLANS BY THE BUREAU OF SANITATION MUST BE SUBMITTED TO THE PUBLIC COUNTER FOR STAFF APPROVAL.***

Project Address:	Building Permit No.:
2311 SELBY AVENUE LOS ANGELES, CA 90064	R19WL01262
Contractor / Architect / Engineer responsible for construction of best management practices per approved LID Plan:	Phone Number: 7162 316 415

I declare that the following statements are true to the best of my knowledge:

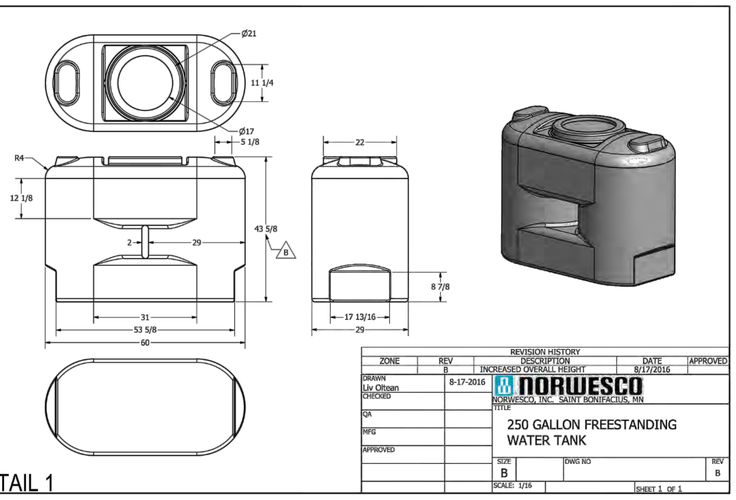
1. I am responsible for the approved LID Plan, and
2. I, or designated staff under my responsible charge, have performed the required site visits at each significant construction stage and at completion to verify that the best management practices as shown on the approved plan have been constructed and installed in accordance with the approved LID Plan.

Signature	June 27, 2019	Darren Asad Architect
	Date	Contractor/Architect/Engineer License



PROPOSED RAIN WATER CATCHMENTS & CONVEYANCE PLAN
SCALE: 3/16" = 1'-0"

NORTH



REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	B	INCREASED OVERALL HEIGHT	8/17/2016	

DRAWN: Liv Oltean — 8-17-2016
CHECKED
QA
MFG
APPROVED

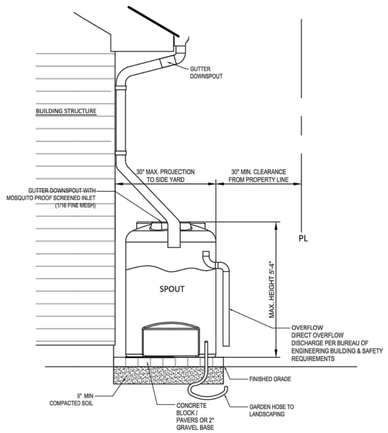
NORWESCO, INC. SAINT BONIFACIUS, MN

TITLE: 250 GALLON FREESTANDING WATER TANK

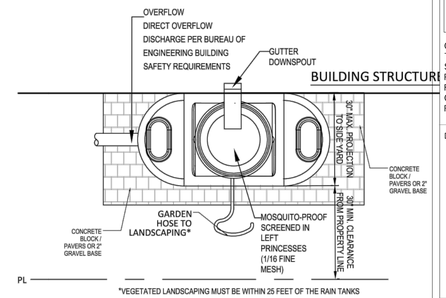
SIZE: B | DWG NO | REV: B
SCALE: 1/16 | SHEET 1 OF 1

DETAIL 1

1. SCREENS ARE PRESENT ON ALL RAIN TANK INLETS TO REMOVE DEBRIS AND LARGER PARTICLES AS THE WATER ENTERS THE TANK.CHILD RESISTANT COVERS AND MOSQUITO SCREENING ARE IN PLACE
2. 2. TANK IS CHILD SAFE. ACCESS IS CHILD-PROOF AND THE BARREL IS PROPERLY SITED AND ANCHORED ON A STABLE SURFACE TO PREVENT TANK FROM TIPPING OVER.
3. 3. ABOVE GROUND TANKS SHALL NOT BE LOCATED ON UNEVEN OR SLOPED SURFACE. IF INSTALLED ON A SLOPED SURFACE, THE BASE WHERE THE TANK IS INSTALLED HAS BEEN LEVELED USING APPROPRIATE CONSTRUCTION MATERIAL PRIOR TO INSTALLATION.
4. 4. INSTALLED RAIN TANKS SHALL NOT BE PLACED ON ELEVATED PLATFORMS, DECKS OR PORCHES WITHOUT CONSULTING LOCAL BUILDING CODE OFFICIALS.
5. 5. DIRECT OVERFLOW DISCHARGE PER BUREAU OF ENGINEERING AND BUILDING AND SAFETY REQUIREMENTS.
6. DISPERSION IS DIRECTED SO AS TO NOT KNOWINGLY CAUSE GEOTECHNICAL HAZARDS RELATED TO SLOPE STABILITY OR TRIGGERING EXPENSIVE SOIL MOVEMENT.
7. RAIN TANKS SHALL BE OPAQUE AND DARK IN COLOR TO PREVENT UV LIGHT PENETRATION AND DISCOURAGE ALGAE GROWTH.
8. TANK PLACEMENT SHALL ALLOW EASY ACCESS FOR REGULAR MAINTENANCE.
9. COLLAPSIBLE RAIN TANKS ARE NOT PERMITTED.
10. SEE TANK FACT SHEETS FOR MORE INFORMATION.



SECTION
NOT TO SCALE



PLAN
NOT TO SCALE

1 DETAIL
Scale: NTS

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Seal:
REGISTERED PROFESSIONAL ENGINEER
JAFAR RAVANBAKHSH
No. 76341
Exp 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
PROPOSED RAIN WATER TANK

Scale: 3/16" = 1'-0"

Date: 5/14/2023

Page No. :

A.501

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Exp. 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:

3D Renders

Scale:

03/05/2023

Date:

Page No. :

A.601

GENERAL NOTES

DESIGN DATA:
APPLICABLE DESIGN LOADS: PER ASCI/SEI 7-16

FLOOR LIVE LOAD: 40 PSF — FLOOR DEAD LOAD: 20PSF
ROOF LIVE LOAD: 20 PSF — ROOF DEAD LOAD: 20PSF
BASIC WIND SPEED: 95 MPH — EXPOSURE: C
STRUCTURAL CATEGORY: II — SEISMIC DESIGN CATEGORY = D

ALL PRESSURES SHOWN ARE BASED ON ASD DESIGN,

SHEAR WALL SCHEDULE

SHEAR WALL SCHEDULE 2019 C.B.C.

S.W. TYPE	SHEAR PANEL DESCRIPTION	ALLOWABLE SHEAR (PLF)	SILL BOLT'G @ FOUNDATION	TOP PL. TO BLK'G.	SILL NAILING UPPER STORIES
1	7/8" STUCCO OVER PAPER BACKED LATH W/ 16 GA STAPLES AT 6" O.C. AT TOP & BOTTOM PLATES, EDGE OF SHEAR WALL AND ON FIELD (CBC TABLE 2306.4.5) SEE NOTE 3 BELOW.	180 *180	5/8" @ 48" O.C. 5/8" @ 24" O.C.	A35 @ 16" A35 @ 16"	16d @ 8" O.C. 16d @ 4" O.C.
2	15/32" APA RATED PLYWOOD SHT'G. STRUCT I WITH 8d COMMON NAILS @ 6" O.C. AT EDGES & 12" O.C. FIELD (TABLE 2306.4.1 CBC) SEE NOTES 1,2,8,9, AND 10 BELOW.	280 *560	5/8" @ 32" O.C. 5/8" @ 16" O.C.	A35 @ 16" A35 @ 8"	16d @ 6" O.C. 16d @ 3" O.C.
3	15/32" APA RATED PLYWOOD SHT'G. STRUCT I WITH 8d COMMON NAILES @ 4" O.C. AT EDGES & 12" O.C. FIELD (TABLE 2306.4.1. CBC) SEE NOTES 1,2,4,5,8,9, AND 10 BELOW.	430 *860	5/8" @ 24" O.C. 5/8" @ 14" O.C.	A35 @ 8" LTP4 @ 6"	16d @ 4" O.C. 16d @ 2" O.C.
4	15/32" APA RATED PLYWOOD SHT'G STRUCT I WITH 8d COMMON NAILS @ 3" O.C. AT EDGES & 12" O.C. FIELD (TABLE 2306.4.1. CBC) SEE NOTES 1,2,4,5,8,9, AND 10 BELOW.	550 *1100	5/8" @ 20" O.C. 3/4" @ 16" O.C.	A35 @ 8" LTP4 @ 6"	16d @ 3" O.C. 1/4"Ø X 3-1/2" LAG SC. @ 2" O.C.
5	15/32" APA RATED PLYWOOD SHT'G. STRUCT I WITH 8d COMMON NAILS @ 2" O.C. AT EDGES & 12" O.C. FIELD (TABLE 2306.4.1. CBC) SEE NOTES 1,2,4,5,8,9, AND 10 BELOW.	730 *1460	5/8" @ 16" O.C. 3/4" @ 16" O.C.	A35 @ 8" LTP4 @ 6"	16d @ 2-1/2" O.C. 1/4" Ø X 3-1/2" LAG SC. @ 2" O.C.
6	15/32" APA RATED STRUCT. I SHT'G. WITH 10d COMMON NAILS @ 2" O.C. AT EDGES & 12" O.C. FIELD OVER 3 X STUDS (TABLE 2306.4.1 CBC) SEE NOTES 1,4,5,8,9, AND 10 BELOW.	870 *1740	3/4" @ 16" O.C. 3/4" @ 8" O.C.	A35 @ 6" LTP4 @ 4-1/2"	#12 X 3-1/2" WD. SC. @ 2" O.C. 1/4" Ø X 3-1/2" LAG SC. @ 1-1/2" O.C.

NOTES:

1. ALL EDGES OF PLYWOOD SHEAR WALLS MUST BE BLOCKED WITH 2X SOLID BLOCKING.
2. DESIGNATES SILL BOLTING OR NAILING WHERE SHEAR WALL PANELS ARE TO BE APPLIED TO BOTH SIDES OF WALL.
3. PAPER BACKED SELF-FURRING EXPANDED METAL OR WOVEN WIRE LATH AND PORTLAND CEMENT PLASTER.
4. FRAMING AT ADJOINING PANEL EDGES SHALL BE 3-INCH NOMINAL OR WIDER AND NAILS SHALL BE STAGGERED. (USE 3X SILL PLATE @ FOUND., FOR SHEAR LOADS LESS THAN 350 PLF 2X SILL PLATE MAY BE USED.)
5. WHERE PANELS ARE APPLIED ON BOTH FACES OF A WALL AND NAILS SPACING IS LESS THAN 6" O.C. ON EITHER SIDE. PANEL JOINTS SHALL BE OFFSET TO FALL ON DIFFERENT FRAMING MEMBERS OR FRAMING SHALL BE 3" NOMINAL OR THICKER & NAILS ON EACH SIDE SHALL BE STAGGERED. (USE 3 X SILL PLATE @ FOUND.)
6. ALL CONTINUOUS EXTERIOR AND INTERIOR SHEAR/BEARING WALL FOOTINGS TO HAVE 5/8"Ø A.B.'S @ 48" O.C. WITH 3" X 3" X 1/4" PLATE WASHERS U.N.O. MINIMUM OF TWO BOLTS PER EACH PIECE OF SILL PLATE AT 4" TO 12" CLEARANCE TO THE END AND 7" MINIMUM EMBEDMENT.(FOR TWO POUR SYSTEM,BOLTS SHALL BE EMBEDDED 4 INCH MIN. INTO FIRST POUR.)

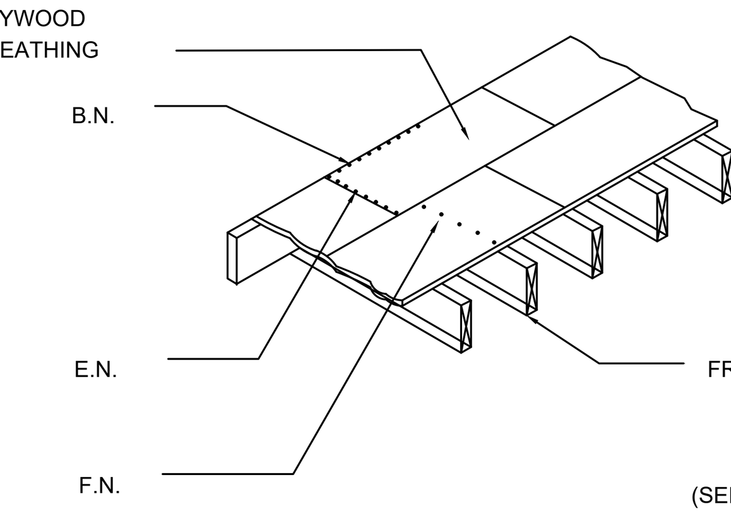
(SEE NOTE 12 FOR A.B. LENGTH.)

7. ALL INTERIOR NON-BEARING FTGS TO HAVE 3/16" Ø SHOT PINS AT 32" O.C., I.E., HILTI SHOT PINS (ICC ESR-1663).
8. USE APA RATED PLYWOOD SHEATHING. OR O.S.B. PANEL. ALL PLYWOOD SHALL BE DOUGLAS FIR. 4-PLY MIN. OTHER SPECIES MAY REQUIRE CHANGES.
9. USE 3 X 3 X 1/4 PLATE WASHERS WITH 5/8"Ø A.B. AT ALL SHEAR WALLS. USE 3 X 3 X 5/16 PLATE WASHERS WITH 3/4"Ø A.B. AT ALL SHEAR WALLS.
10. AT EXISTING FOOTINGS, USE THREADED RODS W/ SIMPSON "SET-XP" EPOXY 7" MIN. EMB. W/MIN. EDGE DIST. OF 1-7/8" (ICC ESR-2508) (SPECIAL INSPECTION REQ'D.)
11. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A-307 U.N.O.

12. ANCHOR BOLT SPEC.:

	BOLT LENGTH	
	SINGLE POUR	DOUBLE POUR
2X SILL	12"	16"
3X SILL	14"	18"

PLYWOOD DIAPHRAGM



NAILING: (EXCEPT WHERE NOTED OTHERWISE)

	ROOF NAIL'G	FLOOR NAIL'G
B.N. = BOUNDARY NAILING	8d @ 6" O.C.	10d @ 6" O.C.
E.N. = EDGE NAILING	8d @ 6" O.C.	10d @ 6" O.C.
F.N. = FIELD NAILING	8d @ 12" O.C.	10d @ 10" O.C.

NOTES:

1. NAILS SHALL BE GALV. COMMON(HOT-DIPPED OR TUMBLED), PLACED NOT LESS THAN 3/8" FROM PANEL EDGES AND SHALL BE FIRMLY DRIVEN.
2. NO UNBLOCKED PIECE LESS THAN 12" SHALL BE USED.
3. WOOD STRUCTURAL PANELS SHALL COMPLY WITH 2019 CBC STANDARD AND SHALL BE APA RATED EXPOSURE I.
4. WOOD STRUCTURAL PANELS, WHEN USED, SHALL COMPLY WITH THE REQUIREMENTS FOR THEIR TYPE IN DOC PSI-95 OR PS2-92.
5. ALL PANELS SHALL BE IDENTIFIED BY TRADE MARK OF AN APPROVED TESTING & GRADING AGENCIES, APA, TECO OR PITTSBURG.

NAILING SCHEDULE

CONNECTION:(TABLE 2304.9.1)

1. JOISTS TO SILL OR GURDER, TOE NAIL — 3 - 8d
2. BRIDGING TO JOISTS, TOE NAIL EA. END — 2 - 8d
3. 1X6 SUBFLR. OR LESS TO EA. JST., FACE NAIL — 2 - 8d
4. WIDER THAN 1X6 SUBFLR. TO EA. JST., FACE NAIL — 3 - 8d
5. 2" SUBFLR. TO JST. OR GURDER, BUND & FACE NAIL — 2 - 16d
6. SILL PLATE TO JST. OR BLK'G., FACE NAIL — 16d @ 16" O.C.
7. TOP PLATE TO STUD, END NAIL — 2 - 16 d
8. RAFT. BLK'G TO TOP PLATE, FACE OR TOE NAIL — 16d @ 8" O.C.
9. STUD TO SILL PLATE, TOE NAIL — 4 - 8d
10. DOUBLE STUDS, FACE NAIL — 16d @ 24" O.C.
11. DOUBLE TOP PLATES, FACE NAIL — 16d @ 16" O.C.
12. TOP PLATES LAPS & INTERSECTIONS, FACE NAIL — 2 - 16d
13. CONTINUOUS HEADER, TWO PIECES — 16d @ 16" O.C. ALONG EA. SIDE
14. CEILING JOISTS TO PLATE, TOE NAIL — 3 - 8d
15. CONTINUOUS HEADER TO STUD, TOE NAIL — 4 - 8d
16. CEILING JOISTS, LAPS O/ PARTITIONS, FACE NAIL — 3 - 16d
17. CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL — 3 - 16d
18. RAFTER TO TOP PLATE, TOE NAIL — 3 - 8d
19. 1" BRACE TO EA. STUD & PLATE, FACE NAIL — 2 - 8d
20. 1X8 SHT'G. OR LESS TO EA. BEARING WALL FACE NAIL — 2 - 8d
21. WIDER THAN 1X8 SHT'G. TO EA. BEARING WALL FACE NAIL — 3 - 8d
22. BUILT-UP CORNER STUDS — 16d @ 24" O.C.
23. BUILT-UP GRADERS & BEAMS — 20d @ 32" O.C. @ TOP & BOT. & STAGG. 2 - 20d @ END & @ EA. SPLICE
24. 2" PLANKS — 2 - 16d @ EA. BRG.
25. PARTICLE BD. - WALL SHTG. (TO FRMG.) — 8d
26. PLYWOOD -
   - SUBFLR. RF. & WALL SHTG. (TO FRMG.):
     - 1/2" & LESS — 8d
     - 5/8" - 3/4" — 8d
     - 7/8" - 1" — 8d
     - 1 1/8" - 1 1/4" — 10d
   - COMBINATION SUBFLR. / UNDERLAYMENT (TO FRMG.):
     - 3/4" & LESS — 8d
     - 7/8" - 1" — 8d
     - 1 1/8" - 1 1/4" — 10d
   - FIBERBD. SHTG.:
     - 1/2" — NO. 11 GA. 6d, NO. 16 GA.
     - 25/32" — NO. 11 GA. 6d, NO. 18 GA.

NOTE:

1. ALL NAILS SHALL BE COMMON WIRE NAILS. WHERE DRIVING OF NAILS CAUSES SPLITTING HOLES FOR THE NAILS SHALL BE SUB DRILLED.
2. FASTENERS IN PRESERVATIVE-TREATED WOOD SHALL BE OF HOT-DIPPED ZINC-COATED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER.(CBC 2304.9.5)

GENERAL NOTES:

1. CONTRACTOR TO ASSUME FULL RESPONSIBILITY FOR ABIDING TO ALL APPLICABLE CALIFORNIA BUILDING CODES, LOCAL CITY ORDINANCES, ZONING REQUIREMENTS, AND LICENSING/PERMIT REQUIREMENTS. CONTRACTOR IS FULLY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES INCLUDING WITHOUT LIMITATION TO DEMOLITION, EXCAVATION AND ERECTION PROCEDURES.
2. THE CONTRACTOR SHALL EXAMINE THE CONSTRICTION DOCUMENTS AND NOTIFY THE PROJECT ENGINEER & ARCHITECT OF ANY DISCREPANCIES, ERRORS, OR OMISSIONS SHE/HE MAY FIND BEFORE PROCEEDING WITH THE WORK.
3. NOTIFY THE PROJECT ENGINEER OF ANY DESIGN CHANGES PROPOSED BY OWNER OR THE CONTRACTOR DURING THE COURSE OF CONSTRUCTION. SUCH CHANGES AFFECTING ROOM ADDITION DESIGN MAY ALSO AFFECT STRUCTURAL DESIGN.
4. ANY SUBCONTRACTOR WHICH AGREES TO CONSTRUCT THE PROJECT PURSUANT TO THESE PLANS FULLY ASSUMES THE RISK OF ALL ERRORS AND OMISSIONS WHICH SHOULD HAVE BEEN DETECTED BY A CAREFUL REVIEW BY A KNOWLEDGEABLE LICENSED CONTRACTOR, THAT WHICH FOR ANY REASON WERE NOT RESOLVED DURING THE BIDDING OR NEGOTIATION PROCESS. FURTHER, THE CONTRACTOR SHALL CAREFULLY REVIEW THESE PLANS AS THE WORK PROGRESSES IN ORDER TO IDENTIFY ANY SIGNIFICANT ERRORS AND OMISSIONS AND TO ASCERTAIN ALL NECESSARY INFORMATION BEFORE PROCEEDING WITH THE AFFECTED WORK, AND ASSUMES THE RISK OF ANY AND ALL LOSS, INCLUDING DELAY, WHICH MAY BE CAUSED OR CONTRIBUTED TO BY THE FAILURE TO ASCERTAIN CORRECT OR NECESSARY INFORMATION IN A TIMELY MANNER.
5. ALL TRADES SHALL, AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR WORK, AND AT THE COMPLETION OF THE WORK SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE JOBSITE AND ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS, AND SHALL LEAVE THE JOB BROOM CLEAN, INCLUDING REMOVING ALL LABELS, STICKERS, PAINT SMEARS, ETC.., FROM LIGHTING FIXTURES, PLUMBING FIXTURES, GLASS SURFACES, FINISH HARDWARE, CABINETS, COUNTER TOPS, ETC.
6. EXCEPT WHERE MORE STRINGENT REQUIREMENTS ARE NOTED OR SHOWN ON THE PLANS, WORKMANSHIP & MATERIALS SHALL CONFORM, TO THE LATEST EDITION OF THE C.B.C. OR LOCAL CODE.
7. THE PLANS SHALL BE REVIEWED FOR DIMENSIONAL & EXISTING SITE CONFORMANCE WITH THE PLANS BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE ARCHITECT & ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES.
8. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD; AND ALL QUESTIONS AS TO DIMENSIONS AND FIELD CONDITIONS SHALL BE RESOLVED BEFORE THE AFFECTED WORK PROCEEDS. NO DIMENSIONS SHALL BE OBTAINED BY SCALING THESE PLANS.
9. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR DIMENSIONS AND CONDITIONS OF THE JOB.
10. THE PRECISE DIMENSIONS AND LOCATIONS OF ALL DOOR, WINDOW AND ROOF OPENINGS SHALL BE DETERMINED FROM DRAWINGS AND OTHER FLOOR, WALL OPENING REQUIRED BY MECHANICAL OR ELECTRICAL SHALL BE VERIFIED FROM SHOP DRAWINGS, EQUIPMENT DATA SHEETS, ETC. AS REQUIRED.
11. ITEMS IDENTIFIED BY TRADE NAMES MAY BE SUBSTITUTED BY APPROVED EQUALS.
12. NOTES & DETAILS ON DRAWINGS SHALL PRECEDE THESE GENERAL NOTES.
13. PROVIDE ANY SHORING & OR BRACING PRIOR TO REMOVING EXISTING WALLS, BEAMS, OR SUPPORTS FOR CONSTRUCTION. REMOVE SHORING ONLY WHEN NEW SUPPORTS ARE IN PLACE AND SECURED.
14. PROVIDE RED HEADS INTO EXISTING CONCRETE AT ALL SHEAR WALLS PER MFG. SPECIFICATIONS. SEE SHEAR WALL SCHEDULE FOR SIZE AND SPACING.
15. PROVIDE SIMPSON ST-6224 BETWEEN NEW WALLS AND EXISTING WALLS AT THE DOUBLE TOP PLATE.
16. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON DRAWINGS AND PROTECT THEM FROM DAMAGE
17. DO NOT CUT POST TENSION SLABS. CONTRACTOR TO DETERMINE EXISTING CONDITIONS PRIOR TO START OF CONSTRUCTION.
18. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS FOR FOOTING, BEAMS AND JOISTS, SIZES, LOCATIONS, ETC., AND SHALL NOTIFY THE ARCHITECT & ENGINEER OF ANY DISCREPANCIES.
19. DOWEL NEW INTO EXISTING SLABS W/ #4 REBAR @ 24" O.C. AND FOOTINGS W/ DOWELS TO MATCH NEW REINF. SIZE/ LOCATION.

ENGINEERING NOTES

1. CONCRETE SLABS ON GRADE HAVE NOT BEEN DESIGNED BY THE STRUCTURAL ENGINEER.
2. THE VIBRATIONAL EFFECTS OF MECHANICAL EQUIPMENT HAVE NOT BEEN CONSIDERED BY THE STRUCTURAL ENGINEER.
3. THE DESIGN, ADEQUACY AND SAFETY OF ERECTION, BRACING SHORING, TEMPORARY SUPPORTS ETC., IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE STRUCTURAL ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING THE ENTIRE COURSE OF CONSTRUCTION. THE ENGINEER SHALL NOT BE HELD RESPONSIBLE FOR FIELD INSPECTION/OBSERVATION OF THE ABOVE ITEMS.
4. ALLOWABLE SOILS PRESSURE TO BE A MINIMUM OF 1500 PSF UNLESS A SOILS REPORT IS PROVIDED. SOILS IN THE BUILDING AREA & 5 FEET BEYOND SHALL BE COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION PER 2019-C.B.C.

REFER TO SOIL REPORT BY: ______________________

JOB NUMBER: ______________ DATED: ______________

STRUCTURAL SYMBOLS

△ INDICATES SHEAR WALL. SEE FOUNDATION, FRAMING PLAN AND SHEAR WALL SCHEDULE FOR TYPE, SILL BOLTING, SHTG., ETC. NOTE: FOR SILL BOLTING AT EXISTING FOOTINGS, USE 5/8" Ø THREADED RODS W/ SIMPSON "SET-XP" EPOXY 7" MIN. EMB. PER ICC ESR-2508 THE SAME SIZE & SPACING AS CALLED FOR ON PLANS

☒ INDICATES POST (BELOW BEAM)

MIN. POST SIZE/TYPE AS FOLLOWS U.N.O.:

BEAM SIZE	POST SIZE
4 X 12 & SMALLER	2-2X4 W/16d NAILS @ 12" O.C.
4 X 14 & LARGER	4X4
6 X 10 & SMALLER	4X6
6 X 12 & LARGER	6X6 SEE HOLDDOWN DETAILS AND TYPICAL WALL

FRAMING FOR FURTHER POST SIZE REQUIREMENTS. POSTS ARE TO CONTINUE DOWN TO FOUNDATION.

FOUNDATION NOTES

GENERAL

1. SOIL BENEATH FOOTINGS AND SLABS SHALL BE COMPACTED PER 2019 C.B.C. (90%) RELATIVE COMPACTION MINIMUM.
2. CONTINUOUS FOOTINGS AND GRADE BEAMS SHALL BE EXCAVATED TO THE DEPTH SHOWN ON THE DRAWINGS BELOW UNDISTURBED SOIL OR COMPACTED EARTH. PROVIDE 1-#4 HORIZONTAL BARS ON TOP AND BOTTOM U.N.O. ON FOUND. PLAN.
3. ALLOWABLE SOIL BEARING PRESSURE IS ASSUMED TO BE 1500. PSF IF NO SOILS REPORT IS PROVIDED.
4. SLAB ON GRADE: 4 INCH. NET CONCRETE SLAB WITH #3 BARS @ 18" O.C. EACH @ CENTER OF SLAB OVER 2 INCH. OF SAND OVER 6 MIL. VISQUEEN OVER 2" SAND BED OVER COMPACTED SOIL. U.N.O.
5. NO TRENCHES OR EXCAVATIONS FIVE FEET IN DEPTH OR GREATER INTO WHICH A PERSON SHALL BE REQUIRED TO DESCEND SHALL BE MADE WITHOUT PROPER PERMIT.
6. THE MINIMUM BOLTING FOR SILL PLATES TO FOUNDATION SHALL BE AS FOLLOWS: 5/8" DIAMETER ANCHOR BOLTS WITH 7" MIN EMBEDMENT IN CONCRETE WITH SPACING NO GREATER THAN 4 FEET O.C. NOR FURTHER THAN 12" FROM CORNERS (MIN 2 BOLTS PER PIECE). SEE THE FOUNDATION PLAN & SHEAR WALL SCHEDULE FOR FURTHER BOLTING REQUIREMENTS.(FOR TWO POUR SYSTEMS,BOLTS SHALL BE EMBEDDED 4 INCH MIN. INTO FIRST POUR.)
7. PIPES OR DUCTS THAT EXCEED ONE THIRD THE SLAB OR CONC. WALL THICKNESS SHALL NOT BE PLACED IN STRUCTURAL CONC. UNLESS SPECIFICALLY DETAILED. SEE MECHANICAL AND/OR ELECTRICAL DRAWINGS FOR LOCATION OF SLEEVES, ACCESSORIES, ETC.
8. PIPES MAY PASS THRU STRUCTURAL CONC. IN SLEEVES, BUT SHALL NOT BE EMBEDDED THEREIN.
9. PROVIDE 3/4" CAMBERS AT ALL EXPOSED CORNERS.
10. SEE ARCHITECTURAL PLANS FOR MOLDS, GROOVES, ORNAMENTS, CLIPS OR GROUNDS REQUIRED TO BE CAST IN CONCRETE, AND FOR LOCATION OF FLOOR FINISHES AND SLAB DEPRESSIONS.
11. LOCATION OF POUR JOINTS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER.

CONCRETE

1. UNLESS OTHERWISE NOTED ON PLANS, CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI IN 28 DAYS.
2. FINE & COURSE AGGREGATE SHALL CONFORM TO A.S.T.M. C-33, USE 3000 P.S.I. CONC. @ GRADE BEAMS. CEMENT SHALL CONFORM TO A.S.T.M. C-150 (STANDARD BRAND PORTLAND CEMENT) TYPE II (USE TYPE V CEMENT IF NOTED IN SOILS REPORT)
3. CONCRETE SHALL BE MACHINE-MIXED USING A MAXIMUM OF '7' GALLONS OF WATER PER SACK OF CEMENT. READY MIX CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C-94 MIXED AT A RATE OF 5 SACKS OF CEMENT PER CUBIC YARD. MAXIMUM SLUMP SHALL BE 4 INCH AS MEASURED BY THE ASTM "STANDARD METHOD OF TESTING FOR SLUMP OF PORTLAND CEMENT CONCRETE.
4. DRY PACK SHALL CONSIST OF 1 PART CEMENT, 4 PARTS SAND. BASED ON DRY LOOSE VOLUMES AND NOT LESS THAN 1/4 PART, NOR MORE THAN 1/2 PART, LINE PUTTY OR DRY HYDRATED LIME. DRY PACK SHALL OBTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 2000 PSI AT 28 DAYS.
5. ADDING CALCIUM CHLORIDE TO CONCRETE OR GROUT IS NOT PERMITTED.
6. CONC. SHALL BE KEPT MOIST FOR 10 DAYS FOR PROPER CURING.

REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS (ACI 4.3)

SULFATE EXPOSURE	CEMENT TYPE	WATER-CEMENT RATIO	COMPRESSIVE STRENGTH
NEGLIGIBLE	NOT REGULATED	-	2500 psi
MODERATE	I, II	0.50	4000 psi
SEVERE	V	0.45	4500 psi
VERY SEVERE	V	0.45	4500 psi

CONCRETE BLOCK MASONRY

1. CONCRETE BLOCK SHALL CONFORM TO A.S.T.M. C-90 MED. WT. GRADE N UNITS, WITH MIN. COMP. STRENGTH OF 1500 PSI. ALL CMU BLOCKS SHALL BE LAID UP IN RUNNING OR COMMON BOND CONFIGURATION.
2. MORTAR SHALL CONFORM TO ASTM C-270, TYPE S, WITH MINIMUM COMPRESSIVE STRENGTH OF 2000. PSI AT 28 DAYS.

   MIX: 1 PART PORTLAND CEMENT.
   1/2 PART LIME PUTTY.
   4 PARTS SAND.
   } BY VOLUME
3. GROUT SHALL CONFORM TO ASTM C-476, WITH MINIMUM COMPRESIVE STRENGTH OF 2000. PSI AT 28 DAYS.

   MIX: 1 PART PORTLAND CEMENT.
   3 PARTS SAND
   2 PARTS PEA GRAVEL
   } BY VOLUME

   WATER SUFFICIENT TO ALLOW GROUT TO FLOW INTO ALL JOINTS.
4. CELLS SHALL BE IN VERTICAL ALIGNMENT TO PROVIDE A MIN. UNOBSTRUCTED CORE OF 3" X 3". DOWELS FROM FOOTINGS SHALL BE SET TO ALIGN WITH CORE REINFORCING.
5. ALL CELLS BELOW FINISHED GRADE AND ALL CELLS WITH REINFORCING, ANCHORS OR INSERTS SHALL BE FILLED SOLID WITH GROUT.
6. CONCRETE SURFACES SHALL BE CLEANED OF ALL LAITANCE PRIOR TO SETTING OF BLOCKS.
7. PROVIDE VERTICAL CONSTRUCTION JOINTS AT 40 FT. O.C.
8. MINIMUM LAP FOR ALL STEEL IS 40 BAR DIAMETER, OR 24 INCHES, WHICHEVER IS GREATER.
9. IF WORK IS STOPPED FOR ONE HOUR OR LONGER, PROVIDE HORIZONTAL CONSTRUCTION JOINTS BY STOPPING GROUT 1-1/2 INCH BELOW THE TOP OF THE BLOCK.

REINFORCED MASONRY (CMU)

1. ALL MASONRY SHALL BE REINFORCED CONCRETE MASONRY UNIT IN ACCORDANCE WITH THE LATEST EDDITION OF ACI 530/ASCE 5/TMS 402.
2. INSTALL ALL BLOCKS IN RUNNING BOND.
3. MINIMUM MASONRY BLOCK (ASTM C90) STRENGTH SHALL (F'M) BE 2000 PSI.
4. TYPE "S" MORTAR (ASTM C270) SHALL BE USED USING 3/8" FULL BEDDING REINFORCED W/ 9 GAGE GALVANIZED LADDER WIRE EVERY 2ND ROW.
5. FILLED CELLS SHALL BE REINFORCED WITH #5 REBAR @ 24" O.C. (UNLESS OTHERWISE IS SPECIFIED ON THE PLANS).
6. GROUT SHALL BE PEA ROCK PUMP MIX (ASTM C476) WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI (28 DAY) (ASTM C1019). TARGETED SLUMP SHALL BE 8"-11".
7. EACH GROUTED CELL SHALL HAVE CLEANOUT OPENINGS AT THE BOTTOM. THERE SHALL BE NO LOOSE MORTAR OR OTHER DEBRIS IN THE BOTTOM OF THE CELL. USE BLAST PRESSURE WASHING FOR SURFACE PREPARATION.

REINFORCING STEEL

1. REINFORCING STEEL, #3 AND #4 GRADE 40, #5 AND LARGER GRADE 60 PER A.S.T.M. A615.
2. LOW HYDROGEN WELDING RODS SHALL BE USED FOR ALL WELDING OF REINFORCING BARS.
3. BARS NOTED AS "CONT" TYPICAL WALL REINFORCING AND VERTICAL COLUMN REINFORCING SHALL HAVE A MINIMUM SPLICE OF 50 BAR DIAMETERS LAP IN MASONRY OR 40 BAR DIAMETERS MINIMUM IN CONCRETE.
4. REINFORCING SHALL BE SPLICED ONLY AS SHOWN OR NOTED. OTHER SPLICES SHALL BE APPROVED BY THE STRUCTURAL ENGINEER.
5. SPLICES IN ADJACENT HORIZONTAL WALL REINFORCING BARS SHALL BE STAGGERED 4 FEET UNLESS OTHERWISE NOTED.
6. PROVIDE DOWELS IN FOOTINGS AND/OR GRADE BEAMS THE SAME SIZE AND NUMBER AS VERTICAL WALL OR COLUMN REINFORCING. DOWELS SHALL HAVE A MINIMUM PROJECTION EQUAL TO STANDARD LAP SPLICE UNLESS OTHERWISE NOTED.
7. ALL REINFORCING, ANCHOR BOLTS, AND OTHER INSERTS SHALL BE SECURED IN PLACE PRIOR TO PLACEMENT OF CONCRETE OR GROUTING OF MASONRY.
8. PROVIDE THE FOLLOWING MINIMUM PROTECTIVE COVERING OF CONCRETE:

   BELOW GRADE (UNFORMED) 3" CLEAR
   BELOW GRADE (FORMED) 2" CLEAR
   WALLS 1" CLEAR
   COLUMNS 1.5" CLEAR
   BEAMS AND GIRDERS 1.5" CLEAR
   STRUCTURAL SLAB (ABOVE GRADE) 3/4" CLEAR
9. #5 OR LARGER REINFORCING BARS SHALL NOT BE RE-BENT WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER.

GRADING NOTES

1. A GRADING PERMIT SHALL BE OBTAINED PRIOR TO ANY GRADING.
2. ALL FILL ONE FOOT & GREATER SHALL BE CERTIFIED AND TESTED AS TO RELATIVE COMPACTION PER U.B.C.
3. ALL FILL SHALL BE COMPACTED IN ACCORDANCE WITH ASTM D-1557, TO MAXIMUM OF 90% DENSITY.
4. ALL UTILITY TRENCH BACKFILLS SHALL BE IN ACCORDANCE WITH THE SOILS ENGINEER'S RECOMMENDATIONS.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36,(Fy=36.KSI) FOR PLATES AND TO ASTM A992,(Fy=50.KSI) FOR W-SHAPE STEEL SECTIONS.
2. CORTEN STEEL SHALL CONFORM TO ASTM A588, Fy=50. KSI.
3. STAINLESS STEEL SHALL CONFORM TO ASTM A276 TYPE 304-HOT ROLLED, Fy=18. KSI.
4. FABRICATION, ERECTION & PAINTING SHALL COMPLY WITH THE AISC SPECS. CHAPTER M. (THIRTEENTH EDITION).
5. ALL BOLTS FOR STEEL MEMBERS SHALL CONFORM TO ASTM A325 OR A490, UNLESS OTHERWISE NOTED.
6. HIGH TENSILE BOLTS WHERE INDICATED ON THE PLANS OR DETAILS SHALL BE THE FRICTION TYPE AND THERE SHALL BE NO PAINT, OIL, LAQUER, OR GALVANIZING BETWEEN THE CONTACT SURFACES. HIGH TENSILE BOLTS SHALL CONFORM TO ASTM A325 OR A490.
7. HIGH STRENGTH BOLTS SHALL HAVE LOAD INDICATOR WASHERS TO SERVE AS A DIRECT TENSION INDICATOR INSTALLATION FOR HIGH STRENGTH BOLTS SHALL REQUIRE INSPECTION BY A DEPUTY INSPECTOR.
8. ANCHOR RODS SHALL BE ASTM F-1554 GRD. 55 KSI U.N.O. ALL ANCHOR RODS SHALL BE. HEADED RODS.ANCHOR ROD WASHER SHALL BE ASTM A436. NUTS SHALL BE ASTM A563.
9. PIPE COLUMNS SHALL CONFORM TO ASTM A-53 GRADE B.
10. STEEL TUBE SHAPED MEMBERS SHALL CONFORM TO ASTM A-501 OR OR A-500 GRADE B.
11. WHERE FINISH IS ATTACHED TO STRUCTURAL STEEL, PROVIDE HOLES FOR 1/2" WELDED STUDS AT 4 FEET O.C. FOR THE ATTACHMENT OF NAILERS. SEE ARCHITECTURAL DRAWINGS FOR FINISHES.
12. OPEN WEB JOISTS SHALL COMPLY WITH THE STANDARDS OR "THE STEEL JOIST INSTITUTE".
13. STEEL STUDS, JOIST, TRACKS & BRIDGING:
    ASTM A-570 GRADE "E" Fy = 50 KSI 12, 14 & 16 GA.
    ASTM A-570 GRADE "C" Fy = 33 KSI 18 & 20 GA.
14. SPECIAL INSPECTION OF HIGH-STRENGTH A325 AND A490 BOLTS SHALL BE IN ACCORDANCE WITH APPROVED NATIONALLY RECOGNIZED STANDARDS AND REQUIREMENT OF SECTION 1701.
15. SHOP DRAWINGS SHALL BE PROVIDED TO ENGINEER OR ARCHITECT OF RECORD FOR REVIEW PRIOR TO FABRICATION.

STRUCT. STEEL WELDING

1. WELDING SHALL BE DONE BY THE ELECTRIC SHIELDED ARC PROCESS W/E70-XX ELECTRODES AND SHALL COMPLY WITH A.W.S. SPECIFICATIONS FOR WELDING AND FABRICATION.
2. WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS WHO ARE APPROVED BY THE LOCAL AUTHORITY USING ARC PROCESS WITH E70XX ELECTRODES.
3. ALL FIELD WELDS SHALL HAVE CONTINUOUS INSPECTION PER CBC (1701) UNLESS OTHERWISE NOTED.
4. ALL BUTT WELDS SHALL BE FULL PENETRATION U.N.O.
5. A CERTIFICATE OF FABRICATION FROM THE SHOP PERFORMING WELDING OR A REPORT FROM THE SPECIAL INSPECTOR MUST BE FURNISHED TO THE JOB INSPECTOR PRIOR TO FRAMING APPROVAL.
6. WELDED, FULLY RESTRAINED CONNECTION BETWEEN MEMBERS OF ORDINARY MOMENT FRAMES OR SPECIAL MOMENT-RESISTING FRAMES SHALL HAVE SPECIAL CONTINUOUS INSPECTION AND CONNECTION TESTED BY NONDESTRUCTIVE METHODS PER SECTION 1703.
7. FIELD WELDING OF REINFOCING STEEL SHALL BE DONE BY WELDERS SPECIFICALLY CERTIFIED FOR REINFORCING STEEL WELDING .BEFORE WELDING,THE "CARBON EQUIVALENT" (CE) OF STEEL SHALL BE DETERMINED. IF THE (CE) OF STEEL IS MORE THAN 0.75% , THEY SHALL NOT BE WELDED.

FRAMING NOTES

1. FRAMING SHALL COMPLY WITH CHAPTER 23 OF THE 2019 CBC

FRAMING-GENERAL

1. USE SIMPSON U-HANGERS ON ALL JOIST/BEAM/BEAM CONNECTIONS UNLESS NOTED ON PLANS.
2. ALL POSTS SHALL HAVE SIMPSON "PC" CONNECTORS AT TOP AND SIMPSON "BC" OR "BCO" CONNECTORS AT BASES UNLESS OTHERWISE NOTED ON PLANS.
3. ALL CONNECTING HARDWARE, JOIST HANGERS, TIE STRAPS, ETC., SHALL BE SIMPSON "STRONG TIE" UNLESS OTHERWISE NOTED OR SHOWN ON PLANS.
4. FRAMING @ CHIMNEY ENCLOSURE SHALL BE 2x6 STUDS BALLOON FRAMED W/APPROVED STRAPS TO ROOF AND FLOOR DIAPHRAGMS.

FRAMING - WALL

1. SIZE, SPACING & HEIGHT LIMITS FOR WOOD STUDS ARE AS FOLLOWS (UNLESS OTHERWISE NOTED ON PLANS):

   2X4 @ 16" OC (BEARING WALL) SUPPORTING A MAXIMUM OF ONE FLOOR AND ONE ROOF SHALL HAVE A MAXIMUM HEIGHT OF 10 FEET
   2X4 @ 16" OC (NON-BEARING WALL) SHALL HAVE A MAXIMUM HEIGHT OF 14 FEET

   2X6 @ 16" OC (BEARING WALL) SUPPORTING A MAXIMUM OF TWO FLOORS AND A ROOF SHALL HAVE A MAXIMUM HEIGHT OF 10 FEET
   2X6 @ 16" OC (NON-BEARING WALL) MAXIMUM HEIGHT IS 20 FEET
2. RAKE WALLS ADJACENT TO SLOPED CEILINGS SHALL BE BALLOON FRAMED. DOUBLE TOP PLATES SHALL ALWAYS BE SUPPORTED BY A ROOF OR CEILING DIAPHRAGM.
3. SHEAR WALL PANELS MUST BE CONTINUOUS TO THE TOP PLATE AT ROOF FRAMING. SHEATHING SHALL HAVE ALL EDGES BLOCKED & THE APPROPRIATE SHEAR TRANSFER THRU CEILING OR SOFFIT FRAMING.
4. BORING AND NOTCHING OF WALL STUDS SHALL BE PER CBC (2308.9)

   NOTCHING MAXIMUM: 25% OF WIDTH OF STUDS ON BEARING WALLS
   40% OF WIDTH OF STUDS ON NON-BEARING WALLS BORING

   MAXIMUM: 40% OF WIDTH OF STUDS ON BEARING WALLS
   60% OF WIDTH OF STUDS ON NON-BEARING WALLS

NOTE: A MIN. 5/8" CLEARANCE FROM EDGE OF STUD TO HOLE SHALL BE PROVIDED.

5. DOUBLE 2X TOP PLATE SHALL BE LAPPED 48" AT ALL SPLICES AND SHALL OVERLAP AT CORNERS.
6. WALL BRACING SHALL BE PROVIDED PER CBC (2308.9.3)
7. HARDY FRAMES INSTALLATION PER MFR. SPECIFICATION (ICC ESR-2089)
8. STRONG WALL INSTALLATION PER MFR. SPECIFICATION (ICC-ESR-1267)

FRAMING - FLOOR

1. FLOOR SHEATHING (MIN) 5/8" STRUCTURAL I T & G PLYWOOD PANEL INDEX NO. 32/16 WITH EXTERIOR GLUE. USE 10d COMMON NAILS AT 6" OC AT ALL EDGES, BOUNDARIES, AND 10" O.C. FIELD. NO BLOCKING IS REQUIRED UNLESS NOTED ON PLAN. ALL EDGES BLOCKED AT DECKS.
2. PROVIDE DOUBLE FLOOR JOISTS UNDER ALL PARALLEL NON- BEARING PARTITIONS.
3. PROVIDE CONTINUOUS BLOCKING BETWEEN FLOOR JOISTS UNDER BEARING WALLS WHICH ARE PERPENDICULAR TO JOISTS.
4. FRAMING AROUND OPENINGS: TPT RIMMER AND HEADER JOISTS SHALL BE DOUBLED AND SUPPORTED BY HANGERS PER (CBC 2320.12.5).

FRAMING - ROOF

1. ROOF SHEATHING (MIN) 15/32" STRUC. I PLYWOOD SHEATHING PANEL INDEX NO. 32/16 WITH EXTERIOR GLUE. USE 8d COMMON NAILS AT 6" OC AT ALL EDGES, BOUNDARIES, AND 12" OC FIELD. NO BLOCKING IS REQUIRED UNLESS NOTED ON PLAN.
2. FRAMING AROUND OPENINGS: TPT RIMMER AND HEADER JOISTS SHALL BE DOUBLED AND SUPPORTED BY HANGERS PER CODE

FRAMING - CEILING (PER TABLE 2308.10.2)

1. CEILING JOISTS SHALL BE 2X6 @ 16" O.C. (MAX SPAN= 17'-8")
2. CEILING JOISTS SHALL BE 2X8 @ 16" O.C. (MAX SPAN= 23'-0")

FRAMING - JOISTS/RAFTERS

1. BORING AND NOTCHING OF JOISTS SHALL BE AS FOLLOWS: (CBC 2308.10) 2019 EDITION

   BORING- MAX DIA OF HOLE SHALL NOT EXCEED 1/3 OF DRESSED DEPTH OF JOIST WITH A MINIMUM EDGE CLEARANCE OF TWO INCHES.

   NOTCHING- MAX NOTCH AT ENDS SHALL NOT EXCEED 1/4 OF DEPTH. NO NOTCHING IS ALLOWED IN THE CENTER THIRD OF THE JOIST SPAN. MAX NOTCH IN TOP OR BOTTTOM OF THE JOIST SHALL NOT EXCEED 1/6 OF THE JOIST DEPTH.
2. WHERE THREE OR MORE (MULTI JOISTS) ARE USED, THE JOISTS SHALL BE BOLTED TOGETHER WITH 1/2" DIA. MACHINE BOLTS W/ WASHERS AT 24" OC STAGGERED. BOLTS SHALL BE RETIGHTENED PRIOR TO APPLYING FINISH MATERIALS.
3. JOISTS/RAFTERS SHALL LAP AT SPLICES A MIN. OF 4 INCHES WITH 3-16d NAILS OR USE SIMPSON ST 2115 @ 48 INCHES O.C.
4. CROSS BRIDGING OR 2X BLDG. SHALL BE PROVIDED @ 8'-0" O.C. MAX. FOR ALL JOISTS AND RAFTERS MORE THAN 8" IN DEPTH.
5. 2X SOLID BLOCKING SHALL BE PLACED BETWEEN JOISTS OR RAFTERS AT ALL SUPPORTS.

DRAINAGE NOTES

1. MINIMUM GRADIENTS ARE AS FOLLOWS: EARTH= 2%, PAVING= .5%
2. POSITIVE DRAINAGE AWAY FROM STRUCTURES SHALL BE AS FOLLOWS:

   2% MIN. TO 21% MAX
   SWALES TO BE 3 FEET MIN. AWAY FROM STRUCTURES.

FRAMING-BOLTING

1. ALL BOLTS BEARING ON WOOD SHALL HAVE WASHERS UNDER HEAD OR NUT. SEE S.W. SCHEDULE.
2. ALL BOLTS SHALL BE RETIGHTENED, PRIOR TO APPLICATION OF PLYWOOD, PLASTER, ETC.
3. HOLES FOR BOLTS SHALL BE BORED 1/32" TO 1/16" LARGER THAN NOMINAL BOLT DIAMETER.
4. FASTENERS IN PRESSURE-TREATED AND FIRE-RETARDANT,TREATED WOOD SHALL BE OF HOT-DIPPED,ZINC-COATED GALVANIZED STEEL,STAINLESS STEEL,SILICON BRONZE OR COPPER.

LUMBER

1. ALL LUMBER SHALL BE DOUGLAS FIR-LARCH OR THE FOLLOWING GRADES UNLESS OTHERWISE NOTED (MAX MOISTURE CONTENT SHALL NOT EXCEED 19% & GRADED IN ACCORDANCE WITH THE (WEST COAST LUMBERMAN'S ASSOCIATION.)

   REPETITIVE USE MEMBERS

   STUDS & PLATES NO. 2

   JOISTS & RAFTERS:

   2X4 TO 4X4 INCLUSIVE N0. 2
   2X6 TO 3X16 INCLUSIVE NO. 2

   SINGLE USE MEMBERS

   BEAMS:
   4X N0. 2
   6X OR LARGER NO. 1

   POSTS & MULLION:
   4X4 & SMALLER N0. 2
   4X6 & LARGER NO. 2
   6X6 & LARGER NO. 1

   BLOCKING, FURRING, ETC. NO. 3
   DECKING & SHEATHING
   2X, 3X, 4X CONST. GRADE
2. ALL WOOD BEARING ON CONCRETE OR MASONRY IF LESS THAN 4 FEET FROM GRADE SHALL BE PRESSURE TREATED DOUG. FIR.
3. GLUED-LAMINATED WOOD BEAMS SHALL BE DOUGLAS FIR COMB. 24F-V4 (*) DF/DF (Fb=2400 PSI, Fv=165 PSI, E=180,000 PSI) INDUSTRIAL APPEARANCE WITH EXTERIOR GLUE UNLESS OTHERWISE NOTED ON PLANS. A CERTIFICATE OF INSPECTION FOR EACH GLU-LAM BEAM FROM AN APPROVED TESTING AGENCY TO BE SUBMITTED AND APPROVED BY THE BUILDING DEPT. PRIOR TO ERECTION. (*) USE V8 FOR CANT. BEAMS AND V4 FOR SIMPLE SPANS BEAMS]
4. SHOP DRAWING SHALL BE PROVIDED TO ENGINEER OR ARCHITECT OF RECORD FOR REVIEW PRIOR TO FABRICATION.
5. ALL STRUCTURAL PLYWOOD SHALL BE IN ACCORDANCE WITH (PS 1-95)
6. PARALLAM PSL PER TRUS JOIST MACMILLAN (ICC ESR-1387) (Fb= 2900 PSI, Fv=290 PSI, E= 2,000,000 PSI)
7. TJI JOISTS INSTALLATION PER MANUFACTURE SPECIFICATION (ICC ES ESR-1153 AND ICC ES ESR-1387)

SPECIAL INSPECTION (PER CBC SECTION 1704,1706 & 1707)

1. SPECIAL INSPECTION BY A REGISTERED DEPUTY BUILDING INSPECTOR, APPROVED BY THE ARCHITECT AND THE CHECKING AGENCY, SHALL BE REQUIRED FOR THE FOLLOWING TYPES OF WORK. SEE PROJECT SPECIFICATIONS FOR SPECIFIC REQUIREMENTS. SPECIAL INSPECTIONS SHALL NOT BE REQUIRED WHEN THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED BY THE BUILDING OFFICIAL TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION.

ITEMS REQUIRE SPECIAL INSPECTION AS MARKED:

VERIFICATION & INSPECTION	CONTINUOUS	PERIODIC
1. STRUCTURAL EPOXY BOLTING.	☒	
2. WELDING.	☐	
2a: FIELD WELDING OF MOMENT RESISTING STEEL FRAMES.	☐	
2b: STRUCTURAL STEEL OR REINFORCING	☐	
2c: STEEL DECKING.	☐	
2d: SHEAR CONNECTORES.	☐	
3. PLACEMENT OF REINFORCING STEEL IN CMU WALL.	☐	
4. HIGH STRENGTH BOLTING	☐	
5. EXPANSION TYPE ANCHOR BOLTS.	☐	
6. HIGH STRENGTH BOLTING		☐
7. CONCRETE WHERE CONCRETE STRENGTH OF 3000 PSI OR GREATER IS SPECIFIED.		☐
8. DIAPHRAGM CONNECTION TO STEEL SUPPORT MEMBERS.		☐
10. WOOD SHEAR WALLS AND WOOD DIAPHRAGMS NAILING.		☐
11. WOOD STRUCTURAL PANEL SHEATHING.		☐
12. NOMINAL SIZE OF FRAMING MEMBERS AT PANEL EDGES.		☐
13. NAIL OR STAPLE DIAMETER AND LENGTH.		☐
14. COMPACTED FILL		☐
15. FOUNDATION -ANCHOR BOLT AND HOLD DOWN.		☒
16. INSPECTION OF LATERAL FORCE RESISTING ELEMENTS.		☐

"CONTRACTOR RESPONSIBILITY:

EACH CONTRACTOR OR SUB-CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF THE WIND AND/OR SEISMIC RESISTING SYSTEM THAT IS LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK REQUIRING SPECIAL INSPECTION.
THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN THE FOLLOWING:
1) ACKNOWLEDGMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS;
2) ACKNOWLEDGMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE BUILDING OFFICIAL;
3) PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, AND THE METHOD AND FREQUENCY OF REPORTING AND THE DISTRIBUTION OF THE REPORTS;
4) IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION."

ABBREVIATIONS:

A.B.	ANCHOR BOLT
ABV.	ABOVE
BAR	REINF. BAR
BD	BOARD
BLKG.	BLOCKING
BLW.	BELOW
BM	BEAM
B.N.	BOUNDARY NAIL
B.W.	BOTH WAYS
CONT.FTG.	CONTINUOUS FOOTING
C.J.	CEILING JOIST
COL.	COLUMN
CONC.	CONCRETE
CONT.	CONTINUOUS
CLG.	CEILING
DP	DEEP
DBL	DOUBLE
D.F.	DOUGLAS FIR
DIA.	DIAMETER
DO	DITTO
(E)	EXISTING
E.W.	EACH WAY
E.J.	EXPANSION JOINT
E.N.	EDGE NAIL
EQ	EQUAL
FB	FLOOR BEAM
F.G.	FINISH GRADE
F.J.	FLOOR JOIST
FL	FLUSH
FMG.	FRAMING
F.N.	FIELD NAIL
F.O.C.	FACE OF CONCRETE
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUDS
F.P.	FULL PENETRATION
FTG	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
GLB	GLUE-LAMINATED BEAM
GRD. BM.	GRADE BEAM
GWB	GYPSUM WALLBOARD
H	HIGH
HDR.	HEADER
HGT.	HEIGHT
HNGR.	HANGER
HORIZ.	HORIZONTAL
K.P.	KING POST
L	LENGTH
LT. WT.	LIGHT WEIGHT
LVL	LAMINATED VENEER LUMBER
MAS.	MASONRY
M.B.	MACHINE BOLT
MLB	MICRO=LAM BEAM
(N)	NEW
N.G.	NATURAL GRADE
O.C.	ON CENTER
P.A.	POST ABOVE
PSL	PARALLAM PSL BEAM
PLWD	PLYWOOD
P.T.	PRESSURE TREATED
R.B.	RIDGE BEAM
REINF.	REINFORCING
REQ'D.	REQUIRED
RF	ROOF
R.R.	ROOF RAFTER
SIM.	SIMILAR
T.R.	THREADED ROD
TYP.	TYPICAL

THESE DRAWINGS AND SPECIFICATIONS AS INSTRUMENT OF SERVICE ARE PROVIDED FOR THE OWNER OR THE BUILDER, WHEN COMBINED WITH OTHER PLANS AND SPECIFICATIONS TO OBTAIN BUILDING PERMIT ONLY FOR THIS PROJECT. THEY ARE NOT INTENDED TO, NOR DO THEY, DETAIL ALL CONDITIONS, IDENTIFY ALL MATERIALS REQUIRED TO COMPLETE THE PROJECT. THE BUILDER ASSUMES RESPONSIBILITY TO SELECT ALL MATERIAL AND ALL SUB-CONTRACTORS AND INSTALLERS AND TO PROVIDE ENOUGH INFORMATION ABOVE AND BEYOND THESE DRAWINGS, TO COMPLETE THE PROJECT IN CONFORMANCE WITH ALL GOVERNING AGENCIES.

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Seal: REGISTERED PROFESSIONAL ENGINEER JAFAR RAVANBAKHSH No. 76341 Exp. 12/31/24 CIVIL STATE OF CALIFORNIA

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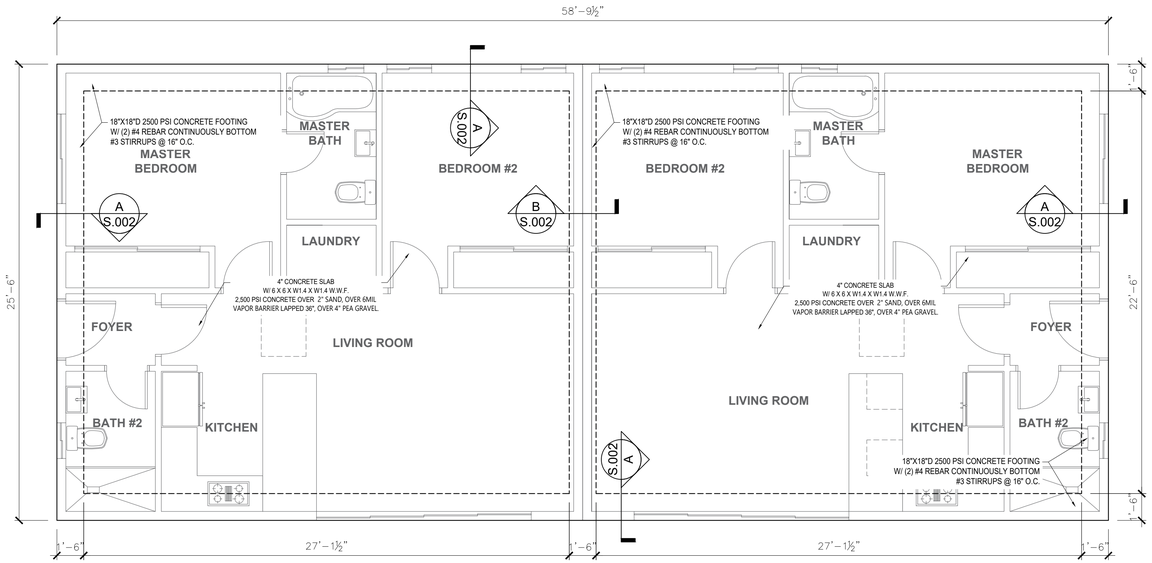
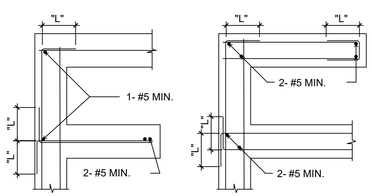
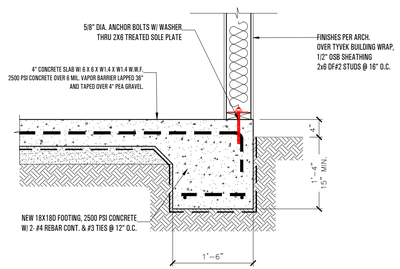


1 FOUNDATION PLAN
SCALE: 1/4"=1'-0"



NOTE: "L" = 40 X BAR DIAMETER IN CONC, U.N.O.RETE
"L" = 50 X BAR DIAMETER IN MASONRY, U.N.O.

2 TYPICAL WALL & FTG. REINFORCEMENT
SCALE: NTS



3 SECTION A-A
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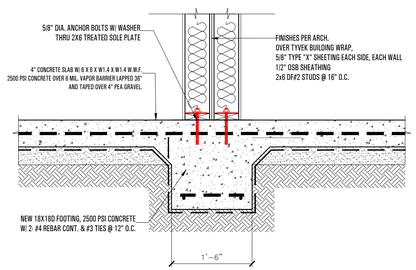
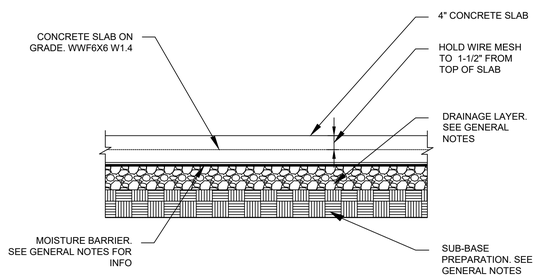


4 SECTION B-B
SCALE: 3/4"=1'-0"



5 TYP SLAB ON GRADE
SCALE: NTS

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FOUNDATION PLAN

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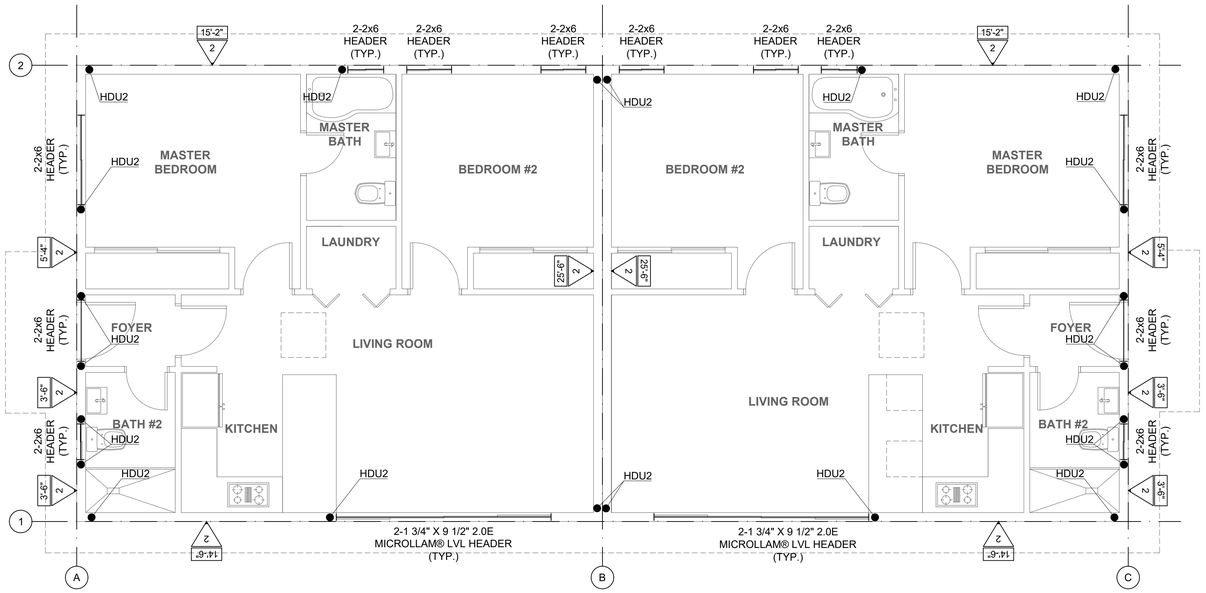


1 FIRST FLOOR SHEAR-WALLS PLAN

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

NOTES:

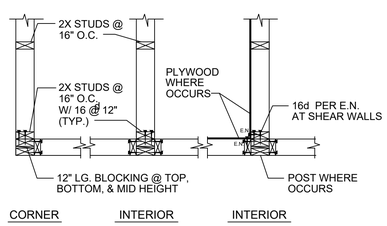
NOTES:

1. "MINIMUM MEMBER THICKNESS @ PANEL SEAM" REFERS TO FRAMING MEMBERS, INCLUDING PLATE AND BLOCKING, WHICH RECEIVE EDGE NAILING FROM ADJACENT PANELS.
2. 3x PLATES: USE 3x PLATES 5/8" DIAMETER ANCHOR BOLTS & 3"x3"x0.229" PLATE WASHERS AT ALL SHEAR WALL LOCATIONS.
3. LTP4 FRAMING CLIPS: LTP4 CLIPS MAY BE USED IN PLACE OF A35 CLIPS SHOWN IN SCHEDULE WERE LOCATION OF RIM OR BLOCKS ABOVE DOUBLE TOP PLATE ALLOWS. USE ONE LTP4 FOR EACH A35 CLIP.
4.- SHEAR WALLS SHALL NOT BE OFFSET MORE THAN 4'-0" FROM EACH OTHER.
5.- SHEAR PANELS TYPES SHALL NOT BE COMBINED IN THE SAME LINE OF RESISTANCE.
6.- WALL STUDS SHALL BE 2X MIN @16" OC.
7.- 10d NAILS SHALL BE PLACED NOT LESS THAN 3/8" FROM PANEL EDGES.
8.- SPLICE TOP PLATES WITH ST6236, U.N.O.
9.- 3"X3"X1/4" PLATE WASHERS, IN LIEU OF CUT WASHERS, SHALL BE PROVIDED FOR ALL PLYWOOD SHEAR WALL SILL PLATE ANCHOR BOLTS AND HOLD DOWNS.
10.- BOLT HOLES THROUGH ANY HOLD DOWN POST SHALL BE OVERSIZED BY 1/16" AND SHALL BE VERIFIED BY INSPECTOR.
11.- MUDSILL TO BE SILL GRADE REDWOOD OR SHALL BE PROTECTED WITH SODIUM BORATE. IF ANY OTHER PRESERVATIVE IS USED, PROTECT ALL FASTENERS IN THESE MATERIALS WITH 1.85 oz. OF ZINC GALVANIZED PER ASTM A653.
12.- 8d = .131" DIA. X 2.5" COMMON NAIL.
13.- 10d = .148" DIA X 3" COMMON NAIL

SHEAR WALL SYMBOL

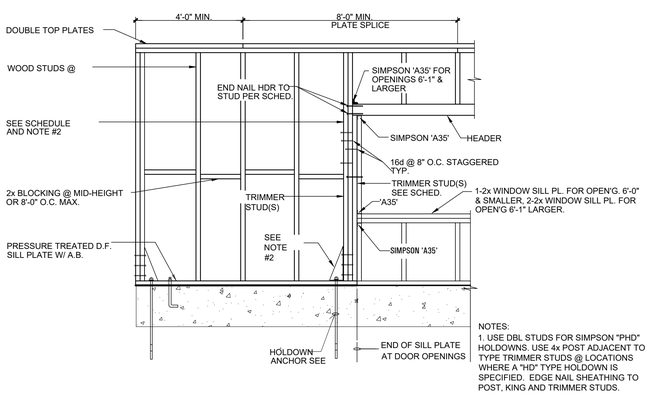
SHEAR WALL LENGTH → 5'-7"

SHEAR WALL TYPE → V



2 TYPICAL STUD WALL INTERSECTION

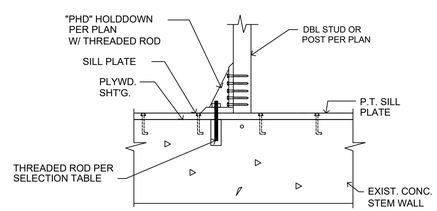
SCALE: NTS



NOTES:
1. USE DBL STUDS FOR SIMPSON "PHD" HOLDOWNS. USE 4x POST ADJACENT TO TYPE TRIMMER STUDS @ LOCATIONS WHERE A "HD" TYPE HOLDOWN IS SPECIFIED. EDGE NAIL SHEATHING TO POST, KING AND TRIMMER STUDS.

3 WALL FRAMING DETAIL

SCALE: NTS

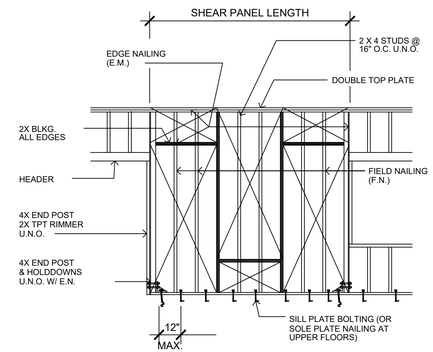


NOTES:
1. CONT. INSPECTION REQ'D.
2. DRILL HOLES PER MANUF. SPECS.
3. A307 THREADED RODS W/ SIMPSON SET XP ICC ESR-2508
4. ALL BOLTS SHALL BE HOT-DIPPED ZINC COATED, GALVANIZED,STAINLESS STEEL

ROD DIA.	EMBED DEPTH	EDGE DIST.	LOAD CAP.
5/8" Ø	10	1-3/4"	-
7/8" Ø	15	1-3/4"	1600

4 TYP. HOLD DOWN INSTALATION DETAILS

SCALE: NTS



5 TYP. SHEAR WALL LAYOUT

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SHEAR WALLS PLAN

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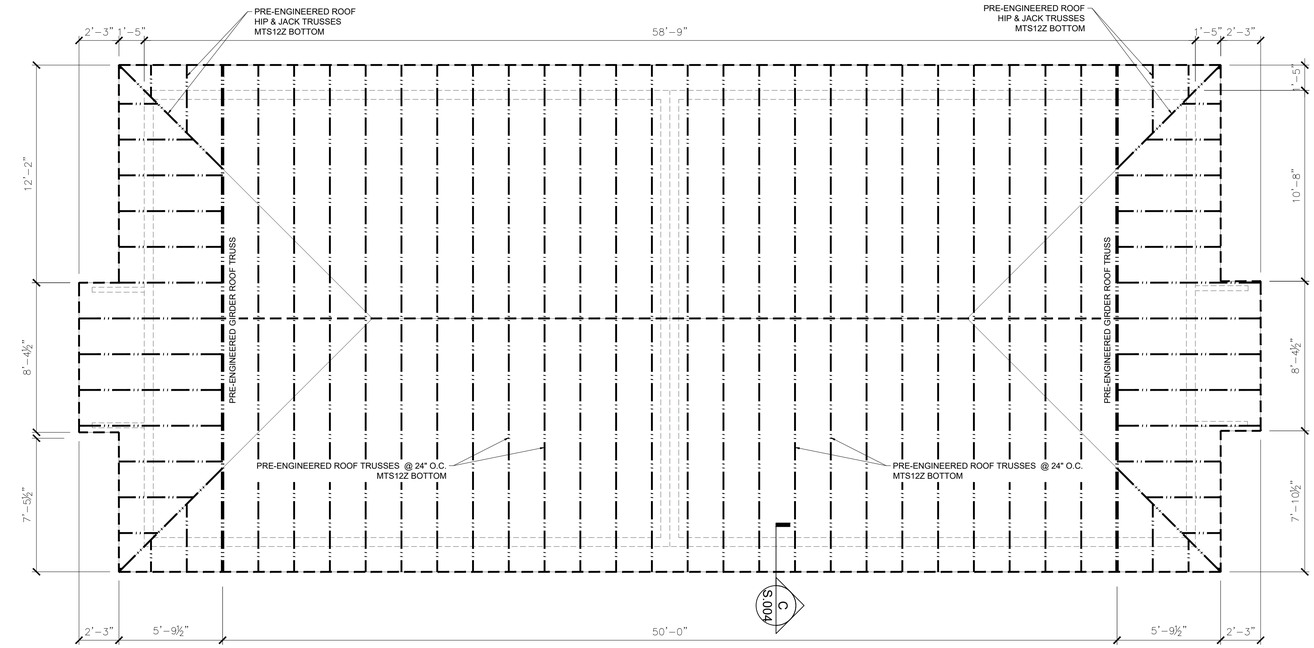
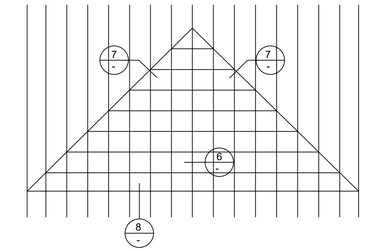
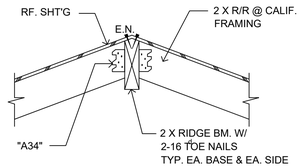


1 ROOF FRAMING PLAN

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

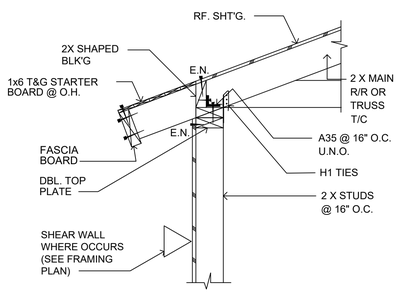
NOTES:
1. ROOF TRUSS LAYOUT IS FOR GUIDANCE PURPOSES. CONTRACTOR TO SUPPLY TRUSS MANUFACTURER SHOP DRAWINGS SIGNED AND SEALED BY SPECIALTY P.E.
2. PRELIMINARY TRUSS CONNECTORS:
ORDINARY TRUSSES: (1) HTS20(2) W/ (24) 10d 1-1/2 NAILS (TWIST STRAPS)
(1) HGA10KT W/ (4) SDS 1/4"x1-1/2" | (4) SDS 1/4"x3" (LATERAL TIES)
GIRDER TRUSSES: PER FINAL APPROVED SHOP DRAWINGS
HIP SETS: (2) HTS20(2) W/ (24) 10d 1-1/2 NAILS (TWIST STRAPS)
(1) HGA10KT W/ (4) SDS 1/4"x1-1/2" | (4) SDS 1/4"x3" (LATERAL TIES)
3. FINAL SIZING OF ALL TRUSS CONNECTOR WILL BE BASED ON THE APPROVED SHOP DRAWINGS. CONTRACTOR SHALL COORDINATE THE REVIEW PRIOR ORDERING ANY TRUSSES AND STRAPS.
4. ROOF SHEATHING 5/8 CDX PLYWOOD NAILED W/ 8d RING SHANK NAILS @ 4" ALL SUPPORTS (ZONE 1 AND 2) AND @ 3" ALL SUPPORTS (ZONE 3) (UNLESS SHOWN OTHERWISE ON THE DETAILS)





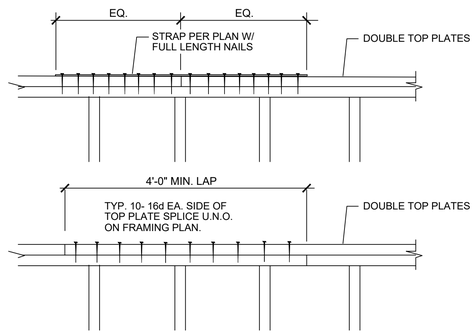
6 CALIF. FRAM'G

SCALE: 1"=1'-0"



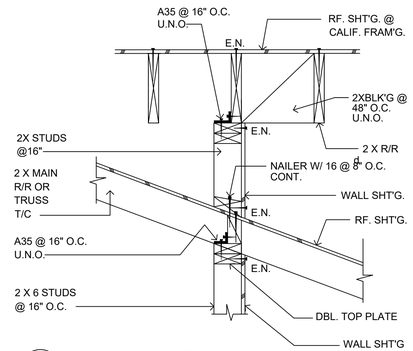
2 SHEAR TRANSFER SECTION C

SCALE: 1"=1'-0"



3 TOP PLATE SPLICE DETAIL

SCALE: NTS



8 CALIF. FRAM'G VIEW

SCALE: 1"=1'-0"

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ROOF FRAMING PLAN

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ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
$	SINGLE POLE SWITCH AND BOX, WALL MOUNTED +44" AFF. LOWER CASE LETTER INDICATES CIRCUIT CONTROLLED BY SWITCH.
D	WALL MOUNTED DIMMER SWITCH, 0–10V DIMMING WITH ON–OFF SWITCH.
$LV	WALL MOUNTED 2 WAY ON, CENTER OFF LOW VOLTAGE SWITCH FOR LCP CONTROLLER LIGHTS.
	RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5–20R +18"AFF U.O.N.(WP=WEATHERPROOF, GFCI=GROUND FAULT CIRCUIT INTERRUPTER)
D	DEDICATE RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5–20R +18"AFF U.O.N. (WP=WEATHERPROOF, GFI=GROUND FAULT CIRCUIT INTERRUPTER)
USB	USB RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5–20R +42"AFF U.O.N.
	RECEPTACLE, SINGLE, 20A, 120V GRD, NEMA 5–20R +18"AFF UON.
	RECEPTACLE, DOUBLE DUPLEX (2) 20A, 120V, GRD – NEMA (2) 5–20R +18"AFF U.O.N.
	RECEPTACLE DUPLEX 20A, 120V GRD NEMA 5–20R FLOOR MOUNTED.
	RECEPTACLE DOUBLE DUPLEX (2) 20A, 120V GRD, NEMA 5–20R UON. FLOOR MOUNTED.
	2 PORT VOICE/ DATA OUTLET, WALL MOUNT +18" AFF PROVIDE RING & STRING TO PULL CABLES THRU HOLLOW WALL. VOICE/ DATA WIRING BY TELECOM SYSTEM INSTALLER.
TV	TV OUTLET, WALL MOUNT +60" AFF PROVIDE RING & STRING TO PULL CABLES THRU HOLLOW WALL.
	COMBINATION 4–PLEX RECEPTACLE, NEMA 5–20R DOUBLE DUPLEX (1 DUPLEX AUTO CONTROLLED BY OCCUPANCY SENSOR PER T24, (1) DUPLEX UNCONTROLLED), & TYPE 6 VOICE/DATA OUTLET, FLOOR MOUNTED. PROVIDE MIN. 3/4" TEL/DATA CONDUIT WITH PULL WIRES.
	4–PLEX RECEPTACLE, NEMA 5–20R DOUBLE DUPLEX (1 DUPLEX AUTO CONTROLLED BY OCCUPANCY SENSOR PER T24, (1) DUPLEX UNCONTROLLED), +18"AFF, U.O.N. SEE NOTE 2.
	DUPLEX RECEPTACLE, NEMA 5–20R OCCUPANCY SENSOR CONTROLLED, +18"AFF. SEE NOTE 2.
GFCI	GFCI DUPLEX RECEPTACLE ABOVE COUNTER LEVEL, NEMA 5–20R.
GFCI	GFCI DUPLEX RECEPTACLE ABOVE COUNTER LEVEL, VACANCY SENSOR CONTROLLED, NEMA 5–20R.
	SPECIAL PURPOSE CONNECTION FOR ELECTRICAL EQUIPMENT. VERIFY CONNECTION TYPE AND WIRING REQUIREMENTS PRIOR TO ROUGH–IN.
EP	CLASS 1, DIVISION 1 RATED EXPLOSION–PROOF OUTLET. SEE ADDITIONAL NOTES ON SHEET E3.1.
	RECEPTACLE, 120V/240V, 3PH, 4W, GRD, RATING AS INDICATED IN PLANS.
	RECEPTACLE 20A, 480V, 3PH, 4W, GRD, NEMA L22–20R, +18"AFF UON.
	DUPLEX RECEPTACLE 20A, 120V, GND (5–20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
	DOUBLE DUPLEX RECEPTACLE 20A, 120V, GND (5–20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
	TWIST–LOCK RECEPTACLE 20, 250V, SINGLE PHASE (L6–20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
OS	OCCUPANCY SENSOR LOW VOLTAGE CEILING MOUNTED FOR ROOM CONTROLLER.
OS	OCCUPANCY SENSOR LOW VOLTAGE WALL MOUNTED FOR ROOM CONTROLLER.
DS	CEILING MOUNTED DAYLIGHT SENSOR.
J	JUNCTION BOX CEILING MOUNTED, SIZE TO CODE, TAPE AND TAG WIRES.
J	JUNCTION BOX WALL MOUNTED, SIZE TO CODE, TAPE AND TAG WIRES.
	ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED (277/480V).
	ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED (120/208V).
	SPECIAL PURPOSE ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED.
	TRANSFORMER – DRY TYPE.
	FUSED DISCONNECT SWITCH WITH DUAL ELEMENT FUSES. SWITCH AND FUSES RATING PER NAMEPLATE OF SERVED UNIT.
	NON–FUSED DISCONNECT SWITCH, RATING PER NAMEPLATE OF SERVED UNIT.
	MAGNETIC MOTOR STARTER, NEMA RATING AS REQUIRED PER SERVED UNIT.
M	MOTOR OUTLET AND FLEX CONNECTION TO MOTOR.
P	WALL MOUNTED JUNCTION BOX FOR PRE–WIRED FURNITURE POWER SYSTEM CONNECTION. PROVIDE POWER WHIP WITH TERMINATION PLUG TO MATCH FURNITURE SYSTEM CONNECTOR. LOCATE BOX AS LOW AS POSSIBLE. FIELD COORDINATE FINAL LOCATION.
C	COMBINATION TELEPHONE AND DATA OUTLET, WALL MOUNTED AS LOW AS POSSIBLE FOR FLEXIBLE CONNECTION TO FURNITURE SYSTEM.
C P	FLOOR MOUNTED FURNITURE FEEDS W/POWER & TELE/DATA PORT CAPACITY FOR ELECTRIFIED DESKS PER CLIENT'S REQUIREMENTS.
C P	POWER POLES W/POWER & TELE/DATA PORT CAPACITY FOR ELECTRIFIED DESKS PER CLIENT'S REQUIREMENTS.
	LEGEND NOTES: 1. MOUNTING HEIGHT INDICATED ARE AFF TO CENTER OF PLATE. INCASE OF CONFLICT, GENERAL NOTES 41 & 42 SHALL PREVAIL. 2. NOT ALL SYMBOLS AND ABBREVIATIONS ARE NECESSARILY USED IN THIS PROJECT.

GENERAL NOTES

1. WORKMANSHIP SHALL BE OF THE HIGHEST ORDER, PER NEC ARTICLE 110-12. ANY DEFECTIVE OR DAMAGED EQUIPMENT SHALL BE REPLACED OR REPAIRED IN A MANNER MEETING WITH THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH NECA STANDARDS OF INSTALLATION. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.

2. ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. ALL CONDUIT SHALL BE ROUTED CONCEALED UNLESS NOTED ON PLAN OR APPROVED BY THE ARCHITECT AND/OR ENGINEER. ROUTING OF RACEWAYS SHALL BE AT THE OPTION OF THE ELECTRICAL CONTRACTOR, UON, AND SHALL BE COORDINATED WITH OTHER TRADES. DO NOT SCALE THE ELECTRICAL PLANS FOR LOCATIONS OF ANY ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL, OR MECHANICAL EQUIPMENT, ITEMS OR FEATURES.

3. THE ELECTRICAL PLANS SHOW CONCEPTUAL UNDERGROUND CONDUIT ROUTING FOR CLARITY ONLY. THE CONTRACTOR HAS THE OPTION TO INSTALL UNDERGROUND CONDUIT IN A MANNER ALLOWING THE SHORTEST POSSIBLE CONDUIT LENGTH.

4. ALL EXISTING ELECTRICAL INFORMATION, POWER AND SIGNALS, SHOWN HEREIN HAS BEEN COMPILED FROM PREVIOUS 'AS-BUILT' CONSTRUCTION DOCUMENTS AND/OR INFORMATION PROVIDED BY THE OWNER'S FACILITIES PERSONNEL. IT HAS NOT NECESSARILY BEEN PHYSICALLY FIELD VERIFIED BY THIS ENGINEER. USE AND APPLICATION OF THIS INFORMATION SHALL BE CONFINED TO THE PROJECT FOR WHICH IT IS INTENDED.

5. ALL EQUIPMENT SHALL HAVE AN INDEPENDENT TESTING LABORATORY LABEL (U.L., C.S.A., ETC.) AS REQUIRED BY NEC ARTICLE 110-2 AND 110-3. PROVIDE EVIDENCE OF COMPLIANCE WITH THIS REQUIREMENT WITH EQUIPMENT SUBMITTALS. ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO ISSUING PURCHASE ORDERS IF EQUIPMENT PROPOSED IS NOT COMPLIANT WITH THIS REQUIREMENT. WHERE FIELD CERTIFIED PRODUCTS MAY BE REQUIRED FOR FIELD ASSEMBLED COMPONENTS, PROVIDE CERTIFIED REPORT BY AN APPROVED TESTING AGENCY ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION. ALL TESTING FEES SHALL BE INCLUDED IN ELECTRICAL CONTRACTOR'S BID.

6. WORKING CLEARANCES ABOUT ELECTRICAL EQUIPMENT SHALL COMPLY WITH THE REQUIREMENTS OF NEC ARTICLE 110 AND ARTICLE 408.18. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF WORKING CLEARANCES FOR EQUIPMENT INSTALLED AS PART OF THIS CONTRACT.

7. THE ELECTRICAL CONTRACTOR SHALL PERFORM ANY AND ALL TRENCHING, EXCAVATION AND BACKFILLING AND FURNISH ALL NECESSARY SCAFFOLDING, STAGING, RIGGING AND HOISTING REQUIRED FOR THE INSTALLATION OF HIS WORK. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

8. ALL EQUIPMENT/MATERIALS REMOVED SHALL BECOME PROPERTY OF THE OWNER.

9. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED LIGHTING FIXTURES. THE ELECTRICAL CONTRACTOR SHALL VERIFY THAT ALL LIGHTING FIXTURES, CEILING TRIMS AND FRAMES ARE COMPATIBLE WITH THE CEILING SYSTEM AND SPACE WHICH THEY ARE INTENDED TO BE INSTALLED TO. LIGHTING FIXTURE MOUNTING SUPPORT AND LOCATIONS SHALL BE PER NEC ARTICLE 410 REQUIREMENTS.

10. COORDINATE ELECTRICAL PANEL AND TERMINAL CABINET LOCATIONS AND ROUTING OF UNDERGROUND CONDUITS WITH FRAMING CONTRACTOR PRIOR TO BEGINNING ANY ROUGH-IN WORK FOR THIS EQUIPMENT.

11. MOTOR DISCONNECT SWITCHES SHALL COMPLY WITH NEC ARTICLES 430 AND 440. ALL CONNECTIONS FROM DISCONNECT SWITCHES TO HVAC UNITS SHALL BE MADE WITH COPPER CONDUCTORS. ALL DISCONNECT SWITCH DEVICES CONTROLLING MECHANICAL EQUIPMENT SHALL BE OF THE SIZE AND TYPE REQUIRED. FUSE ALL HVAC EQUIPMENT PER UNIT NAMEPLATE SPECIFICATIONS. FIELD VERIFY ALL.

12. PER CBC 714.3.2 EXCEPTIONS: ALL OUTLET BOXES IN FIRE RESISTIVE ASSEMBLIES SHALL BE CONSTRUCTED OF STEEL, MAXIMUM OF 16 SQUARE INCHES IN VOLUME AND BE SEPARATED BY A MINIMUM OF 24" HORIZONTALLY WHEN INSTALLED IN COMMON SPACE. ALL PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRE STOP MATERIALS OF AN APPROVED, LISTED FIRE STOP SYSTEM.

13. PROVIDE 3/8" NYLON PULL ROPE OR PULL TAPE IN ALL NEW SPARE CONDUIT AND RACEWAY TO ALLOW FUTURE ADDITION OF CONDUCTORS.

14. PROVIDE ONE STANDARD (INDOOR) OR ONE WEATHERPROOF (OUTDOOR) , 125-VOLT, GROUND FAULT CIRCUIT INTERRUPTING, SINGLE-PHASE, 20-AMPERE-RATED RECEPTACLE OUTLET AT AN ACCESSIBLE LOCATION, ON THE SAME LEVEL, WITHIN 25' OF ALL EXTERIOR MOUNTED HVAC EQUIPMENT. THE RECEPTACLE OUTLET SHALL NOT BE CONNECTED TO THE LOAD SIDE OF THE EQUIPMENT DISCONNECTING MEANS, PER NEC 210.63.

15. ALL FIXTURES, OUTLETS AND EQUIPMENT MOUNTED IN/ON THE BUILDING EXTERIOR SHALL BE UL APPROVED FOR WET LOCATION INSTALLATION. PARTIALLY PROTECTED FIXTURES, DEVICES AND EQUIPMENT SO MOUNTED SHALL BE UL APPROVED FOR DAMP LOCATION INSTALLATION. RECEPTACLES IN DAMP OR WET LOCATIONS SHALL MEET THE REQUIREMENTS OF NEC ARTICLE 406.8.

16. THE TELEPHONE SERVICE AND/OR TELEPHONE BACKBOARD SHALL BE INSTALLED AS REQUIRED. THE CONTRACTOR SHALL COORDINATE WITH THE TELEPHONE COMPANY SO THAT THE ENTIRE SYSTEM IS INSTALLED IN ACCORDANCE WITH THE TELEPHONE COMPANY'S STANDARDS AND POLICIES.

17. ALL TELECOMMUNICATIONS RACEWAY AND CABLING TO BE INSTALLED PER NEC ARTICLE 800.

18. ALL LIGHT SWITCHES MUST BE EFFECTIVELY GROUNDED PER NEC 380.9(b).

19. ALL BRANCH CIRCUITS SHALL BE IN METAL RACEWAYS, FLEXIBLE METAL RACEWAYS AND/OR TYPE MC CABLE CONTAINING AN INSULATED EQUIPMENT GROUNDING CONDUCTOR. ALL INSTALLED ELECTRICAL WIRING SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE SAFETY CODES.

20. PROVIDE DEDICATED NEUTRAL (GROUNDED) CONDUCTOR FOR ALL BRANCH CIRCUITS. NO MULTI-WIRE BRANCH CIRCUITS ARE ALLOWED.

21. ALL WALL OUTLETS NOT PROVIDED WITH A DEVICE BY THIS CONTRACTOR SHALL BE PROVIDED WITH BLANK WALL PLATES.

22. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE AN INSULATED GREEN COVERED GROUND WIRE SIZED PER NEC TABLE 250.122 OR AS SHOWN. CONNECT TO EACH DEVICE AND OUTLET BOX ON THE CIRCUIT AND TO THE PANELBOARD GROUND BUS.

23. CONNECTION TO EQUIPMENT SHALL BE FLEXIBLE METAL CONDUIT EXCEPT IN WET OR DAMP LOCATIONS USE LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

24. PROVIDE GROUNDING FOR SERVICE, ALL CONDUITS, MOTOR FRAMES, METAL CASINGS, RECEPTACLES, SYSTEM NEUTRAL, ETC. AND AS REQUIRED BY NEC AS MINIMUM. RESISTANCE TO GROUND SHALL NOT EXCEED 25 OHMS. CONTRACTOR SHALL SUBMIT GROUNDING TEST REPORT.

25. ALL CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS.

26. ALL EXTERIOR WIRING SHALL BE RUN IN RIGID GALVANIZED CONDUIT OR EMT. FLEXIBLE CONDUIT MAY ONLY BE USED FOR FINAL CONNECTIONS FROM OUTLET BOXES TO LIGHT FIXTURES, MOTORS, APPLIANCES, ETC. FLEXIBLE CONDUIT MAY ONLY BE USED FOR THESE FINAL CONNECTIONS IF ALLOWED BY LOCAL AHJ AND IF THE OVERALL LENGTH IS 6 FEET OR LESS.

27. ALL UNDER FLOOR CONDUIT INSTALLATIONS SHALL BE RUN BELOW, NOT IN, THE SLAB. THE MINIMUM INDOOR CONDUIT SIZE SHALL BE 3/4". THE MINIMUM OUTDOOR UNDERGROUND CONDUIT SIZE SHALL BE 1". FEEDER CONDUITS EXTERIOR TO THE BUILDING FOUNDATION WALL BELOW GRADE SHALL BE SIZED AS SHOWN ON THE DRAWING. OUTDOOR EXPOSED CONDUIT SHALL BE GALV RIGID CONDUIT. UNDERGROUND AND/OR UNDER FLOOR CONDUIT SHALL BE SCHED 40 NONMETALLIC RIGID CONDUIT. CONNECTION TO EQUIPMENT SHALL BE LIQUID-TIGHT FLEXIBLE METAL CONDUIT. WHERE RIGID NON-METALLIC CONDUIT IS USED BELOW THE SLAB PROVIDE RIGID METALLIC CONDUIT TO TURN UP INTO THE BUILDING SPACE OR AT ALL EXTERIOR WALLS AND/OR EQUIPMENT. USE RACEWAY FITTINGS COMPATIBLE WITH RACEWAY AND SUITABLE FOR USE AND LOCATION. RUN CONCEALED RACEWAYS WITH A MINIMUM NUMBER OF BENDS AND THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE TYPE OF BUILDING CONSTRUCTION AND OBSTRUCTIONS. RACEWAYS SHALL RUN PARALLEL TO OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS, AND FOLLOW THE SURFACE CONTOURS AS MUCH AS PRACTICAL.

28. ALL UNDERGROUND RACEWAYS SHALL BE IDENTIFIED BY "UNDERGROUND LINE MARKING TAPE" LOCATED 12" DIRECTLY ABOVE THE RACEWAY. TAPE SHALL BE PERMANENT, BRIGHT-COLORED, CONTINUOUS, MAGNETIC STRIP, PRINTED, PLASTIC TAPE COMPOUNDED FOR DIRECT BURIAL NOT LESS THAN 6" WIDE AND 4 MILS THICK. PRINTED LEGEND SHALL BE INDICATIVE OF THE SERVICE IT IS MARKING.

29. PROVIDE GROUNDING CONNECTIONS FOR RACEWAY, BOXES, AND COMPONENTS AS INDICATED AND INSTRUCTED BY MANUFACTURER. TIGHTEN CONNECTIONS AND TERMINALS, INCLUDING SCREWS AND BOLTS, ACCORDING TO EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS ACCORDING TO TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

30. ALL NEW PANELBOARDS/LOADCENTERS SHALL BE FURNISHED BASED ON THE TYPE, RATING, ENCLOSURES AND FEATURES INDICATED ON THE PLANS. CABINET SHALL BE CODE GAUGE, GALVANIZED STEEL. FRONTS SHALL BE SHEET STEEL WITH GRAY LACQUER FINISH WITH HINGED LOCKING DOOR. GROUND AND NEUTRAL BUS SHALL BE AS INDICATED ON THE PLANS. BUS SHALL BE COPPER OR ALUMINUM. MAIN AND NEUTRAL LUGS SHALL BE BOLT-ON TYPE. EQUIPMENT GROUND BUS SHALL BE ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUND CONDUCTORS AND BONDED TO BOX. TANDEM CIRCUIT BREAKERS SHALL NOT BE USED. MULTI-POLE BREAKERS SHALL HAVE A COMMON TRIP. THE MINIMUM INTERRUPTING RATING FOR CIRCUIT BREAKERS SHALL BE AS INDICATED ON THE PLANS. FOR FLUSH MOUNTED PANELS PROVIDE A MINIMUM OF (4) - 1" CONDUITS STUBBED AN ACCESSIBLE LOCATION IN ATTIC FOR FUTURE USE, UON.

31. PROVIDE PERMANENT PLASTIC ENGRAVED, MECHANICALLY FASTENED NAME PLATE ON EACH PANEL AND DISCONNECTING DEVICE. PROVIDE TYPE WRITTEN PANEL SCHEDULE FOR EACH PANEL INSTALLED OR MODIFIED.

32. ADDITIONALLY, PROVIDE PERMANENT PLASTIC ENGRAVED, MECHANICALLY FASTENED NAME PLATE ON EACH SUB-PANEL OR TRANSFORMER WITH THE WORDING "FED FROM PANEL ____", NOTING THE PANEL NAME OF THE UPSTREAM PANEL.

33. ENCLOSED NON-FUSIBLE DISCONNECT SWITCHES AND ENCLOSED FUSIBLE DISCONNECT SWITCHES (WITH CLIPS TO ACCOMMODATE SPECIFIED FUSES) SHALL HAVE ENCLOSURE CONSISTENT WITH ENVIRONMENT WHERE LOCATED, HANDLE LOCKABLE WITH 2 PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION. ALL SWITCHES SHALL BE "HEAVY DUTY" RATED FOR THE VOLTAGE REQUIRED.

34. ALL WIRING FOR EQUIPMENT SHALL BE ONE OF THE FOLLOWING TYPES THW, THHW, THWN/THHN WITH A RATING OF AT LEAST 75 DEG. CELSIUS.

35. TEMPORARY POWER USED TO SUPPLY EQUIPMENT USED BY PERSONNEL DURING CONSTRUCTION MUST HAVE G.F.C.I. PROTECTION PER NEC 305.6(a)(b).

36. FINAL EQUIPMENT CONNECTIONS - THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LABOR & MATERIALS REQUIRED TO MAKE FINAL CONNECTIONS TO ALL EQUIPMENT DESIGNATED TO BE CONNECTED BY THIS CONTRACTOR. VERIFY ALL REQUIREMENTS, CONDUCTOR SIZES, OVER-CURRENT PROTECTION, PHASES, VOLTAGES, MOTOR ROTATION, ETC., WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. PROVIDE FUSED DISCONNECT IF REQUIRED BY MANUFACTURER.

RESIDENTIAL NOTES

1. PRIOR TO BEGINNING THE PROJECT, THE CONTRACTOR SHALL WALK THE SITE AND COMPARE (E) CONDITIONS WITH THE EXISTING CONDITIONS SHOWN ON THESE DRAWINGS. ANY OBVIOUS OR LIKELY DISCREPANCY BETWEEN THE SITE CONDITIONS AND THESE DRAWINGS SHALL BE IMMEDIATELY REPORTED TO THIS ENGINEER. THE CONTRACTOR SHALL WAIT FOR DIRECTION FROM THIS ENGINEER, BEFORE PROCEEDING WITH ITEMS THAT CONCERN THE DISPUTED MATTER. NO EQUIPMENT SHALL BE ORDERED THAT CONCERNS THE DISPUTED MATTER.

2. THE CONTRACTOR SHALL NOT ORDER ANY EQUIPMENT WITHOUT SUBMITTING THE PRODUCT DATA SHEETS TO THIS ENGINEER FOR APPROVAL.

3. VERIFY UTILITY COMPANY REQUIREMENTS AND PROVIDE ALL TELEPHONE EQUIPMENT REQUIRED INCLUDING: RACEWAY, CONDUCTORS, TERMINAL BLOCKS, CABINETS, BACKBOARDS, OUTLET BOXES, TELEPHONE JACKS AND COVER PLATES.

4. SERVICE ENTRANCE EQUIPMENT SHALL BE PER CEC 230 REQUIREMENTS. SERVICE EQUIPMENT INTERRUPT CURRENT RATINGS SHALL MEET OR EXCEED THE FAULT CURRENT LEVELS AVAILABLE FROM THE UTILITY COMPANY, CONTRACTOR SHALL VERIFY. UTILITY METERING SHALL BE ACCESSIBLE TO THE UTILITY COMPANY AT ALL TIMES.

5. LIGHT FIXTURE MTG SUPPORT AND LOCATIONS SHALL BE PER CEC 410 REQUIREMENTS. LIGHTING OUTLET BOXES LOCATED IN LIVING ROOM AND BEDROOMS SHALL BE INSTALLED WITH CEILING FAN SUPPORT PER CEC 314.27(2)(C & D).

6. AS PERMITTED BY THE AHJ (AUTHORITY HAVING JURISDICTION), THE USE OF NONMETALLIC-SHEATHED CABLING (OR "ROMEX") MAY BE USED FOR BRANCH CIRCUIT WIRING, PER CEC 334, IN LIEU OF THE CONDUIT AND WIRING CALLED FOR IN THESE PLANS.

7. PROVIDE AN AFCI COMBINATION-TYPE CIRCUIT BREAKER AT ELECTRICAL PANEL, PER NEC 210.12, FOR ALL 120V, 15A AND 20A, BRANCH CIRCUITS SUPPLYING OUTLETS (INCLUDING LTG, RECEPTACLE AND SMOKE ALARMS) THROUGHOUT DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, AND SIMILAR AREAS (EXCLUDING KITCHEN, LAUNDRY ROOM, BATHROOMS, AND GARAGES). PROVIDE A DEDICATED NEUTRAL FOR EACH AFCI PROTECTED CIRCUIT. CONNECT CIRCUIT HOT AND NEUTRAL TO AFCI CIRCUIT BREAKER, CONNECT CIRCUIT BREAKER PIGTAIL TO NEUTRAL BAR. VERIFY CONNECTION WITH MFR DOCS.

8. FOR ADA, HEARING IMPAIRED UNITS: PROVIDE AUDIO/VISUAL DEVICES FOR DOORBELL, SMOKE ALARM & CARBON MONOXIDE SENSOR AND SMOKE ALARM VISUAL DEVICE IN THE BATHROOM, INSTALL & CONNECT PER MFR DOCS.

9. PROVIDE LISTED TAMPER-RESISTANT RECEPTACLES THROUGHOUT DWELLING UNITS IN ACCORDANCE WITH CEC 406.12, FOR ALL NON-LOCKING, 125-VOLT, 15- AND 20-AMPERE RECEPTACLES, UNLESS EXCEPTION APPLIES.

10. PROVIDE DEDICATED NEUTRAL (GROUNDED) CONDUCTOR FOR ALL BRANCH CIRCUITS. NO MULTI-WIRE BRANCH CIRCUITS ARE ALLOWED.

11. PROVIDE RECEPTACLE AT GAS WATER HEATER, PER CEC (ENERGY) 150.0(N)(1)(A).

12. PROVIDE GFCI PROTECTED RECEPTACLES AT ALL BATHROOM AND KITCHEN COUNTERS, PER CEC 210.8(A), FOR DWELLING UNITS, TYPICAL.

CERTIFIED ELECTRICIAN NOTE

THE CALIFORNIA STATE LICENSE BOARD (CSLB) "ZERO TOLERANCE POLICY" IS IN EFFECT FOR NON-COMPLIANT ELECTRICIANS. IN CALIFORNIA, ELECTRICAL WORK SHALL ONLY BE DONE BY "STATE CERTIFIED ELECTRICIANS", PER LABOR CODE SECTIONS 3099 AND 3099.2, SECTIONS 209.0 AND THE AB 931. AS OF JANUARY 2006, ENFORCEMENT OF LEGAL ACTION WILL BE ISSUED TO ANY C-10 CONTRACTOR WHO WILLFULLY EMPLOYS AN "UNCERTIFIED ELECTRICIAN" TO PERFORM ELECTRICAL WORK IN THE STATE OF CALIFORNIA.

FIRE WALL PENETRATIONS

PENETRATIONS IN A FIRE RATED WALL SHALL BE PROTECTED BY AN APPROVED FIRE STOP MATERIAL IN ACCORDANCE WITH CBC SECTION 714.3.2 EXP. 2: "MEMBRANE PENETRATIONS OF MAXIMUM 2 HR. FIRE RESISTANCE RATED WALL AND PARTITIONS BY STEEL ELECTRICAL OUTLET BOXES NOT EXCEEDING 16 SQUARE INCHES ARE PERMITTED PROVIDED OPENINGS DO NOT EXCEED 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL AREA. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.

RESIDENTIAL CALGREEN CODE NOTES

CALGREEN, DIV 4.5, SEC 4.506.1: BATHROOM EXHAUST FANS - REQUIRED IN EACH BATHROOM, SHALL BE ENERGY STAR COMPLIANT & DUCTED OUTSIDE. IF SEPARATE FROM WHOLE HOUSE VENTILATION, MUST HAVE HUMIDITY CONTROLS:

1. CAPABLE OF AUTOMATIC OR MANUAL ADJUSTMENT OF < 50% TO MAX OF 80%.
2. MAY BE A SEPARATE COMPONENT, NOT REQUIRED TO BE INTEGRAL TO FAN.

APPLICABLE CODES & STANDARDS

APPLICABLE CODES AS OF JANUARY 1, 2020

LISTING

CAC 2022	CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE	CCR TITLE 24 PART 1	
CBC 2022	CALIFORNIA BUILDING CODE	CCR TITLE 24 PART 2, VOL 1&2	BASED ON THE 2018 INTERNATIONAL BUILDING CODE W/ CA AMENDMENTS
CEC 2022	CALIFORNIA ELECTRICAL CODE	CCR TITLE 24 PART 3	BASED ON THE 2017 NATIONAL ELECTRICAL CODE W/ CA AMENDMENTS
CEC 2022	CALIFORNIA ENERGY CODE	CCR TITLE 24 PART 6	BASED ON THE 2018 CALIFORNIA ENERGY COMMISION BUILDING ENERGY EFFICIENCY STNDS
	2008 CALIFORNIA ELEVATOR SAFETY ORDERS	CCR TITLE 8, DIV 1 CH. 4, SUB CH. 6	
CFC 2022	CALIFORNIA FIRE CODE	CCR TITLE 24 PART 9	BASED ON THE 2018 INTERNATIONAL FIRE CODE W/ CA AMENDMENTS
CALGREEN 2022	CALIFORNIA GREEN BUILDING STANDARDS CODE	CCR TITLE 24 PART 11	
CRSC 2022	CALIFORNIA REFERENCED STANDARDS CODE	CCR TITLE 24 PART 12	

ADDITIONAL CODES AND STANDARDS

ADA	AMERICANS WITH DISABILITIES ACT - PUBLIC ACCOMMODATIONS
NFPA 101	2022 LIFE SAFETY CODE W/ CA AMENDMENTS
NESC	NATIONAL ELECTRICAL SAFETY CODE
IESNA	ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA

ELECTRICAL ABBREVIATIONS

NOTE: SOME ABBREVIATIONS MAY NOT APPLY TO THIS PROJECT

1Ø	-	SINGLE PHASE
3Ø	-	THREE PHASE
3W	-	THREE WIRE
4W	-	FOUR WIRE
A	-	AMPERE
AC	-	ALTERNATING CURRENT
AFG	-	ABOVE FINISHED GROUND
AFF	-	ABOVE FINISHED FLOOR
AIC	-	AMPS INTURRUPTING CAPACITY
AWG	-	AMERICAN WIRE GAUGE
BKR	-	BREAKER
BLDG	-	BUILDING
C	-	CONDUIT (<600V)
CB	-	CIRCUIT BREAKER
CKT	-	CIRCUIT
CU	-	COPPER
DISC	-	DISCONNECT
(E)	-	EXISTING
EF	-	EXHAUST FAN
FLA	-	FULL LOAD AMPS
GFI	-	GROUND FAULT CIRCUIT INTERRUPTER
GND	-	GROUND
HP	-	HORSEPOWER
J-BOX	-	JUNCTION BOX
KCMIL	-	THOUSAND CIRCULAR MILS
KVA	-	KILOVOLT AMPERE
LTG	-	LIGHTING
MCA	-	MIN CIRCUIT AMPS
MFR	-	MANUFACTURER
MFR DOCS	-	MANUFACTURER'S DOCUMENTATION
MLO	-	MAIN LUGS ONLY
MOCP	-	MAX OVERCURRENT PROTECTION
(N)	-	NEW
NEC	-	NATIONAL ELECTRICAL CODE
NECA	-	NATIONAL ELEC CONTRACTORS ASSOCIATION
NEMA	-	NATIONAL ELEC MFR'S ASSOC.
NTS	-	NOT TO SCALE
PB	-	PULL BOX
PVC	-	POLYVINYL CHLORIDE CONDUIT
REC	-	RECEPTACLE
RM	-	ROOM
SPEC	-	SPECIFICATION
SWBD	-	SWITCHBOARD
TELE	-	TELEPHONE
TFMR	-	TRANSFORMER
TYP	-	TYPICAL WHERE OCCURS
UON	-	UNLESS OTHERWISE NOTED
V	-	VOLT
VFD	-	VARIABLE FREQUENCY DRIVE
W	-	WATT
WP	-	WEATHERPROOF (NEMA 3R)

SD — SMOKE DETECTOR HARD WIRED W/ BATTERY BACK-UP, INTERCONNECTED

C — CARBON MONOXIDE DETECTOR HARD WIRED W/ BATTERY BACK-UP, INTERCONNECTED

LIGHTING FIXTURE SCHEDULE

Type	Symbol	Type Location Description	Mfc Catalog #	Lamps	Watts	Voltage	Notes
L1		Ceiling Recessed led (6" round)	"Lithonia Ltg" LDN6 40/05 LO6AR LD	LED	20W	120V	New dimmable lighting fixture
L1E		Ceiling Recessed led	"Lithonia Ltg" LDN6 40/05 LO6AR LD	LED	20W	120V	New dimmable lighting fixture
L3		Wall mounted FIXTURE HIGH EFFICIENCY	"Lithonia Ltg" FMABFL 14 20840 F20	LED	20W	120V	New dimmable lighting fixture
L4		Wall Mounted Bath Bar High Efficiency	"Lithonia Ltg" FMLFUTL 24 840 BN	LED	25W	120V	New dimmable lighting fixture
		Surface mtd. 1'W X 4'L	GT8 2 32 A12 MVOLT GEB10IS	LED	32W	120V	New dimmable lighting fixture
		LED CLOSET LIGHT	"Lithonia Ltg" FMMCL 840 S1	LED	14W	120V	New dimmable lighting fixture
N		Exhaust Fan w/ Light	QTXE110C		31.4W		

Note:
Outdoor Lighting shall be equipped with manual control switch, photocell and motion sensor with no override to on, and by either photocontrol and automatic time switch, astronomical time clock with no override to on, or energy management control system per CENC 150.0(k)3.

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STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
ELECTRICAL SPECS

Scale:

Date:

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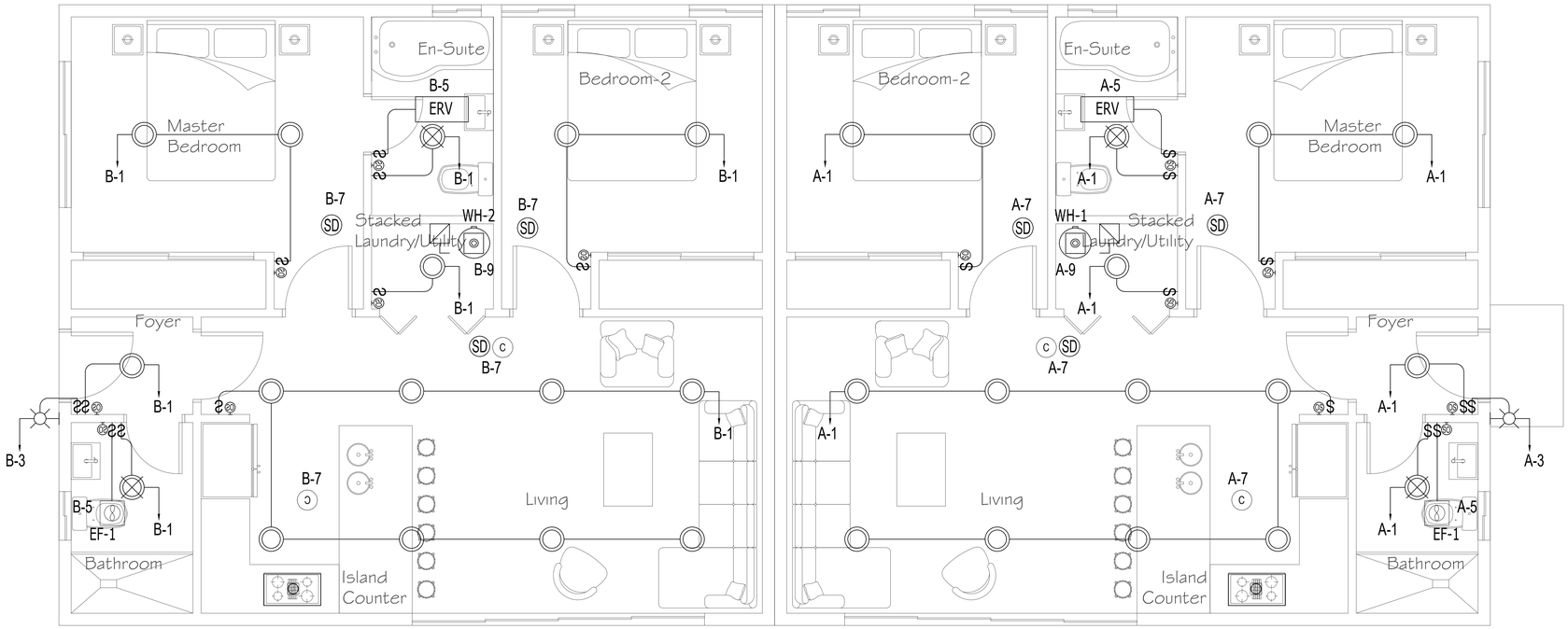
PLAN DESIGN NOTES
All installed luminaires shall be high-efficacy in accordance with ES TABLE 150.0-A.
In bathrooms, garages, laundry rooms, and utility rooms at least one luminaire shall be controlled by a vacancy sensor.
Dimmers or vacancy sensors shall control all LED style luminaires. Two exceptions: Fixtures installed in hallways or (closets under 70 square feet).
Recessed Can Light High Efficiency fixtures shall be IC listed, air-tight labeled, and not be equipped with a standard medium base screw shell lamp holder. ES 150.0(k)
Light sources that are not marked "JA8-2022-E" shall not be installed in enclosed luminaires. ES 150.0(k)
Outdoor lighting fixtures that are attached to a building are required to be high efficacy, be manually on/off switch controlled and have both motion sensor and photocell control. See ES 150.0(k) 3 for additional control options.

MANDATORY (CBEES 150.0(k):
- Provide on utility plans a complete lighting fixture schedule.
- All luminaires shall be high-efficacy in accordance with CBEES Table 150.0-A
- All LED luminaires and lamps shall be marked JA8-2022 and listed in the California Energy Commission database at https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx
- All recessed downlight and enclosed luminaires shall be marked JA8-2016-E and listed in the California Energy Commission database at https://cacertappliances.energy.ca.gov/Pages/AppliancesSearch.aspx
- Recessed downlight luminaires in ceilings shall not be screw-based.
- Bathrooms, garages, laundry rooms, and utility rooms: At least one luminaire in each space shall be controlled by a vacancy sensor.
- All luminaires requiring JA8-2022 or JA8-2022-E marking shall be controlled by a dimmer or vacancy sensor.
  Exception: Closets less than 70 s.f.
  Exception: Hallways
- Outdoor lighting permanently mounted to building shall be controlled by one of the following:
  - Photocontrol **and** motion sensor
  - Photocontrol **and** automatic time-switch control
  - Astronomical time clock

FIRE ALARM PLAN NOTES
1. CO alarms shall be "hard wired" and shall be equipped with battery backup. (CRC R315.6)
2. CO alarms shall be listed in accordance with UL 2034 (CRC R315.1.1). CO detector shall be listed in accordance with UL 2705 (CRC R315.7.1).
3. CO alarms shall be interconnected such that the activation of one alarm will activate all alarms in the individual dwelling unit. (CRC R315.5)
4. 4.In existing dwelling unit a CO alarm is permitted to be battery operated where repair or alteration do not result in the removal of wall or ceiling finishes. (CRC R315.5 exceptions 1)



1 PROPOSED two BEDROOM two BATH FLOOR LIGHTING PLANS
SCALE: 3/8 = 1'-0"

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Revision Notes:

Date	Description

Drawing Title:
LIGHTING PLAN

Scale:

Date:

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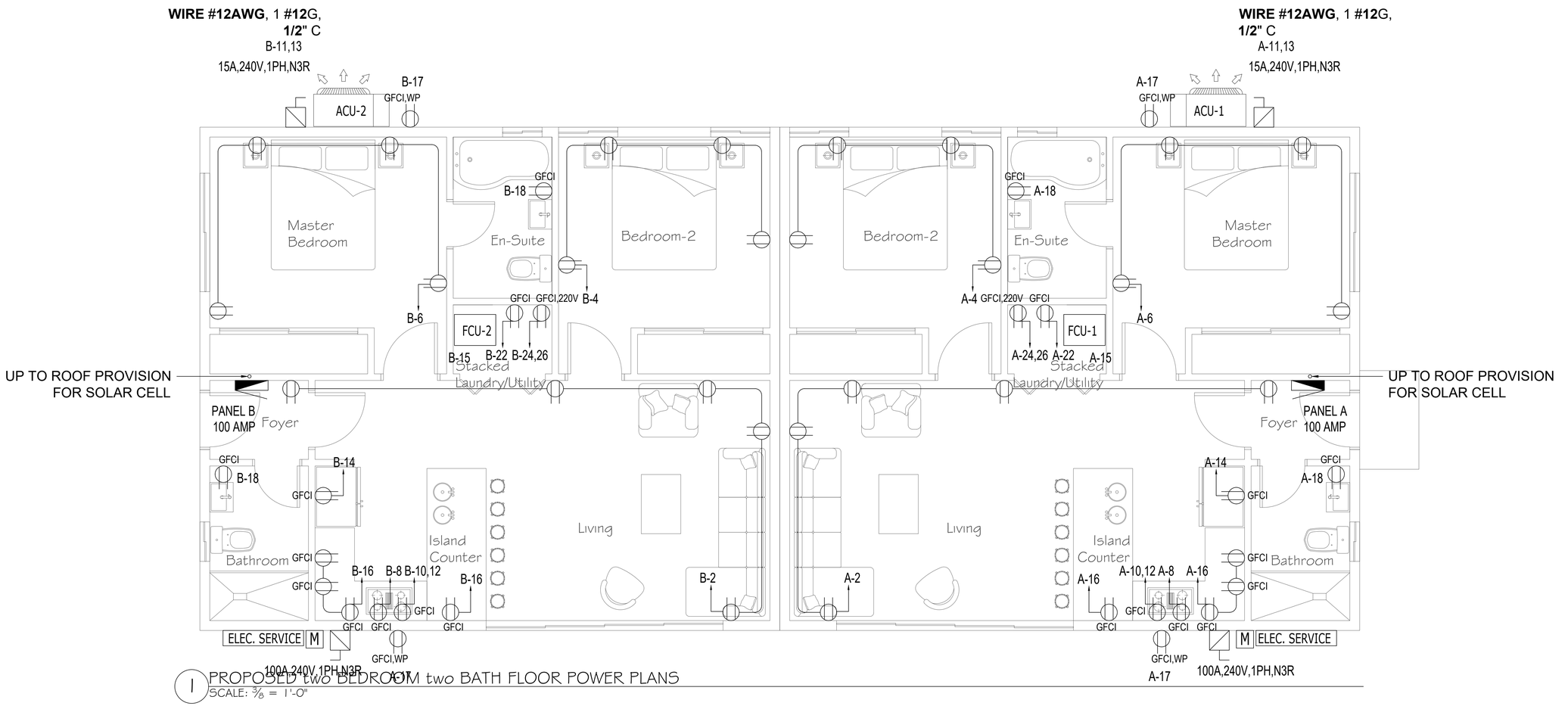
Provide Tamper Resistant Receptacles for all locations in dwelling as described in CEC 210.52

Arc-Fault Protection for all outlets (not just receptacles) located in rooms described in NEC 210.12(A): Kitchens, Laundry areas, Family, Living, Bedrooms, Dining, Halls, etc.



1 PROPOSED two BEDROOM two BATH FLOOR POWER PLANS
SCALE: 3/8 = 1'-0"

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POWER PLAN

Scale:

Date:

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*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	CONNECTED LOAD B	DEMAND TOTAL
L	Lighting	0.34	1.25	0.32	0.02	0.43
R	Convenience Recept	9.48		5.79	3.69	9.48
H	Heating (Space)	0.50	1.25	0.50		0.63
C	Cooling	3.71	1.00	1.43	2.28	3.71
A	HVAC		1.00			
P	Process		1.00			
O	Other Continuous	0.50	1.25	0.25	0.25	0.63
K	Kitchen	5.85	0.65	3.00	2.85	3.80
N	Noncontinuous	0.60	1.00		0.60	0.60
			1.00			
	Total	20.98		11.29	9.69	19.27

Total Demand Load (KVA)	19.27
Total Demand Current (A)	80.30
Min. Feeder Ampacity (A)	100.37

PANEL B

SYSTEM VOLTAGE	240/120V, 1Φ, 3W
BUS SIZE	100A-1P C/B BUS PLUG
SYSTEM TYPE	NORMAL
FEEDER PROT	100
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	100A MCB
SCCR	FULLY RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	0.810
FAULT CURRENT	
KAIC RATING	18
ENCLOSURE	TYPE 1

	DESCRIPTION	*	CB	KVA	A	B	KVA	CB	DESCRIPTION	*	
1	LIGHTING	L	20A-1P ,AFCI	0.32	1.22		0.90	20A-1P ,AFCI	OUTLET AT LIVING & FORYER	R	2
3	OUTDOOR LIGHTING	L	20A-1P	0.02		0.74	0.72	20A-1P ,AFI/GFI	OUTLET AT BEDROOM 2	R	4
5	EXHAUST FAN	C	15A-1P	0.09	0.81		0.72	20A-1P ,AFI/GFI	OUTLET AT MASTER BEDROOM	R	6
7	SMOKE DETECTOR	N	20A-1P	0.60		1.20	0.60	20A-1P ,AFI/GFI	HOOD	K	8
9	WATER HEATER	H	20A-1P	0.50	2.75		2.25	30A-2P ,GFCI	RANGE / OVEN	K	10
11	ACU-1	C	15A-2P	1.34		3.59	2.25			K	12
13		C		1.34	2.09		0.75	20A-1P ,AFI/GFI	FRIDGE	K	14
15	FCU-1	C	15A-1P	0.94		1.66	0.72	20A-1P ,AFI/GFI	GENERAL GFCI OUTLET AT KITCHEN	R	16
17	GFCI OUTLET AT OUTDOOR	R	20A-1P ,GFCI	0.36	0.72		0.36	20A-1P ,GFCI	GFCI OUTLET AT BATHROOM	R	18
19	SPARE		20A-1P					20A-1P	SPARE		20
21	SPARE		20A-1P		1.20		1.20	20A-1P	WASHING MACHINE	R	22
23	SPARE		20A-1P			2.25	2.25	30A-2P	DRYER	R	24
25	SPARE		20A-1P		2.25		2.25			R	26
27	SPARE		20A-1P					20A-1P	SPARE		28
29	SPARE		20A-1P					20A-1P	SPARE		30
31	SPARE		20A-1P					20A-1P	SPARE		32
33	SPARE		20A-1P					20A-1P	SPARE		34
35	SPARE		20A-1P					20A-1P	SPARE		36
37	SPARE		20A-1P					20A-1P	SPARE		38
39	Whole House Surge Protection	O	30A-2P	0.25		0.25		20A-1P	SPARE		40
41		O		0.25	0.25			20A-1P	SPARE		42
		(KVA)									
		Total Connected Load			11.29	9.69					

Available Fault Current Calculation

Utility Fault Current 42,000 amperes

kVA = 19.27
E = 240
trans. FLA = 80

$I = \frac{kVA \times 1000}{E}$ = trans. FLA

$I_{sca} = \frac{\text{trans. FLA} \times 100 \times PF}{\text{transformer } Z}$ =

PF = 95%
Z = 4.00%
I_{sca} 2,113 amperes

I_{sca} = ampere short-circuit current RMS symmetrical.

Point to Point Method — Single Phase 240/120 — Copper in Metal Raceway

'f' factor = $\frac{2 \times L \times I}{N \times C \times E_{L-N}}$

Length (distance) FEET L = 50
(ASC) I_{sca} = 42,000
conductors per phase N = 1
Phase conductor constant C = 5,907 Phase Conductor 2
Volt Line to Line E_{L-L} = 240 Volt
f = 2.963
Neutral conductor constant C = 5,907 Neutral Conductor 2
Volt Line to Neutral E_{L-N} = 120 Volt
f = 8.888

Multiplier

$M = \frac{1}{1+f}$

Line to Line M = 0.252
Line to Neutral M = 0.101

I_{sca} x M = fault current at terminals of main disconnect L-L = → **10,599 amperes**
I_{sca} x M = fault current at terminals of main disconnect L-N = → **6,371 amperes**

Fault Current from PANEL B — Copper in Metal Raceway — Single Phase

'f' factor = $\frac{2 \times L \times I}{N \times C \times E_{L-N}}$

Length (distance) L = 50
(ASC) I_{sca} = 10,599 Phase 6,371 Neutral
conductors per phase N = 1
Phase conductor constant C = 5,907 Phase Conductor 2
Volt Line to Line E_{L-L} = 240 Volt
f = 0.748
Neutral conductor constant C = 5,907 Neutral Conductor 2
Volt Line to Neutral E_{L-N} = 120 Volt
f = 0.899

Multiplier

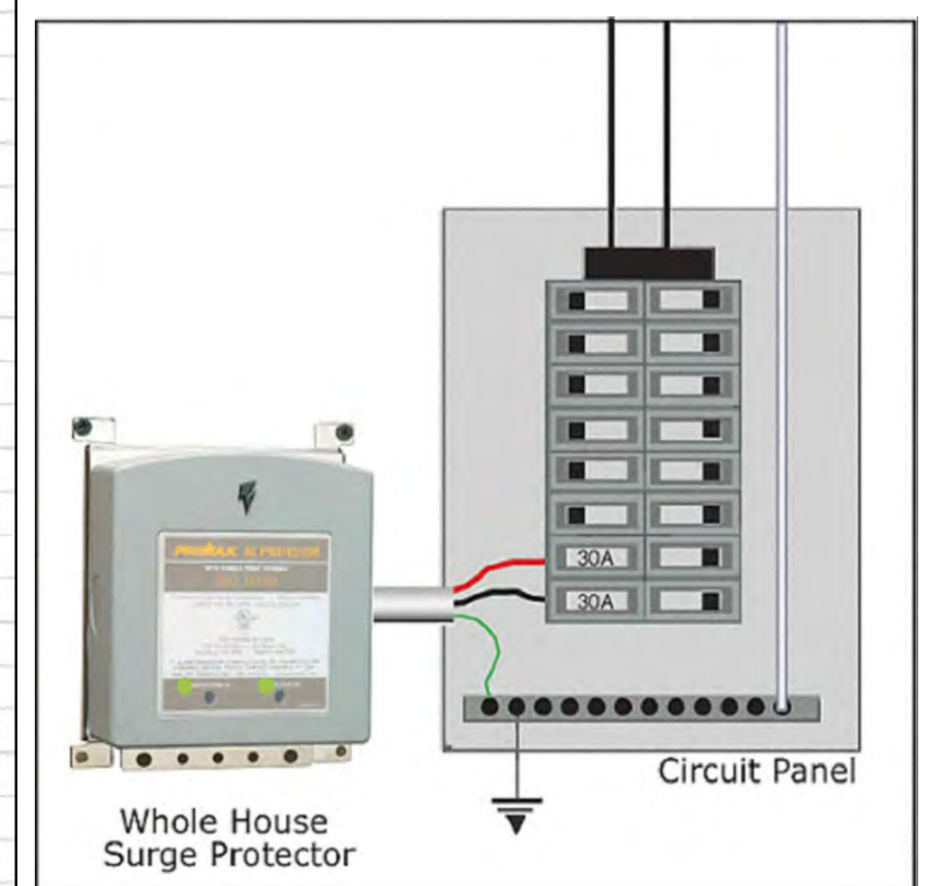
$M = \frac{1}{1+f}$

Line to Line M = 0.572
Line to Neutral M = 0.527

Isca x M = fault current at terminal of the panel L-L **6,065 amperes**
Isca x M = fault current at terminal of the panel L-N **3,355 amperes**

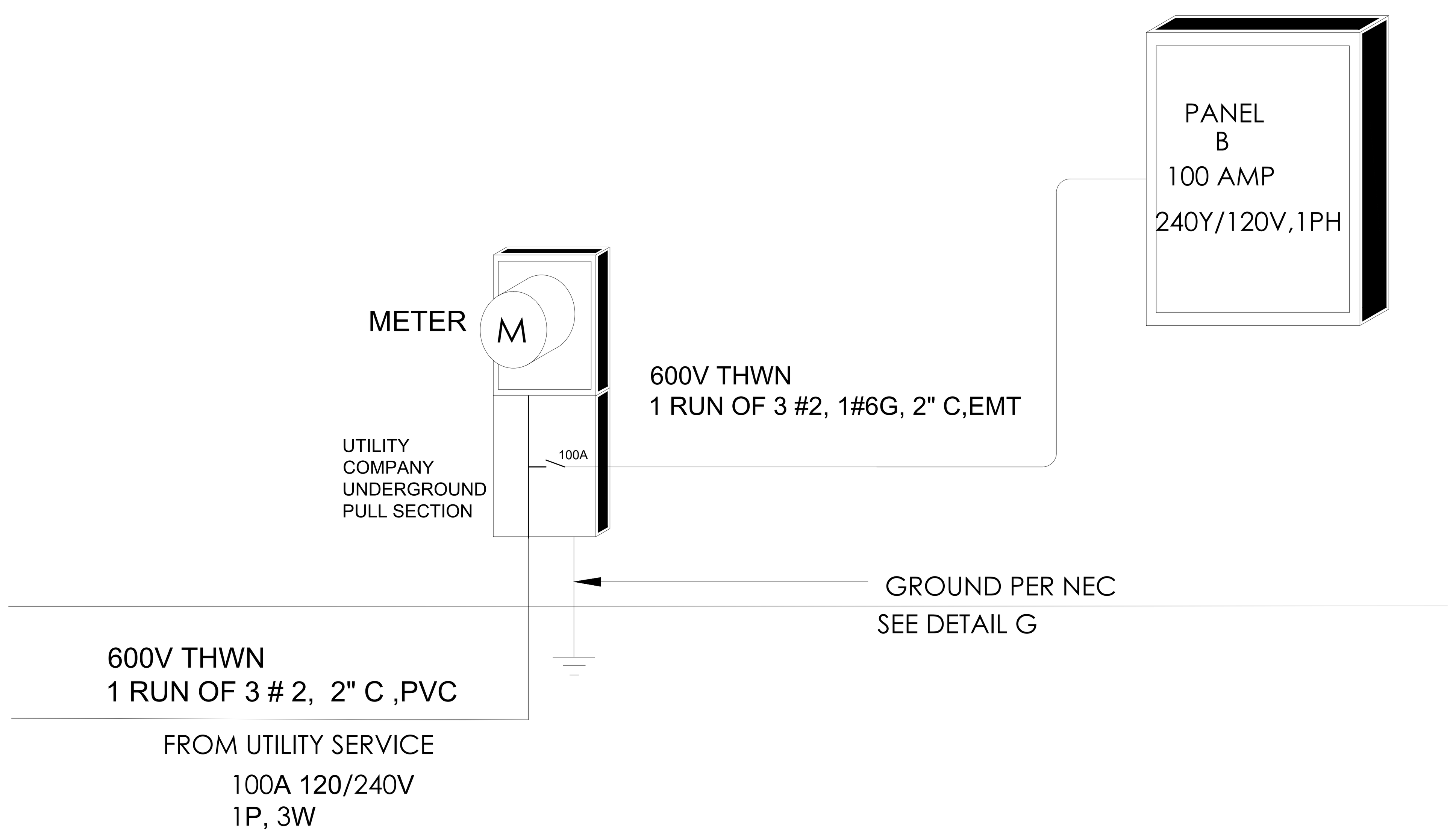
Calculation does not include motor contribution

ELECTRICAL LOAD ANALYSIS		
AREA -	749 SQ. FT.	
LOAD	VA	
LTG/GEN RECEPT 3VA/SQ. FT X 900	2247	
Small Appliance (3-20ACK By CEC 210.11)	4500	
Bathroom(1-20ACKT By CEC210.11):	180	
Dishwasher:	0	
Garbage Disposal:	800	
Dryer:	5700	
FREEZER	0	
Cooktop:	6000	
Refrigerator:	800	
Water Heater:	500	
EXHAUST/ VENT HOOD:	600	
Smoke detector:	600	
SUBTOTAL	21927	
FIRST 10,000 @ 100%	10,000	
REMAINDER @40%	4770.8	
HVAC -CLG	3624	
TOTAL SERVICE LOAD	18,395	
TOTAL SERVICE AMPS	76.6	AMP
AT 120/240, 1 PH, 3 W		
100 AMP PANEL		

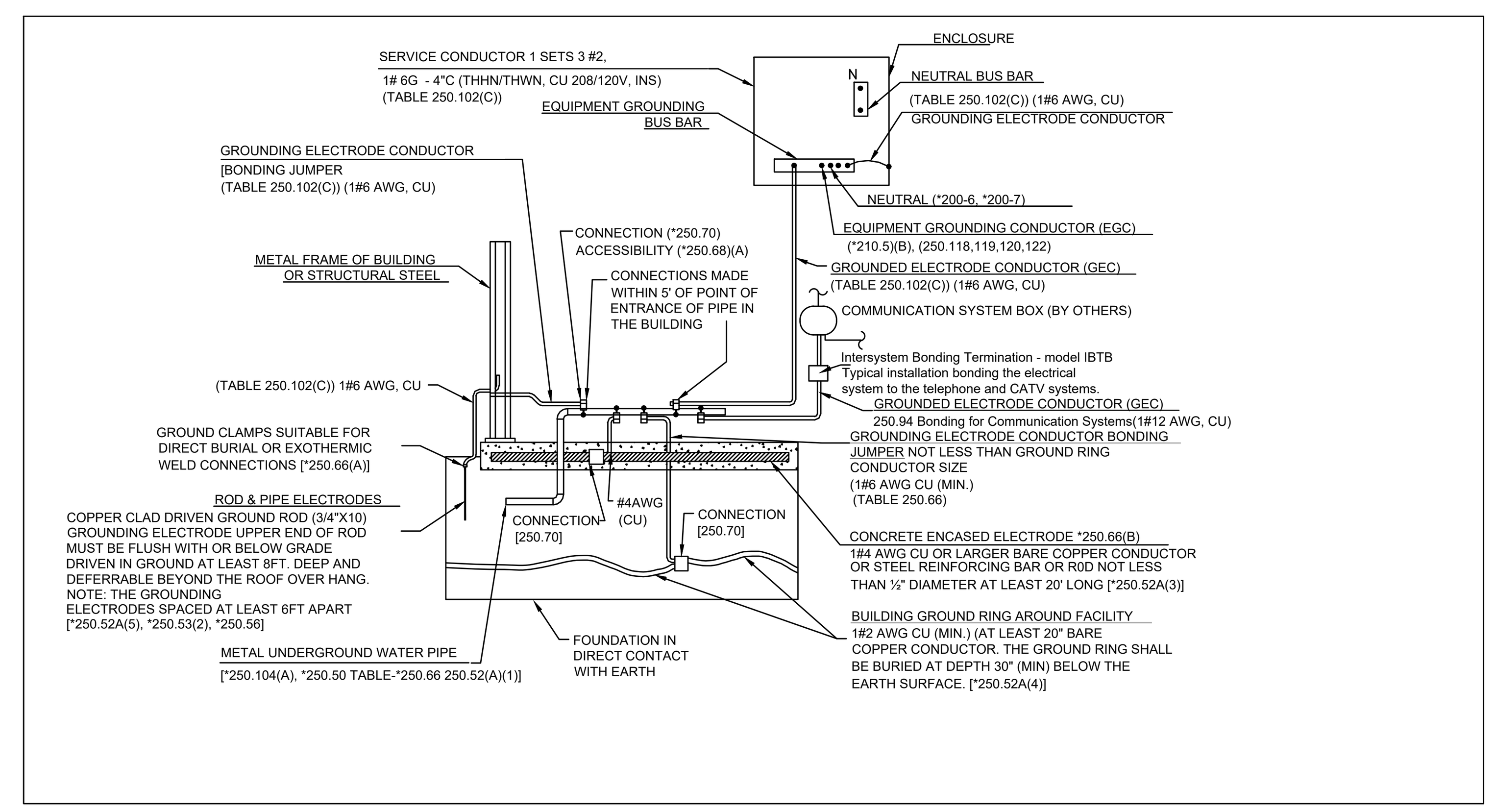


Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	SCCR	I_n	VPR L-N	VPR L-G	VPR L-L	VPR N-G
120/240V	80kA	6	1 Ø, 3-wire+G, side mount	HEPD80	150V	25kA	10kA	600V	700V	1000V	1000V

quare D HEPD80 Universal Whole House Surge Protection Device, 1-Phase, 3-Wire for 120/240V, 80kA



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



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

SCALE: NTS

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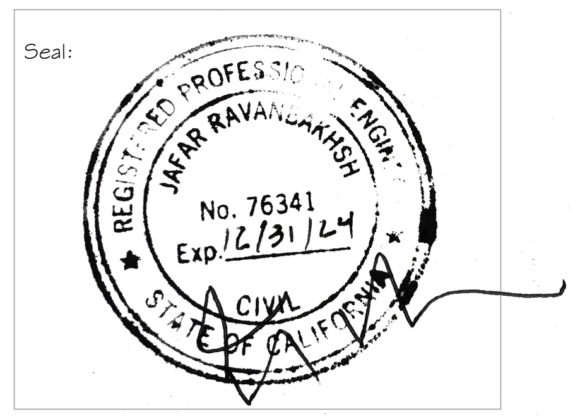

Revision Notes:

Date	Description

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PANEL BOARD & SLD

Scale:

Date:

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*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	CONNECTED LOAD B	DEMAND TOTAL
L	Lighting	0.34	1.25	0.32	0.02	0.43
R	Convenience Recept	9.48		5.79	3.69	9.48
H	Heating (Space)	0.50	1.25	0.50		0.63
C	Cooling	3.71	1.00	1.43	2.28	3.71
A	HVAC		1.00			
P	Process		1.00			
O	Other Continuous	0.50	1.25	0.25	0.25	0.63
K	Kitchen	5.85	0.65	3.00	2.85	3.80
N	Noncontinuous	0.60	1.00		0.60	0.60
			1.00			
	Total	**20.98**		11.29	9.69	19.27

Total Demand Load (KVA)	19.27
Total Demand Current (A)	80.30
Min. Feeder Ampacity (A)	100.37

PANEL A

SYSTEM VOLTAGE	240/120V, 1Φ, 3W
BUS SIZE	100A-1P CB BUS PLUG
SYSTEM TYPE	NORMAL
FEEDER PROT	100
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	100A MCB
SCCR	FULLY RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	0.810
FAULT CURRENT	
KAIC RATING	18
ENCLOSURE	TYPE1

	DESCRIPTION	*	CB	KVA	A	B	KVA	CB	DESCRIPTION	*	
1	LIGHTING	L	20A-1P A/FCI	0.32	1.22		0.90	20A-1P A/FCI	OUTLET AT LIVING & FORYER	R	2
3	OUTDOOR LIGHTING	L	20A-1P	0.02		0.74	0.72	20A-1P A/FI/GFI	OUTLET AT BEDROOM 2	R	4
5	EXHAUST FAN	C	15A-1P	0.09	0.81		0.72	20A-1P A/FI/GFI	OUTLET AT MASTER BEDROOM	R	6
7	SMOKE DETECTOR	N	20A-1P	0.60		1.20	0.60	20A-1P A/FI/GFI	HOOD	K	8
9	WATER HEATER	H	20A-1P	0.50	2.75		2.25	30A-2P /GFCI	RANGE / OVEN	K	10
11	ACU-1	C	15A-2P		1.34		3.59	2.25		K	12
13		C			1.34	2.09		0.75		K	14
15	FCU-1	C	15A-1P	0.94		1.66	0.72	20A-1P A/FI/GFI	GENERAL GFCI OUTLET AT KITCHEN	R	16
17	GFCI OUTLET AT OUTDOOR	R	20A-1P /GFCI	0.36	0.72		0.36	20A-1P /GFCI	GFCI OUTLET AT BATHROOM	R	18
19	SPARE		20A-1P					20A-1P	SPARE		20
21	SPARE		20A-1P		1.20		1.20	20A-1P	WASHING MACHINE	R	22
23	SPARE		20A-1P			2.25	2.25	30A-2P	DRYER	R	24
25	SPARE		20A-1P		2.25		2.25			R	26
27	SPARE		20A-1P					20A-1P	SPARE		28
29	SPARE		20A-1P					20A-1P	SPARE		30
31	SPARE		20A-1P					20A-1P	SPARE		32
33	SPARE		20A-1P					20A-1P	SPARE		34
35	SPARE		20A-1P					20A-1P	SPARE		36
37	SPARE		20A-1P					20A-1P	SPARE		38
39	Whole House Surge Protection	O	30A-2P		0.25		0.25	20A-1P	SPARE		40
41		O			0.25	0.25		20A-1P	SPARE		42
	(KVA)										
	Total Connected Load			11.29		9.69					

Available Fault Current Calculation

Utility Fault Current 42,000 amperes — kVA = 19.27, E = 240, trans. FLA = 80

I = kVA x 1000 = trans. FLA / E

I_{sca} = trans. FLA x 100 x PF / transformer Z = — PF = 95%, Z = 4.00%

I_{sca} = ampere short-circuit current RMS symmetrical. I_{sca} = 2,113 amperes

Point to Point Method — Single Phase 240/120

'f' factor = 2 x L x I / N x C x E L-N

Length (distance) (ASC): FEET, L = 50, Copper in Metal Raceway; I_{sca} = 42,000

conductors per phase: N = 1

Phase conductor constant: C = 5,907 Phase Conductor 2

Volt Line to Line: E L-L = 240 Volt

f = 2.963

Neutral conductor constant: C = 5,907 Neutral Conductor 2

Volt Line to Neutral: E L-N = 120 Volt

f = 8.888

Multiplier M = 1 / 1 + f

Line to Line: M = 0.252

Line to Neutral: M = 0.101

I_{sca} x M = fault current at terminals of main disconnect L-L = ⟶ 10,599 amperes

I_{sca} x M = fault current at terminals of main disconnect L-N = ⟶ 6,371 amperes

Fault Current from PANEL A — Copper in Metal Raceway, Single Phase

'f' factor = 2 x L x I / N x C x E L-N

Length (distance) (ASC): L = 50; I_{sca} = 10,599 Phase, 6,371 Neutral

conductors per phase: N = 1

Phase conductor constant: C = 5,907 Phase Conductor 2

Volt Line to Line: E L-L = 240 Volt

f = 0.748

Neutral conductor constant: C = 5,907 Neutral Conductor 2

Volt Line to Neutral: E L-N = 120 Volt

f = 0.899

Multiplier M = 1 / 1 + f

Line to Line: M = 0.572

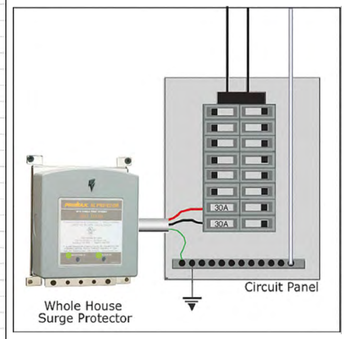
Line to Neutral: M = 0.527

I_{sca} x M = fault current at terminal of the panel L-L: 6,065 amperes

I_{sca} x M = fault current at terminal of the panel L-N: 3,355 amperes

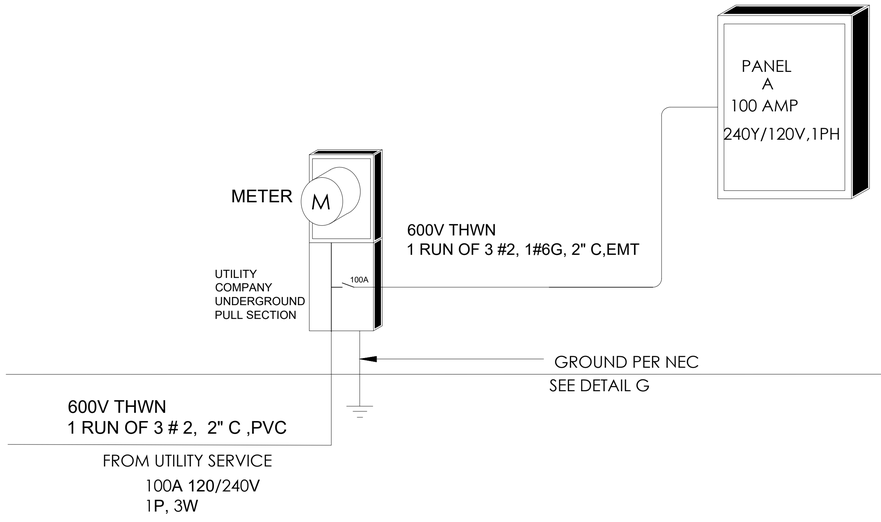
Calculation does not include motor contribution

ELECTRICAL LOAD ANALYSIS		
AREA -	**749 SQ. FT.**	
LOAD		**VA**
LTG/GEN RECEPT 3VA/SQ. FT X 900		2247
Small Appliance (3-20ACK By CEC 210.11)		4500
Bathroom(1-20ACKT By CEC210.11):		180
Dishwasher:		0
Garbage Disposal:		800
Dryer:		5700
FREEZER		0
Cooktop:		6000
Refrigerator:		800
Water Heater:		500
EXHAUST/ VENT HOOD:		600
Smoke detector:		600
SUBTOTAL		**21927**
FIRST 10,000 @ 100%		10,000
REMAINDER @40%		4770.8
HVAC -CLG		3624
TOTAL SERVICE LOAD		**18,395**
TOTAL SERVICE AMPS		**76.6** AMP
AT 120/240, 1 PH, 3 W		
100 AMP PANEL		

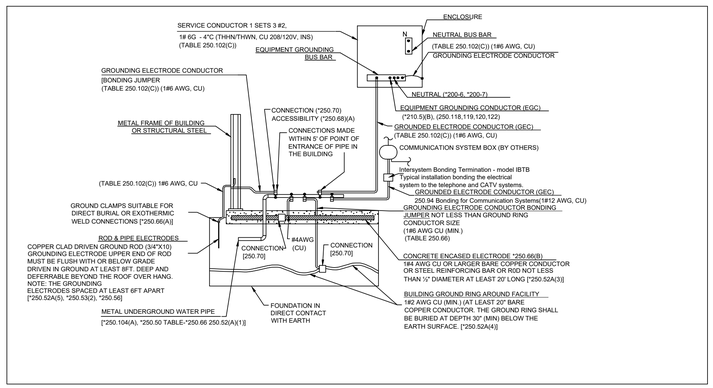


Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	SCCR	VPR I	VPR L-N	VPR L-G	VPR L-L	VPR N-G
120/240V	80kA	6	1 Ø, 3-wire+G, side mount	HEPD80	150V	25kA	10kA	600V	700V	1000V	1000V

quare D HEPD80 Universal Whole House Surge Protection Device, 1-Phase, 3-Wire for 120/240V, 80kA



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



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

SCALE: NTS

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REGISTERED PROFESSIONAL ENGINEER
JAFAR RAVANBAKHSH
No. 76341
Exp 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
PANEL BOARD & SLD

Scale:

Date:

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MECHANICAL SPECIFICATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

FLEXIBLE DUCT : UL #181 LISTED, CLASS 1, AND CONTAIN A 0.1 PERM RATED POLYETHYLENE INNER LINER, WITH R-8 FIBERGLASS INSULATION. FLEXIBLE DUCTS SHALL BE SECURED TO RIGID SHEET METAL COLLARS AND AIR DIFFUSERS WITH NYLON TIES OR STAINLESS STEEL WORM GEAR STRAPS. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT. SUPPORT FLEXIBLE DUCTS FROM THE BUILDINGS STRUCTURE WITH MINIMUM 1" WIDE, 18 GAUGE, GALVANIZED STEEL STRAP AT MAXIMUM 4'-0" CENTERS. PROVIDE 4" WIDE SHEET METAL SADDLES AT EACH SUPPORT EACH STRAP. SAG OF FLEXIBLE DUCT BETWEEN HANGERS SHALL NOT EXCEED 1/2" PER FOOT OF SUPPORT SPACING. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION.

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

RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM ¾" 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 2022 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 2022 CALIFORNIA MECHANICAL CODE.

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

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

CITY CODES

2022 California Building Code
2022 California Residential Code
2022 California Fire Code
2022 California Electrical Code
2022 California Mechanical Code
2022 California Plumbing Code
2022 California Green Building Standards Code
2022 California Historical Building Code
2022 California Referenced Standards Code
2022 California Administrative Code
2022 California Energy Code
ACI 318-14 (Structural Concrete)
TMS 402/602-16 (Structural Masonry)
ASCE 7-16 (Design Loads for Structures)

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Revision Notes:

Date	Description

Drawing Title:
MECHANICAL SPECS

Scale:

Date:

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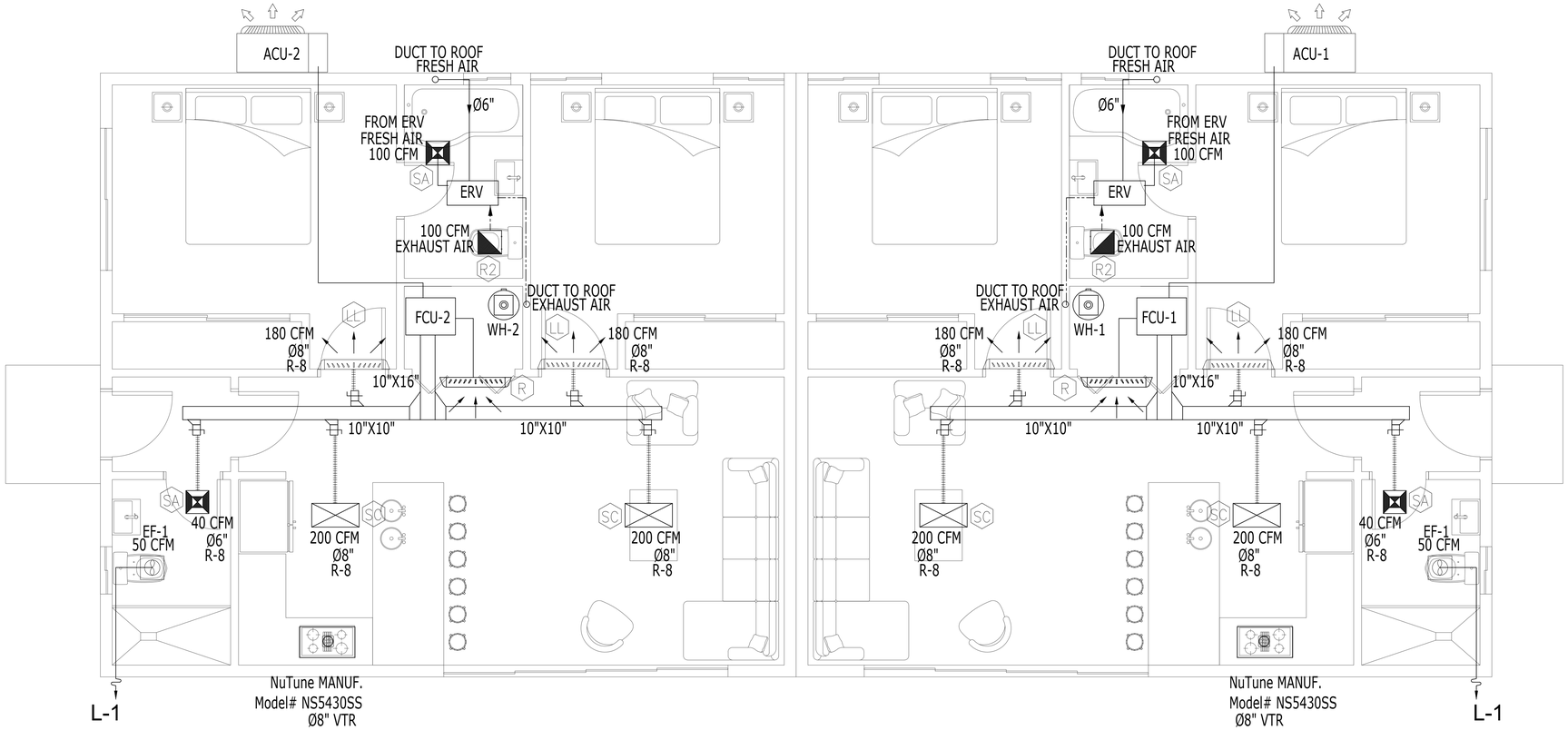

1 MECHANICAL PLAN
SCALE: 3/8" = 1'-0"

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MECHANICAL PLAN

Scale:

Date:

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CONDENSING UNIT SCHEDULE

								COMPRESSOR(S)	CONDENSER FAN(S)		ELECTRICAL DATA		
OUTDOOR UNIT MARK	SERVES	MANUFATURER /CONDENSER MODEL NUMBER	NOMINAL TONNAGE	NOMINAL COOLING	OPERATING WT (LBS)	TYPE	# OF CIRCUITS	QTY	QTY	FLA	V/PH/HZ	MCA (AMPS)	MOP (AMPS)
ACU-1	FCU-1	GOODMAN/GSXN402410A*	2.0	24,000	138	R-410A	1	1.00	1.0	2.8	208-230/1/60	11.2	15.00

NOTES:
1. UNITS ARE 1-STAGE SCROLL COMPRESSORS
2. PROVIDE MOUNTING PADS FOR CONDENSING UNITS PER MANUFACTURER RECOMMENDATIONS. COORDINATE LOCATION WITH ARCHITECT/OWNER.
3. PROVIDE TIMED LOCK-OUT, SERVICE VALVES AND DRYERS.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE WEATHERPROOF DISCONNECT SWITCH.
5. PROVIDE DX LIQUID AND SUCTION REFRIGERANT PIPING SIZED FOR ACTUAL FIELD CONDITIONS AND MANUFACTURER'S RECOMMENDATIONS.
6. PROVIDE REFRIGERANT SAFETY RELIEF VALVE IN ACCORDANCE WITH LOCAL CODES.
7. PROVIDE LOW AMBIENT CONTROL.
8. EQUIVALENT MODEL OR EQUAL. CONTRACTOR TO VERIFY ALL PART NUMBERS WITH MANUFACTURER AND PROVIDE SUBMITTALS TO THE DESIGN TEAM.

FORCE AIR INDOOR UNIT

				EVAPORATOR FAN DATA			HEATING DATA			ELECTRICAL DATA		
INDOOR UNIT MARK	OUTDOOR UNIT MARK	MANUF. /AHU MODEL NUMBER	OPERATING WT (LBS)	SUPPLY AIRFLOW (CFM)	ESP (IN. WC)	LBS	HEATING INPUT (NAT. GAS MBTUH	HEATING OUTPUT (NAT. GAS MBTUH	AFUE	V/PH/HZ	MCA (AMPS)	MOP (AMPS)
FCU-1	ACU-1	GOODMAN/GMVC96 0403BNB	2.0	800	0.50	144.00	40000.0	38000	96	115/1/60	7.8	15

NOTES:
1) PROVIDE MOTORIZED DAMPER FOR OA INTAKE
2) PROVIDE WALL MOUNTED 7-DAY PROGRAMMABLE THERMOSTAT , 1 -STAGE COOLING AND 2-STAGE HEATING
3) COORDINATE CONDENSATE DRAIN WITH PLUMBING CONTRACTOR. PIPE TO NEAREST APPROVED PLUMBING FIXTURE
4) PROVIDE FLOAT SWITCH IN SECONDARY DRAIN PAN FOR EMERGENCY SHUT-DOWN
5) PROVIDE CONCENTRIC VENT KIT. ALLOWS FOR BOTH EXHAUST AND COMBUSTION AIR.

Exhaust Ultra-Silent Humidity-Sensing Ventilation Fan schedule

TAG NUMBER	AREA SERVED	MANUFACTURER/MODEL	AIR DIRECTION	WATTS	AMPS	VOLTAGE / HZ	CFM
EF-1	SEE PLAN	PANASONIC / FV-0511VQCL1	EXHAUST	5.90	0.27	120 /60	80

REMARKS:
1. DISCONNECT SWITCH/STARTER
2. PROVIDE MANUFACTURER VIBRATION ISOLATION KIT
3. BACKDRAFT DAMPER
4. EQUIVALENT MODEL OR EQUAL

DIFFUSER SCHEDULE

SYMBOL	ADAPTOR/ NECK SIZE	FACE SIZE	MAX CFM	MAX TP	MAX NC	THROW
SB	6"Ø	12"X12"	118	0.041	_	4-WAY
SC	14"Ø	24"X24"	535	0.028	13	4-WAY
R	14"Ø	24"X24"	1283	0.159	38	4-WAY
R2	6"Ø	12"X12"	118	0.041	_	4-WAY
SYMBOL	**Effective AREA**	**NOMINAL DUCT WIDTH**	**MAX CFM**	**MAX TP**	**MAX NC**	**THROW (FT)**
LL	0.389	11-3/4	235	0.04	22	32
R1	0.389	11-3/4	550	0.219	43	32

1. SA THRU SB ARE TITUS MODEL OMNI STEEL DIFFUSERS.
2. R IS TITUS MODEL OMNI STEEL DIFFUSERS.
3. ALL SUPPLY DIFFUSERS SHALL BE PROVIDED W/2" INSULATION BLANKET ON BACK OF DIFFUSER. ALL DIFFUSERS SHALL HAVE OPPOSED BLADE DAMPERS (OBD).
* RUNOUTS ARE DUCTS SERVING ONLY ONE SUPPLY DIFFUSER.

Energy Recovery Ventilator

TAG	MODEL	CFM	Power Consumption (Watts)	Power Rating (V/Hz)
ERV	PANASONIC FV-10VEC2	100	81	120/60

LOUVER SCHEDULE

TAG	TYPE	CFM	PR. DROP W.G.	MANUFACTURER MODEL
L-1	INTAKE AIR	110	0.03	RUSKIN ELF6375DX

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Goodman Air Conditioning & Heating

GSXN4

Energy-Efficient Base Split System Air Conditioner 14.3 SEER2 1½ To 5 Tons

Contents

Standard Features

- Energy-Efficient Compressor
- Copper tube/ enhanced aluminum fin coil-5mm diameter on 1.5-4.0T
- Factory-installed filter drier
- Fully charged for 15' of tubing length
- Service valves with sweat connections and easy-to-access gauge ports
- Contactor with lug connection
- Ground lug connection
- AHRI Certified
- ETL Listed

Cabinet Features

- Removable grille-style top design compliant with UL 60335-2-40
- Heavy-gauge galvanized-steel cabinet
- Attractive Architectural Gray powder-paint finish with 500-hour salt-spray approval
- Steel louver coil guard
- Single-panel access to controls with space provided for field-installed accessories
- When properly anchored, meets the 2020 Florida Building Code unit integrity requirements for hurricane-type winds (Anchor bracket kits available.)

10 YEAR PARTS LIMITED WARRANTY* · Intertek · AHRI CERTIFIED · COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 = · COMPANY WITH ENVIRONMENTAL SYSTEM CERTIFIED BY DNV GL = ISO 14001 = · BBB ACCREDITED BUSINESS

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

G	S	X	N	4	0	36	1	0	**
1	2	3	4	5	6	7,8	9	10	11,12

Brand
G - Goodman® Brand

Product Category
S Split System R-410A

Unit Type
X Condenser
Z Heat Pump

Feature
N Value · H Enhanced
B Classic · C Premium
M Multi-Family · V Ultimate

SEER2
13.4 - 13.7 = 3 · 16.6 - 17.5 = 7
13.8 - 14.5 = 4 · 17.6 - 18.5 = 8
14.6 - 15.5 = 5 · 18.6 - 19.5 = 9
15.6 - 16.5 = 6 · 19.6 + = 0

Engineering
Major/Minor Revisions
A - Initial Release
B - 1st Revision

Variation

Electrical
1 208/230 V, 1 Phase, 60 Hz

Nominal Capacity
18 - 1.5 Ton · 42 - 3.5 Tons
24 - 2.0 Tons · 48 - 4.0 Tons
30 - 2.5 Tons · 60 - 5.0 Tons
36 - 3.0 Tons

Sales Region
N North
S Southeast & North
0 All Regions

* Denotes AHRI wild cards

	GSXN4 01810A*	GSXN4 02410A*	GSXN4 03010A*	GSXN4 03610A*	GSXN4 04210A*	GSXN4 04810A*	GSXN4 06010A*
Capacities							
Nominal Cooling (BTU/h)	18,000	24,000	30,000	36,000	42,000	48,000	60,000
Decibels (dBA)	71.0	72.0	72.0	72.0	71.0	73.0	75.0
Compressor							
RLA	6.1	8.4	11.6	16	17.7	19.9	25.6
LRA	35.1	41.2	59	91.9	110.2	110	150
Stage	Single	Single	Single	Single	Single	Single	Single
Type	Rotary	Rotary	Rotary	Scroll	Scroll	Scroll	Scroll
Condenser Fan Motor							
Motor Type	PSC	PSC	PSC	PSC	PSC	PSC	PSC
Horsepower	1/8	1/8	1/6	1/6	1/6	1/4	1/4
FLA	0.70	0.70	0.95	0.95	0.97	1.30	1.30
Refrigeration System							
Refrigerant Line Size [1]							
Liquid Line Size ("O.D.)	⅜"	⅜"	⅜"	⅜"	⅜"	⅜"	⅜"
Suction Line Size ("O.D.)	¾"	¾"	⅞"	⅞"	⅞"	⅞"	⅞"
Refrigerant Connection Size							
Liquid Valve Size ("O.D.)	⅜"	⅜"	⅜"	⅜"	⅜"	⅜"	⅜"
Suction Valve Size ("O.D.) [2,3]	¾"	¾"	⅞"	⅞"	⅞"	⅞"	⅞"
Valve Type	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat	Sweat
Refrigerant Charge [4]	65	71	79	95	107	120	181
Electrical Data							
Voltage-Phase (60 Hz)	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1
Minimum Circuit Ampacity [5]	8.3	11.2	15.5	21.0	23.1	26.2	33.3
Max. Overcurrent Protection [6]	15	15	25	35	40	45	50
Min / Max Volts	197/253	197/253	197/253	197/253	197/253	197/253	197/253
Electrical Conduit Size	½" or ¾"	½" or ¾"	½" or ¾"	½" or ¾"	½" or ¾"	½" or ¾"	½" or ¾"
Equipment Weight (lbs)	118	138	156	188	226	226	260
Ship Weight (lbs)	136	153	180	210	248	248	282

[1] Line sizes denoted for 25' line sets, tested and rated in accordance with ARI Standard 210/240. For other line set lengths or sizes, refer to the Installation Instructions and/or the Long Line Set Applications guide.
[2] Installer will need to supply ¾" to ⅞" adapters for suction line connections.
[3] Installer will need to supply ⅞" to 1⅛" adapters for suction line connections.
[4] Unit is factory charged with refrigerant for 15' of ⅜" liquid line. System charge must be adjusted per the Final Charge Adjustment procedure found in the Installation Instructions.
[5] Wire size should be determined in accordance with National Electrical Codes; extensive wire runs will require larger wire sizes
[6] Must use time-delay fuses or HACR-type circuit breakers of the same size as noted.

Notes
- Always check the S&R plate for electrical data on the unit being installed.

[illegible]	[illegible]

Goodman Air Conditioning & Heating

GMVC96 (B)

Heating Input: 40,000–120,000 BTU/h

Two-Stage, Variable-Speed ECM Gas Furnace Up to 96% AFUE

Contents

ENERGY STAR · ComfortBridge™ technology · CoolCloud™

Standard Features

- Integrated communicating ComfortBridge™ Technology
- Commissioning and diagnostics via on board Bluetooth with the CoolCloud phone and tablet application
- Heavy-duty aluminized-steel tubular heat exchanger
- Stainless-steel secondary heat exchanger
- Two-stage gas valve provides quiet, economical heating
- Durable Silicon Nitride igniter
- Quiet two-speed induced draft blower
- Compatible with any single-stage thermostat
- Self-diagnostic control board with constant memory fault code history output to a triple 7-segment display
- Color-coded low-voltage terminals with provisions for electronic air cleaner
- Efficient and quiet variable-speed airflow system gently ramps up or down according to heating or cooling demand
- Multiple continuous fan speed options offer quiet air circulation
- Auto-Comfort and enhanced dehumidification modes available
- All models comply with California 40 ng/J Low NOx emissions standard
- Can no longer be installed in California's South Coast Air Quality Management District (SCAQMD) on or after October 1, 2019.

Cabinet Features

- Designed for multi-position installation — upflow, horizontal left or right
- Certified for direct vent (2-pipe) or non-direct vent (1-pipe)
- Easy to install top venting with optional side venting
- Convenient left or right connection for gas and electrical service
- Cabinet air leakage (Q_{Leak}) ≤ 2%
- Heavy-gauge steel cabinet with durable baked-enamel finish
- Fully insulated heat exchanger and blower section
- Airtight solid bottom or side-return with easy-cut tabs for effortless removal in bottom air-inlet applications

LIFETIME HEAT EXCHANGER LIMITED WARRANTY* · 10 YEAR UNIT REPLACEMENT LIMITED WARRANTY* · 10 YEAR PARTS LIMITED WARRANTY* · Intertek · AHRI CERTIFIED · COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 = · COMPANY WITH ENVIRONMENTAL SYSTEM CERTIFIED BY DNV GL = ISO 14001 = · BBB ACCREDITED BUSINESS

* Complete warranty details available from your local dealer or at www.goodmanmfg.com. To receive the Lifetime Heat Exchanger Limited Warranty (good for as long as you own your home), 10-Year Unit Replacement Limited Warranty and 10-Year Parts Limited Warranty, online registration must be completed within 60 days of installation. Online registration is not required in California or Québec.

G	M	V	C	96	060	3	B	N	**
1	2	3	4	5,6	7,8,9	10	11	12	13,14

Brand
G- Goodman® Brand

Configuration
M- Upflow/Horizontal
C- Downflow/Horizontal

Motor
V- Variable Speed ECM/ComfortBridge
E- Multi-Speed ECM
S- Single Speed

Gas Valve
M- Modulating
C- Two- Stage
S- Single Stage

AFUE
97- 97% AFUE · 96- 96% AFUE
92- 92% AFUE

Engineering
Major / Minor Revisions
* Not used for inventory control.

NOx
N- Low NOx

Cabinet Width
B- 17½" · C- 21"
D- 24½"

Maximum CFM
2- 800 CFM · 4- 1600 CFM
3- 1200 CFM · 5- 2000 CFM

MBTU/h
040- 40,000 BTU/h
060- 60,000 BTU/h
120- 120,000 BTU/h

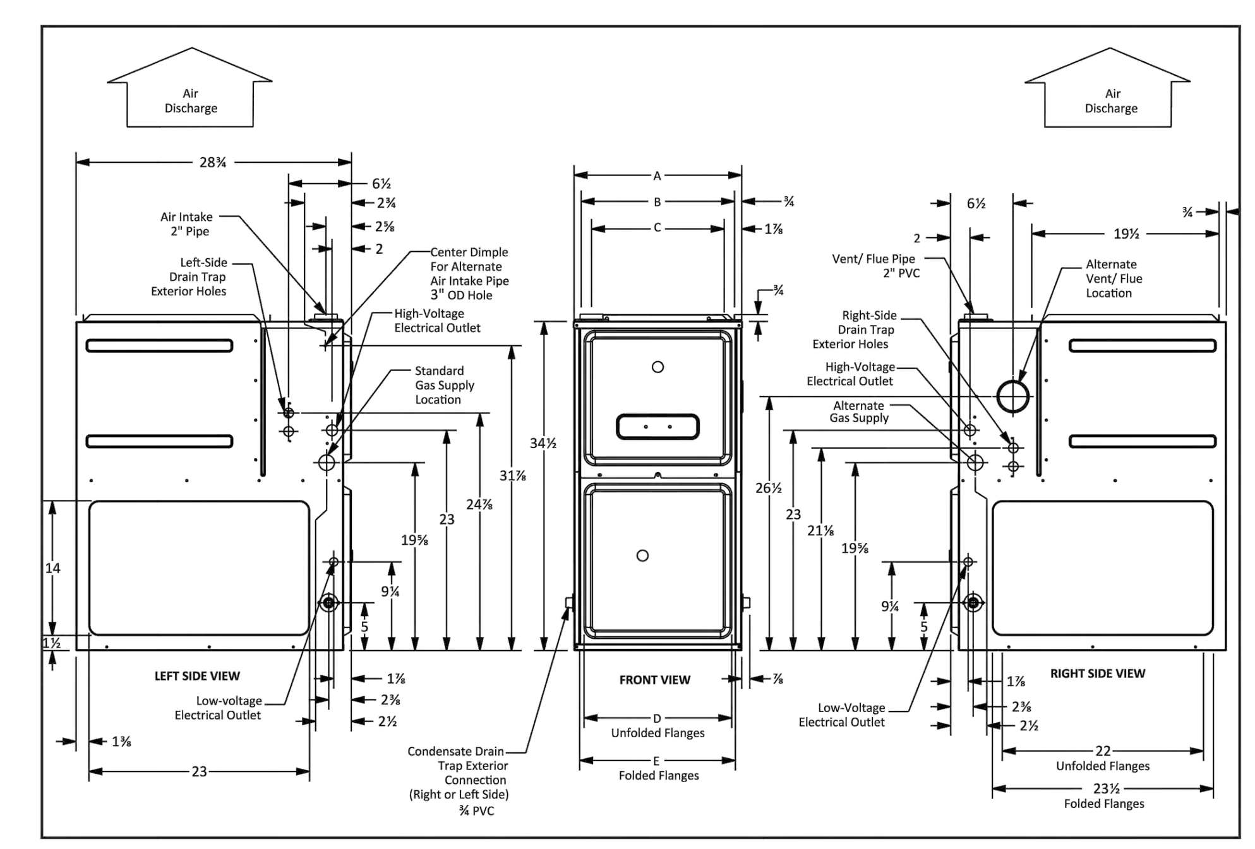
Accessories

Model	Description	GMVC96 0403BNB	GMVC96 0603BNB	GMVC96 0803BNB	GMVC96 0804CNB	GMVC96 1005CNB	GMVC96 1005DNB	GMVC96 1205DNB
CVENT-2	Concentric Vent Kit (2")	√	√	√	√	√	√	---
CVENT-3	Concentric Vent Kit (3")	√	√	√	√	√	√	√
RF000142	Drain Kit-Horizontal Left Vertical Flue	√	√	√	√	√	√	√
EFR02	External Filter Rack with 16"x25" Permanent Filter	√	√	√	√	√	√	√
0170K00000S	Flush Mount Vent Kit- 3" or 2"	√	√	√	√	√	√	√
0170K00001S	Flush Mount Vent Kit- 2"	√	√	√	√	√	√	---
HASFK	High-Altitude Natural Gas Kit	HASFK-1	HASFK-1	HASFK-2	HASFK-2	HASFK-3	TBD	HASFK-2
HASFK	High-Altitude LP Gas Kit	HASFK-1	HASFK-1	HASFK-1	HASFK-2	HASFK-2	TBD	HASFK-2
LPLP03	Low LP Gas Pressure Switch	√	√	√	√	√	√	√
LPM-08	LP Conversion Kits	√	√	√	√	√	√	√

	GMVC96 0403BNB	GMVC96 0603BNB	GMVC96 0803BNB	GMVC96 0804CNB	GMVC96 1005CNB	GMVC96 1005DNB	GMVC96 1205DNB
Heating Data							
High Fire Input[1]	40,000	60,000	80,000	80,000	100,000	100,000	120,000
High Fire Output[1]	38,400	57,600	76,800	76,800	96,000	96,000	115,200
Low-Fire Steady-State Input[1]	28,000	42,000	56,000	56,000	70,000	70,000	84,000
Low-Fire Steady-State Output[1]	26,880	40,320	53,760	53,760	67,200	67,200	80,640
AFUE[2]	96	96	96	96	96	96	96
Temperature Rise Range (°F)	20- 50	35- 65	35- 65	25- 55	35- 65	30- 60	35- 65
Vent Diameter[3]	2"- 3"	2"- 3"	2"- 3"	2"- 3"	2"- 3"	2"- 3"	2"- 3"
No. of Burners	2	3	4	4	5	5	6
Circulator Blower							
Available AC @ 0.5" ESP	1.5- 3	1.5- 3	1.5- 3	1.5- 4	2- 5	2- 5	2- 5
Size (D x W)	10" x 8"	11" x 8"	11" x 8"	11" x 10"	11" x 10"	11" x 11"	11" x 11"
Horsepower @ 1075 RPM	½	½	½	¾	1	1	1
Speed	VS ECM	VS ECM	VS ECM	VS ECM	VS ECM	VS ECM	VS ECM
Electrical Data							
Min. Circuit Ampacity[4]	7.8	7.8	7.8	10.6	14.4	14.4	14.4
Max. Overcurrent Device (amps)[5]	15	15	15	15	20	20	20
Shipping Weight (lbs)	114	117	120	141	143	153	156

[1] Natural Gas BTU/h
[2] DOE AFUE based upon Isolated Combustion System (ICS)
[3] Installer must supply one or two PVC pipes: one for combustion air (optional) and one for the flue outlet (required). Vent pipe must be either 2" or 3" in diameter, depending upon furnace input, number of elbows, length of run and installation (1 or 2 pipes). The optional Combustion Air Pipe is dependent on installation/code requirements and must be 2" or 3" diameter PVC.
[4] Minimum Circuit Ampacity = (1.25 x Circulator Blower Amps) + ID Blower amps. Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.
[5] Maximum Overcurrent Protection Device refers to maximum recommended fuse or circuit breaker size. May use fuses or HACR-type circuit breakers of the same size as noted.

Notes
- All furnaces are manufactured for use on 115 VAC, 60 Hz, single-phase electrical supply.
- Gas Service Connection ½" FPT
- Important: Size fuses and wires properly and make electrical connections in accordance with the National Electrical Code and/or all existing local codes.
- For bottom return: Failure to unfold flanges may reduce airflow by up to 18%. This could result in performance and noise issues.
- For servicing or cleaning, a 24" front clearance is required. Unit connections (electrical, flue and drain) may necessitate greater clearances than the minimum clearances listed above. In all cases, accessibility clearance must take precedence over clearances from the enclosure where accessibility clearances are greater.



Model	W	D	H	A	B (Air Discharge)	C	D	E (Air Return)
GMVC960403BNB	17½"	28⅞"	34½"	17½"	16"	13⅞"	12⅛"	13⅝"
GMVC960603BNB	17½"	28⅞"	34½"	17½"	16"	13⅞"	12⅛"	13⅝"
GMVC960803BNB	17½"	28⅞"	34½"	17½"	16"	13⅞"	12⅛"	13⅝"
GMVC960804CNB	21"	28⅞"	34½"	21"	19½"	17⅞"	16"	17½"
GMVC961005CNB	21"	28⅞"	34½"	21"	19½"	17⅞"	16"	17½"
GMVC961005DNB	24½"	28⅞"	34½"	24½"	23"	20⅞"	19⅜"	20⅞"
GMVC961205DNB	24½"	28⅞"	34½"	24½"	23"	20⅞"	19⅜"	20⅞"

Minimum Clearances to Combustible Materials

Position	Sides	Rear	Front	Bottom	Flue	Top
Upflow	0"	0"	3"	C	0"	1"
Horizontal	6"	0"	3"	C	0"	6"

C = If placed on combustible floor, the floor MUST be wood ONLY.

Minimum Filter Sizes

	GMVC96 0403BNB	GMVC96 0603BNB	GMVC96 0803BNB	GMVC96 0804CNB	GMVC96 1005CNB	GMVC96 1005DNB	GMVC96 1205DNB
Filter Size (in²) (Qty)	(1) 16 x 25 (side or bottom)				(1) 20 x 25 (bottom) or (2) 16 x 25 (side)		

Note: Other size filters of equal or greater dimensions may be used. Filters may also be centrally located.

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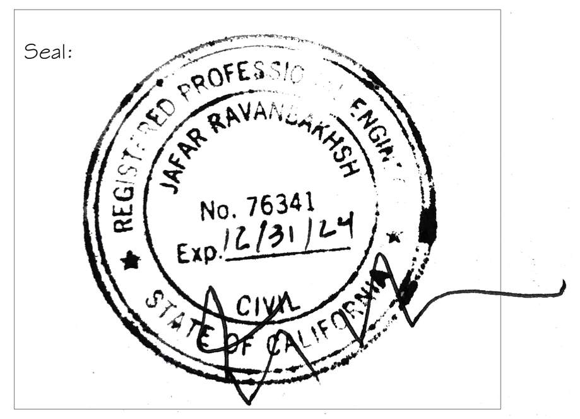
Project Name and Address:
ZOE PRIVATE RESIDENCE
1705 E LINCOLN AVE, ANAHEIM, CA

Seal:



Revision Notes:

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Scale:

Date:

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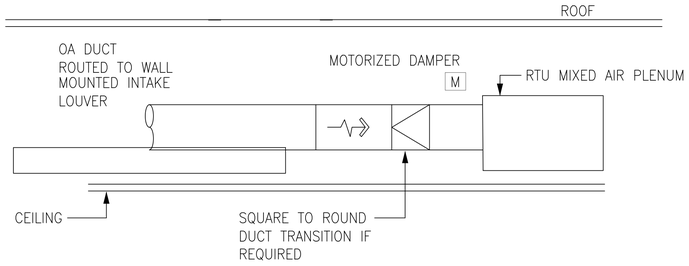
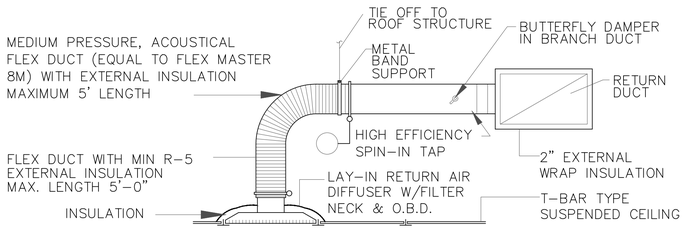
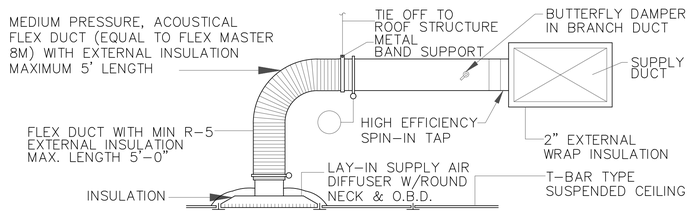


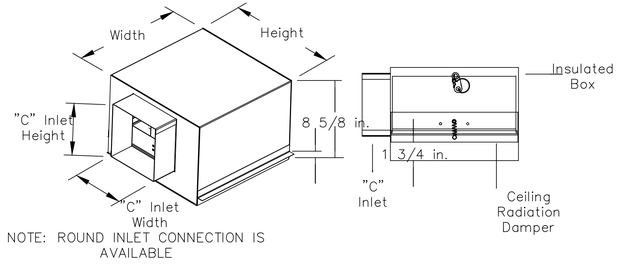
OUTSIDE AIR CONNECTION



RETURN AIR GRILLE BOX CONNECTION

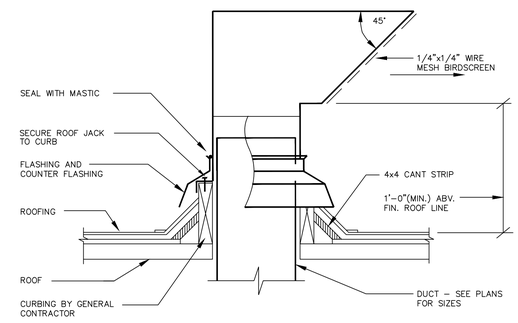


SUPPLY AIR DIFFUSER CONNECTION

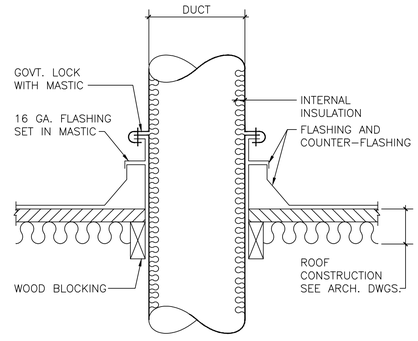


NOTE: ROUND INLET CONNECTION IS AVAILABLE

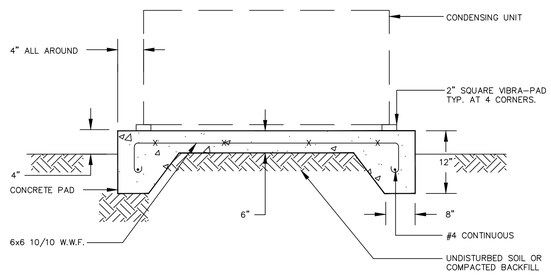
CEILING RADIATION DAMPER



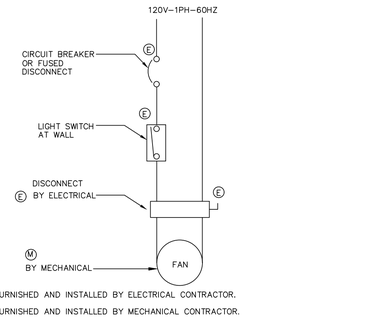
ROOF JACK DETAIL | SCALE NONE | 4



DUCT ROOF PENETRATION | SCALE NONE | 1

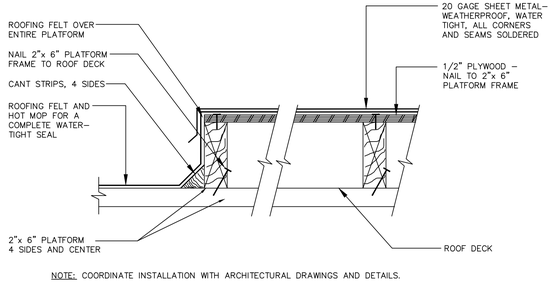


HEAT PUMP/CONDENSING UNIT MOUNTING DETAIL | SCALE NONE | 5



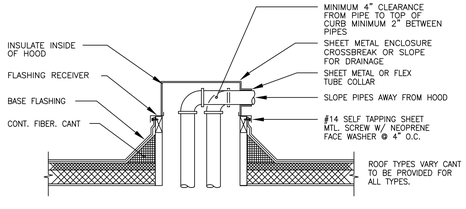
(E) FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
(M) FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.

TOILET EXHAUST FAN DIAGRAM | SCALE NONE | 2



NOTE: COORDINATE INSTALLATION WITH ARCHITECTURAL DRAWINGS AND DETAILS.

SECTION PLATFORM DETAIL | SCALE NONE | 6



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ZOE PRIVATE RESIDENCE
1705 E LINCOLN AVE, ANAHEIM, CA

Seal:

Revision Notes:

Date	Description

Drawing Title:

MECHANICAL
DETAILS

Scale:

Date:

Page No. : M5.0

Project Report

General Project Information

Project Title: Zoe
Project Date: Sunday, May 7, 2023

Design Data

Reference City:	ANAHEIM , California
Building Orientation:	Front door faces North
Daily Temperature Range:	Medium
Latitude:	41 Degrees
Elevation:	218 ft.
Altitude Factor:	0.992
Elevation Sensible Adj. Factor:	1.000
Elevation Total Adj. Factor:	1.000
Elevation Heating Adj. Factor:	1.000
Elevation Heating Adj. Factor:	1.000

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	80%	n/a	70	n/a
Summer:	65	59	71%	50%	75	0

Check Figures

Total Building Supply CFM:	852	CFM Per Square ft.:	1.275
Square ft. of Room Area:	668	Square ft. Per Ton:	389
Volume (ft³) of Cond. Space:	6,680		

Building Loads

Total Heating Required Including Ventilation Air:	18,612 Btuh	18.612	MBH
Total Sensible Gain:	18,586 Btuh	90	%
Total Latent Gain:	2,042 Btuh	10	%
Total Cooling Required Including Ventilation Air:	20,628 Btuh	1.72	Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.
All computed results are estimates as building use and weather may vary.
Be sure to select a unit that meets both sensible and latent loads.

Miscellaneous Report

System 1 Acu-1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	80%	n/a	70	n/a
Summer:	65	59	71%	50%	75	0.31

Duct Sizing Inputs

	Main Trunk		Runouts	
Calculate:	Yes		Yes	
Use Schedule:	Yes		Yes	
Roughness Factor:	0.00300		0.01000	
Pressure Drop:	0.1000	in.wg./100 ft.	0.1000	in.wg./100 ft.
Minimum Velocity:	650	ft./min	450	ft./min
Maximum Velocity:	900	ft./min	750	ft./min
Minimum Height:	0	in.	0	in.
Maximum Height:	0	in.	0	in.

Outside Air Data

	Winter		Summer	
Infiltration Specified:	0.310	AC/hr	0.160	AC/hr
	35	CFM	18	CFM
Infiltration Actual:	0.310	AC/hr	0.000	AC/hr
Above Grade Volume:	X 6,680	Cu.ft.	X 6,680	Cu.ft.
	2,071	Cu.ft./hr	0	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	35	CFM	0	CFM
Total Building Ventilation:	0	CFM	200	CFM

—System 1—
Infiltration & Ventilation Sensible Gain Multiplier: -10.91 = (1.10 X 0.992 X -10.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier: 0.21 = (0.68 X 0.992 X 0.31 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier: 40.38 = (1.10 X 0.992 X 37.00 Winter Temp. Difference)
Winter Infiltration Specified: 0.310 AC/hr (35 CFM), Construction: Semi-Tight
Summer Infiltration Specified: 0.160 AC/hr (18 CFM), Construction: Semi-Tight

Load Preview Report

Scope	Net Ton	ft²/Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
Building	1.72	389	668	18,586	2,042	20,628	18,612	244	852	852	
System 1	1.72	389	668	18,586	2,042	20,628	18,612	244	852	852	10x16
Ventilation				0	42	42	0				
Zone 1			668	18,586	2,000	20,586	18,612	244	852	852	10x16
1-Bedroom 1			144	4,022	400	4,422	4,234	55	184	184	2–6
2-Bedroom 2			144	4,022	400	4,422	4,234	55	184	184	2–6
3-Living Room			300	8,517	1,000	9,517	8,582	112	390	390	4–6
4-Bath 1			80	2,025	200	2,225	1,562	20	93	93	1–6

Duct Size Preview

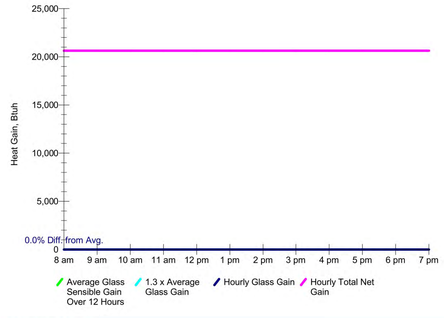
Room or Duct Name	Minimum Velocity	Maximum Velocity	Rough Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act. Flow	Duct Size
System 1											
Supply Runouts											
Zone 1											
1-Bedroom 1	450	750	0	0.1		469.2		55	184	184	2–6
2-Bedroom 2	450	750	0	0.1		469.2		55	184	184	2–6
3-Living Room	450	750	0	0.1		496.8		112	390	390	4–6
4-Bath 1	450	750	0	0.1		472.5		20	93	93	1–6
Other Ducts											
Supply Main Trunk	650	900	0	0.1		766.4		244	852	852	10x16

Summary

System 1
Heating Flow: 244
Cooling Flow: 852

System 1 - Acu-1 - Adequate Exposure Diversity Test

Test For Adequate Exposure Diversity



AED Calculation Summary

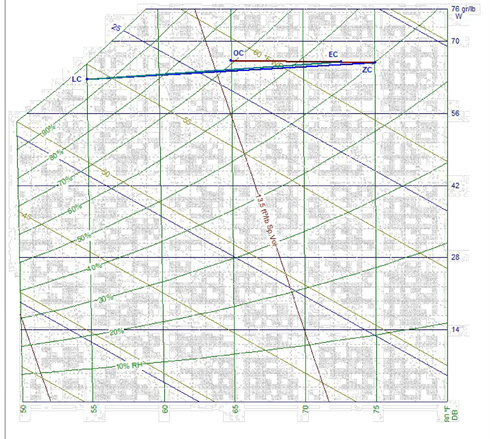
--- SYSTEM HAS ADEQUATE EXPOSURE DIVERSITY. ---

System is on NE, SE, SW, NW rosette.
Peak load exceeds 12-hour average load by 0.0%.
AED Excursion (amount by which peak exceeds 1.3 x average): 0 Btuh

Definition: A system has adequate exposure diversity if the peak-hour glass load for the entire conditioned space does not exceed the average glass load for the entire conditioned space by more than 30 percent.

System 1 - Acu-1 - Psychrometric Chart

ZC	Zone (Room) Condition	OC	Outdoor Condition
LC	Leaving Coil Condition	EC	Entering Coil Condition
SD	Supply Duct Temperature Rise	DTF	Draw Through Fan Sensible Gain
HRV	Heat Recovery Ventilator		



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
12A-0sw: Wall-Frame, no insulation in stud cavity, no board insulation, siding finish, wood studs	470	4,174	0	1,297	1,297
16A-0: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Unvented Attic, No Radiant Barrier, Any Roofing Material, Any Roof Color, R-0 insulation	668	10,085	0	14,989	14,989
19A-0tp: Floor-Over enclosed unconditioned crawl space, No insulation on exposed walls, sealed or vented space, passive, no floor insulation, tile or vinyl	668	2,959	0	0	0
Subtotals for structure:		17,218	0	16,286	16,286
People:	10		2,000	2,300	4,300
Equipment:			0	0	0
Lighting:	0			0	0
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 35, Summer CFM: 0		1,394	0	0	0
Ventilation: Winter CFM: 0, Summer CFM: 200		0	42	0	42
Total Building Load Totals:		18,612	2,042	18,586	20,628

Check Figures

Total Building Supply CFM:	852	CFM Per Square ft.:	1.275
Square ft. of Room Area:	668	Square ft. Per Ton:	389
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1705 E LINCOLN AVE, ANAHEIM, CA

Seal:
REGISTERED PROFESSIONAL ENGINEER
JAFAR RAVANMASHI
No. 76341
Exp 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

Drawing Title:
MECHANICAL CALCULATION

Scale:

Date:

Page No. : M6.0

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 2022 CALIFORNIA PLUMBING CODE, THE 2022 CALIFORNIA ENERGY CODE, AND THE 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

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 2022 CALIFORNIA PLUMBING 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 COPPER 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 2022 CALIFORNIA PLUMBING CODE.

13. PROVIDE WATER TIGHT FLASHINGS WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOFS, OR FLOORS.

14. PROVIDE ISOLATION FOR ALL PIPES THAT COME IN CONTACT WITH THE STRUCTURE.

15. LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICES PRIOR TO STARTING WORK OF THIS SECTION. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.

16. VALVES SHALL BE NIBCO, JENKINS, HAMMOND, RED & WHITE OR APPROVED EQUAL. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. THE MAIN WATER SHUT OF VALVE SHALL BE A FULL PORT BALL TYPE AND APPROVED FOR SERVICE INTENDED.

17. CONTRACTOR SHALL PROVIDE ALL SHUT OFF VALVES AS NECESSARY TO ISOLATE ANY EQUIPMENT, PLUMBING ITEMS, OR FIXTURES, THAT MAY NEED SERVICING OR ARE SUBJECT TO FAILURE WHETHER OR NOT SUCH VALVES ARE SHOWN ON THE DRAWINGS.

18. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.

19. CONTRACTOR IS RESPONSIBLE FOR HIS OWN TRENCHING, BACKFILL, AND COMPACTION OF TRENCHES NECESSARY TO COMPLETE HIS SCOPE OF WORK. BACKFILLED TRENCHES SHALL BE RETURNED TO THEIR ORIGINAL GRADE UNLESS NOTED OTHERWISE.

20. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE MAINTENANCE AND OPERATIONAL MANUALS IN ACCORDANCE WITH THE SPECIFICATIONS.

21. ALL EQUIPMENT THAT REQUIRES KEYS OR SPECIAL TOOLS TO OPERATE SHALL SUPPLY THE OWNER WITH TWO OF ANY SUCH KEYS OR TOOLS FOR EACH PIECE OF EQUIPMENT THAT REQUIRE THE SAME.

25. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE APPROVAL, IN WRITING, OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.

26. ALL PLUMBING, ELECTRICAL, AND GAS LINES SHALL BE CONCEALED WITHIN THE THE BUILDING STRUCTURE TO AS GREAT EXTENT AS POSSIBLE. ALL LINES NOT CONCEALED SHALL BE SECURED 6" OFF THE FLOOR AND 3/4" FROM THE WALLS USING STANDOFF BRACKETS

27. AN APPROVED BACKFLOW PREVENTOR SHALL BE PROPERLY INSTALLED UPSTREAM OF ANY POTENTIAL HAZARD BETWEEN THE POTABLE WATER SUPPLY AND SOURCE OF CONTAMINATION.

28. WATER SUPPLY CARBONATORS SHALL BE PROTECTED BY AN APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR. THE RELIEF VALVE SHALL DRAIN IN-DIRECTLY TO A FLOOR SINK WITH A 1" MIN. AIR GAP.

PLUMBING FIXTURE FLOW RATE

FIXTURE TYPE	MAXIMUM FLOW RATE
Waterdosets	1.28 gallons flush
Showerheads	1.8gpm@ 80psi
Lavatory faucets	1.2gpm@ 60psi
Kitchenfaucets	1.8gpm@ 60psi

PIPE MATERIAL SCHEDULE

SERVICE		COPPER TYPE "M"	COPPER TYPE "L"	PEX	COPPER TYPE "K"	CAST IRON	BLACK STEEL	GALV. STEEL	VTRI. CLAY	ABS	SCH.40 PVC	SCH.40 CPVC	REMARKS
WATER PIPING	INSIDE		X	X									
	OUTSIDE										X		
SANITARY DRAIN	INSIDE					X					X		
	OUTSIDE										X		
SANITARY VENT	INSIDE					X					X		
	OUTSIDE										X		
GAS PIPING	INSIDE						X						
	OUTSIDE							X					
STORM DRAIN	INSIDE										X		
	OUTSIDE										X		
INDIRECT DRAINAGE	INSIDE										X		
	OUTSIDE										X		
CONDESATE	INSIDE										X		
	OUTSIDE										X		
COMPRESSED AIR	INSIDE						X						
	OUTSIDE							X					

NOTES:A. CERTIFICATION OF COMPLIANCE IS NECESSARY WHEN INSTALLING CPVC/PEX WATER PIPING MATERIALS PRIOR TO BUILDING PERMIT ISSUANCE. CPC 604.1.1 (CPVC)/CPC 604.1.2(PEX)

B. FOR BUILDING MORE THAN 2 STORY CAST IRON DRAIN WILL BE FROM SURFACE OF SLAB TO SURFACE OF SECOND FLOOR. THIRD FLOOR THE DRAINAGE PIPE IS SCH.40 PVC.

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
HO	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	TP	TRAP PRIMER & TRAP PRIMER PIPING
	SOV	SHUT-OFF VALVE
	CV	CHECK VALVE
	PRV	BACKFLOW PREVENTER W SOV'S
	T & P	
	DN	PIPE DOWN
	UP	PIPE UP
	POC	POINT OF CONNECTION
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 414/2022
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 2022
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/2022
VERIFY AND WHERE WATER PRESSURE EXCEEDS 80 PSI AN APPROVED PRESSURE REGULATOR PRECEDED BY AN ADEQUATE STRAINER SHALL BE INSTALLED 608.2 CPC / 2022
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. (2022 CPC 906) IF WATER PRESSURE EXCEEDS 80 PSI, AND EXPANSION TANK AND AN APPROVED PRESSURE REGULATOR SHALL BE INSTALLED. (2022 CPC608.2)
NON-REMOVABLE BACK FLOW PRE-VENTER OR BIBB-TYPE VACUUM BREAKER WILL BE INSTALLED ON ALL EXTERIOR HOSE BIBS. (2022 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)

CITY CODES

2022 California Building Code
2022 California Residential Code
2022 California Fire Code
2022 California Electrical Code
2022 California Mechanical Code
2022 California Plumbing Code
2022 California Green Building Standards Code
2022 California Historical Building Code
2022 California Referenced Standards Code
2022 California Administrative Code
2022 California Energy Code
ACI 318-14 (Structural Concrete)
TMS 402/602-16 (Structural Masonry)
ASCE 7-16 (Design Loads for Structures)

609.11.2 Pipe Insulation Wall Thickness
Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.

Exceptions;
Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.
Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated

NOTES:

1-Projects which disturb less than one acre of soil shall manage storm water drainage during construction by one of the following: A. Retention basins. B. Where storm water is conveyed to a public drainage system, water shall be filtered by use of a barrier system, wattle or other approved method.
2-Site grading or drainage system will manage all surface water flows to keep water from entering buildings (swales, water collection, French drains, etc.). CGC Section 4.106.3. Exception: Additions not altering the drainage path.
3-When a shower is provided with multiple shower heads, the sum of flow to all the heads shall not exceed 1.8 gpm @ 80 psi, or the shower shall be designed so that only one head is on at a time. CGC Section 4.303.1.3.2.
4-Landscape irrigation water use shall have weather or soil based controllers. CGC Section 4.304.1.
5-The plans that a minimum of 65% of construction waste is to be recycled. CGC Section 4.408.1.
6-The contractor shall submit a Construction Waste Management Plan, per CGC Section 4.408.2.
7-The builder is to provide an operation manual (containing information for maintaining appliances, etc.) for the owner at the time of final inspection. CGC Section 4.410.1.
8-The gas fireplace(s) shall be a direct-vent sealed- combustion type. Woodstove or pellet stoves must be US EPA Phase II rated appliances. CGC Section 4.503.1.
9-building drain and vent piping materials shall comply with sections 701.0 and 903.0 of the California plumbing code.
10-All sanitary system materials shall be listed by an approved listing agency.
11-Each vent shall rise vertically to a point not less than six 6 inches above the flood -level rim of the fixture served before offsetting horizontally or before being connected to any other vent."

WATER SAVING STANDARDS.

THE WATER SAVING PERFORMANCE STANDARDS FOR A PLUMBING FIXTURE ARE THOSE ESTABLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), CURRENT REVISION,
OR THE FOLLOWING STANDARDS, WHICHEVER ARE THE MORE RESTRICTIVE
1. THE MAXIMUM FLOW FROM A SINK OR LAVATORY FAUCET OR A FAUCET AERATOR SHALL
NOT EXCEED 0.5 GALLONS OF WATER PER MINUTE AT A PRESSURE OF 60 POUNDS
PER SQUARE INCH WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES
2.THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A TOILET SHALL NOT EXCEED AN
AVERAGE OF 1 28 GALLONS WHEN TESTED IN ACCORDANCE WITH ANSI TESTING
PROCEDURES
3. THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A URINAL AND THE ASSOCIATED
FLUSH VALVE, IF ANY, SHALL NOT EXCEED AN AVERAGE OF ONE GALLON WHEN TESTED
IN ACCORDANCE WITH ANSI TESTING PROCEDURES

SPECIAL NOTICE TO CONTRACTORS

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

2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.

3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

PLUMBING SPECS
SCALE :NTS

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Revision Notes:

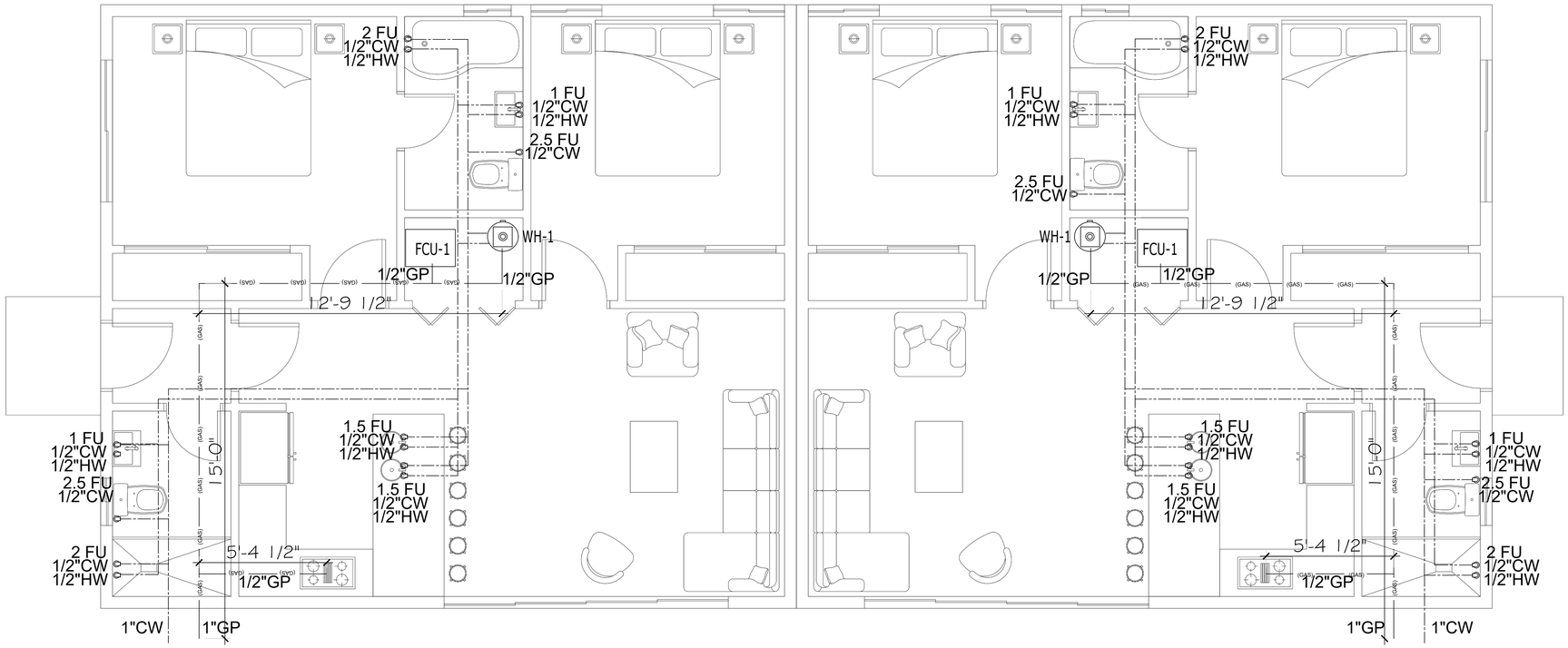
Date	Description

Drawing Title:
PLUMBING SPECS

Scale:

Date:

Page No. : P1.0



1 WATER SUPPLY PLAN
SCALE: 3/8 = 1'-0"

PIPING INSULATION SCHEDULE

PIPE SIZE:	UP TO 1.5"	1.5" AND LARGER	
INSULATION THICKNESS	MINIMUM PIPE DIAMETER SIZE	2"	
ALL INSULATION SHALL BE W/R VALUES OF 4.0 TO 4.6			

NOTE
THE FIRST 8 FEET OF ALL HOT WATER & TEMPERED HOT WATER PIPING SHALL HAVE INSULATION CONSISTING 0.5 INCH OF MATERIAL HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H x SF x DEGREE F.

ABBREVIATIONS :

ABBREV.	DESCRIPTION
CO.	CLEAN OUT
DN.	DOWN
FD	FLOOR DRAIN
FCO	FLOOR CLEAN OUT
F.F.L	FINISH FLOOR LEVEL
UG	UNDER GROUND
GP	GAS PIPE
DP	WASTE PIPE
VP	VENT PIPE
VS	VENT STACK
VTR	VENT TO ROOF
FU	FIXTURE UNIT
CW	COLD WATER
HW	HOT WATER
TWH	TANKLESS GAS WATER HEATER
HB	HOSE PIPE

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JAFAR RAVANBAKHSH
No. 76341
Exp 12/31/24
CIVIL
STATE OF CALIFORNIA

Revision Notes:

Date	Description

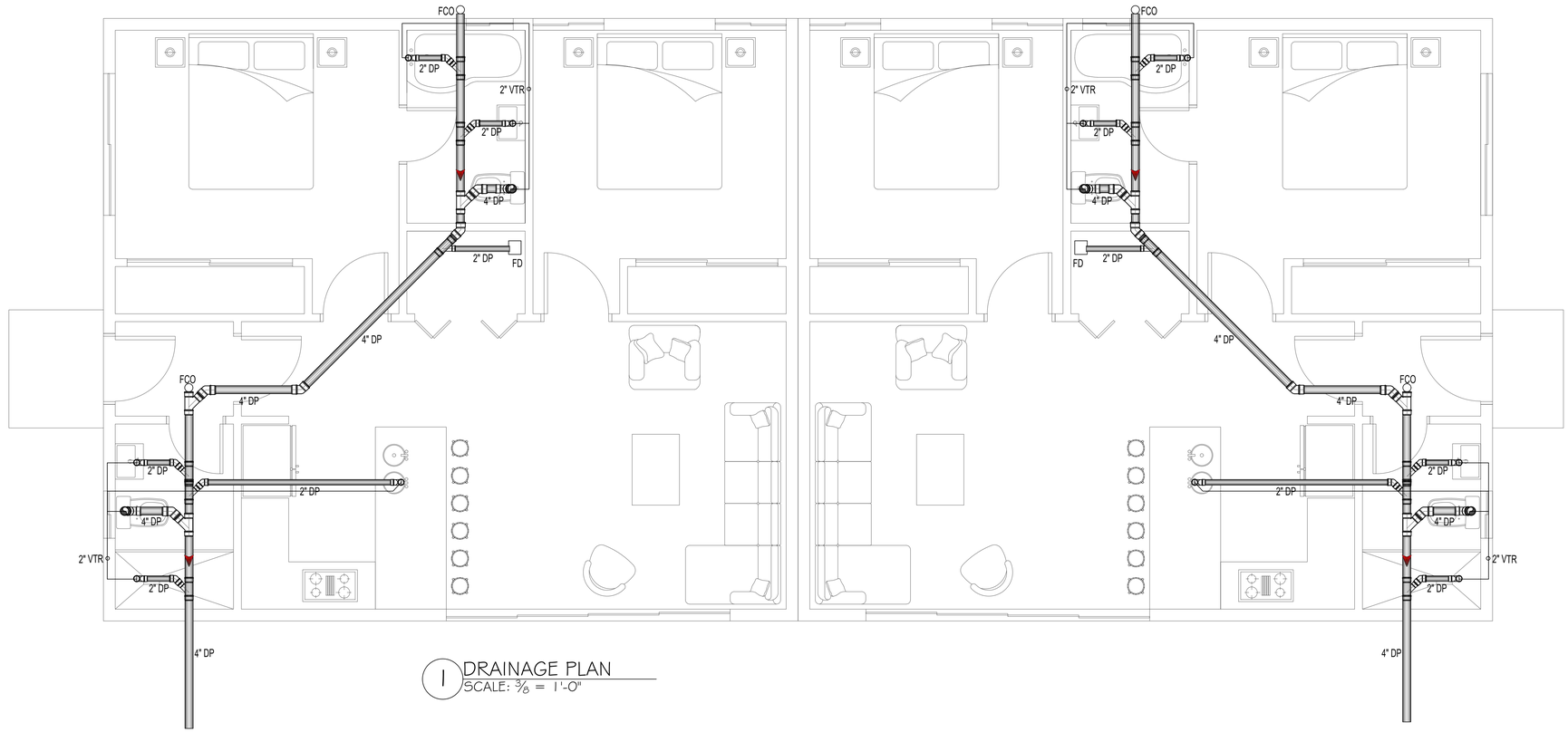
Drawing Title:
WATER SUPPLY PLAN

Scale:

Date:

Page No. : P2.0

Important note: Owner is Responsible to Contact the Union Sanitary District for the required sewer service fee



1 DRAINAGE PLAN
SCALE: 3/8 = 1'-0"

PIPING INSULATION SCHEDULE			
PIPE SIZE:	UP TO 1.5"	1.5" AND LARGER	
INSULATION THICKNESS	MINIMUM PIPE DIAMETER SIZE	2"	
ALL INSULATION SHALL BE W/R VALUES OF 4.0 TO 4.6			

NOTE
THE FIRST 8 FEET OF ALL HOT WATER & TEMPERED HOT WATER PIPING SHALL HAVE INSULATION CONSISTING 0.5 INCH OF MATERIAL HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H x SF x DEGREE F.

ABBREVIATIONS :

ABBREV.	DESCRIPTION
CO.	CLEAN OUT
DN.	DOWN
FD	FLOOR DRAIN
FCO	FLOOR CLEAN OUT
F.F.L	FINISH FLOOR LEVEL
UG	UNDER GROUND
GP	GAS PIPE
DP	WASTE PIPE
VP	VENT PIPE
VS	VENT STACK
VTR	VENT TO ROOF
FU	FIXTURE UNIT
CW	COLD WATER
HW	HOT WATER
TWH	TANKLESS GAS WATER HEATER
HB	HOSE PIPE

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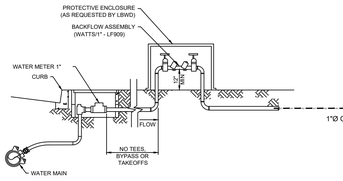
Drawing Title:
DRAINAGE PLAN

Scale:

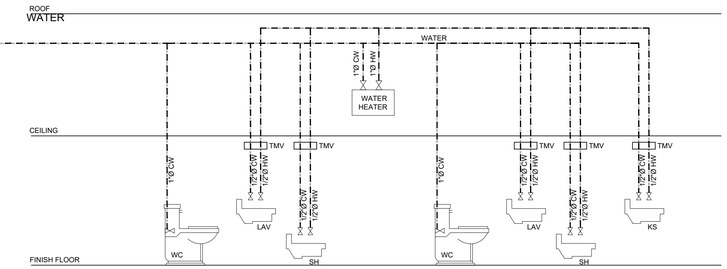
Date:

Page No. : P3.0

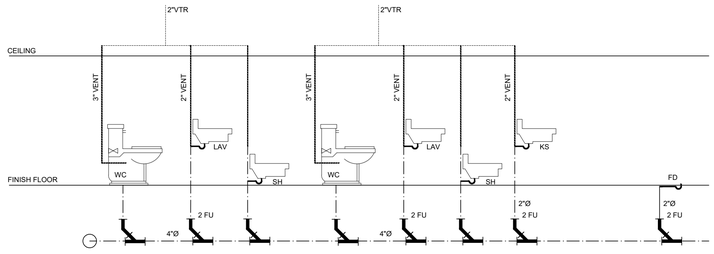


NOTES :

1. THE REDUCED-PRESSURE-PRINCIPLE BACKFLOW PREVENTION ASSEMBLY MUST BE INSTALLED AS CLOSE TO THE WATER METER AS POSSIBLE ON THE CUSTOMER'S SIDE, AT AN EASILY ACCESSIBLE LOCATION FOR TESTING.
2. NO PLUMBING CONNECTION(S) BETWEEN THE BACKFLOW PREVENTION ASSEMBLY AND THE WATER METER SHALL BE MADE BY THE CUSTOMER'S PLUMBER AFTER THE BACKFLOW ASSEMBLY IS INSTALLED.
3. TO ENSURE PROPER OPERATION, THE BACKFLOW ASSEMBLY MUST BE TESTED PRIOR TO SERVICE ACTIVATION AND YEARLY THEREAFTER. COPIES OF THE TEST REPORT MUST BE SUBMITTED TO LONG BEACH WATER DEPARTMENT AND HEALTH DEPARTMENT.
4. THIS DETAIL IS ONLY APPLICABLE FOR "EXTERNAL" APPLICATION, WHICH IS TO PROTECT THE PUBLIC WATER SYSTEM. FOR "INTERNAL" APPLICATION, WHICH IS TO PROTECT THE PRIVATE OR INTERNAL WATER SYSTEM, REFER TO HEALTH DEPARTMENT FOR REGULATIONS.



WATER SUPPLY RISER DIAGRAM



DRAINAGE RISER DIAGRAM

WATER REDUCTION FIXTURE FLOW RATES

FIXTURE TYPE	MAXIMUM ALLOWABLE FLOW RATE
Showerheads	1.8 gpm @ 80 psi
Lavatory faucets, residential	1.2 gpm @ 60 psi
Lavatory Faucets, nonresidential	0.4 gpm @ 60 psi
Kitchen faucets	1.5 gpm @ 60 psi
Wash fountains	1.8 gpm for every 20 in. of rim space @60 psi
Metering faucets	0.2 gallons/cycle
Metering faucets for wash fountains	0.2 gpm for every 20 in. of rim space @ 60 psi
Gravity tank type water closets	1.28 gallons/flush
Flushometer tank water closets	1.28 gallons/flush
Flushometer valve water closets	1.28 gallons/flush
Urinals	0.125 gallons/flush
Clothes Washers	ENERGY-STAR certified
Dishwashers	ENERGY-STAR certified

ITEM	FIXTURE	TRAP	COLD WATER	HOT WATER	WASTE	VENT	DESCRIPTION
WC	WATER CLOSET	-	1/2"	-	3"	2"	1.28 GPM EFECTIVE FLUSH TANK VERIFY SELECTION W/ ARCH/OWNER
LAV	LAVATORY SINK	1-1/2"	1/2"	1/2"	2"	2"	1.2 GPM VERIFY SELECTION W/ ARCH/OWNER
KS	KITCHEN SINK	1-1/2"	1/2"	1/2"	2"	2"	1.8 GPM VERIFY SELECTION W/ ARCH/OWNER
LS	LAUDRY SINK	1-1/2"	1/2"	1/2"	2"	2"	1.8 GPM VERIFY SELECTION W/ ARCH/OWNER
TUB	BATHTUB	1-1/2"	1/2"	1/2"	2"	2"	SELECTION W/ ARCH/OWNER
SH	SHAWER	1-1/2"	1/2"	1/2"	2"	2"	SELECTION W/ ARCH/OWNER
DW	DISH WASHER	-	-	1/2"	-	-	SELECTION W/ ARCH/OWNER, ENERGY-STAR CERTIFIED
W/D	WASHER/DRYER	-	1/2"	1/2"	2"	-	SELECTION W/ ARCH/OWNER, ENERGY-STAR CERTIFIED
FD	FLOOR DRAIN	-	1/2"	-	-	-	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
FS	FLOOR SINK	-	1/2"	-	-	-	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.
FCO	FLOOR CLEAN OUT	-	-	-	-	-	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.
HB	HOSE BIBB	-	1/2"	-	-	-	SELECTION W/ ARCH/OWNER, PROVIDE ANTI-SIPHONE DEVICE

PLUMBING FIXTURE SUMMARY FOR THE HOUSE

FIXTURE	QTY.	DRAIN					COLD WATER		HOT WATER	
		F.U.	SAN WASTE	TOTAL F.U. (SAN)	GREASE WASTE	TOTAL F.U. (GREASE)	F.U. CW	TOTAL CW	F.U. HW	TOTAL HW
WATER CLOSET (Private)	2	4.0	4.0	8.0		0	2.5	5.0		0
WATER CLOSET (Public)		6	6	0		0	5.5	0.0		0
LAVATORY (Private)	2	1	1	2		0	1.0	2	1	2
LAVATORY (Public)		1	1	0		0	1	0	1	0
URINAL (private)		2	2	0		0	2	0		0
URINAL (Public)		2	2	0		0	2	0		0
SHOWER (private)	2	2	2	4		0	2	4	2	4
SHOWER (Public)		2	2	0		0	2	0	2	0
LAUNDRY SINK		2	2	0		0	1.5	0	1.5	0
HAND SINK (HAND SINK)		2		0	2	0	2	0	2	0
PREP (1-COMP) SINK (A3 5L)**		2		0	2	0	2	0	2	0
3 -COMP SINK (D40) **		6		0	6	0	4	0	4	0
HOSE BIB (WHD)				0		0	2.5	0		0
FLOOR DRAIN		2	2	0		0		0		0
FLOOR SINK (1.5" Trap)		2		0	2	0				0
FLOOR SINK (2" Trap)		4		0	4	0				0
FLOOR SINK (3" Trap)		6		0	6	0				0
FLOOR SINK (4" Trap)		8		0	8	0				0
DISHWASHER		2		0		0	1.5	0	1.5	0
DRINKING FOUNTAIN		0.5	0.5	0		0	0.5	0		0
KITCHEN SINK (private)	1	2	2	2		0	1.5	2	1.5	2
KITCHEN SINK (Public)		2		0	2	0	1.5	0	1.5	0
MOP SINK (MS-1) (private)				0		0	1.5	0	1.5	0
MOP SINK (MS-1) (Public)		3	3	0		0	3	0	3	0
clothes washer (private)	1	3	3	3		0	4	4		0
clothes washer (Public)		3	3	0		0	4	0		0
OTHERS		2	2	0		0	1	0		0
TOTAL				19.0		0.0		16.5		7.5

1215.2 Tables for Sizing Gas Piping Systems

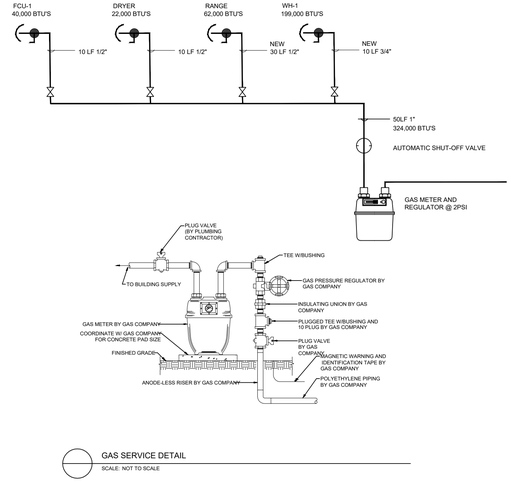
Table 1215.2(1) through Table 1215.2(36) shall be used to size gas piping in conjunction with one of the methods described in Section 1215.1.1 through Section 1215.1.3. [NFPA 54:6.2]

TABLE 1215.2(1)
SCHEDULE 40 METALLIC PIPE [NFPA 54:TABLE 6.2(b)][1,2]

GAS: NATURAL
INLET PRESSURE: LESS THAN 2 psi
PRESSURE DROP: 0.5 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	
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 (feet)	CAPACITY IN CUBIC FEET OF GAS PER HOUR													
10	172	360	678	1390	2090	4020	6400	11 300	23 100	41 800	67 600	139 000	252 000	399 000
20	118	247	466	957	1430	2760	4400	7780	15 900	28 700	46 500	95 500	173 000	275 000
30	95	199	374	768	1150	2220	3530	6250	12 700	23 000	37 300	76 700	139 000	220 000
40	81	170	320	657	985	1900	3020	5350	10 900	19 700	31 900	65 600	119 000	189 000
50	72	151	284	583	873	1680	2680	4740	9660	17 500	28 300	58 200	106 000	167 000
60	65	137	257	528	791	1520	2430	4290	8760	15 800	25 600	52 700	95 700	152 000
70	60	126	237	486	728	1400	2230	3950	8050	14 600	23 600	48 500	88 100	139 000
80	56	117	220	452	677	1300	2080	3670	7490	13 600	22 000	45 100	81 900	130 000
90	52	110	207	424	635	1220	1950	3450	7030	12 700	20 600	42 300	76 900	122 000
100	50	104	195	400	600	1160	1840	3260	6640	12 000	19 500	40 000	72 600	115 000
125	44	92	173	355	532	1020	1630	2890	5890	10 600	17 200	35 400	64 300	102 000
150	40	83	157	322	482	928	1480	2610	5330	9650	15 600	32 100	58 300	92 300
175	37	77	144	296	443	854	1360	2410	4910	8880	14 400	29 500	53 600	84 900
200	34	71	134	275	412	794	1270	2240	4560	8260	13 400	27 500	49 900	79 000
250	30	63	119	244	366	704	1120	1980	4050	7320	11 900	24 300	44200	70 000
300	27	57	108	221	331	638	1020	1800	3670	6630	10 700	22 100	40 100	63 400
350	25	53	99	203	305	587	935	1650	3370	6100	9880	20 300	36 900	58 400
400	23	49	92	189	283	546	870	1540	3140	5680	9190	18 900	34 300	54 300
450	22	46	86	177	266	512	816	1440	2940	5330	8620	17 700	32 200	50 900
500	21	43	82	168	251	484	771	1360	2780	5030	8150	16 700	30 400	48 100
550	20	41	78	159	239	459	732	1290	2640	4780	7740	15 900	28 900	45 700
600	19	39	74	152	228	438	699	1240	2520	4560	7380	15 200	27 500	43 600
650	18	38	71	145	218	420	669	1180	2410	4360	7070	14 500	26 400	41 800
700	17	36	68	140	209	403	643	1140	2320	4190	6790	14 000	25 300	40 100
750	17	35	66	135	202	389	619	1090	2230	4040	6540	13 400	24400	38 600
800	16	34	63	130	195	375	598	1060	2160	3900	6320	13 000	23 600	37 300
850	16	33	61	126	189	363	579	1020	2090	3780	6110	12 600	22 800	36 100
900	15	32	59	122	183	352	561	992	2020	3660	5930	12 200	22 100	35 000
950	15	31	58	118	178	342	545	963	1960	3550	5760	11 800	21 500	34 000
1000	14	30	56	115	173	333	530	937	1910	3460	5600	11 500	20 900	33 100



GAS SERVICE DETAIL
SCALE: NOT TO SCALE

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Revision Notes:

Date	Description

Drawing Title:

PLUMBING
RISER DIAGRAM
FOR UNIT

Scale:

Date:

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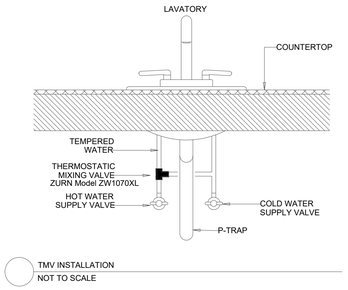

TMV INSTALLATION
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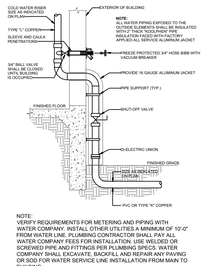
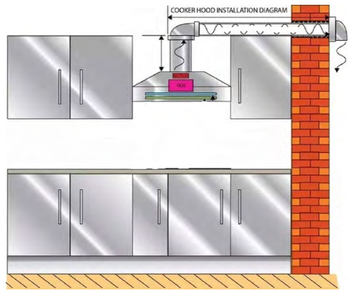
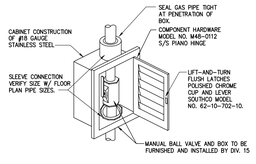


NOTE:
VERIFY REQUIREMENTS FOR METERING AND PIPING WITH WATER COMPANY. INSTALL OTHER UTILITIES A MINIMUM OF 10'-0" FROM WATER LINE. PLUMBING CONTRACTOR SHALL PAY ALL WATER COMPANY FEES FOR INSTALLATION. USE WELDED OR SCREWED PIPE AND FITTINGS PER PLUMBING SPECS. WATER COMPANY SHALL EXCAVATE, BACKFILL AND REPAIR ANY PAVING OR SOD FOR WATER SERVICE LINE INSTALLATION FROM MAIN TO BUILDING.

EXTERIOR COLD WATER BUILDING ENTRY
NOT TO SCALE

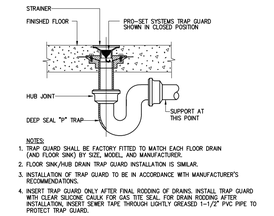


KITCHEN EXHAUST TERMINATION
SCALE: NONE



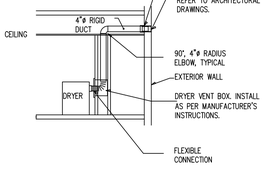
NOTE: INSTALL MANUAL VALVE IN BOX UPSTREAM OF ANSUL VALVE.

7 **KITCHEN MANUAL VALVE BOX**
SCALE: NONE



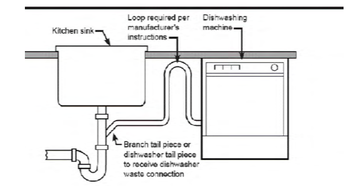
NOTES:
1. TRAP GUARD SHALL BE FACTORY FITTED TO MATCH EACH FLOOR DRAIN (AND FLOOR SINK) BY SIZE, MODEL, AND MANUFACTURER.
2. FLOOR SINK/HUB DRAIN TRAP GUARD INSTALLATION IS SIMILAR.
3. INSTALLATION OF TRAP GUARD TO BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INSERT TRAP GUARD ONLY AFTER 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

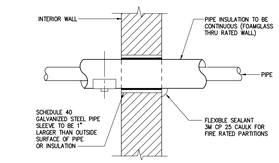


CONDENSATE TERMINATION

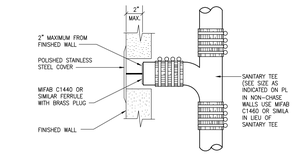
12 **TYPICAL WASTE AND VENT RISERS**
SCALE: NONE



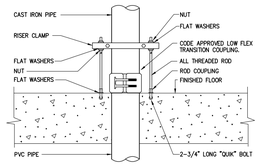
10 DISHWASHER INSTALLATION DETAIL



6 **INTERIOR WALL PENETRATION**
SCALE: NONE



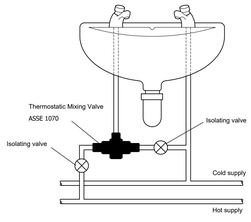
2 **WALL CLEANOUT**
SCALE: NONE



NOTE:
THERE IS TO BE NO EXPOSED PVC ABOVE SLAB.

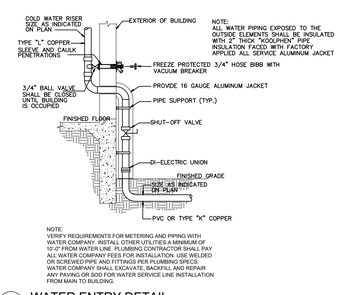
TO PVC PIPE TRANSITION

8 **CAST IRON**
SCALE: NONE



ITEM	FIXTURE	COLD WATER	HOT WATER	WASTE	TRAP	VENT	DESCRIPTION
MV	MIXING VALVE	1/2-3/4"	1/2-3/4"	–	–	–	"WILKINS" MODEL ZW3870T-4P THERMOSTATIC MIXING VALVE. 1/4TURN STOP AT INLET OF USE. BRONZE ASTM B-584 MAIN BODY. ASSE 1016 AND ASSE 1070 LISTED. CSA CERTIFIED. (APPROVED EQUAL.)

11 Thermostatic Mixing Valve
SCALE:



NOTE:
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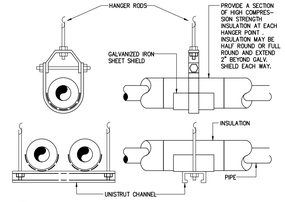
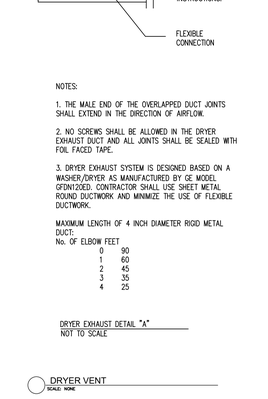
WATER ENTRY DETAIL
SCALE: NONE

MINIMUM DIMENSIONS OF GALVANIZED SHEETMETAL PROTECTION SHIELDS AT PIPE HANGERS		
NOMINAL SIZE PIPE	SHIELD LENGTH MIN. (IN.)	GAUGE THICKNESS
1/2" & 3/4"	12	18
1" – 2-1/2"	12	18
3" – 4"	12	16
6"	12	16



1 **HANGER FOR WATER PIPING**
SCALE: NONE



NOTES:

1. THE MALE END OF THE OVERLAPPED DUCT JOINTS SHALL EXTEND IN THE DIRECTION OF AIRFLOW.

2. NO SCREWS SHALL BE ALLOWED IN THE DRYER EXHAUST DUCT AND ALL JOINTS SHALL BE SEALED WITH FOIL FACED TAPE.

3. DRYER EXHAUST SYSTEM IS DESIGNED BASED ON A WASHER/DRYER AS MANUFACTURED BY GE MODEL GFDN120ED. CONTRACTOR SHALL USE SHEET METAL ROUND DUCTWORK AND MINIMIZE THE USE OF FLEXIBLE DUCTWORK.

MAXIMUM LENGTH OF 4 INCH DIAMETER RIGID METAL DUCT:

No. OF ELBOW	FEET
0	90
1	60
2	45
3	35
4	25

DRYER EXHAUST DETAIL "A"
NOT TO SCALE

DRYER VENT
SCALE: NONE

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Seal:

Revision Notes:

Date	Description

Drawing Title:

PLUMBING DETAILS

Scale:

Date:

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BRADFORD WHITE
WATER HEATERS

2008 NAECA Compliant

Residential Power Direct Vent Energy Saver Gas Water Heater

Photo is of RG2PDV40S6N

FEATURING:

ICON System

DEFENDER SAFETY SYSTEM

HYPERFLOW

AUDI

The Power Direct Vent Models Feature:

- **ENERGY STAR® Qualified**—Some models qualify for the September 1, 2010 minimum ENERGY STAR® EF requirement, as well as most utility rebate programs.
- **Bradford White ICON System™**—Intelligent gas control with spark to pilot ignition system eliminates the constant burning pilot. This results in savings of pilot gas during standby periods (120 V.A.C.).
  - **Enhanced Performance**—Proprietary algorithms provide enhanced First Hour Delivery ratings and tighter temperature differentials.
  - **Advanced Temperature Control System**—Microprocessor constantly monitors and controls burner operation to maintain consistent and accurate water temperature levels.
  - **Intelligent Diagnostics**—An exclusive green LED light prompts the installer during start-up and provides ten different diagnostic codes to assist in troubleshooting.
  - **Separate Immersed Thermowell**—High-strength advanced polymer composite thermowell provides isolation between electric temperature sensor and surrounding water. No need to drain the tank when removing gas valve.
- **Closed Combustion Venting System**—Power Direct Vent models are ideal for installations which lack sufficient air for combustion, such as new construction homes or additions which are tightly insulated. These models use a twin pipe system where combustion air is drawn from outside the building in one pipe, and combustion products are expelled to the outside in another pipe.
- **Cast Aluminum Air Intake Boot**—A cast molded air intake boot design provides exceptional durability during installation and operation.
- **Horizontal and Vertical Venting**—PVC, ABS, or CPVC. The equivalent feet of intake venting cannot be greater than the equivalent feet of exhaust venting.
- **Optional Concentric Vent Kit Termination**—Termination fitting provides for only one exit opening through a wall or roof. (Subtract 10ft. for intake pipe and 10ft. for exhaust pipe when calculating total vent length.)
- **Flammable Vapor Sensor**—Electronic sensor prevents burner operation if flammable vapors are detected. The sensor will also prevent burner operation if there is an ongoing flammable vapor burn inside the combustion chamber (excluding RG2PDV75H6N).
- **Factory-Installed Hydrojet® Total Performance System**—Cold water inlet sediment reducing device helps prevent sediment build-up in tank. Increases first hour delivery of hot water while minimizing temperature build-up in tank.
- **Vitraglas® Lining**—Bradford White tanks are lined with an exclusively engineered enamel formula that provides superior tank protection from the highly corrosive effects of hot water. This formula (Vitraglas®) is fused to the steel surface by firing at a temperature of over 1600°F (871°C).
- **2" Non-CFC Foam Insulation**—Surrounds the tank surface, saving energy by retarding loss of heat.
- **Water Connections**— 3/4" NPT factory-installed true dielectric fittings extend water heater life and make installation easier.
- **Side Connections**— 3/4" NPT tappings allow easy connections for space heating applications (Potable water only) (RG2PDV50H6N & RG2PDV75H6N only).
- **Factory Installed Heat Traps**—Design incorporates a flexible disk that reduces heat loss in piping and eliminates the potential for noise generation.
- **Protective Magnesium Anode Rod**—Provides added protection against corrosion for long trouble-free service.
- **T&P Relief Valve**—Installed.
- **Low Restriction Brass Drain Valve**—Durable tamper-proof design.

6 or 10-Year Limited Tank Warranties / 6 or 10-Year Limited Warranty on Component Parts.
For more information on warranty, please visit www.bradfordwhite.com
For products installed in USA, Canada and Puerto Rico. Some states do not allow limitations on warranties. See complete copy of the warranty included with the heater.

1117-A-0215

Power Direct Vent Gas Water Heater

Energy Saver Models

NATURAL GAS AND LIQUID PROPANE GAS

Meet or exceed ASHRAE 90.1b (current standard) C.E.C. Listed 78% Recovery Efficiency

Model Number	Capacity U.S. Gal.	Capacity Imp. Gal.	Nat. BTU/Hr. Input	LP BTU/Hr. Input	1st Hour Rating* (Gal.)	Energy Factor	Recovery at 90°F Rise* Nat. U.S. GPH	Recovery at 90°F Rise* LP U.S. GPH	Recovery at 90°F Rise* LP Imp. GPH
★ RG2PDV40S6N	40	33	40,000	38,000	72	0.70	43	36	41	34
★ RG2PDV50S6N	50	42	40,000	38,000	86	0.70	43	36	41	34
★ RG2PDV50H6N	48	40	60,000	60,000	100	0.68	65	54	65	54
RG2PDV75H6N	75	62	80,000	78,000	—	—	86	72	84	70

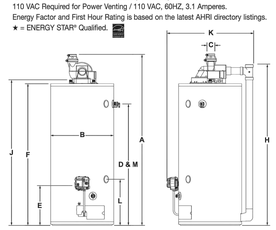
Model Number	A Floor to Exhaust Outlet in.	B Jacket Dia. in.	C Vent Size in.	D Floor to T&P Conn. in.	E Floor to Gas Conn. in.	F Floor to Top of Heater in.
★ RG2PDV40S6N	59 19/32	22	2 or 3	42 1/2	14	49 1/2
★ RG2PDV50S6N	60 1/8	24	2 or 3	43 1/2	14	50 1/2
★ RG2PDV50H6N	69	22	3 or 4	52 1/4	13 1/2	58 1/4
RG2PDV75H6N	72	26	3 or 4	54 1/4	18 1/4	62 1/4

Model Number	H Floor to Air Intake in.	J Floor to Water Conn. in.	K Depth in.	L Floor to Space Heating Return in.	M Floor to Space Heating Supply in.	Approx. Shipping Weight lbs.
★ RG2PDV40S6N	59 1/4	50 11/16	30 1/2	—	—	156
★ RG2PDV50S6N	60 1/8	51 11/16	32 1/2	—	—	186
★ RG2PDV50H6N	67	60	30 1/2	15 1/4	52 1/4	205
RG2PDV75H6N	79 7/8	63 3/4	38	19	54 1/4	392

Model Number	A Floor to Exhaust Outlet mm.	B Jacket Dia. mm.	C Vent Size mm.	D Floor to T&P Conn. mm.	E Floor to Gas Conn. mm.	F Floor to Top of Heater mm.
★ RG2PDV40S6N	1516	559	51 or 76	1080	356	1257
★ RG2PDV50S6N	1546	610	51 or 76	1105	356	1283
★ RG2PDV50H6N	1753	559	76 or 102	1327	346	1492
RG2PDV75H6N	1829	660	76 or 102	1378	413	1594

Model Number	H Floor to Air Intake mm.	J Floor to Water Conn. mm.	K Depth mm.	L Floor to Space Heating Return mm.	M Floor to Space Heating Supply mm.	Approx. Shipping Weight kg.
★ RG2PDV40S6N	1508	1291	775	—	—	71
★ RG2PDV50S6N	1534	1316	826	—	—	84
★ RG2PDV50H6N	1702	1524	778	400	1327	93
RG2PDV75H6N	1788	1619	914	483	1378	178

Propane models feature a Titanium Stabilized Stainless Steel propane burner. For Propane (LP) models change suffix "N" to "X".
For 10 year model, change suffix "6" to "10".
*Based on manufacturer's rated recovery efficiency.
110 VAC Required for Power Venting / 110 VAC, 60HZ, 3.1 Amperes.
Energy Factor and First Hour Rating is based on the latest AHRI directory listings.
★ = ENERGY STAR® Qualified.



Concentric Vent Kit Termination

2" Kit	A (in.)
P/N 239-44069-02	29 1/4
3" Kit	**A (in.)**
P/N 239-44069-01	36 1/4

2" Vent Pipe		RG2PDV40S6N RG2PDV50S6N
Max. Intake Length		35 ft.
Max. Exhaust Length		35 ft.
Min. Vent Length		7 ft.
Number	1	30 ft.
of	2	25 ft.
90° Elbows	3	20 ft.

3" Vent Pipe		RG2PDV40S6N RG2PDV50S6N	RG2PDV50H6N RG2PDV75H6N
Max. Intake Length		85 ft.	60 ft.
Max. Exhaust Length		85 ft.	60 ft.
Min. Vent Length		7 ft.	7 ft.
Number	1	80 ft.	55 ft.
of	2	75 ft.	50 ft.
90° Elbows	3	70 ft.	45 ft.

4" Vent Pipe		RG2PDV50H6N RG2PDV75H6N
Max. Intake Length		100 ft.
Max. Exhaust Length		100 ft.
Min. Vent Length		7 ft.
Number	1	95 ft.
of	2	90 ft.
90° Elbows	3	85 ft.

Subtract 5ft. for each additional 90° elbow.

General:
Meets NAECA Requirements (Applicable Models).
All gas water heaters are certified at 300 PSI test pressure (2068 kPa) and 150 PSI working pressure (1034 kPa). All water connections are 3/4" NPT (19mm). All gas connections are 1/2" (13mm).
All models design-certified by CSA International (formerly AGA/CGA), to meet ANSI standard Z-21.10.1 and peak performance rated.
Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.
Suitable for Water (Potable) Heating and Space Heating.
Toxic chemicals, such as those used for boiler treatment, shall NEVER be introduced into this system. This unit may NEVER be connected to any existing heating system or component(s) previously used with a non-potable water heating appliance.

BRADFORD WHITE WATER HEATERS Ambler, PA

For U.S. and Canada field service, contact your professional installer or local Bradford White sales representative.
Sales 800-523-2931 • Fax 215-641-1670 / Technical Support 800-334-3393 • Fax 269-795-1089 • Warranty 800-531-2111 • Fax 269-795-1089
International: Telephone 215-641-9400 • Telefax 215-641-9750 / www.bradfordwhite.com

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Built to be the Best™

1117-A-0215

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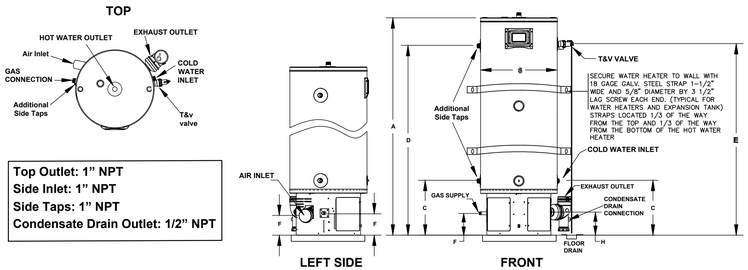

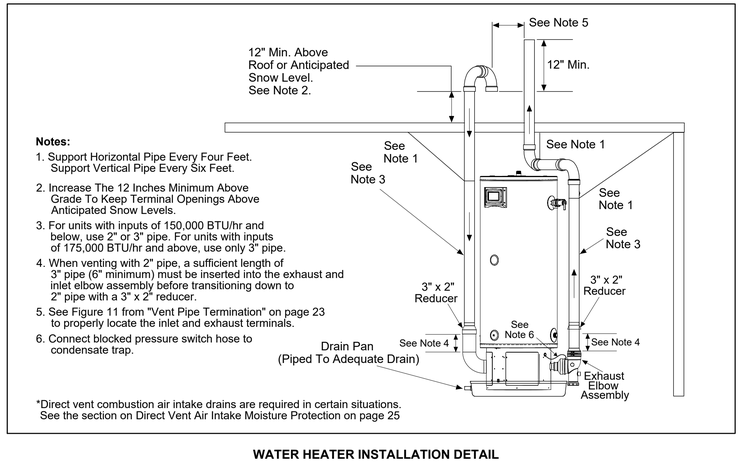

WATER HEATER INSTALLATION DETAIL

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SCOPE OF WORK

SYSTEM SIZE: 3.75 kWp
MODULES: (10) LG-Mono-X-Plus-LG375S1C-U6

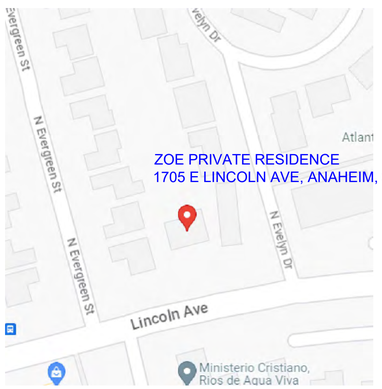
(1) goodwe-inverter-GW3600D-NS

This approval is for compliance to the current adopted building codes for the proposed Solar System only. It is the owner's/applicant's responsibility to ensure that the proposed installation of solar systems and associated equipment is on legally permitted structures. If determined by inspection staff the proposed solar system is installed on non-permitted structures, any required modifications needed for code compliance will be at the owner's/applicant's expense

GENERAL NOTES

- LOCAL UTILITY PROVIDER SHALL BE NOTIFIED PRIOR TO USE AND ACTIVATION OF ANY SOLAR PHOTOVOLTAIC INSTALLATION
- THIS PROJECT SHALL COMPLY WITH LOCAL ORDINANCES
- PROPER ACCESS AND WORKING CLEARANCE WILL BE PROVIDED
- ALL ELECTRICAL WORK SHOWN ON THESE PLANS WILL BE COMPLETED BY THE UNDERSIGNED HOMEOWNER
- ALL APPLICABLE PV EQUIPMENT LISTED AND COMPLIANT WITH UL2703 AND UL1703
- ALL ROOF PENETRATIONS TO BE SEALED WITH A HIGH PERFORMANCE ROOF SEALANT SUCH AS GeoCel 2300 CLEAR SEALANT
- THE SYSTEM WILL NOT BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND THE UTILITY IS OBTAINED
- THE SOLAR PHOTOVOLTAIC INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS
- IF THE EXISTING MAIN PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE HOME OWNERS (OWNER INSTALLED SYSTEM) RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE
- EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS"
- A LADDER SHALL BE IN PLACE FOR THE INSPECTION IN COMPLIANCE WITH CAL-OSHA REGULATIONS
- MAX HEIGHT OF MODULES OFF OF ROOF FACE : <8"
- MAX RAIL SPAN IS 4' OC BETWEEN ROOF ATTACHMENTS"
- ALL WORK SHALL COMPLY WITH 2017 NEC, 2012 IBC, MUNICIPAL CODE, AND ALL MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTION.
- PHOTOVOLTAIC SYSTEM WILL COMPLY WITH 2017 NEC.
- ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH 2017 NEC.
- PHOTOVOLTAIC SYSTEM IN UNGROUNDED. NO CONDUCTORS ARE SOLIDLY GROUNDED IN THE INVERTER. SYSTEM COMPLIES WITH 690.35.
- MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
- INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
- CONSTRUCTION FOREMAN TO PLACE CONDUIT RUN PER 690.31 (E) AND 2012 IFC 605.11.2.
- ELECTRICAL EQUIPMENT AND MATERIAL TO BE LISTED, LABELED, AND INSTALLED PER THE NEC, THE INSTALLATION STANDARDS/MANUFACTURER'S RECOMMENDATIONS AND , IF
- REQUIRED A RECOGNIZED ELECTRICAL TESTING LABORATORY.

SITE MAP



COVER SHEET

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PV-1

PROCEDURAL NOTES:
P1. PRIOR TO COMMENCEMENT OF ANY WORK THE CONTRACTOR SHALL NOTIFY POWERFIN OF ANY DISCREPANCIES NOTED TO EXISTING CONDITIONS, STRUCTURE, ELECTRICAL RUNS (SPECIFY EXISTING ITEMS), WALL, PARAPETS, FLASHINGS, ETC. AMONG SITE CONDITIONS, MANUFACTURER RECOMMENDATIONS, OR CODES, REGULATIONS OR RULES OF JURISDICTIONS HAVING AUTHORITY.
P2. ALL DIMENSIONS OF EXISTING CONDITIONS TO BE VERIFIED PRIOR TO COMMENCING WORK.
P3. THE CONTRACTOR IS RESPONSIBLE FOR ALL BRACING AND SHORING OF EQUIPMENT
DURING INSTALLATION.
P4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS, OSHA REQUIREMENTS AND SAFETY MEASURES ON SITE. THE ENGINEER HAS NO OVERALL SUPERVISORY AUTHORITY AND NO DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS OR FOR POSSIBLE EXISTING HAZARDS.
P5. CONTRACTOR QUESTIONS SHALL BE SUBMITTED TO POWERFIN PRIOR TO MAKING ANY CHANGES. POWERFIN WILL PROVIDE RFI'S TO ENGINEER AND RFI RESPONSES TO CONTRACTOR AS REQUIRED. ALL DOCUMENT CONTROL WILL BE ADMINISTERED BY POWERFIN.

GENERAL NOTES:
G1. ALL WORK SHALL BE PERFORMED IN A SAFE, EFFICIENT, AND WORKMAN LIKE MANNER.
G2. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL MANUFACTURER'S OR ENGINEER'S DIRECTIONS AND INSTRUCTIONS SHOWN HERE.
G3. THE ELECTRICAL CONTRACTOR IS ADVISED THAT ALL DRAWINGS, COMPONENT MANUALS, ESPECIALLY THE INVERTER MANUALS, ARE TO BE READ AND UNDERSTOOD PRIOR TO INSTALLATION OR ENERGIZATION OF ANY EQUIPMENT. THE CONTRACTOR IS ALSO ADVISED TO HAVE ALL COMPONENT SWITCHES IN THE OFF (OPEN) POSITION AND FUSES REMOVED PRIOR TO INSTALLATION OF FUSE-BEARING COMPONENTS.
G4. INSTALLATION CREW IS TO HAVE A MINIMUM OF ONE JOURNEYMAN LEVEL ELECTRICIAN PER THREE APPRENTICES ON SITE AT ALL TIMES WHEN ELECTRICAL WORK IS BEING PERFORMED.
G5. THE SOLAR PHOTOVOLTAIC SYSTEM SHALL BE INSTALLED FOLLOWING THE CONVENTIONS OF THE NEC. ANY LOCAL CODE WHICH MAY SUPERSEDE THE NEC SHALL GOVERN.
G6. CONTRACTOR SHALL HAVE A NABCEP-CERTIFIED INSTALLER DIRECTLY SUPERVISE ALL PV INSTALLATION WORK.
G7. FOR SAFETY IT IS RECOMMENDED THE CREW ALWAYS HAS A MINIMUM OF TWO PEOPLE WORKING TOGETHER.
G8. ALL COMPONENTS TO BE INSTALLED ARE TO BE LISTED BY A NATIONALLY RECOGNIZED THIRD PARTY TESTING AGENCY (UL, ETL, ETC). EQUIPMENT SHALL BE NEMA3R OUTDOOR RATED OR BETTER, UNLESS LOCATED INDOORS.
G9. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING AND PURCHASING EQUIPMENT THAT SHALL LAST THE LIFETIME OF THE PV SYSTEM. ALL ENCLOSURES, CONDUIT, STRAPS, PAINTED METAL SURFACES, CONCRETE, GROUNDING EQUIPMENT AND OTHER PRODUCTS SHALL BE SELECTED TO LAST THE LIFETIME OF THE PV SYSTEM. THE ENGINEER SPECIFIES THE MINIMUM REQUIRED EQUIPMENT AND SPECIFICATIONS TO ACCOMPLISH THE PROJECT AND THE ELECTRICAL CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THESE SPECIFICATIONS ARE MET OR EXCEEDED WITH GOOD QUALITY EQUIPMENT, WORKMANSHIP AND SKILL.
G10. DC VOLTAGE FROM THE ARRAY IS ALWAYS PRESENT AT THE DC DISCONNECT ENCLOSURE AND THE DC TERMINALS OF THE INVERTER DURING DAYLIGHT HOURS. ALL PERSONS WORKING ON OR INVOLVED WITH THIS PHOTOVOLTAIC SYSTEM MUST BE WARNED THAT SOLAR MODULES ARE ENERGIZED WHEN EXPOSED TO DAYLIGHT. THE LINE AND LOAD TERMINALS ON THE DC DISCONNECT MAY BE ENERGIZED IN THE OPEN POSITION AND THE SWITCH IS TO BE LABELED TO COMPLY WITH ARTICLE 690.17 OF THE NEC.
G11. ALL PORTIONS OF THIS SOLAR ELECTRIC SYSTEM SHALL BE CLEARLY MARKED IN
ACCORDANCE WITH NEC ARTICLE 690.
G12. THE ELECTRICAL CONTRACTOR SHALL PERFORM INITIAL HARDWARE CHECKS AND
PV-WIRING CONDUCTIVITY CHECKS PRIOR TO TERMINATING ANY WIRES. ALL AC AND DC WIRE RUNS SHALL BE INSULATION RESISTANCE TESTED AT 1,000VDC TO DEMONSTRATE A MINIMUM OF 100 MEGAOHMS RESISTANCE TO GROUND. DO NOT MEGGER THE SOLAR MODULES, AS THIS WILL LIKELY DAMAGE THEIR INTERNAL DIODES. INSULATION RESISTANCE TESTING IS INTENDED FOR ALL CONDUCTORS INSTALLED BY THE ELECTRICAL CONTRACTOR.
G13. FOR PROPER MAINTENANCE AND ISOLATION OF INVERTERS, REFER TO ISOLATION
PROCEDURE IN INVERTER OPERATION MANUAL. CONTRACTOR PERFORMING THE MAINTENANCE IS RESPONSIBLE FOR FOLLOWING ALL LOCKOUT/ TAGOUT PROCEDURES.
G14. THE PHOTOVOLTAIC SYSTEM'S UTILITY INTERCONNECTION POINT SHALL MEET THE
SPECIFIC REQUIREMENTS OF NEC ARTICLE 705.12 FOLLOW SPECIFIC INSTRUCTIONS IN THIS DRAWING SET TO MEET CODE REQUIREMENTS.
G15. THE GROUNDING OF THE PHOTOVOLTAIC SYSTEM SHALL COMPLY WITH NEC 690.45 AND NEC 690.47. IF THE REQUIREMENTS DESCRIBED IN THIS DRAWING SET ARE CLOSELY FOLLOWED, THE GROUNDING REQUIREMENT SHALL BE MET. ANY CHANGES SHALL BE REVIEWED AND DEEMED ACCEPTABLE BY THE ENGINEER, MANUFACTURER AND LISTING AGENCY FOR PRODUCT SAFETY.
G16. ELECTRICAL CONTRACTOR SHALL COORDINATE EQUIPMENT ACCEPTANCE TESTING AND COMMISSIONING WITH POWERFIN.
G17. THE CONTRACTOR IS RESPONSIBLE FOR MOUNTING ALL EQUIPMENT PER THE ENGINEER'S
REPORT OR MANUFACTURE'S SPECIFICATIONS. IF SPECIFICATIONS ARE NOT APPARENT, THE CONTRACTOR SHALL USE DILIGENT EFFORTS TO MOUNT EQUIPMENT SUCH THAT IT WILL BE CLEAN, LEVEL AND SOLD IN ORDER TO LAST THE LIFE TIME OF THIS SOLAR ELECTRIC SYSTEM.
G18. ANY METAL SHAVINGS RESULTING FROM SITE WORK SHALL BE CLEANED FROM
ENCLOSURE INTERIORS, TOP SURFACES OF ENCLOSURES, THE GROUND SURFACE, ROOFS AND ANY ADDITIONAL AREAS WHERE OXIDIZED OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUITS OR OTHER DAMAGE.
G19. THE ELECTRICAL CONTRACTOR SHALL CONSIDER THE WEATHERING OF EQUIPMENT OVER TIME AND ELIMINATE THE POSSIBILITY OF DEGRADATION OF EQUIPMENT DUE TO WATER ENTRY AND UV EXPOSURE. AS A RESULT, POWERFIN REQUIRES THE USE OF UNISTRUT OR SIMILAR MOUNTING SYSTEMS TO MOUNT ENCLOSURES, PULL BOXES, LOAD CENTERS, FUSE BOXES OR OTHER EQUIPMENT TO ROOFTOPS AND WALLS TO PREVENT WATER BUILD-UP WEEP HOLES SHALL NOT BE PROVIDED IN ENCLOSURES THAT WOULD CAUSE A REDUCTION IN THE ENCLOSURES' NEMA RATING.
G20. SEALING CONDUIT WITH A FIRE RETARDANT FOAM OR CAULK AT ENCLOSURE ENTRY
POINTS IS RECOMMENDED TO MINIMIZE CONDENSATION AND PESTS IN ENCLOSURES. FOR CONDUIT LOCATIONS RUNNING THROUGH WALLS FIRE RETARDANT FOAM OR CAULK MUST BE USED TO MAINTAIN THE CURRENT FIRE RATING OF THE WALL AND MUST COMPLY WITH UL 1479 & UL 723 STANDARDS FOR THROUGH PENETRATIONS.
G21. ALL MATERIAL SHALL BE NEW AND RATED FOR UV EXPOSURE WHERE EXPOSED TO
SUNLIGHT.
G22. ALL METALLIC ENCLOSURES SHALL BE GROUNDED PER NEC ARTICLE 250.
G23. ALL WORK SHALL BE PERFORMED IN A SAFE, EFFICIENT AND WORKMAN LIKE MANNER PER NEC 110.12.
G24. CONSTRUCTION STAGING OF CONCENTRATED LOADS ON ROOF SHALL BE MINIMIZED. SPECIAL ATTENTION SHALL BE PAID TO ROOF LOADING DURING INSTALLATION SUCH THAT HEAVY ITEMS ARE NOT LOADED IN A MANNER THAT WOULD OVERLOAD THE ROOF.
G25. CONTRACTOR SHALL RESTORE INTERIOR/EXTERIOR FINISHES TO ORIGINAL OR BETTER CONDITION.
G26. CONTRACTOR SHALL COORDINATE SOLAR INSTALLATION WORK WITH ROOF REPAIR/REPLACEMENT WORK.
G27. EXISTING TREES REMOVED AS PART OF CONSTRUCTION SHALL HAVE THEIR STUMPS GROUND TO 12"BELOW GRADE AND COVERED WITH NATIVE TOPSOIL. THE TOPSOIL SHALL BE FILLED AND COMPACTED TO MATCH EXISTING GRADE.

ELECTRICAL NOTES:
E1. IN EVERY PULL BOX, TERMINAL BOX, AND AT ALL PLACES WHERE CONDUCTORS MAY NOT BE READILY IDENTIFIED BY NAMEPLATE MARKINGS ON THE EQUIPMENT TO WHICH THEY CONNECT, IDENTIFY EACH CIRCUIT WITH A PLASTIC LABEL OR TAG FOR NUMBER, POLARITY OR PHASE.
E2. THE LAYOUT OF CONDUIT SHOWN IN THESE PLANS IS INDICATIVE ONLY. CONTRACTOR SHALL ROUTE AND LOCATE THE CONDUITS TO SUIT SITE CONDITIONS BUT SHALL NOT EXCEED THE MAXIMUM CONDUCTOR LENGTHS IDENTIFIED ON THE CONDUCTOR SCHEDULE.
CONTRACTOR SHALL COORDINATE ALL CHANGES IN CONDUCTOR AND CONDUIT WITH THE ENGINEER VIA AN RFI.
E3. WHERE CONDUCTOR AND CABLE ROUTING IS NOT SHOWN, AND DESTINATION ONLY IS
INDICATED, CONTRACTOR SHALL DETERMINE EXACT ROUTING AND LENGTHS REQUIRED. A SHOP DRAWING OF PROPOSED INSTALLATION SHALL BE SUPPLIED PRIOR TO INSTALLATION.
E4. BENDS SHALL NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAYS (NO KINKS).
E5. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH REQUIREMENT IN NEC 300.19.
E6. INSTALL ALL CONDUCTOR MATERIALS IN A NEAT WORKMANLIKE MANNER. USE GOOD
TRADE PRACTICES AS REQUIRED BY CHAPTER 3 OF THE NEC. DO NOT EXCEED BEND RADIUS.
E7. ALL WIRING INSTALLED IN FREE-AIR SHALL BE ROUTED AWAY FROM ALL METAL EDGES, BOLT HEADS/THREADS, AND OTHER SHARP OBJECTS.
E8. ALL WIRING INSTALLED IN FREE-AIR SHALL BE ROUTED SUCH THAT IT IS OUT OF UV
EXPOSURE (FROM A MINIMUM OF 7AM TO 7PM). NO WIRING SHALL TOUCH THE ROOF DECK. WIRING SHALL BE AT LEAST 3.5" ABOVE ROOF DECK.
E9. INSTALL CONDUIT TO MAINTAIN PROPER CLEARANCES AND IN A NEAT INCONSPICUOUS MANNER. RUN PARALLEL AND AT RIGHT ANGLES TO STRUCTURAL MEMBERS OR OTHER CONDUITS. PROVIDE BOXES, FITTINGS AND BENDS FOR CHANGES IN DIRECTION. FASTEN CONDUIT SECURELY IN PLACE.
E10. SUPPORT CONDUIT USING STEEL PIPE STRAPS (OAE), LAY-IN ADJUSTABLE HANGERS, CLEVIS HANGERS OR SPLIT-HANGERS. HANGER SPACING SHALL BE INSTALLED PER NEC REQUIREMENTS FOR THE TYPE OF CONDUIT BEING INSTALLED. USE APPROVED BEAN CLAMPS FOR CONNECTION TO STRUCTURAL MEMBERS.
E11. PROVIDE PULL, JUNCTION, OR CHRISTY BOXES WHERE REQUIRED FOR THE INSTALLATION OF CONDUCTOR IN ADDITION TO THOSE SHOWN ON THE DRAWINGS. BENDS IN CONDUITS BETWEEN PULL BOXES SHALL NOT EXCEED THE EQUIVALENT OF FOUR 90 DEGREE BENDS.
E12. RACEWAY EXPANSION FITTINGS SHALL BE INSTALLED TO ALLOW FOR THERMAL EXPANSION
AND CONTRACTION WHERE NECESSARY, PER NEC 300.7(B). COMPONENT MANUFACTURER INSTRUCTIONS SHALL BE FOLLOWED AND ALL ACCESSORIES SHALL BE INSTALLED TO ENSURE PROPER FUNCTIONING OF FITTINGS.
EXPANSION FITTINGS SHALL HAVE EXTERNAL GROUNDING STRIP. USE PIPE GUIDES OR PIPE SLIDES TO ALLOW THE RACEWAY TO MOVE LONGITUDINALLY, AND INSTALL SLIP SHEETS BENEATH EACH SUPPORTING MEMBER (PIPE, PIERS, OR EQUIVALENT).
E13. ALL RACEWAYS THAT CROSS OVER BUILDING EXPANSION JOINTS SHALL HAVE AN
EXPANSION/CONTRACTION JOINT INSTALLED AT THE LOCATION OF THE EXPANSION JOINT.
E14.WHEN FIELD CUTTING IS REQUIRED, THE CONDUIT SHALL BE CUT SQUARE AND DEBURRED.
E15. CONDUIT SIZES NOT SPECIFIED SHOULD CONFORM TO NEC SPECIFICATIONS, TO INCLUDE
FILL FACTOR AND DERATING FOR NUMBERS OF CONDUCTORS WITH A MINIMUM CONDUIT SIZE BEGIN ¾ ". A SHOP DRAWING OF THE PROPOSED INSTALLATION SHALL BE REVIEWED BY ENGINEER PRIOR TO INSTALLATION. CONDUIT SIZES SHALL BE REVIEWED BY THE ENGINEER.
E16.THE POWER CONDUCTOR'S MINIMUM SIZE SHALL BE #12 AWG.
E17. SAFETY REGULATIONS (LOCK OUT, TAG OUT, ETC.) ARE THE FULL RESPONSIBILITY OF THE CONTRACTOR DURING CONSTRUCTION.
E18. THE CONDUCTOR SIZE IS BASED ON THE ESTIMATED CONDUIT ROUTING AS SHOWN IN THIS DRAWING PACKAGE. SHOULD THE CONDUIT'S LENGTH INCREASE DUE TO RELOCATION OF SOURCE AND/OR ROUTING, THE CONDUITS AND THE CONDUCTORS MAY NEED TO BE RESIZED. SUBCONTRACTOR SHALL CONTACT POWERFIN PRIOR TO MAKING ANY FIELD CHANGES.
E19. ALL WIRING IN CONDUIT SHALL BE THWN-2 FOR 90°C WET APPLICATIONS. USE BARE
COPPER FOR GROUND FOR ALL EXTERNAL GROUNDING. FOR 1000VDC OR UNGROUNDED
SYSTEMS, 1000VDC RATED PV WIRE OR APPROVED EQUIVALENT SHALL BE USED FOR ALL DC CONDUCTORS.
E20. ALL CONDUITS SHALL BE FREE OF ANY OBSTRUCTIONS AND PROPERLY SECURED BEFORE WIRE IS PULLED.
E21. CONTRACTOR SHALL PROVIDE SIGNS TO ALL ELECTRICAL BOXES, JUNCTION BOXES, DC DISCONNECTS, PULL BOXES, CONDUIT RUNS, AC DISCONNECTS, SUB PANELS AND MAIN SERVICES PER NEC ARTICLES 690 AND 705.
E22. INSTALL GROUNDING BUSHINGS ON ALL DC CONDUITS, ON ALL CONDUITS CONTAINING A GROUNDING ELECTRODE CONDUCTOR AND ON ALL CONDUITS THAT PASS THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS. REFER TO NEC 250.97.
E23. ALL IMC RACEWAY CONNECTIONS SHALL BE MADE WRENCH-TIGHT WITHOUT ANY
THREAD-STRIPPING. THREAD COMPOUND MUST ALSO BE USED ON ALL THREADED JOINTS TO ELP ENSURE CORROSION AND WATER INGRESS RESISTANCE.
E24. FOR INTERCONNECTION VIA BUS TAP:
OVERCURRENT PROTECTION (SWITCHING DEVICE AND MEANS OF DISCONNECT) MUST BE
LOCATED PER NEC 240.21. THE CONDUCTORS SHALL BE CRIMPED WITH A CRIMP-ON TERMINAL LUG, MANUFACTURED BY ILSCO, BURNDY, OAE. THE TERMINAL LUG SHALL HAVE IDENTIFICATION OR COLOR CODING TO MATCH THE CONDUCTOR SIZE. TERMINAL LUGS SHALL HAVE LONG BARRELS TO PROVIDE 2 CRIMPS PER TERMINAL LUG PER CONDUCTOR.
CRIMPED TERMINAL LUGS SHALL BE CONSTRUCTED OF PURE COPPER.
CRIMP MUST BE MADE WITH MANUFACTURER'S APPROVED TOOL TO ACHIEVE THE PROPER CRIMP CONNECTION.
USE STAINLESS STEEL HARDWARE WITH THE FASTENER TORQUED TO MANUFACTURER'S
RECOMMENDATIONS ON ALL phases TO COMPLY WITH ARTICLE 110.14 OF THE NEC. MINIMUM BEND RADIUS SHALL BE OBSERVED TO MAINTAIN GOOD CONDUCTOR QUALITY AND CONDUCTOR MANAGEMENT IN THE LOAD CENTER OR TRANSFORMER. IF THIS BEND RADIUS IS TOO CONSTRICTING USE CRIMP-ON LUG MUST BE INSTALLED WITH RATED INSULATION THAT MEETS OR EXCEEDS THE CONDUCTOR'S INSULATION IT IS BEING USED WITH. IT IS RECOMMENDED THAT ACCEPTABLE CLEARANCES ARE MAINTAINED WITH THE BUS TAP FOR SAFE, CONTINUOUS OPERATION.
FOLLOW MANUFACTURER GUIDELINES, OR APPLICABLE AHJ, FOR MODIFICATION OF BUS BARS.
E25. THE ELECTRICAL CONTRACTOR SHALL PERFORM INITIAL HARDWARE CHECKS AND
CONDUCTOR CONDUCTIVITY CHECKS PRIOR TO TERMINATING ANY CONDUCTORS. COMPLETE MEGGER (INSULATION RESISTANCE) TESTING IN REFERENCE TO GROUND AND EACH CONDUCTOR IN THE SAME CONDUIT ON ALL AC AND DC POWER CONDUCTORS. VERIFY AND DOCUMENT RESISTANCE OF CONDUCTOR. DO NOT MEGGER THE SOLAR MODULES. MEGGERING IS INTENDED FOR ALL POWER CONDUCTORS INSTALLED BY THE ELECTRICAL CONTRACTOR.
E26. TORQUE: ALL CONDUCTORS LANDING IN SCREW CONNECTIONS MUST BE PROPERLY
TIGHTENED TO THE MANUFACTURE'S TORQUE REQUIREMENTS. ALL BOLTED CONDUCTOR TERMINATIONS MUST BE TORQUED TO THEIR RATED VALUE. IT IS THE SUBCONTRACTOR'S RESPONSIBILITY TO ENSURE ALL CONDUCTORS WITH TORQUE REQUIREMENTS HAVE BEEN MARKED WITH A PAINT PEN OR PERMANENT MARKER.
E27. ALL METALLIC ENCLOSURES SHALL BE GROUNDED PER NEC ART 250.
E28. EQUIPMENT USED SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS BEING
INSTALLED (I.E. NEMA1, 3R, 4, 4X, 12).
E29. CONTRACTOR SHALL COMPLY WITH THE GENERAL DC CONDUCTOR CONDUIT MAX FILL OUTLINED TABLE BELOW. A SINGLE #6 THWN-2 EGC HAS BEEN INCLUDED IN THE FILL
CALCULATIONS.

PV WIRE CONDUIT FILL

CONDUIT SIZE	EMT	IMC	RMC	PVC40		HDPE
3/4"		3	4	3	3	3
1"		6	6	6	5	5
1-1/4"	10	11	10	10	10	
1-1/2"	14	15	14	13	13	
2"		23	25	23	23	23
2-1/2"		40	35	34	32	32

ROOFING AND SEALING NOTES (IF APPLICABLE):
R1. A POLYURETHANE BASED ADHESIVE SHALL BE APPLIED TO ANY DRILLED HOLE FOR
FASTENING.
R2. ALL STANDOFFS SHALL BE MADE WATER TIGHT USING APPROVED METHODS BY THE
ROOFING MATERIAL MANUFACTURER, DISTRIBUTOR OR ENGINEER OF RECORD.
R3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY TRANSITION MATERIAL WHERE A DIFFERENCE OF 14" OF HEIGHT OR MORE BETWEEN THE ROOF AND STANDOFF BASE.
R4. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF RIGID FOAM OR SPRAY FOAM TO FILL ANY VOID AROUND THE STANDOFF, FROM THE BASE UP TO 6" ABOVE THE ROOF. MODULE INSTALLATION NOTES:
M1. REFER TO THE MODULE INSTALLATION MANUAL FOR MORE DETAILS ON RIGGING,
UNPACKING, HANDLING, PLANNING, AND INSTALLATION.
M2. THE MODULES MAY BE SHIPPED WITH SEVERAL MODULES PER BOX. TAKE CARE WHEN OPENING THE BOX TO ENSURE THAT ALL MODULES ARE SECURELY HANDLED.
M3. NEVER LEAVE A MODULE UNSUPPORTED OR UNSECURED. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIAL HANDLING ON THE JOB SITE.
SOLAR ARRAY COMMISSIONING:
THE CUSTOMER SHALL BE RESPONSIBLE FOR ANY THIRD PARTY COMMISSIONING.

GENERAL SAFETY NOTE:
THE ARRAY LAYOUT INCORPORATES DESIGN CONSIDERATIONS SET FORTH THAT INCLUDE OFFSETS AND AISLE-WAYS TO ACCOMMODATE MOVEMENT ACROSS THE ROOF-TOP IN THE EVENT OF A FIRE.
THERE ARE ALSO CONSIDERATIONS FOR MAXIMUM DIMENSIONS OF A CONTINUOUS ARRAY OR SUB-ARRAY. SINCE PHOTOVOLTAIC (PV) SOURCE AND OUTPUT CIRCUITS WILL BE ENERGIZED AS LONG AS THERE IS VISIBLE LIGHT, LABELING IS SPECIFIED IN THE PLANS TO DISTINGUISH PV CONDUITS FROM EXISTING SITE CONDUIT. BEYOND CAL-FIRE, THESE PLANS INCORPORATE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES. THIS MAINLY PERTAINS TO MINIMUM OFFSETS FROM PARAPETS OR THE ROOF EDGE. ELECTRICALLY, THE DESIGN SHALL MEET ALL EQUIPMENT WORKING CLEARANCES AS DEFINED IN NEC ARTICLE 110.26 AS WELL AS CAREFUL CONSIDERATION OF EGRESS PATHS WHEN EQUIPMENT DOORS ARE OPENED. EQUIPMENT ELEVATION DRAWINGS INCORPORATE TRUESCALED DIMENSION OF TRADE-SIZE CONDUIT BODIES AND SWEEPS TO ENSURE PROPER CONDUCTOR BEND RADII. THIS MEASURE WILL ENSURE THAT THE CORRECT CONDUIT FITTING WILL FIT THE ALLOTTED SPACE. FURTHER, ALL EQUIPMENT SPECIFIED SHALL BE LISTED BY A NATIONAL RECOGNIZED TEST LAB (UL, IEEE, ETC.).
THE PLANS ALSO INCORPORATE EQUIPMENT AND GROUNDING DETAILS TO ENSURE PROPER INSTALLATION AS WELL AS A COMPLETE SHEET OF THE REQUIRED LABELS AND MARKINGS. THE LABELS ADDRESS PERTINENT ARTICLES OF THE NEC AS WELL AS STANDARDS ADOPTED FROM PAST PROJECTS WITH VARIOUS UTILITY COMPANIES AND LOCAL AUTHORITIES HAVING JURISDICTION

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SPECIFICATIONS

Scale:

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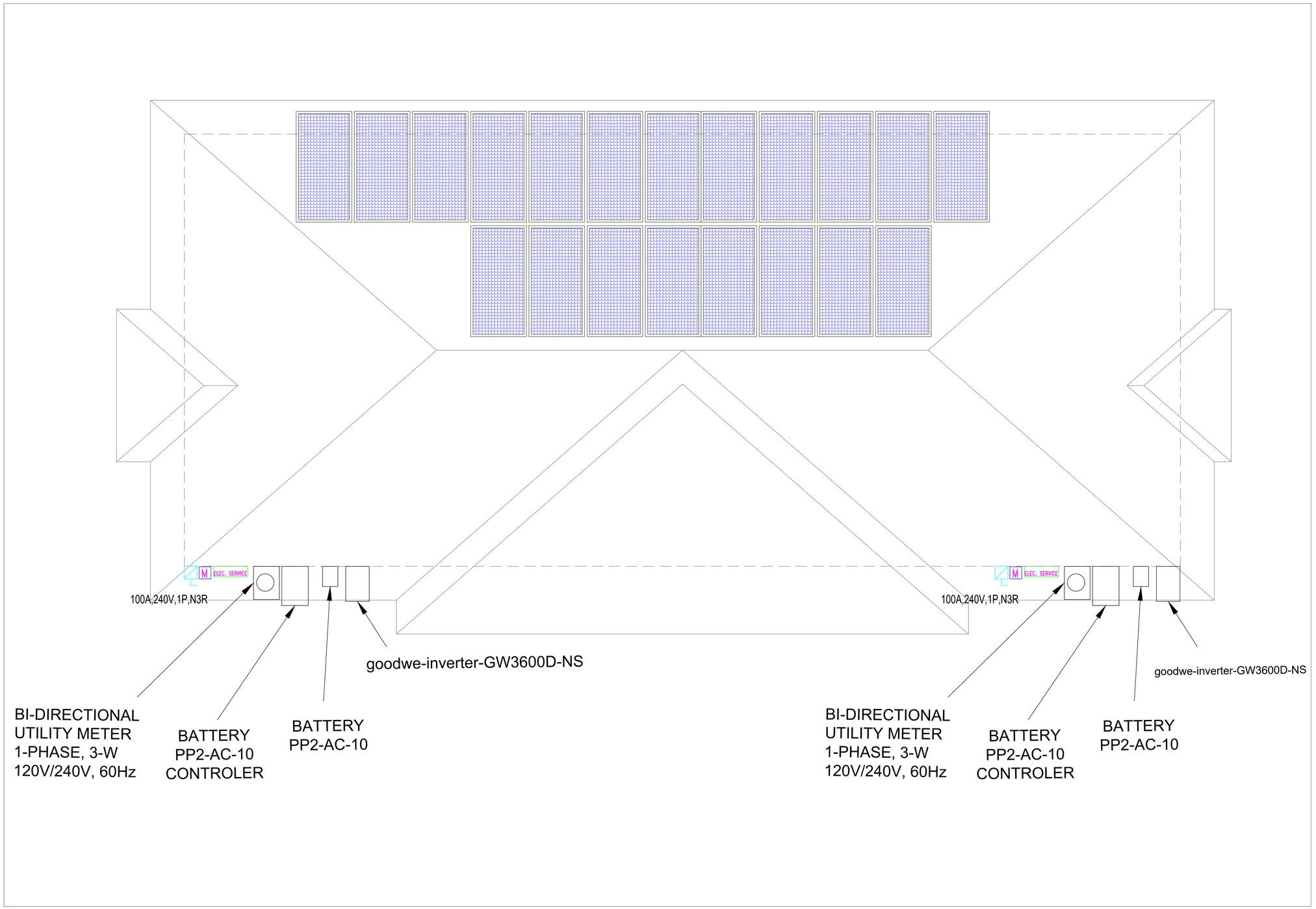

PV-SOLAR LAYOUT

SCALE : 1/16"=1'-0"

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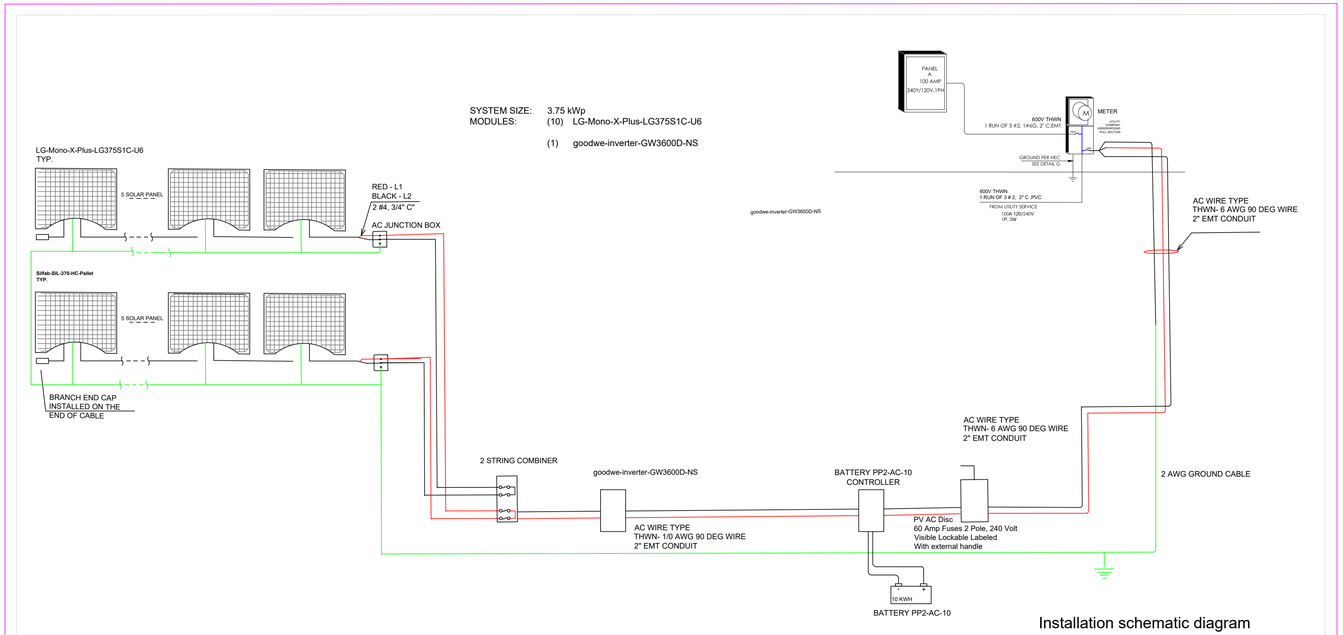

SYSTEM SIZE: 3.75 kWp
MODULES: (10) LG-Mono-X-Plus-LG375S1C-U6
(1) goodwe-inverter-GW3600D-NS
LG-Mono-X-Plus-LG375S1C-U6
TYP.
5 SOLAR PANEL
RED - L1
BLACK - L2
2 #4, 3/4" C*
AC JUNCTION BOX
Silfab-SIL-370-HC-Pallet
TYP.
5 SOLAR PANEL
BRANCH END CAP
INSTALLED ON THE
END OF CABLE
2 STRING COMBINER
goodwe-inverter-GW3600D-NS
AC WIRE TYPE
THWN- 1/0 AWG 90 DEG WIRE
2" EMT CONDUIT
BATTERY PP2-AC-10
CONTROLLER
PV AC Disc
60 Amp Fuses 2 Pole, 240 Volt
Visible Lockable Labeled
With external handle
AC WIRE TYPE
THWN- 6 AWG 90 DEG WIRE
2" EMT CONDUIT
2 AWG GROUND CABLE
10 KWH
BATTERY PP2-AC-10
PANEL
A
100 AMP
240Y/120V,1PH
METER
600V THWN
1 RUN OF 3 #2, 1#4G, 2" C.EMT
GROUND PER NEC
SEE DETAIL 0/
600V THWN
1 RUN OF 3 # 2, 2" C ,PVC
FROM UTILITY SERVICE
100A 120/240V
1P, 3W
goodwe-inverter-GW3600D-NS
AC WIRE TYPE
THWN- 6 AWG 90 DEG WIRE
2" EMT CONDUIT
Installation schematic diagram

PV-SOLAR ONE LINE DIAGRAM

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PV-SOLAR
ONE LINE DIAGRAM

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AC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO 1 STRING COMBINER/JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	35°
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	0.80
CIRCUIT CONDUCTOR SIZE	4 AWG
CIRCUIT CONDUCTOR AMPACITY	50A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	26.27A
1.25 X 1.25 X ISC OF MODULE	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	32.84A
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (15.16A) otherwise less the entry for circuit conductor size and ampacity	

AC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO 3 STRING COMBINER/JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	35°
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	0.80
CIRCUIT CONDUCTOR SIZE	4 AWG
CIRCUIT CONDUCTOR AMPACITY	50A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	26.27A
1.25 X 1.25 X ISC OF MODULE	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	32.84A
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (15.16A) otherwise less the entry for circuit conductor size and ampacity	

AC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO 2 STRING COMBINER/JUNCTION BOX:

AMBIENT TEMPERATURE ADJUSTMENT FOR EXPOSED CONDUIT PER NEC 310.15(B)(2)(c)	+22°
EXPECTED WIRE TEMP (In Celsius)	35°+22=57°
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	0.80
CIRCUIT CONDUCTOR SIZE	4 AWG
CIRCUIT CONDUCTOR AMPACITY	50A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	26.27A
1.25 X 1.25 X ISC OF MODULE	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	32.84A
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (63.92A) otherwise less the entry for circuit conductor size and ampacity	

AC CONDUCTOR AMPACITY CALCULATIONS: INVERTER TO FUSED AC DISCONNECT:

NUMBER OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	35°
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	0.94
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	1.00
CIRCUIT CONDUCTOR SIZE	6AWG
CIRCUIT CONDUCTOR AMPACITY	60A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B)	52.54A
1.25 X INVERTER OUTPUT CURRENT	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	65.69A
TEMP. CORRECTION PER TABLE 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (112.8A) otherwise less the entry for circuit conductor size and ampacity	

ELECTRICAL NOTES:

1. ALL CALCULATIONS, WORK, AND INSTALLATIONS TO BE IN ACCORDANCE WITH NEC 2017.
2. ALL CONDUCTORS TO BE RATED FOR 90°C OR HIGHER AND ALL EQUIPMENT TO BE RATED FOR 75°C OR HIGHER.
3. ALL CONDUIT ON CARPORT ROOF IS TO BE INSTALLED AT LEAST 1/2" ABOVE THE ROOFTOP SURFACE.
4. THE INVERTER IS "CHASSIS GROUNDED". THE GROUND WIRE IN CONTAINED WITHIN THE AC BUS CABLE.
5. POINT OF PV EQUIPMENT GROUNDING CONNECTION IS MADE AT THE INVERTER VIA THE AC EQUIPMENT GROUNDING CONDUCTOR.
6. PV ARRAY MUST HAVE EQUIPMENT GROUNDING/BONDING.
7. EXPOSED ARRAY EQUIPMENT GROUNDING CONDUCTORS SIZE 8 AWG AND SMALLER THAT ARE SUBJECT TO PHYSICAL DAMAGE MUST BE INSTALLED IN A RACEWAY.
8. EQUIPMENT GROUNDING CONDUCTORS AND GROUNDING ELECTRODES SIZE 6 AWG AND SMALLER ARE PERMITTED TO BE SOLID WHERE INSTALLED IN RACEWAY.
9. PV LOAD CENTER BREAKERS (60A) ARE TO BE RATED FOR 240VAC AND SUITABLE FOR BACKFEED.
10. PV SUPPLY SIDE FUSIBLE DISCONNECT MUST BE WITHIN 10 FEET OF SUPPLY SIDE POINT OF INTERCONNECTION.
11. A MAIN BONDING JUMPER IS REQUIRED FOR THE PURPOSE OF BONDING THE FUSIBLE DISCONNECT TO THE SERVICE NEUTRAL CONDUCTOR.
12. A SUPPLY SIDE BONDING JUMPER (2 AWG) IS REQUIRED TO BOND THE METALLIC SERVICE ENTRANCE CONDUIT TO HE NEUTRAL CONDUCTOR AT THE FUSIBLE SERVICE DISCONNECT.
13. THE GROUNDING ELECTRODE CONDUCTOR MUST TERMINATE TO THE NEUTRAL CONDUCTOR IN THE FUSIBLE SERVICE DISCONNECT.
14. WIRE SIZE BASED ON 75°C RATED CONDUCTORS AND THE GREATER OF DERATED AMPACITY AND 1.56LSC, AND VOLTAGE DROP ≤ 3%.

WARNING LABELS

1. WARNING: ELECTRIC SHOCK HAZARD DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE SIDE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION
[Affixed at DC Disconnects and DC Combiners]

2. WARNING – LOAD SIDE TERMINALS MAY BE ENERGIZED BY BACKFEED
[Affixed at PV Load Centers and Service Disconnects]

3. All PV Load Centers must be marked as to the where the power originates

4. Where multiple Utility-Interactive Inverters are located remote from each other, a Directory is required at each DC PV system Disconnecting Means, AC Disconnecting Means for Mini- and Micro-Inverters, and Service Disconnecting Means showing the locating of all DC and AC PV System Disconnecting Means

5. The PV DC System Disconnect must be marked to identify it as the PV System Disconnect

6. Non-load-break-rated Fuse Disconnecting Means must be marked “Do Not Open Under Load.”

7. WARNING: PHOTOVOLTAIC POWER SOURCE
[Affixed every 10’ on exposed wiring methods and enclosures containing PV DC Power Source Conductors]

8. Power Source Label
Maximum Power-Point Current: 9.29 Amps
Maximum Power-Point Voltage: 37.8 Volts
Maximum System Voltage: 47.3 Volts
Maximum Circuit Current: 9.82 Amps
[Affixed to PV DC Disconnect]

9. PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN
[Affixed to Service (Visible Lockable Labeled) Disconnecting Means]

10. EQUIPMENT IS ENERGIZED FROM TWO SOURCES OF AC POWER
SOLAR – 200 AMPS AT 240 VOLTS
UTILITY GRID - ??? AMPS AT 240 VOLTS
[Affixed to Point of Interconnection at Pad Mount Transformers]

11. EQUIPMENT IS SUPPLIED FROM ON-SITE SOLAR GENERATION
PV AC SYSTEM DISCONNECT
AC CURRENT – 200 Amps
AC VOLTAGE – 208/120 WYE Volts
[Affixed to PV Fusible (Visible Lockable Labeled) DisconnECTS]

12. AGGREGATE PANEL
CAUTION: DO NOT INSTALL ADDITIONAL LOADS IN THIS PANELBOARD
[Affixed to PV Load Centers]

SOLAR PANEL TO INVERTER NOTES AND CALCULATION

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SOLAR PANEL TO INVERTER NOTES AND CALCULATION

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1

⚠ CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LOCATION: BACKFED BREAKER
CODE REF:NEC 705.12(4)

2

⚠ WARNING
INVERTER OUTPUT CONNECTION:
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LOCATION: BACKFED BREAKER
CODE REF:2017 NEC 705.12(2)(3)(b)

3

WARNING
A GENERATION SCOURCE IS CONNECTED TO THE SUPPLY (UTILITY) SIDE OF THE MAIN SERVICE DISCONNECT. FOLLOW THE PROPER LOCK-OUT/TAG-OUT PROCEDURES TO ENSURE THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE

LOCATION: (IF APPLICABLE)
SUPPLY SIDE TAP
LOAD PANEL
CODE REF: UTILITY

4

PHOTOVOLTAIC AC DISCONNECT
RATED AC OPERATING CURRENT: 16 A AC
NOMINAL OPERATING AC VOLTAGE: 240 V AC

LOCATION: MAIN PANEL
AC DISCONNECT(S)
CODE REF: NEC 690.54

5

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LOCATION: MAIN PANEL (EXTERIOR)
PV BREAKER (INTERIOR)
CODE REF: NEC 690.56(C)(3)

6

⚠ WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LOCATION: COMBINER PANEL
AC DISCONNECT
JUNCTION BOX
INVERTER(S)
CODE REF: NEC 690.13(B)

7

PHOTO VOLTAIC
SYSTEM METER

LOCATION: DEDICATED KWH METER
CODE REF: NEC 690.4(B) UTILITY

8

⚠ WARNING
PHOTOVOLTAIC SYSTEM COMBINER PANEL
DO NOT ADD LOADS

LOCATION: AC COMBINER PANEL
CODE REF: NEC 690.13(B)

9

MAXIMUM VOLTAGE: 480VDC
MAXIMUM CIRCUIT CURRENT: 15.0ADC
MAX. RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC- CONVERTER (IF INSTALLED) 15.0ADC

LOCATION: DC DISCONNECT
INVERTER
CODE REF: UTILITY

10

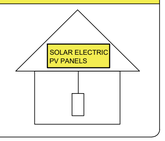
⚠ WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LOCATION: DC DISCONNECT, COMBINE BOX
CODE REF: NEC 690.13(B)

11

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



LOCATION: MAIN SERVICE (OUTSIDE COVER)
CODE REF: NEC 690.12
NEC 690.56(C)(1)(a)

12

WARNING PHOTOVOLTAIC POWER SOURCE

LOCATION: DC CONDUIT
JUNCTION BOX
NO MORE THAN 10FT
CODE REF: NEC 690.31(G)(3)
NEC 690.31(G)(4)
REFLECTIVE AND WEATHER RESISTANT

LABEL REQUIRES CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8 INCH, WHITE LETTERS ON RED BACKGROUND
LABELS SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, AND CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS.

13

⚠ CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC

LOCATION: SERVICE METER
MAIN PANEL
CODE REF: UTILITY

14

⚠ WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LOCATION: (IF APPLICABLE)
SERVICE PANEL
CODE REF: NEC 705.12(7)

15

PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SYSTEM

LOCATION: AC DISCONNECT
CODE REF: UTILITY

16

PV SOLAR BREAKER
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LOCATION: MAIN PANEL:(EXTERIOR)
PV BREAKER: (INTERIOR)
CODE REF: NEC 705.12(B)(2)(3)(B)

MAIN PV AC DISCONNECT "ACD" LABELS

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MAIN PV AC DISCONNECT "ACD" LABELS

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LG Mono X® Plus

LG MonoX® Plusis LG's robust P-type module
that maintains high performance and efficiency.

375W | 370W | 365W

FEATURES

Extended Product Warranty
The LG MonoX® Plus now comes with a product warranty extended to 15 years.

Outstanding Durability
LG MonoX® Plus is rated to with stand up to 5400 Pa on the front side and up to 3000 Pa on the rear side.

120cell

SOLAR ANALYTICA.

About LG Electronics
LG is transforming today's solar landscape, offering high-efficiency solar panels for customers who demand high performance, reliability and consistently strong energy yield from a brand they can trust. LG's modules feature high power outputs, outstanding durability, appealing aesthetics and high-efficiency technology.

Life's Good

LG Mono X® Plus

LG375S1C-U6 / LG370S1C-U6 / LG365S1C-U6

General Data

Cell Properties (Material / Type)	Monocrystalline / P-type
Cell Configuration	120 cells (6 x 20)
Number of Busbar	9EA
Module Dimensions (L x W x H)	1,776 x 1,052 x 40mm
Weight	19.7kg
Glass (Material)	Tempered Glass with AR coating
Backsheet (Color)	White
Frame (Material)	Anodized Aluminium
Junction Box (Protection Degree)	IP68
Cables (Length)	1,150mm x 2EA
Connector (Type / Maker)	MC4 (IEC 1000V)

Certifications and Warranty

Certifications	IEC 61215-1/1-1/2 : 2016, IEC 61730-1/2 : 2016
	ISO 9001, ISO 14001
	OHSAS 18001
Salt Mist Corrosion Test	IEC 61701 : 2012 Severity 6
Ammonia Corrosion Test	IEC 62716 : 2013
Fire Rating	Class C (UL 790)
Product Warranty	15 Years
Output Warranty of Pmax	Linear Warranty*

* 1) First years : 97.5%, 2) After 1st year : 0.4% annual degradation, 3) 87.9% for 25 years

Temperature Characteristics

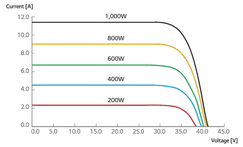
NMOT*	[°C]	42 ± 3
Pmax	[%/°C]	-0.365
Voc	[%/°C]	-0.270
Isc	[%/°C]	0.038

* NMOT (Nominal Module Operating Temperature)
: Irradiance 800W/m², Ambient temperature 20°C, Wind speed 1m/s, Spectrum AM 1.5

Electrical Properties (NMOT)

Model		LG375S1C-U6	LG370S1C-U6	LG365S1C-U6
Maximum Power (Pmax)	[W]	281	277	2 73
MPP Voltage (Vmpp)	[V]	31.76	31.64	31.52
MPP Current (Impp)	[A]	8.84	8.75	8.66
Open Circuit Voltage (Voc)	[V]	39.24	39.09	38.95
Short Circuit Current (Isc)	[A]	9.20	9.21	9.04

I-V Curves



Electrical Properties (STC*)

Model		LG375S1C-U6	LG370S1C-U6	LG365S1C-U6
Maximum Power (Pmax)	[W]	375	370	365
MPP Voltage (Vmpp)	[V]	34.10	33.95	33.82
MPP Current (Impp)	[A]	11.01	10.91	10.80
Open Circuit Voltage (Voc, ±3 %)	[V]	41.89	41.72	41.57
Short Circuit Current (Isc, ±4 %)	[A]	11.43	11.32	11.22
Module Efficiency	[%]	20.1	19.8	19.5
Power Tolerance	[%]		0 ~ +3	

* STC (Standard Test Condition)
: Irradiance 1000W/m², Cell temperature 25°C, AM 1.5

Operating Conditions

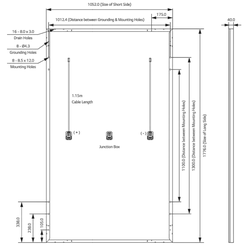
Operating Temperature	[°C]	-40 ~ +85
Maximum System Voltage	[V]	1000 (IEC)
Maximum Series Fuse Rating	[A]	20
Mechanical Test Load (Front)	[Pa/psf]	5,400 / 113
Mechanical Test Load (Rear)	[Pa/psf]	3,000 / 62

* Test Load = Design Load x Safety Factor (1.5)

Packaging Configuration

Number of Modules Per Pallet	[EA]	25
Number of Modules Per 40ft HQ Container	[EA]	600
Packaging Box Dimensions (L x W x H)	[mm]	1,825 x1,130 x 1,225
Packaging Box Gross Weight	[kg]	540

Dimensions (mm/inch)



* The distance between the center of the mounting/grounding holes.

LG Electronics Inc.
Energy Business Division
LG Twin Towers, 128 Yeoui-daero, Yeongdeungpo-gu, Seoul 07336, Korea
www.lg-solar.com

Life's Good

Product specifications are subject to change without notice.

SOLAR ANALYTICA.

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ELECTRIQ POWER

PowerPod 2

AC-Coupled

Introducing the all new Electriq PowerPod 2, an all-in-one solution with even more power output than before. Experience longer-lasting battery life, increased reliability and enhanced safety with Lithium Iron Phosphate ($LiFePO_4$) cells.

(10 kWh Model Shown)

LFP BATTERIES

$LiFePO_4$ chemistry means longer battery life and increased safety.

7.6 kW OUTPUT

Now with 7.6 kW of maximum power output to fill your every day energy needs.

OUTDOOR RATED

NEMA 3R rated enclosures for complete flexibility in the installation location.

BACKUP POWER SECURITY

When grid power goes down, maintain power to critical items such as refrigerators, computers, TVs, lights, and garage doors.

BUILT-IN INTERNET CONNECTIVITY

Always connected to the internet for easier commissioning and reliable communication even during power outages. No dependency on Wi-Fi for system operation, grid services and maintenance.

ON/OFF GRID

Supports autonomous off-grid applications and is a complete resilient solution when paired with solar.

GRID SERVICES

OpenADR 2.0b-certified solution that is ready for your ADR programs. For the immediate aggregation of an existing fleet of storage systems, PowerADR is another option.

HOME ENERGY MANAGEMENT

Automated cost saving through energy rate arbitrage and system power flow control.

(20 kWh Model Shown)

Technical Specs

Product Part No.	PP2-AC-10	PP2-AC-15 300-1013 or 350-10LC	PP2-AC-20
Battery Input Data			
Usable Capacity (kWh)	10	15	20
Battery Type		$LiFePO_4$ (LFP)	
Nominal, Battery Voltage Range (V)	102.4 VDC (89.6 - 115.2 VDC)	153.6 VDC (134.4 - 172.8 VDC)	204.8 VDC (179.2 - 230.4 VDC)
Max. Charging Current (A)		50	
Max. Discharging Current (A)		50	
AC Output Data (On-grid)			
Output Voltage Range (VAC)		211 to 264 @240	
Nominal Output Frequency (Hz)		60	
Continuous Output to Grid (A)	20.8	31.7	31.7
AC Output Data (Back-up)			
Nominal Output Voltage L-N/L1-L2 (VAC)		120/240	
Continuous Output @240V (W)	5120	7600	7600
Peak Output @240V (W)	5760, 60 sec	8640, 60 sec	9120, 60 sec
Efficiency			
Battery Charge/Discharge to AC Max. Efficiency		96.6%	
CEC Efficiency		96.1%	
General Data			
Operating Temperature Range		-20°C~55°C / -4°F~131°F	
Relative Humidity		0~95%	
Operating Altitude		3000m	
Noise (dB)		<45	
Communication with PowerHub		Electriq Power 4G Cellular Communication, WiFi	
Weight	530 lb (240 kg)	725 lb (329 kg)	925 lb (420 kg)
Size (W*H*D)	27.5" x 50" x 9" (Battery) & 18" x 33.7" x 7" (Inverter)	60" x 50" x 9" (Battery) & 18" x 33.7" x 7" (Inverter)	60" x 50" x 9" (Battery) & 18" x 33.7" x 7" (Inverter)
Operating Modes		Backup, TOU & Self-Supply	
Rating		NEMA 3R	
Standard Warranty		10 Years	
Certifications & Standards			
Grid Regulation		UL1741 SA (CA Rule 21), UL9540, UL9540A, HECO Rule 14, IEEE 1547, IEEE 1547.1, CSA 22.2	

PSS-0002_Rev_02

(833) GO-BATTERIES
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www.electriqpower.com
1937 Davis St., #1, San Leandro, CA 94577
625 N. Flagler St. Ste 1003 West Palm Beach, FL 33401

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D-NS Series(Dual-MPPT, Single-Phase)

GoodWe D-NS series inverter adopts cutting-edge technology in photovoltaic fields, designed under modern industrial concept. Inheriting all the excellent traits from GoodWe SS and DS series, the D-NS series is much smarter in size and weight. Excellent cooling design, comprehensive software and hardware technology is guaranteed to maximize the life-span of these inverters.

- Up to 10 safety measurements
- DC switch
- IP65 dust-proof and water-proof
- 45℃ full-load output
- Built-in anti-reverse function
- 30% lighter than similar products
- 20% Volume optimization
- Wide range of MPPT voltage
- Multiple monitoring and communication
- Fanless low-noise design

Technical Data

	GW3000D-NS	GW3600D-NS	GW4200D-NS	GW5000D-NS
DC Input Data				
Max. recommended PV Power [W]	3900	4680	5460	6500
Nominal DC Power [W]	3300	3960	4500	5500
Max. DC voltage [V]	580	580	580	580
MPPT voltage range [V]	80~550	125~550	125~550	125~550
Starting voltage [V]	120	120	120	120
Max. DC current [A]	11/11	11/11	11/11	11/11
No. of DC connectors	2	2	2	2
No. of MPPTs	2 (can parallel)	2 (can parallel)	2 (can parallel)	2 (can parallel)
DC connector	MC4/ Phoenix/ Amphenol	MC4/ Phoenix/ Amphenol	MC4/ Phoenix/ Amphenol	MC4/ Phoenix/ Amphenol
AC Output Data				
Norminal AC power [W]	3000	3680	4200	5000*
Max. AC power [W]	3000	3680	4200	5000*
Max. AC current [A]	13.6	16	19	22.8
Nominal AC output	50/60Hz; 230Vac		50/60Hz; 230Vac	
AC output range	45~55Hz/55~65Hz; 180~270Vac		45~55Hz/55~65Hz; 180~270Vac	
THDi	<1.5%		<1.5%	
Power factor	0.8 leading-0.8 lagging		0.8 leading-0.8 lagging	
Grid connection	Single phase		Single phase	
Efficiency				
Max. efficiency	97.8%	97.8%	97.8%	97.8%
Euro efficiency	>97.5%	>97.5%	>97.5%	>97.5%
MPPT adaptation efficiency	99.9%	99.9%	99.9%	99.9%
Protection				
Residual current monitoring unit	Integrated	Integrated	Integrated	Integrated
Anti-islanding protection	Integrated	Integrated	Integrated	Integrated
DC switch	Integrated (optional)	Integrated (optional)	Integrated (optional)	Integrated (optional)
AC over current protection	Integrated	Integrated	Integrated	Integrated
Insulation monitoring	Integrated	Integrated	Integrated	Integrated
Certifications & Standards				
Grid regulation	VDE-AR-N 4105, EN50438, VDE0126-1-1, AS4777.2&.3, G83/G59	VDE-AR-N 4105, G83/G59, VDE0126-1-1, EN50438, AS4777.2&.3, MEA,PEA	VDE-AR-N 4105, EN50438, VDE0126-1-1, AS4777.2&.3, G83/G59	VDE-AR-N 4105, EN50438, VDE0126-1-1, G83/G59, AS4777.2&.3 , MEA, PEA
Safety	IEC62109-1&-2, AS3100			
EMC	IEC/EN 61000-6-1,IEC/EN 61000-6-2,IEC/EN 61000-6-3,IEC/EN 61000-6-4,IEC/EN 61000-3-11, IEC/EN 61000-3-12			
General Data				
Dimensions (WxHxD) [mm]	347*432*145	347*432*145	347*432*145	347*432*145
Weight [kg]	14	14	14	14
Mounting	Wall bracket	Wall bracket	Wall bracket	Wall bracket
Ambient temperature range	-25~60°C (>45°C derating)	-25~60°C (>45°C derating)	-25~60°C (>45°C derating)	-25~60°C (>45°C derating)
Relative humidity	0~95%	0~95%	0~95%	0~95%
Max. operating altitude	4000m(> 3000m derating)	4000m(> 3000m derating)	4000m(> 3000m derating)	4000m(> 3000m derating)
Protection degree	IP65	IP65	IP65	IP65
Topology	Transformerless	Transformerless	Transformerless	Transformerless
Night power consumption [W]	<1	<1	<1	<1
Cooling	Natural convection	Natural convection	Natural convection	Natural convection
Noise emision [dB]	<25	<25	<25	<25
Display	LCD	LCD	LCD	LCD
Communication	USB2.0; RS485 or WiFi	USB2.0; RS485 or WiFi	USB2.0; RS485 or WiFi	USB2.0; RS485 or WiFi
Standard warranty [years]	5/10/15/20/25 (optional)	5/10/15/20/25 (optional)	5/10/15/20/25 (optional)	5/10/15/20/25 (optional)

*Note：4600W for VDE-AR-N4105

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Tech Brief

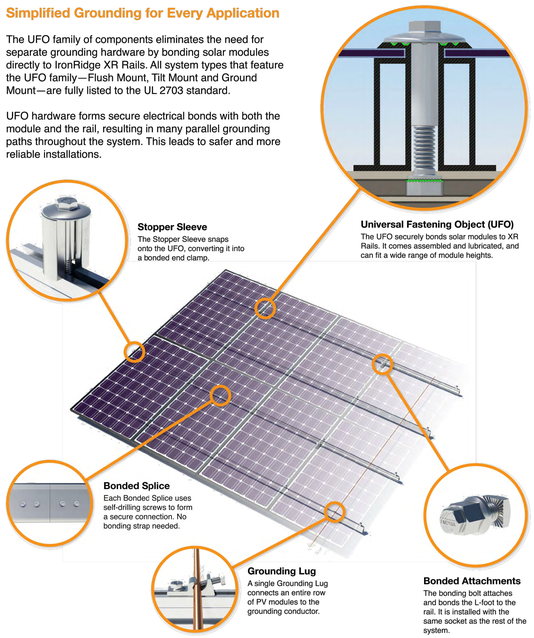
IRONRIDGE

UFO Family of Components

Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



Stopper Sleeve
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.

Universal Fastening Object (UFO)
The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.

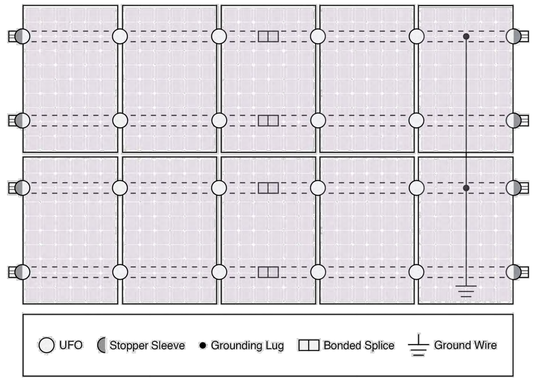
Bonded Splice
Each Bondec Splice uses self-drilling screws to form a secure connection. No bonding strap needed.

Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

Bonded Attachments
The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

Tech Brief

System Diagram



♀ Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

Cross-System Compatibility

Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	✔	✔	XR1000 Only
UFO/Stopper	✔	✔	✔
Bonded Splice	✔	✔	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

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Tech Brief

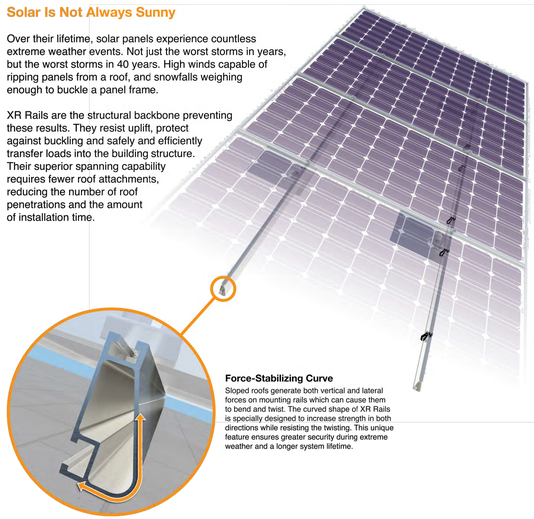
IRONRIDGE

XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available

XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

EQUIPMENT CATALOGUE

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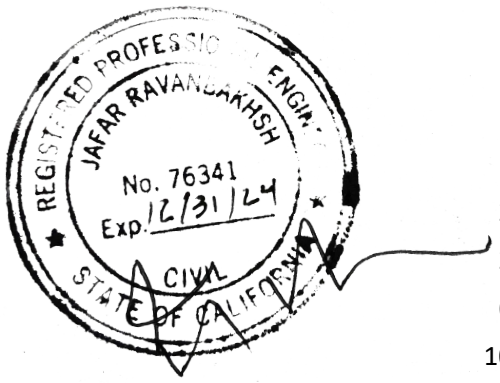


PA LTD	Project SINGLE FAMILY HOUSE				Job Ref.	
	Address 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev. 1	
	Calc. by	Date 06-16-23	Chk'd by	Date	App'd by	Date

1. DESIGN CODES AND STANDARDS

APPLICABLE BUILDING CODE 2019 CALIFORNIA BUILDING CODE
APPLICABLE DESIGN LOADS: ASCI/SEI 7-16
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE ACI 318-08 :
ALL PRESSURES SHOWN ARE BASED ON ASD DESIGN

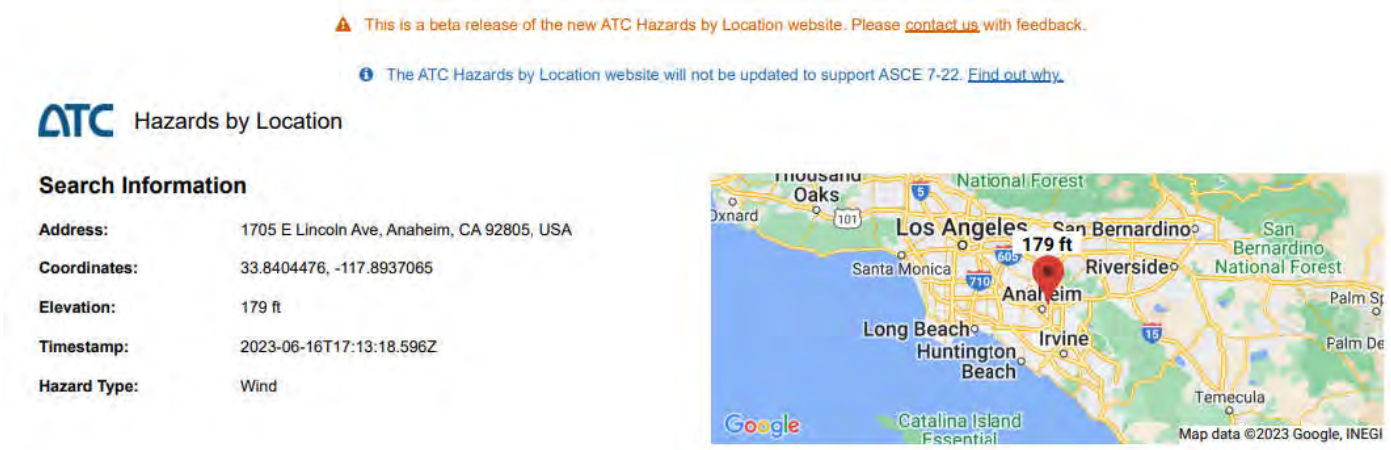
2. DESIGN DATA

ROOF LIVE LOAD - 20 PSF
ROOF DEAD LOAD - 15 PSF

ROOF DL
ASPHALT SHINGLES - 3.05 PSF
19/32-INCH SHEATING - 2.1 PSF
ROOF TRUSSES OR RAFTERS -6.2 PSF
TOTAL - 11.35 PSF

CEILING DL
1/2-INCH GWB - 1.8 PSF
MISCELLANEOUS - 0.8 PSF
TOTAL - 2.6 PSF

FLOOR DEAD LOAD - 15 PSF
FLOOR LIVE LOAD - 40 PSF
GROUND SNOW LOAD - 0 PSF
WIND PRESSURE– 16 PSF
WALL WIND PRESSURE- 24 PSF



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ASCE 7-16

MRI 10-Year	66 mph
MRI 25-Year	71 mph
MRI 50-Year	77 mph
MRI 100-Year	81 mph
Risk Category I	89 mph
Risk Category II	95 mph
Risk Category III	102 mph
Risk Category IV	106 mph

ASCE 7-10

MRI 10-Year ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

MRI 25-Year ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

MRI 50-Year ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

MRI 100-Year ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

Risk Category I ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

Risk Category II ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

Risk Category III-IV ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

ASCE 7-05

ASCE 7-05 Wind Speed ⚠ Special Region mph
You are in a special wind region. Please contact the Authority Having Jurisdiction.

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Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

https://hazards.atcouncil.org/#/wind?lat=33.8404476&lng=-117.8937065&address=1705 E Lincoln Ave%2C Anaheim%2C CA 92805%2C USA

PA LTD	Project: SINGLE FAMILY HOUSE				Job Ref.	
	Address: 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev.: 1	
	Calc. by	Date: 06-16-23	Chk'd by	Date	App'd by	Date

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

ℹ The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

ATC Hazards by Location

Search Information

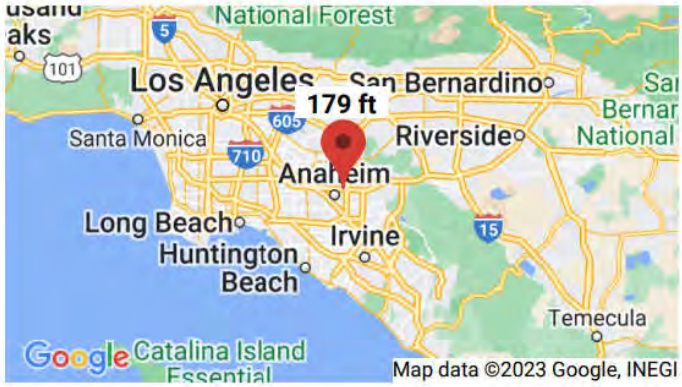
Address: 1705 E Lincoln Ave, Anaheim, CA 92805, USA

Coordinates: 33.8404476, -117.8937065

Elevation: 179 ft

Timestamp: 2023-06-16T17:14:05.749Z

Hazard Type: Snow



ASCE 7-16

Ground Snow Load ..... ⚠ 0 lb/sqft

The reported ground snow load applies at the query location of 179 feet up to a maximum elevation of 1800 feet.

ASCE 7-10

Ground Snow Load ..... ⚠ 0 lb/sqft

The reported ground snow load applies at the query location of 179 feet up to a maximum elevation of 1800 feet.

ASCE 7-05

Ground Snow Load ..... ⚠ 0 lb/sqft

The reported ground snow load applies at the query location of 179 feet up to a maximum elevation of 1800 feet.

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	Project SINGLE FAMILY HOUSE				Job Ref.	
	Address 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev. 1	
	Calc. by	Date 06-16-23	Chk'd by	Date	App'd by	Date

6/16/23, 1:15 PM ATC Hazards by Location

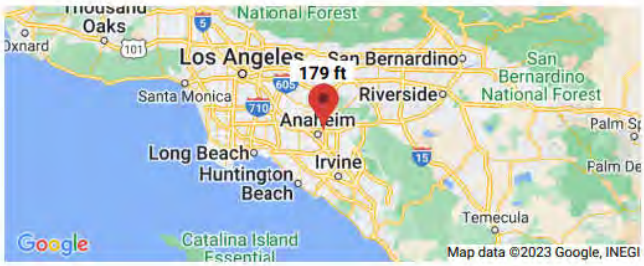
⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

ℹ The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

ATC Hazards by Location

Search Information

Address:	1705 E Lincoln Ave, Anaheim, CA 92805, USA
Coordinates:	33.8404476, -117.8937065
Elevation:	179 ft
Timestamp:	2023-06-16T17:15:00.588Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default



Basic Parameters

Name	Value	Description
S_S	1.53	MCE_R ground motion (period=0.2s)
S_1	0.541	MCE_R ground motion (period=1.0s)
S_{MS}	1.837	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.224	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.915	Coefficient of risk (0.2s)
CR_1	0.915	Coefficient of risk (1.0s)
PGA	0.65	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.78	Site modified peak ground acceleration
T_L	8	Long-period transition period (s)
SsRT	1.53	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.673	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.157	Factored deterministic acceleration value (0.2s)
S1RT	0.541	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.591	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.729	Factored deterministic acceleration value (1.0s)
PGAd	0.876	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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3. HEADERS

Project SINGLE FAMILY HOUSE				Job Ref.	
Address 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev. 1	
Calc. by	Date 06-16-23	Chk'd by	Date	App'd by	Date

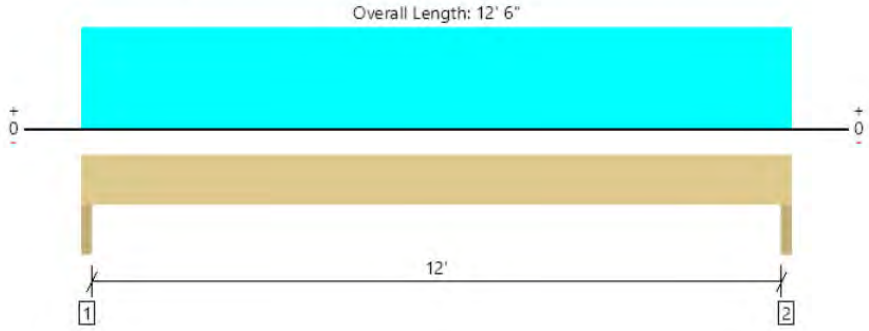
FORTEWEB

MEMBER REPORT

Level, Wall: Header

PASSED

2 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3602 @ 1 1/2"	7875 (3.00")	Passed (46%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	3002 @ 1' 1/2"	7897	Passed (38%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	10811 @ 6' 3"	14719	Passed (73%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.305 @ 6' 3"	0.408	Passed (L/481)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.621 @ 6' 3"	0.613	Passed (L/237)	--	1.0 D + 1.0 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - SYP	3.00"	3.00"	1.50"	1831	1771	3602	None
2 - Trimmer - SYP	3.00"	3.00"	1.50"	1831	1771	3602	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 11" o/c	
Bottom Edge (Lu)	12' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof (1.25)	Comments
0 - Self Weight (PLF)	0 to 12' 6"	N/A	9.7	--	
1 - Uniform (PSF)	0 to 12' 6"	14' 2"	20.0	20.0	Default Load

Project: SINGLE FAMILY HOUSE				Job Ref.	
Address: 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev.: 1	
Calc. by	Date: 06-16-23	Chk'd by	Date	App'd by	Date

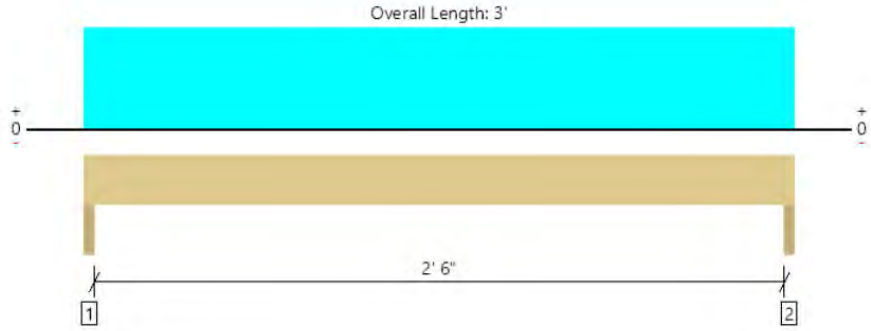
FORTEWEB

MEMBER REPORT

PASSED

Level, 2-6' Wall: Header

2 piece(s) 2 x 6 DF No.2



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	856 @ 1 1/2"	5625 (3.00")	Passed (15%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	452 @ 8 1/2"	2475	Passed (18%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	540 @ 1' 6"	1843	Passed (29%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.005 @ 1' 6"	0.092	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.011 @ 1' 6"	0.138	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	**Total**	**Available**	**Required**	**Dead**	**Roof Live**	**Factored**	**Accessories**
1 - Trimmer - SYP	3.00"	3.00"	1.50"	431	425	856	None
2 - Trimmer - SYP	3.00"	3.00"	1.50"	431	425	856	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' o/c	
Bottom Edge (Lu)	3' o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof (1.25)	Comments
0 - Self Weight (PLF)	0 to 3'	N/A	4.2	--	
1 - Uniform (PSF)	0 to 3'	14' 2"	20.0	20.0	Default Load

Project SINGLE FAMILY HOUSE				Job Ref.	
Address 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev. 1	
Calc. by	Date 06-16-23	Chk'd by	Date	App'd by	Date

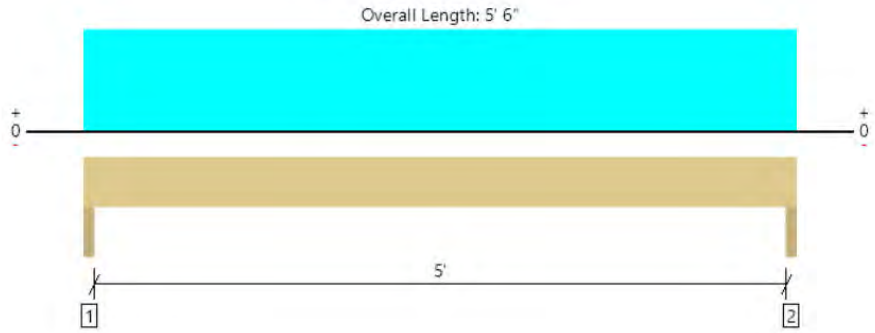
FORTEWEB

MEMBER REPORT

PASSED

Level, 5' Wall: Header

2 piece(s) 2 x 6 DF No.2



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	433 @ 1 1/2"	5625 (3.00")	Passed (8%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	322 @ 8 1/2"	2475	Passed (13%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	543 @ 2' 9"	1843	Passed (29%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.020 @ 2' 9"	0.175	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.040 @ 2' 9"	0.262	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - SYP	3.00"	3.00"	1.50"	222	211	433	None
2 - Trimmer - SYP	3.00"	3.00"	1.50"	222	211	433	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 6" o/c	
Bottom Edge (Lu)	5' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof (1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 5' 6"	3' 10"	20.0	20.0	Default Load

Project SINGLE FAMILY HOUSE				Job Ref.	
Address 1705 E LINCOLN AVE, ANAHEIM, CA				Sheet no./rev. 1	
Calc. by	Date 06-16-23	Chk'd by	Date	App'd by	Date

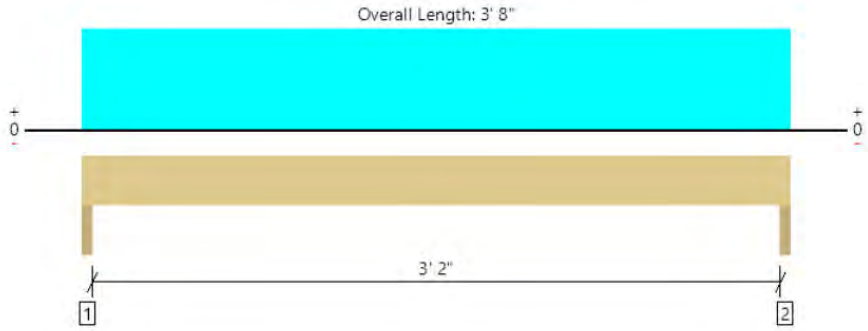
FORTEWEB

MEMBER REPORT

Level, 3'-2"' Wall: Header

2 piece(s) 2 x 6 DF No.2

PASSED



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	460 @ 1 1/2"	5625 (3.00")	Passed (8%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	282 @ 8 1/2"	2475	Passed (11%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	366 @ 1' 10"	1843	Passed (20%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.006 @ 1' 10"	0.114	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.012 @ 1' 10"	0.171	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - SYP	3.00"	3.00"	1.50"	234	226	460	None
2 - Trimmer - SYP	3.00"	3.00"	1.50"	234	226	460	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 8" o/c	
Bottom Edge (Lu)	3' 8" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof (1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 8"	N/A	4.2	--	
1 - Uniform (PSF)	0 to 3' 8"	6' 2"	20.0	20.0	Default Load

4. FOUNDATION CALCULATION

LINEAR FOOTING CALCULATION WALL

LOADS	20	40	20	20	WALLS	
	Df	L	Dr	S	D	

LEVEL 1	12.75	12.75	0	0	108	873.00	plf
LEVEL 2	0	0	0	0		0.00	plf
LEVEL 3	0	0	0	0		0.00	plf
ROOF	0	0	14.2	14.2		568.00	plf
FOUNDATION WALL (8"X11')					310.88	310.88	plf
							plf
GARAGE SLAB						0.00	plf
FOOTING					217.50	217.50	plf
TOTAL						**1969.38**	**plf**

DEAD	1175.38	plf
LIVE	510	plf
SNOW	284	plf
LR	284	plf
D+0.75L+0.75S	**1983.88**	**plf**

SOIL BEARING PRESSSURE	1500	psf
FOOTING WIDTH	18	"
FOOTING BEARING PRESSURE	**2250**	psf
BEARING PRESSURE RATIO	**0.88**	%

5. GARAGE LATERAL ANALYSIS

Wind loads analysis

	Type of plywood Table 4.3A						Anchor capacity					
	6.0		4.0		3.0		HDU2 SDS2.5	HDU4 SDS2.5	HDU5 SDS2.5	HDU8 SDS2.5	HDU11 SDS2.5	HDU14 SDS2.5
15/32 8d 1-3/8 TYPE 1*	730.0		1065.0	*	1370.0		3075.0	4565.0	5645.0	6765.0	9535.0	10770.0
TYPE 1	365.0		532.5		685.0					6970.0	11175.0	14390.0
15/32 10d 1-1/2 TYPE2*	870.0		1290.0	*	1680.0					7870.0		14445.0
TYPE2	435.0		645.0		840.0							
19/32 10d 1-1/2	950.0		1430.0		1860.0							
	475.0		715.0		930.0							

Axe 1,2

Project				Job Ref.	
SINGLE FAMILY HOUSE					
Address				Sheet no./rev.	
1705 E LINCOLN AVE, ANAHEIM, CA				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
	06-16-23				

Wall wind Load	24.0		PSF													
Roof wind load	16.7		PSF													
	b		h													
Wall area	12.8	x	9.0	/	2.0	=	57.4	SQ.FT.								
Roof area	14.2	x	5.0	/	1.0	=	71.0	SQ.FT.								
Shear wall length	29.0	f t														
Wind pressure per line foot =		(	57.4	x	24.0	+	71.0	x	16.7	)/	29.0	=	**88.4**	<	**TYPE 1**	
Anchor bolt calculation																
Wall height	9.0															
Roof height/2	2.5															
Uplift F=(	57.4	x	24.0	x	9.0	+	71.0	x	16.7	x(	9.0	+	2.5	))/	29.0	= **898**

HDU2 SDS2.5

Axe A, C

Wall wind Load	24.0		PSF													
Roof wind load	16.7		PSF													
	b		h													
Wall area	14.7	x	9.0	/	2.0	=	66.0	SQ.FT.								
Roof area	16.5	x	5.0	/	1.0	=	82.5	SQ.FT.								
Shear wall length	12.3	f t														
Wind pressure per line foot =		(	66.0	x	24.0	+	82.5	x	16.7	)/	12.3	=	**240.2**	<	**TYPE 1**	
Anchor bolt calculation																
Wall height	9.0															
Roof height/2	2.5															
Uplift F=(	66.0	x	24.0	x	9.0	+	82.5	x	16.7	x(	9.0	+	2.5	))/	12.3	= **2441**

HDU2 SDS2.5

Axe B

Wall wind Load	24.0		PSF													
Roof wind load	16.7		PSF													
	b		h													

Project				Job Ref.	
SINGLE FAMILY HOUSE					
Address				Sheet no./rev.	
1705 E LINCOLN AVE, ANAHEIM, CA				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
	06-16-23				

Wall area	29.3	x	9.0	/	2.0	=	132.0	SQ.FT.								
Roof area	29.3	x	5.0	/	1.0	=	146.7	SQ.FT.								
Shear wall length	25.5	f t														

Wind pressure per line foot =		(	132.0	x	24.0	+	146.7	x	16.7	)/	25.5	=	**220.3**	<	**TYPE 1**			

Anchor bolt calculation

Wall height	9.0
Roof height/2	2.5

Uplift F=(	132.0	x	24.0	x	9.0	+	146.7	x	16.7	x(	9.0	+	2.5	))/	25.5	=	**2222**		

HDU2 SDS2.5

SEISMIC ANALYSIS

FORCE DISTRIBUTION

ROOF			
	ROOF WEIGHT	20	PSF
	PARTITION WEIGHT	5	PSF
	W TOTAL	25	PSF
2ND	FLOOR WEIGHT	0	PSF
	PARTITION WEIGHT	0	PSF
	W TOTAL	0	PSF
	HEIGHT :	9	FT

2016 CBC / 2015 IBC, SEC. 1613; ASCE 7-10, SEC. 12.8

V = 0.7 x (C s x W) x ρ		R:	6.5	I:	1	SDC:	D
Cs = Sds/(R/I)		S1:	0.541	Sds:	1.22	Sd1:	0.541
				Occ.		Site	
Cs=	**0.2354**			Cat:	II	Class:	D

Check Constraints

Cs min = 0.044 * I * S_{DS}

Cs max = S_{D1} / T (R / I)

Cs min = **0.067**

Project				Job Ref.	
SINGLE FAMILY HOUSE					
Address				Sheet no./rev.	
1705 E LINCOLN AVE, ANAHEIM, CA				1	
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	06-16-23				

For S_{D1}: $S_{D1} = 2/3 * S_{M1}$

ASCE 7-02 Eq. 9.4.1.2.5-2

$S_{M1} = Fv * S_1$ S_1 [a] = **0.541** S_{M1} = **0.88**

ASCE 7-02 Eq. 9.4.1.2.4-2 Fv [a] = **1.5**

S_{D1} = 0.587

For T: $T = Cu * Ta$ Cu = **1.4** [a]

$Ta = C_T * hn^{3/4}$ C_T = **0.02** [a]

hn = **9**

Ta = 0.104

T = 0.145

Cs max = 0.7763

Cs FINAL = 0.2354

V = 0.7 x (Cs x W) x ρ = 0.2142 **V= 5.355**

wt ht wt*ht % F		W TOTAL	H TOTAL	WT*HT	%	F	V TOTAL
2ND FLOOR		25	9	225	1.00	5.36	5.36
				225			

HOLD DOWN CAPACITIES SHEAR WALL CAPACITIES

HDU2	HDU4	HDU5	HDU8	HDU11	HDU14	
2307	3425	4254	5904	7152	10835	lbs

SHEAR WALL DESIGN

TYPE 2	TYPE 3	TYPE 4	TYPE 5	
335	490	630	820	lbs/ft
560	860	1100	1460	

SHEAR WALL DESIGN

Shear Line Level

	LENGTH	TRIBUTARY AREA	F FLR	F ADD	F TOTAL	V/FT	WALL	T/C	DL/FLR	T NET WALL DL	HDU
Line 1, 2											
GR	29.0	901.0	4824.9		4824.9	166.4	2.0	1497.4	80.0	337.4	**HDU2**

							TYPE				HDU2
							1		WIND		SDS2.5
Line A, C											
1ST	12.3	476.0	2549.0		2549.0	206.7	2.0	1860.6	80.0	1367.4	**HDU2**
							TYPE				HDU2
							1		WIND		SDS2.5
Line B											
1ST	25.5	830.0	4444.7		4444.7	174.3	2.0	1568.7	80.0	548.7	**HDU2**
											HDU2
							0.0		WIND		SDS2.5