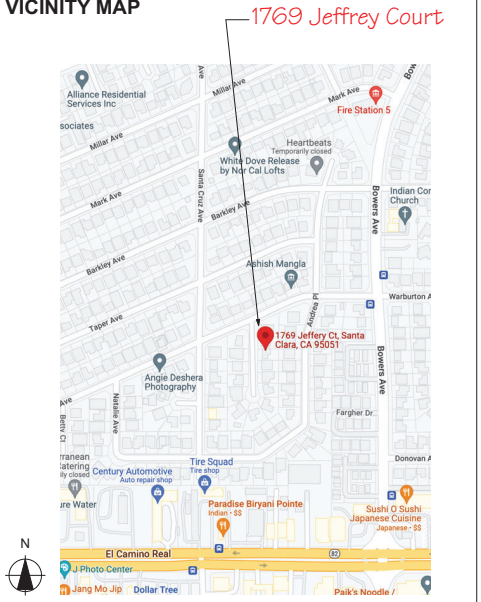
VICINITY MAP



PROJECT TEAM

Project Designer:
Anny Tangkilisan
ANNY DESIGNS, LLC
537 Osprey Dr. Redwood City, CA 94065
650.576.4379
annytan@annydesigns.com

Architect:
Dwinasari Rachmadi
2358 Crestline Road. Pleasanton, CA 94566
dwinasari@yahoo.com

Structural Engineer:
TBD

Surveyor:
AB Surveying & Mapping
10331 Stokes Ave. Cupertino, CA 95014
408.800.7494

General Contractor:
TBD

PROJECT SUMMARY

Addition:
- Add 730 SF of living space
- Configure the new addition to have master bedroom suite
- Expand kitchen, and add a laundry and mudroom

Master Bathroom:
- Configure the bathroom layout
- Add new skylights
- Install new fixture, vanity, tiles, and lighting

Bathroom Remodeling:
- Configure the bathroom layout
- Install new fixture, vanity, tiles, and lighting

Kitchen Remodeling:
- Configure kitchen layout
- Install new cabinets, appliances, and lighting

PLANNING DATA

APN	220 31 053
Zoning	R1-6L (Very Low Density Residential)
Construction Type	V-B
Garage occupancy	U
Number of Stories	Two (Single Family)
Fire Sprinkler Status	None
Existing Number of bedroom/bath	3 bedrooms/ 2.5 bathrooms
Proposed Number of bedroom/bath	4 bedrooms/ 3.5 bathrooms
LOT Area	5,540 SF
Existing Floor Area	1,535 SF (834 SF 1st floor + 701 SF 2nd floor)
Existing Garage	438 SF
Total existing house	1,973 SF
Proposed Addition	730 SF (383 SF 1st floor + 347 SF 2nd floor)
Proposed Floor Area	2,265 SF (1,535 SF + 730 SF)
Proposed Garage	394 SF
Total proposed house	2,659 SF
Total proposed first story	1,611 SF (inc. garage)
Total proposed second story	1,048 SF
Second story/first story ratio	65% (max 66%)
Existing lot coverage	1,549 /5,540 = 27.96%
Proposed lot coverage	1,781/5,540 = 32.15% (Max 40%)

GENERAL NOTES

0. All construction shall comply with the City of Santa Clara, 2019 California Building Code, 2019 California Fire Code, 2019 California Plumbing Code, 2019 California Mechanical Code, 2019 California Electrical Code, and 2019 California Green Building Code (2018 IBC, 2018 IFC, 2018 IRC, 2018 UPC, 2018 UMC and 2017 NEC as amended by the State of California).

1. Building address numbers to comply with section R319 CRC.

2. Required fire blocking to be installed in locations per R302.11 CRC.

3. All construction shall conform to the current editions of state, and local codes.

4. Contractor shall provide all necessary temporary barriers, lighting, coverings, fire protection, and equipment to protect the safety of all persons and property through out the entire period of construction.

5. Contractor shall familiarize themself with the actual site conditions prior to bidding and with any unique circumstances or discrepancies that may exist. Contractor shall verify all dimensions called out in the plans, elevations, sections, etc. to determine potential discrepancies and conflicts prior to construction. Any errors and/or discrepancies shall be brought to the attention of the designer or owner (in writing) immediately. Unless reported, contractor shall be responsible for any dimensional inconsistencies and probable remedial work.

6. Contractor shall coordinate between the various trades, vendors, and/or subcontractors to assure that all schedules are met and that all work is done in conformance to the manufacturer's requirements and recommendations. Manufacturer's operating instructions and guarantees shall be given to the owner upon completion of the project.

7. These architectural/design documents do not imply a guarantee for quality of construction. The contractor shall assume full responsibility for any and all construction adjustments and/or deficiencies.

8. Construction requires the coordination and installation of many individual parts by various construction industry trades. These architectural/design documents cannot portray all components or assemblies, exactly. It shall be the owner's and contractor's responsibility to fully recognize and implement the necessary standard of care.

SHEET INDEX

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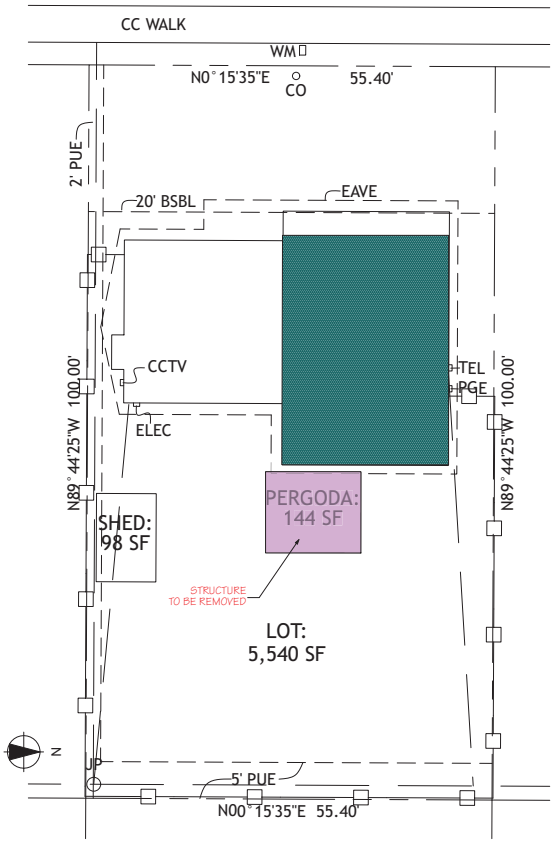
MARK	DATE	DESCRIPTION

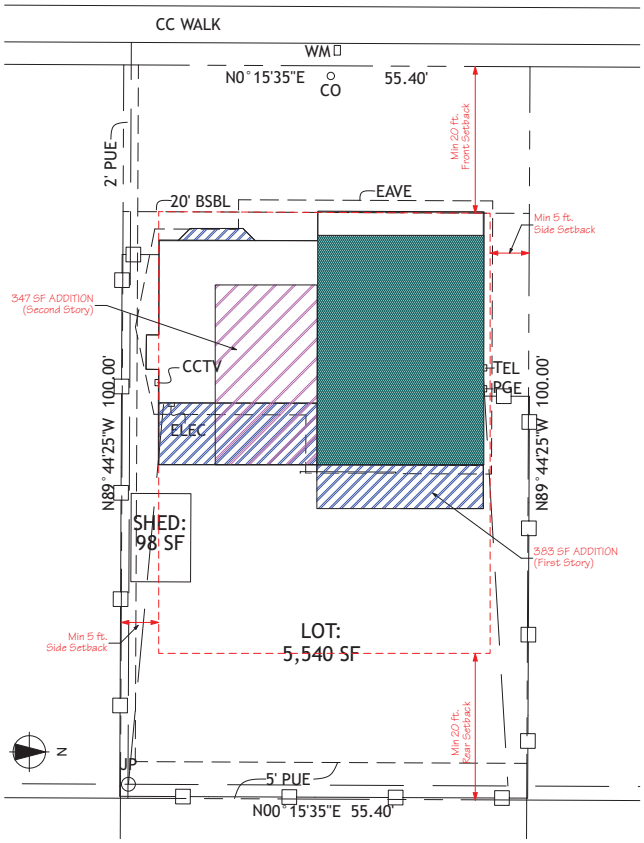
PROJECT NO: 10605
DATE: 1/10/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE
COVER PAGE

A-1



1 EXISTING SITE PLAN
SCALE: 1/8" = 1'-0"



2 PROPOSED SITE PLAN
SCALE: 1/8" = 1'-0"

(E) FIRST STORY

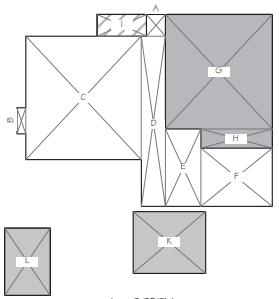
(E) SECOND STORY

(N) PROPOSED FIRST STORY

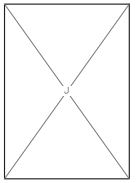
(N) PROPOSED SECOND STORY

STRUCTURE TO BE REMOVED

(E) FLOOR AREA COVERAGE



1st STORY



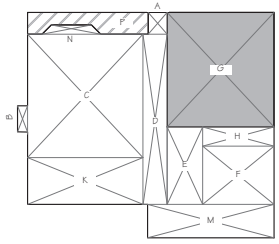
2nd STORY

**STRUCTURE TO BE REMOVED

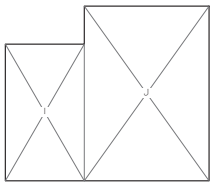
EXISTING FLOOR AREA AND COVERAGE CALCULATIONS

SECTION	DIMENSIONS	AREA
A	4' x 3.4'	14
B	4' x 1.6'	6
C	22.2' x 20.8'	462
D	30.5' x 4.3'	131
E	13.9' x 6.4'	89
F	10.4' x 12.8'	132
G (garage)	20.5' x 19.2'	394
H (garage)	3.4' x 12.8'	44
J	31.3' x 22.4'	701
TOTAL FLOOR AREA =		1,973
I (porch)	4' x 8.8'	35
K** (pergoda)	12' x 12'	144
L** (shed)	14' x 7'	98
TOTAL COVERAGE =		2,250

PROPOSED FLOOR AREA COVERAGE



1st STORY



2nd STORY

*STRUCTURE TO BE ADDED

PROPOSED FLOOR AREA AND COVERAGE CALCULATIONS

SECTION	DIMENSIONS	AREA
A	4' x 3.4'	14
B	4' x 1.6'	6
C	22.2' x 20.8'	462
D	30.5' x 4.3'	131
E	13.9' x 6.4'	89
F	10.4' x 12.8'	132
G (garage)	20.5' x 19.2'	394
H*	3.4' x 12.8'	44
I*	24.5' x 14.2'	347
J	31.3' x 22.4'	701
K*	8.4' x 21.7	183
M*	6' x 23.5'	141
N*	1.7' X 8.8'	15
TOTAL FLOOR AREA =		2,659
P (porch)	21.7' x 4'	72
TOTAL COVERAGE =		2,746

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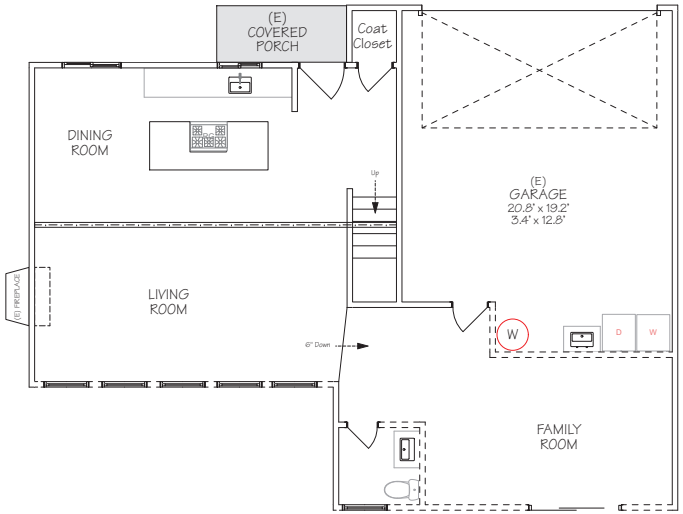
D. Rachmadi

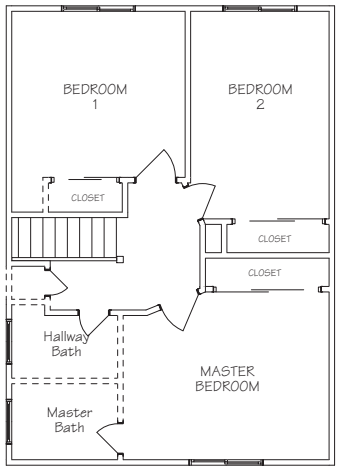
SHEET TITLE
SITE PLAN

A-2



N

1 (E) 1st STORY
SCALE: 1/4" = 1'-0"



N

2 (E) 2nd STORY
SCALE: 1/4" = 1'-0"

EXISTING WALL

WALL TO BE ALTERED or REMOVED

DEMOLITION NOTES

Verify all dimensions in the field. It shall be the contractors responsibility to notify the home owner immediately of any conflicts, discrepancies, omissions, and/or any other conditions that may effect or prevent the full implantation and accurate execution of identified within these drawings.

All debris will stored in a debris box
All debris and construction materials will be secured at end of the work day
All areas on site will remain hazard free and accessible
The contractor will contact the owner to determine items to be saved

Use temporary barriers to conceal dust and debris to areas being worked on

Plan carefully the use of temporary structures to stabilize existing elements of structure

Remove all existing wall framing indicated. Make all necessary modifications to subfloor and support structure required for new work. Replace or repair sub flooring and framing members as needed.

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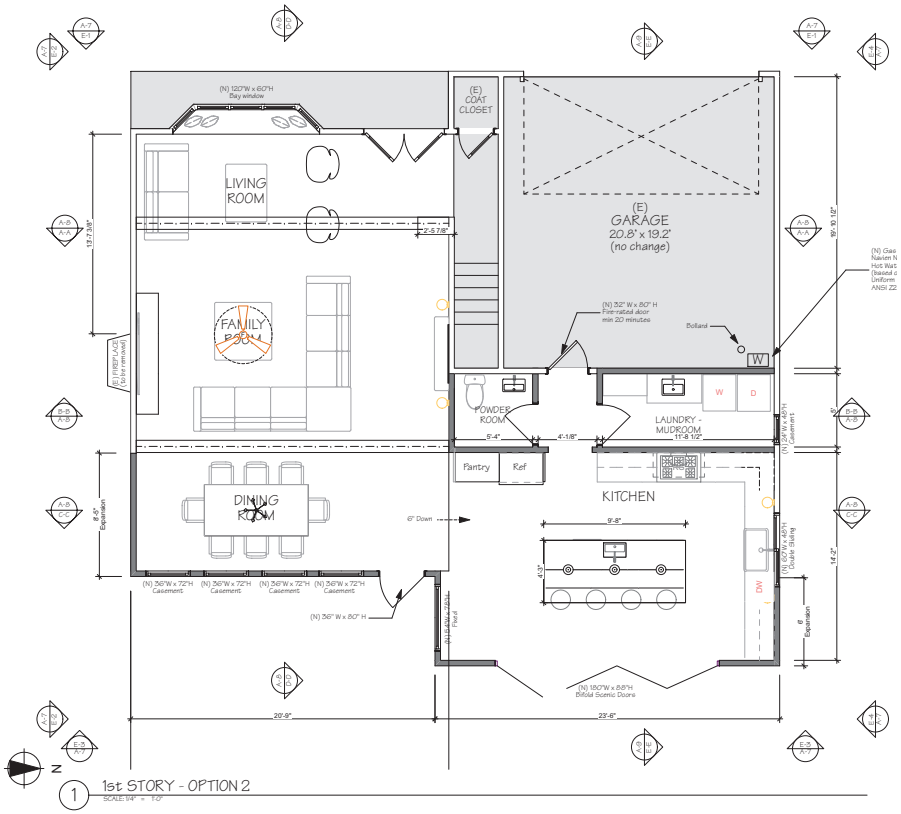
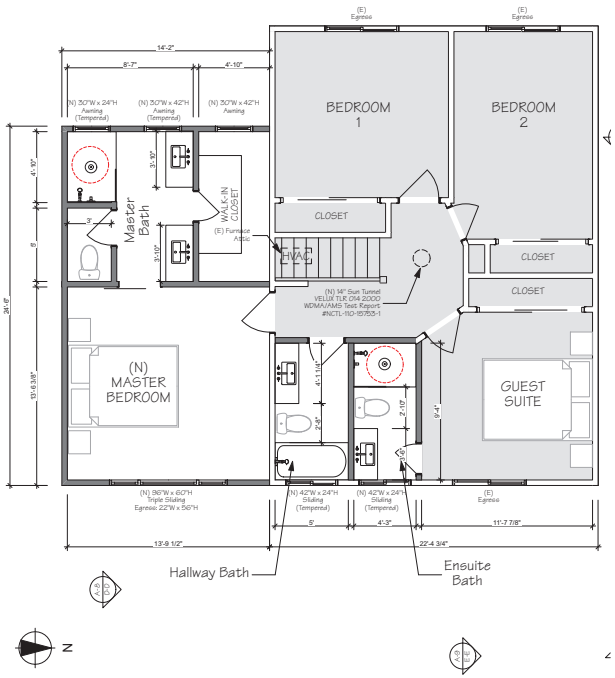
SHEET TITLE

EXISTING
FLOOR PLANS

A-3



1 1st STORY - OPTION 2
SCALE: 1/4" = 1'-0"



2 2nd STORY - OPTION 2
SCALE: 1/4" = 1'-0"

EXISTING WALL 2x4 @16" OC Stud Wall, V.I.F

NEW or ALTERED WALL 2x4 or 2x6 @16" OC Stud Wall

Greyed Areas Remain Unchanged

DIMENSIONS:

All dimensions are measured from finished surface.

PLUMBING FIXTURES MAXIMUM FLOW RATE

Compliance with water efficiency standards of CGBSC Section 4.303

Showerheads	≤1.8 gpm @ 80psi
Lavatory faucet	≤1.2 gpm @ 60psi
Kitchen/utility faucets	≤1.8 gpm @ 60psi
Water closet	≤1.28 gallons per flush

WATER HEATER
Water heater shall be installed with two seismic steel straps and a minimum distance of 4" shall be maintained above the controls with the strapping per section 507.2 CPC.
Water heater shall be elevated a minimum 18" AFF per section 507.13 CPC.
Pressure relief piping serving the water heater to be piped to the exterior of the building per sections 504.6 & 608.5 CPC.
The termination of such pipe shall be at a minimum 6" AFF and maximum of 24" AFF.
At the water heater, the first 5' of the water lines shall be insulated.

GARAGE FIRE SEPARATION
The garage shall have fire separation as required by table R302.6 CRC. 1/2" gypsum board shall be installed on the garage side extending to the underside of the roof sheathing per table R302.6 CRC.

WINDOWS AND DOORWAYS
All egress windows shall comply with CRC section R310. Egress windows shall be a minimum 20" wide, 24" tall, have a minimum 5.7 SF clear opening, and the bottom of the clear opening not more than 44" above the finished floor (CRC R310).
Landings at exterior doors shall be not more than 1.5" lower than the top of the threshold. (CRC R311.3.1).
At all exterior doors provide a landing that are a minimum of 36" from the face of the building wall to the edge of the landing and the minimum width shall be equal to the width of the opening.
At all exterior doors provide a landing with a maximum step of 7 3/4".
The main exit (hinged door) serving the building to be a minimum 36" width x 80" tall (CRC R311).

KITCHEN
Range hood shall be ducted to the exterior of the building per table 402 CMC.

WATER CLOSET
The water closet shall have a clearance of 30 inches wide (15 inches on center) and 24 inches in front. (CPC 402.5)

LAUNDRY
Dryer duct shall be connected to the exterior of the building, and shall be a minimum of 36" to openings into the building.

PLUMBING
All plumbing vents shall terminate not less than 6" above the 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. CPC 906
All domestic water piping in the following conditions/ locations shall be insulated. CEES 150.0(j)2A:
All hot water piping with a diameter of ¾" or larger.
Hot water piping buried below grade.
All hot water pipes from the water heater to the kitchen fixtures.
A pressure absorbing device (or approved mechanical device), located as close as possible to quick acting valves, that will absorb high pressures resulting from the quick closing of quick-acting valves (i.e., dishwasher, washing machine, etc.). CPC 609.10
A sediment trap shall be provided on the gas line downstream of the appliance shut-off valve, as close to the inlet of the equipment as practical, and upstream of the flex connector. CPC 1212.8
A dedicated fuel shut-off valve must be within 6 feet of each gas appliance. CPC 1212.5 and CMC 1313.4
Provide state architect certified earthquake-actuated gas shut-off valves at all new, relocated, and replaced gas utility meters.
Island sinks to comply with section 909 CPC.
All proposed hose bibs to have non-removable back-flow device.

BATHROOMS
Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth and non-absorbent surface to a height not less than 72" above the drain inlet. Slope to drain must be minimum 2% grade. (CRC R307, R702.4.2, CPC 408.5)
Shower and tub compartments shall use water resistant backing board.
Shower compartments - provide minimum of 1024 square feet and a minimum finish dimension of 30" in any direction.
Shower enclosures to be tempered and have an outward swing clearance of 22" minimum for the shower door.
Shower membrane must extend at least 18" beyond front edge of safety drain.
Showers with strip drains shall require an IAMPO (International Association of Mechanical and Plumbing Officials) number for the shower drain system.
Combination pressure balance/thermostatic mixing valves for all tub/showers and bathtubs & whirlpool tubs shall meet requirements in section 408.3 and 409 CPC.
Valves shall be adjusted per manufacturer's instructions to deliver a maximum mixed water setting of 120°F.

WATER CLOSET
The water closet shall have a clearance of 30 inches wide (15 inches on center) and 24 inches in front. (CPC 402.5)

LAUNDRY
Dryer duct shall be connected to the exterior of the building, and shall be a minimum of 36" to openings into the building.

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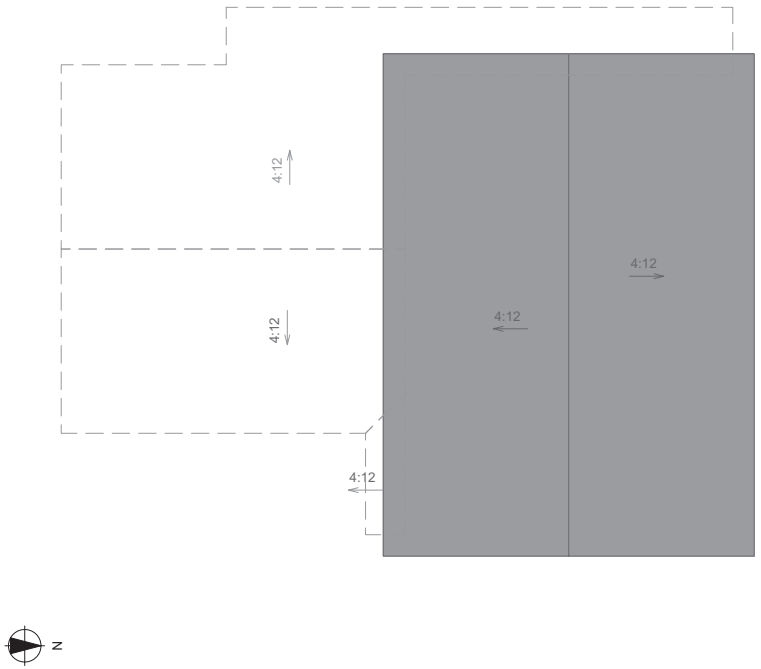
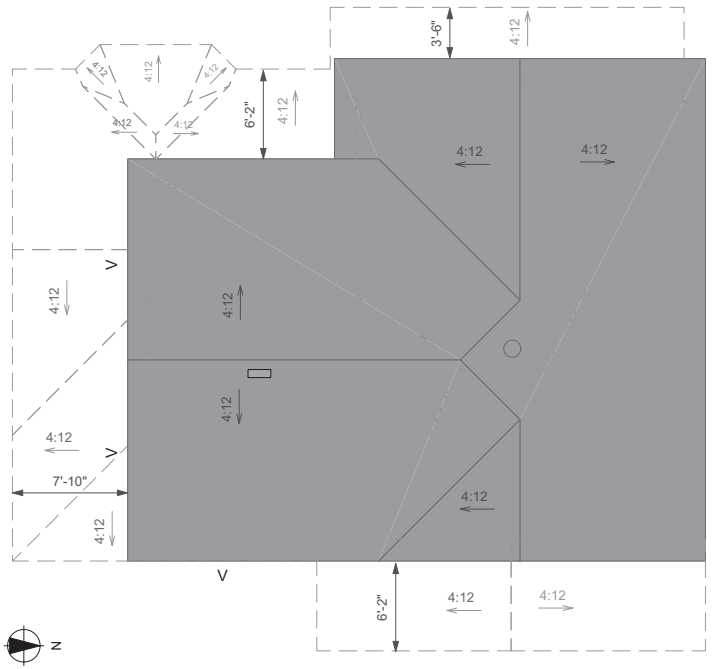
SHEET TITLE

PROPOSED FLOOR PLANS (Option 2)

A-4



1 (E) ROOF PLAN
SCALE: 1/4" = 1'-0"



2 PROPOSED ROOF PLAN
SCALE: 1/4" = 1'-0"

ATTIC SPACE VENTILATION

The minimum attic ventilation shall be no less than one square foot for every 300 SF of attic area with no less than 40% and not more than 50% of the required ventilating area provided by ventilators located not more than 3 feet below the ridge or the highest point of the space to be ventilated.

Vent openings shall be covered with corrosion-resistant wire not exceeding 0.25".

Enclosed attic and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings.

A minimum of 1" clear airspace shall be provided between the insulation and the roof sheathing. And, blocking shall be arranged to not interfere with the movement of air.

New Attic area ~383 SF
Ventilation requirement ~383/300 = 1.28 SF

Vents:
Roof vent 4" x 20" dormer ~0.55 SF
Eave 22" x 3" eave vent ~0.27 SF

Provide minimum of 1 dormer vents.
Provide minimum of 3 eave vents.

Upper portion ventilation ~ 1 * 0.55 = 0.55 SF
Lower portion ventilation ~ 3 * 0.27 = 0.81 SF
Total attic ventilation ~ 0.55 + 0.81 = 1.36 SF
Upper portion ventilation ~ 0.55 / 0.81 = 67.9%

▭ = suggested roof vent locations
V = suggested eave vent locations

INDEX:

A CertainTEED Presidential Solaris, color TBD
B Dormer vent, TYP
C Eave vent, TYP

PLAN NOTES:

One layer of synthetic 15# felt underlayment (or per the roofing manufacturer's installation requirements) shall be installed over the newly installed plywood roof sheathing.
CertainTEED Presidential Solaris, color TBD, using six large-headed roofing nails per shingle
Finished roofing material shall be installed and completed prior to frame inspection.

5" Seamless fascia-style gutter over 2x6 primed pine fascia

16" Overhang, unless noted

INSULATION: Per Title 24

- Floor: R-19
- Exterior wall: R-15
- Ceiling/roof: R-38

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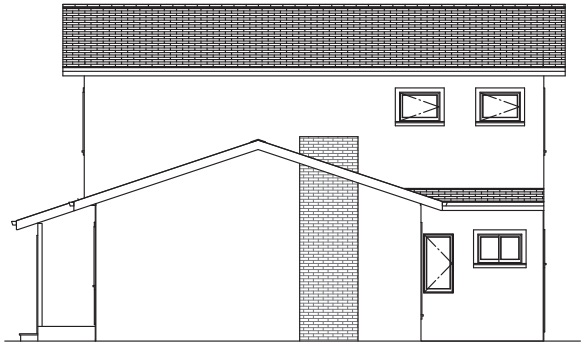
SHEET TITLE
ROOF PLANS

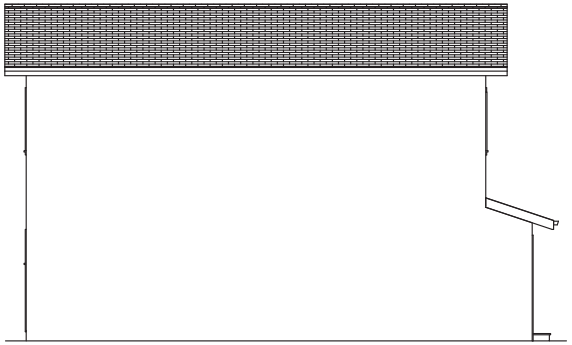
A-5

Z-1 (E) FRONT ELEVATION
SCALE: 1/4" = 1'-0"



Z-2 (E) RIGHT ELEVATION
SCALE: 1/4" = 1'-0"

Z-3 (E) BACK ELEVATION
SCALE: 1/4" = 1'-0"



Z-4 (E) LEFT ELEVATION
SCALE: 1/4" = 1'-0"

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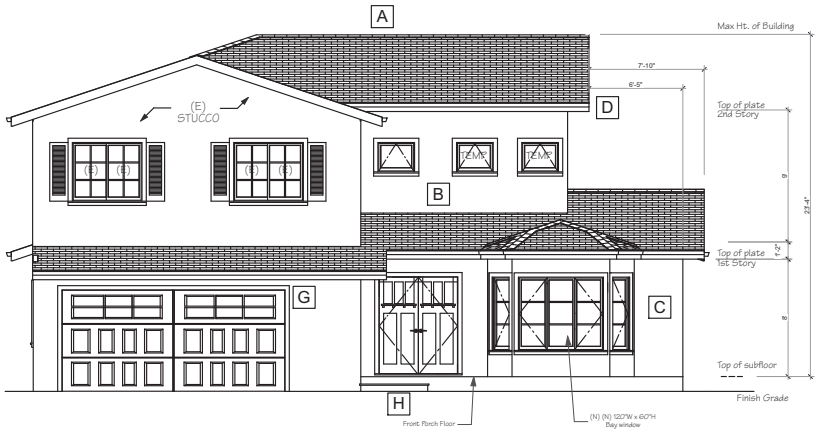
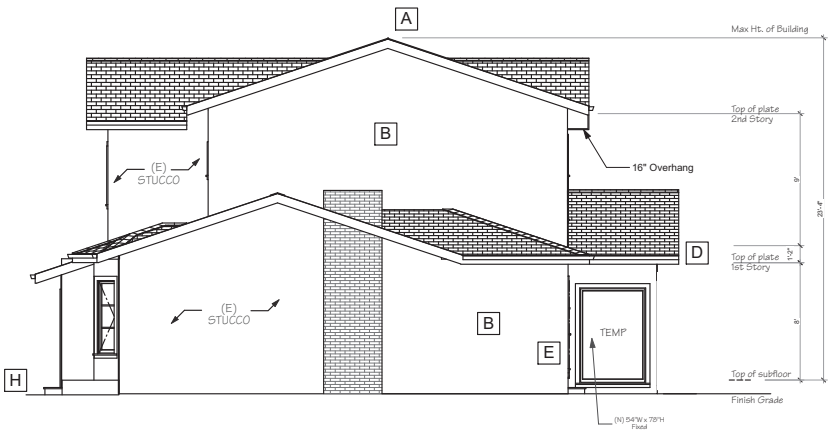
SHEET TITLE

(E) EXTERIOR ELEVATIONS

A-6

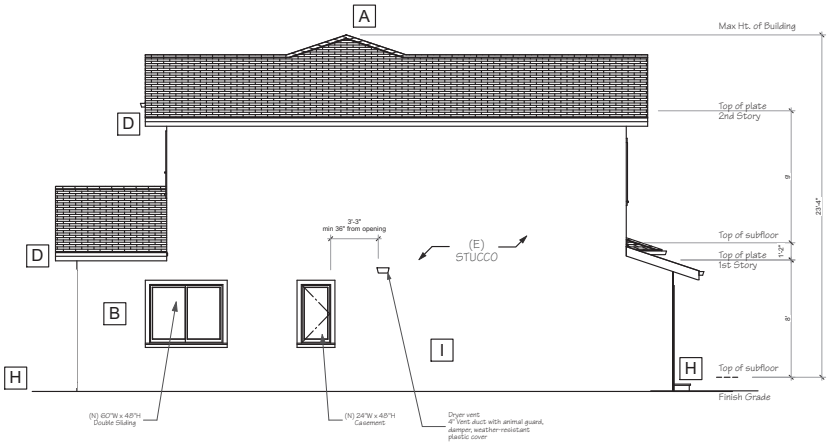


E-1 PROPOSED FRONT ELEVATION
SCALE: 1/4" = 1'-0"



E-2 PROPOSED RIGHT ELEVATION
SCALE: 1/4" = 1'-0"

E-3 PROPOSED BACK ELEVATION
SCALE: 1/4" = 1'-0"



E-4 PROPOSED LEFT ELEVATION
SCALE: 1/4" = 1'-0"

INSULATION: Per Title 24

- Floor: R-19
- Exterior wall: R-15
- Ceiling/roof: R-38

UNDER FLOOR SPACE VENTILATION

The minimum net area of the under floor opening shall be no less than one square foot for every 150 SF of under floor space area. One ventilation shall be within 3' of each corner of the building for cross ventilation.

New under floor space area ~183 SF
Ventilation requirement ~183/150 = 1.22 SF

Foundation vent 14"x6" ~0.45 SF

Provide a minimum of 3 additional foundation vents.

Under floor ventilation ~0.45 * 3 vents = 1.35 SF

General contractor shall replace the amount of foundation vents that are blocked because of the new addition.

EXTERIOR PLAN NOTES

A CertainTEED Presidential Solaris, color to match existing shingles, using six large-headed roofing nails per shingle, one layer of synthetic felt underlayment shall be installed over the newly installed plywood roof sheathing.
B 7/8" 3 Stucco over 2-layers grade "D" tar paper with 26-gauge galvanized weep screed at foundation plate line at least 4" above grade or 2" above concrete or paving.
C Wood siding to match the existing vertical siding
D 5" Seamless fascia-style gutter over 2x6 primed pine fascia
E (E) Electrical panel - 200A
F Typical galvanized crawlspace vent 14"x6"
G Exterior wall light, ETL rated for damp locations
H Concrete step and landing
I (E) Gas Meter

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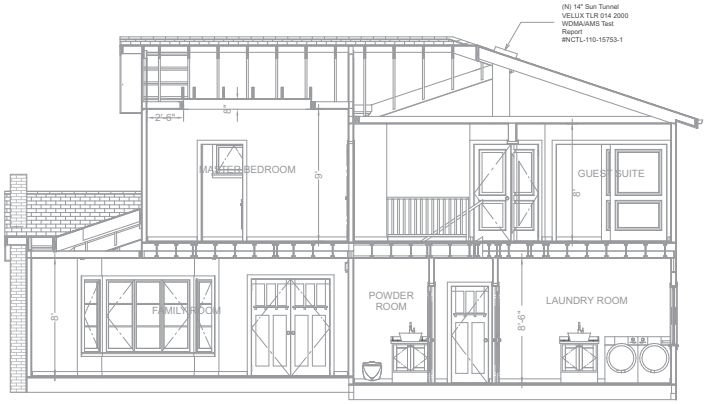
SHEET TITLE
PROPOSED EXTERIOR ELEVATIONS

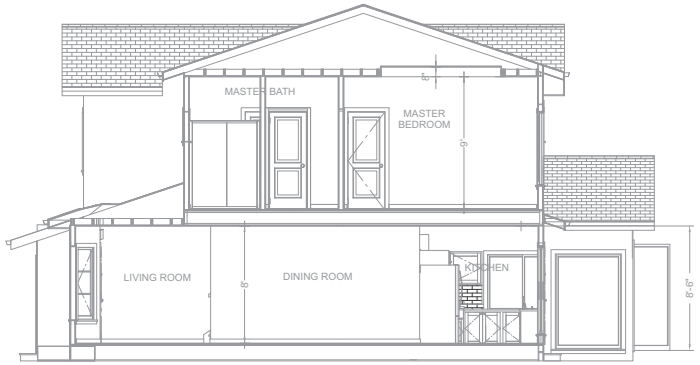
A-7

A-A CROSS ELEVATION
SCALE: 1/4" = 1'-0"



B-B CROSS ELEVATION
SCALE: 1/4" = 1'-0"

C-C CROSS ELEVATION
SCALE: 1/4" = 1'-0"



D-D CROSS ELEVATION
SCALE: 1/4" = 1'-0"

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Phone: 408-480-5831

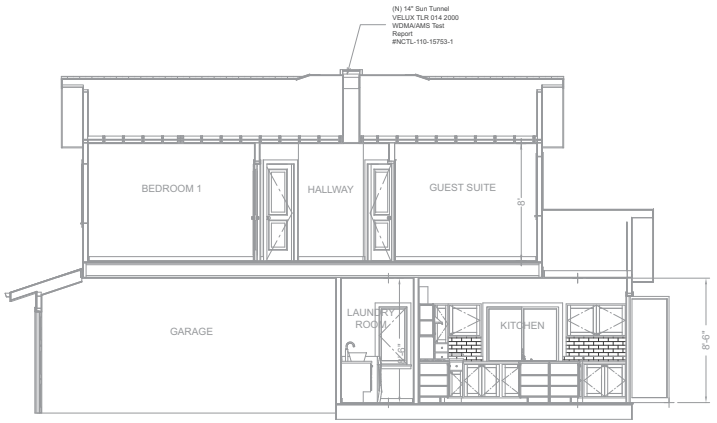
MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/10/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

CROSS SECTIONS

A-8



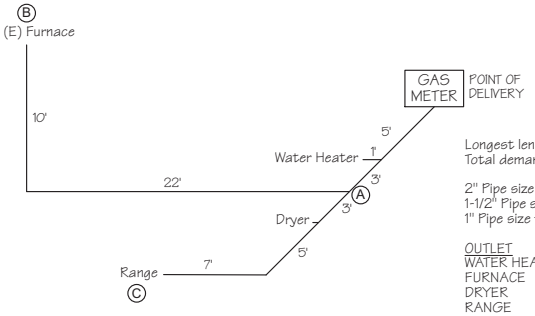
E-E CROSS ELEVATION
SCALE: 1/4" = 1'-0"

Electrical Load Calculation for New Equipment (2019 CEC 220.83)

Project Address: 1769 Jeffrey Court, Santa Clara, CA 95051 — 12/12/22

LOAD				VA	
General Lighting/Power Loads					
General lighting load of habitable living area	2659	sqft	x 3VA per sqft	7977	
Small appliance circuits	2	each	x 1500VA each	3000	
Laundry circuit	1	each	x 1500VA each	1500	
Appliances & Equipment Loads					
Garbage disposal	1/2	HP	9.8A x 115V	1127	
Dishwasher			12A x 120V	1440	
Range hood			5A x 120V	600	
Refridgerator			780W	780	
Wine fridge			100W	100	
Bathroom exhaust fans	4	each	x 10W each	40	
Wall oven			6KW	6000	
Microwave oven			13A x 120V	1560	
Clothes dryer			5KW	5000	
EV charger	2	Each	48A x 240V	23040	
Proposed/New Loads					
Heated towel bars	3	each	x 175W each	525	
Washlets/bidets	4	each	x 835W each	3340	
			Sub-total General Loads	56029	
			First 8k VA @ 100%	8000	
			Remainder VA @ 40%	19211.6	
			Total General Loads	27211.6	
Heating and Air Conditioning Load				600	
Gas furnace			600W		
			Total Demand Loads in VA	27811.6	
			Total Demand Loads in amps (divided by 240)	115.882	
			Required Minimum Service Size	120	amps
			Existing Service Size	200	amps

1 ELECTRICAL LOAD CALCULATION
SCALE: 1:0.80



Longest length gas line from meter: 40 Linear Feet
Total demand: 274,000 BTU/hr

2" Pipe size from Meter to Outlet A - Per CPC Table 1215.2(1)
1-1/2" Pipe size from Outlet A to Outlet B - Per CPC Table 1215.2(1)
1" Pipe size from Outlet A to Outlet C - Per CPC Table 1215.2(1)

OUTLET	LENGTH	BTU/hr	PIPE
WATER HEATER	1'	200,000	1-1/4"
FURNACE	32'	36,000	1"
DRYER	1'	20,000	1/2"
RANGE	12'	18,000	3/4"

2 PROPOSED GAS DELIVERY ISOMETRIC DIAGRAM
SCALE: 1/4" = 1'-0"

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MARK	DATE	DESCRIPTION

PROJECT NO: 10605
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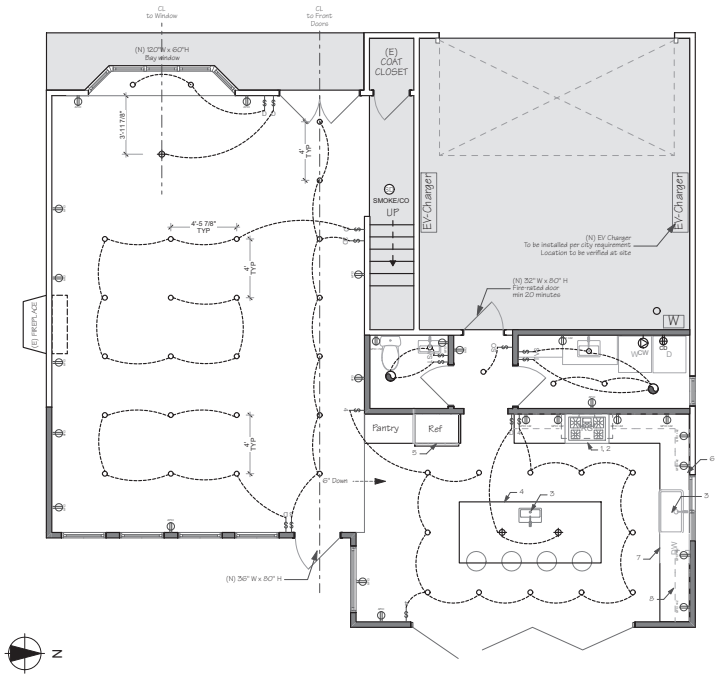
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

CROSS SECTIONS and Electrical Load Calculation

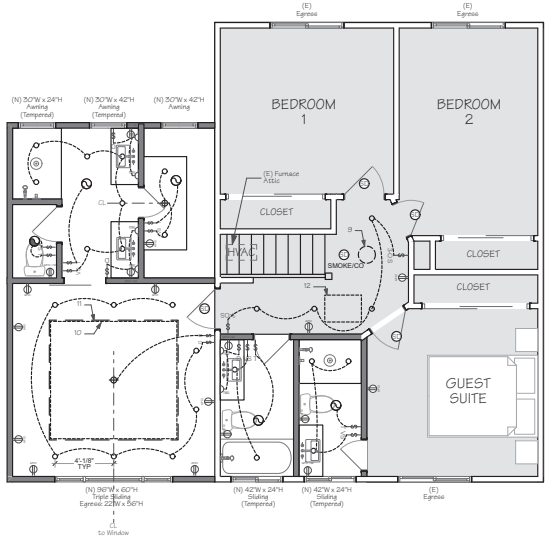
A-9



N

1 RCP - 1st Floor

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



N

2 RCP - 2nd Floor

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

Greyed Areas Remain Unchanged

APPLIANCE and ELECTRICAL NOTES*:

(1) GAS RANGE, 15A, 120V, AFCI outlet
(2) RANGE HOOD, 15A 120V, AFCI outlet
(3) GARBAGE DISPOSAL, 10.2A, 120V, AFCI outlet
(4) MICROWAVE OVEN, 15A, 120V, AFCI outlet
(5) REFRIGERATOR, 15A, 120V, AFCI outlet
(6) Switches for:
- Light above the sink
- Garbage disposal
- Under-cabinet lights

(7) DISHWASHER, Requires 15A, 120V, GFCI outlet
(8) Under cabinet lights, DiodeLED strip, 3000K, 12VDC or 24VDC
(9) 14" Sun Tunnel
(10) LED Strip, DiodeLED strip, 3000K, 12VDC or 24VDC
(11) Tray ceiling, ~8" high
(12) Attic access, min opening 22" x 30"

**Electrician to confirm electric circuit requirements for actual appliance chosen by homeowner.*

GENERAL ELECTRICAL NOTES:

Maintain required working clearances at the AC exterior electrical disconnect 110.26 CEC.
Provide the minimum separate electrical circuits for:
a. 20 amps for the bathroom 210.11 B (3) CEC
b. Two (2) small appliance circuits for the kitchen 20 Amp B (1) CEC
c. Motor (FAU)
d. Garbage disposal
e. Dishwasher

MECHANICAL NOTES:

Provide required combustion air per section 701.1 CMC
All exhaust fans shall be controlled by a separate switch, except for light/fan combinations.
All exhaust fans are equipped with backdraft dampers.
Environmental air ducts, vents, and exhaust ducts not terminate less than 3 feet from the property line or openings into the building. 502.2.1 CMC

ELECTRICAL SYMBOLS

- SINGLE POLE SWITCH, 3-WAY SWITCH, 4-WAY SWITCH
- SWITCH WITH TIMER, SWITCH WITH DIMMER, SWITCH WITH VACANCY SENSOR, DOOR JAMB SWTICH
- 3"-4" RECESSED LED LIGHT, RECESSED LIGHT WITH GIMBAL
- SCONCE, + 6'-7", 5'-6" ARE SPECIFIC PLACEMENT HEIGHTS (IF NOT SHOWN, PLEASE REFER TO ELEVATION PLANS)
- CHANDELIER, PENDANT, +72 AFF IS SPECIFIC PLACEMENT HEIGHTS
- EXHAUST FAN with LIGHT, EXHAUST FAN without LIGHT
- WALL MOUNTED DATA JUNCTION BOX FOR Cat6 and Coax CABLES + 18", 36" ARE SPECIFIC PLACEMENT HEIGHT (WITH CONDUIT TO INCLUDE DRAGE LINE)
- GFCI DUPLEX, GFCI QUADPLEX, + 30, 42 ARE SPECIFIC PLACEMENT HEIGHTS
- LED STRIP LIGHTS
- CLOTHES DRYER OUTLET (240 V)
- CLOTHES WASHER OUTLET
- UNDER CABINET LIGHT
- SMOKE DETECTOR
- WEATHER PROOF DUPLEX
- CAMERA
- SPOT LIGHT
- MOTION SENSOR FLOOR LIGHT

ELECTRICAL NOTES
All 15- and 20-amp receptacles shall be listed tamper-resistant (TR). CEC 406.12.
All 15- and 20-amp circuits supplying outlets or devices in kitchens, family rooms, dining rooms, living rooms, dens, bedrooms, closets, hallways, laundry, and similar areas shall be AFCI protected. CEC 210.12 (A)
All exterior receptacles shall be GFCI protected. CEC 210-52
All exhaust fans shall be controlled by a separate switch, except light/fan combinations.

Kitchen:
GFCI protection shall be provided for all countertop receptacles, receptacles within 6 feet of a sink (including below counter and behind an appliance), and for receptacles supplying dishwashers (CEC 210.8 (D)). The reset button for GFCI receptacles shall be installed in an accessible location (i.e. not behind an appliance). CEC 210.8.
All outlets and devices (i.e. receptacles, lighting, hoods, etc.) in the kitchen shall be AFCI protected and tamper-resistant (TR). CEC 210.12, 406.12
Countertop receptacles shall be located so that no point along the wall is more than 24 inches from a receptacle. CEC 210.52
Countertop receptacles shall be located no more than 20 inches above the countertop. CEC 210.52
Electric stoves and ovens shall be supplied with a 40- or 50- amp branch circuit. CEC 210.23
Countertop receptacles shall be supplied by a minimum of two 20-amp branch circuits. CEC 210.52
A dedicated circuit is required for cord and plug connected range exhaust hoods. Separate circuits may be required for the garbage disposal, dishwasher, and built-in microwave based on the manufacturer's requirements and the motor rating. CEC 210.52

Bathroom:
All receptacles shall be GFCI protected and tamper-resistant (TR). If any new/ additional outlets are installed, the bathroom shall have a dedicated 20-amp circuit. CEC 210.8, 210.11, 406.12
Exhaust fans with a minimum ventilation rate of 50 CFM are required in all bathrooms, even if an operable window is installed. Exhaust fans and lighting shall have separate control switches (even if a combination unit is installed). The exhaust fan may need to be supplied by a GFCI protected circuit based on the manufacturer's requirements. California Energy Efficiency Standards 150.0(k), 150.0(o)
Lighting fixtures located within 3 feet horizontally and 8 feet vertically of the bathtub rim or shower stall threshold shall be listed for a damp location, or listed for wet locations where subject to shower spray. CEC 410.10
Each bathroom shall have one light fixture controlled by a vacancy sensor switch that requires a manual on activation (does not automatically turn on) and automatically turns off within 30 minutes after the room is vacated. All other light fixtures shall be controlled by a vacancy sensor or dimmer. California Energy Efficiency Standards 150.0(k).

CALIFORNIA ENERGY EFFICIENCY STANDARDS 150.0(k)
All lighting fixtures shall be controlled by either a dimmer switch or by a vacancy sensor switch that requires a manual on activation (does not automatically turn on) and automatically turns off within 30 minutes after the room is vacated.
Except that bathrooms, laundry room, garages, and utility rooms shall have one light fixture controlled be a vacancy sensor. All other lighting in these rooms shall be controlled by a vacancy sensor or a dimmer switch.
All light fixtures shall contain bulbs that are labeled as JA8-2016 (JA8-2016-E for sealed lens or recessed fixture). Screw base bulbs are permitted, except in recessed lighting fixtures.
Recessed lighting shall be listed as IC (zero clearance to insulation) and AT (air tight), be sealed/caulked between the fixture housing and ceiling, shall not contain a screw base socket, and contain bulbs marked with JA8-2016-E efficiency label.
All outdoor lighting shall be controlled by a manual ON and OFF switch and controlled by photocell and motion sensor. All outdoor lights shall be labeled "suitable for wet locations."
All fans shall be energy star compliant, with humidity controls adjusting from 50% - 80%.
All interiors and exterior lighting to be high efficiency per section 150.0 (K) 2016 CEC.

SMOKE AND CARBON MONOXIDE ALARM CRC 314 and 315
Smoke alarms and carbon monoxide alarms are required to be listed by the California State Fire Marshal.
Provide a minimum of one smoke detector and carbon monoxide detector per floor.
Smoke detectors to be provided above door at each sleeping room and in corridors adjacent to the bedroom.
All smoke detectors per CBC 310.9.1,3,4.
Smoke detectors and carbon monoxide detectors shall receive their primary power source from the building wiring and shall be equipped with a battery backup and low battery signal.
All smoke detectors and carbon monoxide detectors shall be interconnected in such a manner so that the activation of one alarm will activate all of the alarms. Install Carbon Monoxide detectors outside of each separate sleeping area, in the immediate vicinity of the bedroom(s) in dwelling units and on every level including basements within which fuel-fired appliances are installed, and in dwelling units that have attached garages.

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Phone: 408-480-5831

MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/10/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

ELECTRICAL and MECHANICAL PLAN

E-1

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

Nisha Sameer Res (E+A)
1769 Jeffrey Court
Santa Clara, CA 95051

Project Designer:

Anny Designs
537 Osprey Dr
Redwood Shores , CA 94065
(650) 576-4379

Report Prepared by:

Sam Suzuki
Energy Calc Co.
45 Mitchell Blvd, Suite 16
San Rafael, CA 94903
(415) 457-0990

Job Number:

1125NIS

Date:

11/28/2022

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2019 Building Energy Efficiency Standards.

This program developed by EnergySoft Software – www.energysoft.com.

TABLE OF CONTENTS

GENERAL INFORMATION					
01	**Project Name**	Nisha Sameer Res (E+A)			
02	**Run Title**	Title 24 Analysis			
03	**Project Location**	1769 Jeffrey Court			
04	**City**	Santa Clara	05	**Standards Version**	2019
06	**Zip code**	95051	07	**Software Version**	EnergyPro 8.3
08	**Climate Zone**	4	09	**Front Orientation (deg/ Cardinal)**	270
10	**Building Type**	Single family	11	**Number of Dwelling Units**	1
12	**Project Scope**	Addition\Alteration	13	**Number of Bedrooms**	4
14	**Addition Cond. Floor Area (ft²)**	730	15	**Number of Stories**	2
16	**Existing Cond. Floor Area (ft²)**	1535	17	**Fenestration Average U-factor**	0.27
18	**Total Cond. Floor Area (ft²)**	2265	19	**Glazing Percentage (%)**	19.74%
20	**ADU Bedroom Count**	n/a	21	**ADU Conditioned Floor Area**	n/a
22	**Is Natural Gas Available?**	Yes			

COMPLIANCE RESULTS	
01	**Building Complies with Computer Performance**
02	**Building does not require field testing or HERS verification**
03	**This building incorporates one or more Special Features shown below**

ENERGY USE SUMMARY				
Energy Use (kTDV/ft²-yr)	**Standard Design**	**Proposed Design**	**Compliance Margin**	**Percent Improvement**
Space Heating	49.52	48.2	1.32	2.7
Space Cooling	26.89	29.62	-2.73	-10.2
IAQ Ventilation	0	0	0	
Water Heating	12.5	11	1.5	12
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	**88.91**	**88.82**	**0.09**	**0.1**

REQUIRED SPECIAL FEATURES

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

- New ductwork added is less than 40 ft. in length

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- -- None --

Cooling System Verifications:
- -- None --

Heating System Verifications:
- -- None --

HVAC Distribution System Verifications:
- -- None --

Domestic Hot Water System Verifications:
- -- None --

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	**Conditioned Floor Area (ft²)**	**Number of Dwelling Units**	**Number of Bedrooms**	**Number of Zones**	**Number of Ventilation Cooling Systems**	**Number of Water Heating Systems**
Nisha Sameer Res (E+A)	2265	1	4	2	0	1

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	**Zone Type**	**HVAC System Name**	**Zone Floor Area (ft²)**	**Avg. Ceiling Height**	**Water Heating System 1**	**Water Heating System 2**
Existing Zone	Conditioned	HVAC1	1535	8	DHW Sys 1	N/A
Addition Zone	Conditioned	HVAC1	730	8	DHW Sys 1	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10	11
Name	**Zone**	**Construction**	**Azimuth**	**Orientation**	**Gross Area (ft²)**	**Window and Door Area (ft2)**	**Tilt (deg)**	**Wall Exceptions**	**Status**	**Verified Existing Condition**
Front Wall	Existing Zone	Ex No HERS Ver 2x4 Wall	270	Front	134	0	90	none	Existing	No
Left Wall	Existing Zone	Ex No HERS Ver 2x4 Wall	0	Left	97	28	90	none	Existing	No
Right Wall	Existing Zone	Ex No HERS Ver 2x4 Wall	180	Right	234	0	90	none	Existing	No
Front Wall 2	Existing Zone	Ex No HERS Ver 2x4 Wall	270	Front	202	38	90	none	Existing	No
Left Wall 2	Existing Zone	Ex No HERS Ver 2x4 Wall	0	Left	282	0	90	none	Existing	No
Back Wall	Existing Zone	Ex No HERS Ver 2x4 Wall	90	Back	202	33	90	none	Existing	No
Right Wall 2	Existing Zone	Ex No HERS Ver 2x4 Wall	180	Right	61	0	90	none	Existing	No
Front Wall 3	Addition Zone	R-15 Wall	270	Front	95	50	90	none	New	n/a
Left Wall 3	Addition Zone	R-15 Wall	0	Left	86	0	90	Extension	New	n/a
Back Wall 2	Addition Zone	R-15 Wall	90	Back	398	202	90	Extension	New	n/a
Right Wall 3	Addition Zone	R-15 Wall	180	Right	131	29	90	Extension	New	n/a
Front Wall 4	Addition Zone	R-15 Wall	270	Front	128	26	90	Extension	New	n/a
Back Wall 3	Addition Zone	R-15 Wall	90	Back	128	40	90	Extension	New	n/a
Right Wall 4	Addition Zone	R-15 Wall	180	Right	221	0	90	Extension	New	n/a
Wall to	Existing Zone>>__Garag e__	Ex No HERS Ver 2x4 Wall1	n/a	n/a	239	0	n/a		Existing	No
Wall to 2	Addition Zone>>__Garag e__	R-15 Wall1	n/a	n/a	113	0	n/a		New	n/a

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MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/4/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

TITLE 24

T24-1

CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Nisha Sameer Res (E+A) **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 **(Page 4 of 12)**

Calculation Description: Title 24 Analysis **Input File Name:** 1125NIS.ribd19x

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft²)	Window and Door Area (ft2)	Tilt (deg)	Wall Exceptions	Status	Verified Existing Condition
Wall to 3	Addition Zone=>Existing Zone	R-0 Wall	n/a	n/a	10	0	n/a		New	n/a
Wall to 4	Addition Zone=>Existing Zone	R-0 Wall	n/a	n/a	10	0	n/a		New	n/a
Roof 2	Existing Zone	Ex No HERS Ver Roof (Atti	n/a	n/a	372	n/a	n/a		Existing	No
Roof 3	Existing Zone	Ex No HERS Ver Roof (Atti	n/a	n/a	700	n/a	n/a		Existing	No
Roof 4	Addition Zone	R-38 Roof	n/a	n/a	231	n/a	n/a		New	n/a
Roof 5	Addition Zone	R-38 Roof	n/a	n/a	347	n/a	n/a		New	n/a
Roof 6	__Garage__	Garage Roof	n/a	n/a	59	n/a	n/a		Existing	No
Floor	Existing Zone	Ex No HERS Ver Floor (Cra	n/a	n/a	834	n/a	n/a		Existing	No
Floor 2	Addition Zone	R-19 Floor Crawlspace	n/a	n/a	383	n/a	n/a		New	n/a
Floor to	Existing Zone	Ex No HERS Ver Floor (No-	n/a	n/a	322	n/a	n/a		Existing	No
Floor to 2	Existing Zone	Ex No HERS Ver Floor (No-	n/a	n/a	337	n/a	n/a		Existing	No
Floor to 3	Existing Zone	Ex No HERS Ver Floor (No-	n/a	n/a	42	n/a	n/a		Existing	No
Floor to 4	Addition Zone	R-0 Floor No Crawlspace	n/a	n/a	125	n/a	n/a		New	n/a
Floor to 5	Addition Zone	R-0 Floor No Crawlspace	n/a	n/a	110	n/a	n/a		New	n/a
Front Wall 5	__Garage__	Garage Wall	270	Front	169	0	90	none	Existing	No
Left Wall 4	__Garage__	Garage Wall	0	Left	182	0	90	none	Existing	No

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Nisha Sameer Res (E+A) **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 **(Page 5 of 12)**

Calculation Description: Title 24 Analysis **Input File Name:** 1125NIS.ribd19x

OPAQUE SURFACES - CATHEDRAL CEILINGS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Zone	Construction	Azimuth	Orientation	Area (ft²)	Skylight Area (ft²)	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Cool Roof	Status	Verified Existing Condition	Existing Construction
Roof	Existing Zone	Ex No HERS Ver Roof (Atti1	270	Front	1.1	1	4	0.1	0.85	No	Existing	No	

ATTIC

01	02	03	04	05	06	07	08	09	10
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof	Status	Verified Existing Condition
Attic __Garage__	Attic Garage Roof Cons	Ventilated	4	0.1	0.85	No	No	Existing	No
Attic Existing Zone	Attic RoofExisting Zone	Ventilated	4	0.1	0.85	No	No	Existing	No
Attic Addition Zone	Attic RoofAddition Zone	Ventilated	4	0.1	0.85	No	No	New	n/a

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Glazing	Window	Left Wall	Left	0			1	28	0.27	NFRC	0.2	NFRC	Bug Screen	Altered	No
Ex Glazing	Window	Front Wall 2	Front	270			1	38	0.4	NFRC	0.35	NFRC	Bug Screen	Existing	No
Ex Glazing 2	Window	Back Wall	Back	90			1	19	0.4	NFRC	0.35	NFRC	Bug Screen	Existing	No
Glazing 2	Window	Back Wall	Back	90			1	14	0.27	NFRC	0.2	NFRC	Bug Screen	Altered	No
Glazing 3	Window	Front Wall 3	Front	270			1	50	0.27	NFRC	0.2	NFRC	Bug Screen	New	n/a
Glazing 4	Window	Back Wall 2	Back	90			1	202	0.27	NFRC	0.2	NFRC	Bug Screen	New	n/a
Glazing 5	Window	Right Wall 3	Right	180			1	29	0.27	NFRC	0.2	NFRC	Bug Screen	New	n/a
Glazing 6	Window	Front Wall 4	Front	270			1	26	0.27	NFRC	0.2	NFRC	Bug Screen	New	n/a
Glazing 7	Window	Back Wall 3	Back	90			1	40	0.27	NFRC	0.2	NFRC	Bug Screen	New	n/a
Skylight	Skylight	Roof	Front	270			1	1	0.5	NFRC	0.3	NFRC	None	New	n/a

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Nisha Sameer Res (E+A) **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 **(Page 6 of 12)**

Calculation Description: Title 24 Analysis **Input File Name:** 1125NIS.ribd19x

SLAB FLOORS

01	02	03	04	05	06	07	08	09	10
Name	Zone	Area (ft²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated	Status	Verified Existing Condition
Slab-on-Grade	__Garage__	381	39	none	0	0%	No	Existing	No

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Garage Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.361	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Exterior Finish: 3 Coat Stucco
Ex No HERS Ver 2x4 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.361	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Exterior Finish: 3 Coat Stucco
R-15 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Exterior Finish: 3 Coat Stucco
Ex No HERS Ver Roof (Atti1	Cathedral Ceilings	Wood Framed Ceiling	2x4 @ 16 in. O. C.	R-11	None / None	0.088	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-11 / 2x4 Inside Finish: Gypsum Board
Ex No HERS Ver 2x4 Wall1	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.277	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Other Side Finish: Gypsum Board
R-15 Wall1	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.086	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Other Side Finish: Gypsum Board

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Nisha Sameer Res (E+A) **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 **(Page 7 of 12)**

Calculation Description: Title 24 Analysis **Input File Name:** 1125NIS.ribd19x

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
R-0 Wall	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.277	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Other Side Finish: Gypsum Board
Attic Garage Roof Cons	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic RoofExisting Zone	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic RoofAddition Zone	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Ex No HERS Ver Floor (Cra	Floors Over Crawlspace	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.216	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x6 @ 16 in. O. C.	R-19	None / None	0.05	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6
Garage Roof	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.481	Cavity / Frame: no insul. / 2x4 Inside Finish: Gypsum Board

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Nisha Sameer Res (E+A) **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 **(Page 8 of 12)**

Calculation Description: Title 24 Analysis **Input File Name:** 1125NIS.ribd19x

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Ex No HERS Ver Roof (Atti	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 16 in. O. C.	R-11	None / None	0.083	Over Ceiling Joists: R-1.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
R-38 Roof	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 16 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
Ex No HERS Ver Floor (No-	Interior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.196	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12 Ceiling Below Finish: Gypsum Board
R-0 Floor No Crawlspace	Interior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.196	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12 Ceiling Below Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

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

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-28 13:11:12

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MARK	DATE	DESCRIPTION

PROJECT NO: 1060S
DATE: 1/4/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

TITLE 24

T24-2

CERTIFICATE OF COMPLIANCE — CF1R-PRF-01E

Project Name: Nisha Sameer Res (E+A) — **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 — (Page 9 of 12)

Calculation Description: Title 24 Analysis — **Input File Name:** 1125NIS.ribd19x

WATER HEATING SYSTEMS

01 Name	02 System Type	03 Distribution Type	04 Water Heater Name (#)	05 Solar Heating System	06 Compact Distribution	07 HERS Verification	08 Status	09 Verified Existing Condition	10 Existing Water Heating System
DHW Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heater 1 (1)	n/a	None	n/a	Altered	No	

WATER HEATERS

01 Name	02 Heating Element Type	03 Tank Type	04 # of Units	05 Tank Vol. (gal)	06 Energy Factor or Efficiency	07 Input Rating or Pilot	08 Tank Insulation R-value (Int/Ext)	09 Standby Loss or Recovery Eff	10 1st Hr. Rating or Flow Rate	11 NEEA Heat Pump Brand or Model	12 Tank Location or Ambient Condition	13 Status	14 Verified Existing Condition
DHW Heater 1	Gas	Consumer Instantaneous	1	0	0.95-UEF	<= 200 kBtu/hr	0	n/a	n/a	n/a	n/a	Altered	No

WATER HEATING - HERS VERIFICATION

01 Name	02 Pipe Insulation	03 Parallel Piping	04 Compact Distribution	05 Compact Distribution Type	06 Recirculation Control	07 Central DHW Distribution	08 Shower Drain Water Heat Recovery
DHW Sys 1 - 1/1	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required

Registration Number: — Registration Date/Time: — HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance — Report Version: 2019.2.000 Schema Version: rev 20200901 — Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE — CF1R-PRF-01E

Project Name: Nisha Sameer Res (E+A) — **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 — (Page 10 of 12)

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SPACE CONDITIONING SYSTEMS

01 Name	02 System Type	03 Heating Unit Name	04 Cooling Unit Name	05 Fan Name	06 Distribution Name	07 Required Thermostat Type	08 Status	09 Verified Existing Condition	10 Heating Equipment Count	11 Cooling Equipment Count
HVAC1	Heating and cooling system other	Heating Component 1	Cooling Component 1	HVAC Fan 1	Air Distribution System 1	n/a	Existing	No	1	1

HVAC - HEATING UNIT TYPES

01 Name	02 System Type	03 Number of Units	04 Heating Efficiency
Heating Component 1	Central gas furnace	1	AFUE-80

HVAC - COOLING UNIT TYPES

01 Name	02 System Type	03 Number of Units	04 Efficiency EER/CEER	05 Efficiency SEER	06 Zonally Controlled	07 Multi-speed Compressor	08 HERS Verification
Cooling Component 1	Central split AC	1	12.2	14	Not Zonal	Single Speed	Cooling Component 1-hers-cool

HVAC - DISTRIBUTION SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
			Duct Ins. R-value		Duct Location		Surface Area								
Name	Type	Design Type	Supply	Return	Supply	Return	Supply	Return	Bypass Duct	Duct Leakage	HERS Verification	Status	Verified Existing Condition	Existing Distribution system	New Ducts 40 ft
Air Distribution System 1	Unconditioned attic	Non-Verified	R-6	R-6	Attic	Attic	n/a	n/a	No Bypass Duct	Existing (not specified)	Air Distribution System	Existing + New	No	n/a	n/a

Registration Number: — Registration Date/Time: — HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance — Report Version: 2019.2.000 Schema Version: rev 20200901 — Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE — CF1R-PRF-01E

Project Name: Nisha Sameer Res (E+A) — **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 — (Page 11 of 12)

Calculation Description: Title 24 Analysis — **Input File Name:** 1125NIS.ribd19x

HVAC - DISTRIBUTION SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
			Duct Ins. R-value		Duct Location		Surface Area								
Name	Type	Design Type	Supply	Return	Supply	Return	Supply	Return	Bypass Duct	Duct Leakage	HERS Verification	Status	Verified Existing Condition	Existing Distribution system	New Ducts 40 ft
											1-hers-dist				

HVAC - FAN SYSTEMS

01 Name	02 Type	03 Fan Power (Watts/CFM)	04 Name
HVAC Fan 1	HVAC Fan	0.58	HVAC Fan 1-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION

01 Name	02 Verified Fan Watt Draw	03 Required Fan Efficacy (Watts/CFM)
HVAC Fan 1-hers-fan	Not Required	0

HERS RATER VERIFICATION OF EXISTING CONDITIONS

Registration Number: — Registration Date/Time: — HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance — Report Version: 2019.2.000 Schema Version: rev 20200901 — Report Generated: 2022-11-28 13:11:12

CERTIFICATE OF COMPLIANCE — CF1R-PRF-01E

Project Name: Nisha Sameer Res (E+A) — **Calculation Date/Time:** 2022-11-28T13:10:41-08:00 — (Page 12 of 12)

Calculation Description: Title 24 Analysis — **Input File Name:** 1125NIS.ribd19x

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I, I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Sam Suzuki	
Company: Energy Calc Co.	Signature Date: 11/28/2022
Address: 45 Mitchell Blvd, Suite 16	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: San Rafael, CA 94903	Phone: (415) 457-0990

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Responsible Designer Name:	Responsible Designer Signature:
Anny Tangkilisan	
Company: Anny Designs	Date Signed: Dec 1, 2022
Address: 537 Osprey Dr	License:
City/State/Zip: Redwood Shores , CA 94065	Phone: (650) 576-4379

Registration Number: — Registration Date/Time: — HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance — Report Version: 2019.2.000 Schema Version: rev 20200901 — Report Generated: 2022-11-28 13:11:12

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MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/4/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

TITLE 24

T24-3

2019 Low-Rise Residential Mandatory Measures Summary

*NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply.*
(01/2020)

Building Envelope Measures:	
§ 110.6(a)1:	**Air Leakage.** Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283 or AAMA/WDMA/CSA 101/I.S.2/A440-2011.*
§ 110.6(a)5:	**Labeling.** Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).
§ 110.6(b):	**Field fabricated exterior doors and fenestration** products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 for exterior doors. They must be caulked and/or weather-stripped.*
§ 110.7:	**Air Leakage.** All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stripped.
§ 110.8(a):	**Insulation Certification by Manufacturers.** Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
§ 110.8(g):	**Insulation Requirements for Heated Slab Floors.** Heated slab floors must be insulated per the requirements of § 110.8(g).
§ 110.8(i):	**Roofing Products Solar Reflectance and Thermal Emittance.** The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.
§ 110.8(j):	**Radiant Barrier.** When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
§ 150.0(a):	**Ceiling and Rafter Roof Insulation.** Minimum R-22 insulation in wood-frame ceiling; or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.054 or less in a rafter roof alteration. Attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling.*
§ 150.0(b):	**Loose-fill Insulation.** Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
§ 150.0(c):	**Wall Insulation.** Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B.*
§ 150.0(d):	**Raised-floor Insulation.** Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.*
§ 150.0(f):	**Slab Edge Insulation.** Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
§ 150.0(g)1:	**Vapor Retarder.** In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space for buildings complying with the exception to § 150.0(d).
§ 150.0(g)2:	**Vapor Retarder.** In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.
§ 150.0(q):	**Fenestration Products.** Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.58; or the weighted average U-factor of all fenestration must not exceed 0.58.*
Fireplaces, Decorative Gas Appliances, and Gas Log Measures:	
§ 110.5(e)	**Pilot Light.** Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
§ 150.0(e)1:	**Closable Doors.** Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
§ 150.0(e)2:	**Combustion Intake.** Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device.*
§ 150.0(e)3:	**Flue Damper.** Masonry or factory-built fireplaces must have a flue damper with a readily accessible control.*
Space Conditioning, Water Heating, and Plumbing System Measures:	
§ 110.0-§ 110.3:	**Certification.** Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.*
§ 110.2(a):	**HVAC Efficiency.** Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.*
§ 110.2(b):	**Controls for Heat Pumps with Supplementary Electric Resistance Heaters.** Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone; and in which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.*
§ 110.2(c):	**Thermostats.** All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat.*
§ 110.3(c)4:	**Water Heating Recirculation Loops Serving Multiple Dwelling Units.** Water heating recirculation loops serving multiple dwelling units must meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(c)4.
§ 110.3(c)6:	**Isolation Valves.** Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.
§ 110.5:	**Pilot Lights.** Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces; household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour); and pool and spa heaters.*
§ 150.0(h)1:	**Building Cooling and Heating Loads.** Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.

2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(h)3A:	**Clearances.** Air conditioner and heat pump outdoor condensing units must have a clearance of at least five feet from the outlet of any dryer
§ 150.0(h)3B:	**Liquid Line Drier.** Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.
§ 150.0(j)1:	**Storage Tank Insulation.** Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.
§ 150.0(j)2A:	**Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation.** All domestic hot water piping must be insulated as specified in Section 609.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of one inch or a minimum insulation R-value of 7.7: the first five feet of cold water pipes from the storage tank; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter less than 3/4 inch that is: associated with a domestic hot water recirculation system, from the heating source to storage tank or between tanks, buried below grade, and from the heating source to kitchen fixtures.*
§ 150.0(j)3:	**Insulation Protection.** Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.
§ 150.0(n)1:	**Gas or Propane Water Heating Systems.** Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptacle connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within three feet of the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; a Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than two inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour.
§ 150.0(n)2:	**Recirculating Loops.** Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c)5.
§ 150.0(n)3:	**Solar Water-heating Systems.** Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.
Ducts and Fans Measures:	
§ 110.8(d)3:	**Ducts.** Insulation installed on an existing space-conditioning duct must comply with § 604.0 of the California Mechanical Code (CMC). If a contractor installs the insulation, the contractor must certify to the customer, in writing, that the insulation meets this requirement.
§ 150.0(m)1:	**CMC Compliance.** All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ¼ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.*
§ 150.0(m)2:	**Factory-Fabricated Duct Systems.** Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.
§ 150.0(m)3:	**Field-Fabricated Duct Systems.** Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.
§ 150.0(m)7:	**Backdraft Damper.** Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 150.0(m)8:	**Gravity Ventilation Dampers.** Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.
§ 150.0(m)9:	**Protection of Insulation.** Insulation must be protected from damage, sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service. For example, protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation.
§ 150.0(m)10:	**Porous Inner Core Flex Duct.** Porous inner core flex ducts must have a non-porous layer between the inner core and outer vapor barrier.
§ 150.0(m)11:	**Duct System Sealing and Leakage Test.** When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with § 150.0(m)11 and Reference Residential Appendix RA3.
§ 150.0(m)12:	**Air Filtration.** Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Pressure drops and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service.*
§ 150.0(m)13:	**Space Conditioning System Airflow Rate and Fan Efficacy.** Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.45 watts per CFM for gas furnace air handlers and ≤ 0.58 watts per CFM for all others. Small duct high velocity systems must provide an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.*

2019 Low-Rise Residential Mandatory Measures Summary

Requirements for Ventilation and Indoor Air Quality:	
§ 150.0(o)1:	**Requirements for Ventilation and Indoor Air Quality.** All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1.
§ 150.0(o)1C:	**Single Family Detached Dwelling Units.** Single family detached dwelling units, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow provided at rates determined by ASHRAE 62.2 Sections 4.1.1 and 4.1.2 and as specified in § 150.0(o)1C.
§ 150.0(o)1E:	**Multifamily Attached Dwelling Units.** Multifamily attached dwelling units must have mechanical ventilation airflow provided at rates in accordance with Equation 150.0-B and must be either a balanced system or continuous supply or continuous exhaust system. If a balanced system is not used, all units in the building must use the same system type and the dwelling-unit envelope leakage must be ≤ 0.3 CFM at 50 Pa (0.2 inch water) per square foot of dwelling unit envelope surface area and verified in accordance with Reference Residential Appendix RA3.8.
§ 150.0(o)1F:	**Multifamily Building Central Ventilation Systems.** Central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow for each dwelling unit served at a rate equal to or greater than the rate specified by Equation 150.0-B. All unit airflows must be within 20 percent of the unit with the lowest airflow rate as it relates to the individual unit's minimum required airflow rate needed for compliance.
§ 150.0(o)1G:	**Kitchen Range Hoods.** Kitchen range hoods must be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.
§ 150.0(o)2:	**Field Verification and Diagnostic Testing.** Dwelling unit ventilation airflow must be verified in accordance with Reference Residential Appendix RA3.7. A kitchen range hood must be verified in accordance with Reference Residential Appendix RA3.7.4.3 to confirm it is rated by HVI to comply with the airflow rates and sound requirements as specified in Section 5 and 7.2 of ASHRAE 62.2.
Pool and Spa Systems and Equipment Measures:	
§ 110.4(a):	**Certification by Manufacturers.** Any pool or spa heating system or equipment must be certified to have all of the following: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating.*
§ 110.4(b)1:	**Piping.** Any pool or spa heating system or equipment must be installed with at least 36 inches of pipe between the filter and the heater, or dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.
§ 110.4(b)2:	**Covers.** Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(b)3:	**Directional Inlets and Time Switches for Pools.** Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.
§ 110.5:	**Pilot Light.** Natural gas pool and spa heaters must not have a continuously burning pilot light.
§ 150.0(p):	**Pool Systems and Equipment Installation.** Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves.*
Lighting Measures:	
§ 110.9:	**Lighting Controls and Components.** All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.*
§ 150.0(k)1A:	**Luminaire Efficacy.** All installed luminaires must meet the requirements in Table 150.0-A.
§ 150.0(k)1B:	**Blank Electrical Boxes.** The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control.
§ 150.0(k)1C:	**Recessed Downlight Luminaires in Ceilings.** Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C.
§ 150.0(k)1D:	**Electronic Ballasts for Fluorescent Lamps.** Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz.
§ 150.0(k)1E:	**Night Lights, Step Lights, and Path Lights.** Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.
§ 150.0(k)1F:	**Lighting Integral to Exhaust Fans.** Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(k).*
§ 150.0(k)1G:	**Screw based luminaires.** Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.*
§ 150.0(k)1H:	**Light Sources in Enclosed or Recessed Luminaires.** Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)1I:	**Light Sources in Drawers, Cabinets, and Linen Closets.** Light sources internal to drawers, cabinetry or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
§ 150.0(k)2A:	**Interior Switches and Controls.** All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.
§ 150.0(k)2B:	**Interior Switches and Controls.** Exhaust fans must be controlled separately from lighting systems.*
§ 150.0(k)2C:	**Interior Switches and Controls.** Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF.*
§ 150.0(k)2D:	**Interior Switches and Controls.** Controls and equipment must be installed in accordance with manufacturer's instructions.
§ 150.0(k)2E:	**Interior Switches and Controls.** Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the control is installed to comply with § 150.0(k).
§ 150.0(k)2F:	**Interior Switches and Controls.** Lighting controls must comply with the applicable requirements of § 110.9.

2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(k)2G:	**Interior Switches and Controls.** An energy management control system (EMCS) may be used to comply with control requirements if it: provides functionality of the specified control according to § 110.9; meets the Installation Certificate requirements of § 130.4; meets the EMCS requirements of § 130.0(e); and meets all other requirements in § 150.0(k)2.
§ 150.0(k)2H:	**Interior Switches and Controls.** A multiscene programmable controller may be used to comply with dimmer requirements in § 150.0(k) if it provides the functionality of a dimmer according to § 110.9, and complies with all other applicable requirements in § 150.0(k)2.
§ 150.0(k)2I:	**Interior Switches and Controls.** In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces must be controlled by an occupant sensor or a vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it must be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.
§ 150.0(k)2J:	**Interior Switches and Controls.** Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, must have dimming controls.*
§ 150.0(k)2K:	**Interior Switches and Controls.** Under cabinet lighting must be controlled separately from ceiling-installed lighting systems.
§ 150.0(k)3A:	**Residential Outdoor Lighting.** For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must meet the requirement in item § 150.0(k)3Ai (ON and OFF switch) and the requirements in either § 150.0(k)3Aii (photocell and either a motion sensor or automatic time switch control) or § 150.0(k)3Aiii (astronomical time clock), or an EMCS.
§ 150.0(k)3B:	**Residential Outdoor Lighting.** For low-rise residential buildings with four or more dwelling units, outdoor lighting for private patios, entrances, balconies, and porches; and residential parking lots and carports with less than eight vehicles per site must comply with either § 150.0(k)3A or with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k)3C:	**Residential Outdoor Lighting.** For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by § 150.0(k)3B or § 150.0(k)3D must comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k)4:	**Internally illuminated address signs.** Internally illuminated address signs must comply with § 140.8; or must consume no more than 5 watts of power as determined according to § 130.0(c).
§ 150.0(k)5:	**Residential Garages for Eight or More Vehicles.** Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages in Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.
§ 150.0(k)6A:	**Interior Common Areas of Low-rise Multifamily Residential Buildings.** In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building must be comply with Table 150.0-A and be controlled by an occupant sensor.
§ 150.0(k)6B:	**Interior Common Areas of Low-rise Multifamily Residential Buildings.** In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must: i. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0; and ii. Lighting installed in corridors and stairwells must be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors must be capable of turning the light fully on and off from all designed paths of ingress and egress.
Solar Ready Buildings:	
§ 110.10(a)1:	**Single Family Residences.** Single family residences located in subdivisions with 10 or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.10(b) through § 110.10(e).
§ 110.10(a)2:	**Low-rise Multifamily Buildings.** Low-rise multi-family buildings that do not have a photovoltaic system installed must comply with the requirements of § 110.10(b) through § 110.10(d).
§ 110.10(b)1:	**Minimum Solar Zone Area.** The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For single family residences, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet. For low-rise multi-family buildings the solar zone must be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project, and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area. The solar zone requirement is applicable to the entire building, including mixed occupancy.*
§ 110.10(b)2:	**Azimuth.** All sections of the solar zone located on steep-sloped roofs must be oriented between 90 degrees and 300 degrees of true north.
§ 110.10(b)3A:	**Shading.** The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.*
§ 110.10(b)3B:	**Shading.** Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.*
§ 110.10(b)4:	**Structural Design Loads on Construction Documents.** For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.
§ 110.10(c):	**Interconnection Pathways.** The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.
§ 110.10(d):	**Documentation.** A copy of the construction documents or a comparable document indicating the information from § 110.10(b) through § 110.10(c) must be provided to the occupant.
§ 110.10(e)1:	**Main Electrical Service Panel.** The main electrical service panel must have a minimum busbar rating of 200 amps.
§ 110.10(e)2:	**Main Electrical Service Panel.** The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric".

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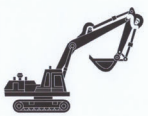
DATE: 1/4/23
DRAWN BY: A. Tangkilisan, D. Rachmadi

SHEET TITLE
TITLE 24 - MANDATORY MEASURES

T24-4

Heavy Equipment Operation

Best Management Practices for the Construction Industry



Best Management Practices for the

- Vehicle and equipment operators
- Site supervisors
- General contractors
- Home builders
- Developers

Doing The Job Right

Site Planning and Preventive Vehicle Maintenance

- ☐ Maintain all vehicles and heavy equipment. Inspect frequently for and repair leaks.
- ☐ Perform major maintenance, repair jobs, and vehicle and equipment washing off site where cleanup is easier.
- ☐ If you must drain and replace motor oil, radiator coolant, or other fluids on site, use drip pans or drop cloths to catch drips and spills. Collect all spent fluids, store in separate containers, and properly dispose as hazardous waste (recycle whenever possible).
- ☐ Do not use diesel oil to lubricate equipment parts, or clean equipment. Use only water for any onsite cleaning.
- ☐ Cover exposed fifth wheel hitches and other oily or greasy equipment during rain events.

Storm water Pollution from Heavy Equipment on Construction Sites

Poorly maintained vehicles and heavy equipment that leak fuel, oil, antifreeze or other fluids on the construction site are common sources of storm drain pollution. Prevent spills and leaks by isolating equipment from runoff channels, and by watching for leaks and other maintenance problems. Remove construction equipment from the site as soon as possible

Spill Cleanup

- ☐ Clean up spills immediately when they happen.
- ☐ Never hose down "dirty" pavement or impermeable surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags) whenever possible and properly dispose of absorbent materials.
- ☐ Sweep up spilled dry materials immediately. Never attempt to "wash them away" with water, or bury them.
- ☐ Use as little water as possible for dust control. Ensure water used doesn't leave silt or discharge to storm drains.
- ☐ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ☐ Report significant spills to the appropriate local spill response agencies immediately.
- ☐ If the spill poses a significant hazard to human health and safety, property or the environment, you must also report it to the State Office of Emergency Services

Roadwork and Paving

Best Management Practices for the Construction Industry

Best Management Practices for the

- Road crews
- Driveway/sidewalk/parking lot construction crews
- Seal coat contractors
- Operators of grading equipment, paving machines, dump trucks, concrete mixers
- Construction inspectors
- General contractors
- Home builders
- Developers

Doing The Job Right

General Business Practices

- ☐ Develop and implement erosion/sediment control plans for roadway embankments.
- ☐ Schedule excavation and grading work during dry weather.
- ☐ Check for and repair leaking equipment.
- ☐ Perform major equipment repairs at designated areas in your maintenance yard, where cleanup is easier. Avoid performing equipment repairs at construction sites.
- ☐ When refueling or when vehicle/equipment maintenance must be done on site, designate a location away from storm drains And creeks.
- ☐ Do not use diesel oil to lubricate equipment parts or clean equipment.
- ☐ Recycle used oil, concrete, broken asphalt, etc. whenever possible, or dispose of properly.

During Construction

- ☐ Avoid paving and seal coating in wet weather, or when rain is forecast, to prevent fresh materials from contacting stormwater runoff.
- ☐ Cover and seal catch basins and manholes when applying seal coat, slurry seal, fog seal, or similar materials.
- ☐ Protect drainage ways by using earth dikes, sand bags, or other controls to divert or trap and filter runoff.

Storm Drain Pollution from Roadwork

Road paving, surfacing, and pavement removal happen right in the street, where there are numerous opportunities for asphalt, saw-cut slurry, or excavated material to illegally enter storm drains. Extra planning is required to store and dispose of materials properly and guard against pollution of storm drains, creeks, and the Bay.

- ☐ Never wash excess material from exposed- aggregate concrete or similar treatments into a street or storm drain. Collect and recycle, or dispose to dirt area.
- ☐ Cover stockpiles (asphalt, sand, etc.) and other construction materials with plastic tarps. Protect from rainfall and prevent runoff with temporary roofs or plastic sheets and berms.
- ☐ Park paving machines over drip pans or absorbent material (cloth, rags, etc.) to catch drips when not in use.
- ☐ Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags), or dig up, remove, and properly dispose of contaminated soil.
- ☐ Collect and recycle or appropriately dispose of excess abrasive gravel or sand.
- ☐ Avoid over-application by water trucks for dust control.

Asphalt/Concrete Removal

- ☐ Avoid creating excess dust when breaking asphalt or concrete.
- ☐ After breaking up old pavement, be sure to remove all chunks and pieces. Make sure broken pavement does not come in contact with rainfall or runoff.
- ☐ When making saw cuts, use as little water as possible. Shovel or vacuum saw-cut slurry and remove from the site. Cover or protect storm drain inlets during saw-cutting. Sweep up, and properly dispose of, all residues.
- ☐ Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquor in storm drains.

Fresh Concrete and Mortar Application

Best Management Practices for the Construction Industry

Best Management Practices for the

- Masons and bricklayers
- Sidewalk construction crews
- Patio construction workers
- Construction inspectors
- General contractors
- Home builders
- Developers
- Concrete delivery/pumping workers

Doing The Job Right

General Business Practices

- ☐ Wash out concrete mixers only in designated wash-out areas in your yard, away from storm drains and waterways, where the water will flow into a temporary waste pit in a dirt area. Let water percolate through soil and dispose of settled, hardened concrete as garbage. Whenever possible, recycle washout by pumping back into mixers for reuse.
- ☐ Wash out chutes onto dirt areas at site that do not flow to streets or drains.
- ☐ Always store both dry and wet materials under cover, protected from rainfall and runoff and away from storm drains or waterways. Protect dry materials from wind.
- ☐ Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- ☐ Do not use diesel fuel as a lubricant on concrete forms, tools, or trailers.

Storm Drain Pollution from Fresh Concrete and Mortar Applications

Fresh concrete and cement-related mortars that wash into lakes, streams, or estuaries are toxic to fish and the aquatic environment. Disposing of these materials to the storm drains or creeks can block storm drains, causes serious problems, and is prohibited by law.

During Construction

- ☐ Don't mix up more fresh concrete or cement than you will use in a two-hour period.
- ☐ Set up and operate small mixers on tarps or heavy plastic drop cloths.
- ☐ When cleaning up after driveway or sidewalk construction, wash fines onto dirt areas, not down the driveway or into the street or storm drain.
- ☐ Protect applications of fresh concrete and mortar from rainfall and runoff until the material has dried.
- ☐ Wash down exposed aggregate concrete only when the wash water can (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be pumped and disposed of properly; or (3) be vacuumed from a catchment created by blocking a storm drain inlet. If necessary, divert runoff with temporary berms. Make sure runoff does not reach gutters or storm drains.
- ☐ When breaking up pavement, be sure to pick up all the pieces and dispose of properly. Recycle large chunks of broken concrete at a landfill.
- ☐ Never bury waste material. Dispose of small amounts of excess dry concrete, grout, and mortar in the trash.
- ☐ Never dispose of washout into the street, storm drains, drainage ditches, or streams.

Preventing Pollution: It's Up to Us

In the Santa Clara Valley, storm drains transport water directly to local creeks and San Francisco Bay without treatment. Storm water pollution is a serious problem for wildlife dependent on our waterways and for the people who live near polluted streams or bay lands. Some common sources of this pollution include spilled oil, fuel, and fluids from vehicles and heavy equipment; construction debris; sediment created by erosion; landscaping runoff containing pesticides or weed killers; and materials such as used motor oil, antifreeze, and paint products that people pour or spill into a street or storm drain.

Thirteen valley municipalities have joined together with Santa Clara County and the Santa Clara Valley Water District to educate local residents and businesses and fight storm water pollution. TO comply with this program, contractors most comply with the practices described this drawing sheet.

Spill Response Agencies

DIAL 9-1-1

State Office of Emergency Services Warning Center (24 hours): **800-852-7550**

Santa Clara County Environmental Health Services: (408) 299-6930

Local Pollution Control Agencies

County of Santa Clara Pollution Prevention Program: (408) 441-1195

County of Santa Clara Integrated Waste Management Program: (408) 441-1198

County of Santa Clara District Attorney Environmental Crimes Hotline: (408) 299-TIPS

Santa Clara County Recycling Hotline: 1-800-533-8414

Santa Clara Valley Water District: (408) 265-2600

Santa Clara Valley Water District Pollution Hotline: 1-888-510-5151

Regional Water Quality Control Board San Francisco Bay Region: (510) 622-2300

Palo Alto Regional Water Quality Control Plant: (650) 329-2598

Serving East Palo Alto Sanitary District, Los Altos, Los Altos Hills, Mountain View, Palo Alto, Stanford

City of Los Altos

Building Department: (650) 947-2752

Engineering Department: (650) 947-2780

Landscaping, Gardening, and Pool Maintenance

Best Management Practices for the Construction Industry

Best Management Practices for the

- Landscapers
- Gardeners
- Swimming pool/spa service and repair workers
- General contractors
- Home builders
- Developers
- Homeowners

Doing The Right Job

General Business Practices

- ☐ Protect stockpiles and landscaping materials from wind and rain by storing them under tarps or secured plastic sheeting.
- ☐ Store pesticides, fertilizers, and other chemicals indoors or in a shed or storage cabinet.
- ☐ Schedule grading and excavation projects during dry weather.
- ☐ Use temporary check dams or ditches to divert runoff away from storm drains.
- ☐ Protect storm drains with sandbags or other sediment controls.
- ☐ Re-vegetation is an excellent form of erosion control for any site

Landscaping/Garden Maintenance

- ☐ Use pesticides sparingly; according to instructions on the label. Rinse empty containers, and use rinse water as product. Dispose of rinsed, empty containers in the trash. Dispose of unused pesticides as hazardous waste.
- ☐ Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost.
- ☐ In communities with curbside pick-up of yard waste, place clippings and pruning waste at the curb in approved bags or containers. Or, take to a landfill that composts yard waste. No curbside pickup of yard waste is available for commercial properties.

Storm Drain Pollution From Landscaping and Swimming Pool Maintenance

Many landscaping activities expose soils and increase the likelihood that earth and garden chemicals will run off into the storm drains during irrigation or when it rains. Swimming pool water containing chlorine and copper-based algaecides should never be discharged to storm drains. These chemicals are toxic to aquatic life.

- ☐ Do not blow or rake leaves, etc. into the street, or place yard waste in gutters or on dirt shoulders, unless you are piling them for recycling (allowed by San Jose and unincorporated County only). Sweep up any leaves, litter or residue in gutters or on street.
- ☐ In San Jose, leave yard waste for curbside recycling pickup in piles in the street, 18 inches from the curb and completely out of the flow line to any storm drain.

Pool/Fountain/Spa Maintenance

Draining Pools Or Spas

When it's time to drain a pool, spa, or fountain, please be sure to call your local wastewater treatment plant before you start for further guidance on flow restrictions, backflow prevention, and handling special cleaning waste (such as acid wash). Discharge flows shall not exceed 100 gallon per minute.

- ☐ Never discharge pool or spa water to a street or storm drain; discharge to a sanitary sewer cleanout.
- ☐ If possible, when emptying a pool or spa, let chlorine dissipate for a few days and then recycle/reuse water by draining it gradually onto a landscaped area.
- ☐ Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.

Filter Cleaning

- ☐ Never clean a filter in the street or near a storm drain. Rinse cartridge and diatomaceous earth filters onto a dirt area, and spade filter residue into soil. Dispose of spent diatomaceous earth in the garbage.
- ☐ If there is no suitable dirt area, call your local wastewater treatment plant for instructions on discharging filter backwash or rinse water to the sanitary sewer.

Painting and Application of Solvents and Adhesives

Best Management Practices for the Construction Industry

Best Management Practices for the

- Homeowners
- Painters
- Paperhangers
- Plasterers
- Graphic artists
- Dry wall crews
- Floor covering installers
- General contractors
- Home builders
- Developers

Doing The Job Right

Handling Paint Products

- ☐ **Keep all liquid paint products and wastes away from the gutter, street, and storm drains.** Liquid residues from paints, thinners, solvents, glues, and cleaning fluids are hazardous wastes and must be disposed of at a hazardous waste collection facility (contact your local stormwater program listed on the back of this brochure).
- ☐ When thoroughly dry, empty paint cans, used brushes, rags, and drop cloths may be disposed of as garbage in a sanitary landfill. Empty, dry paint cans also may be recycled as metal.
- ☐ Wash water from painted buildings constructed before 1978 can contain high amounts of lead, even if paint chips are not present. Before you begin stripping paint or cleaning pre-1978 building exteriors with water under high pressure, test paint for lead by taking paint scrapings to a local laboratory. See Yellow Pages for a state-certified laboratory.
- ☐ If there is loose paint on the building, or if the paint tests positive for lead, block storm drains. Check with the wastewater treatment plant to determine whether you may discharge water to the sanitary sewer, or if you must send it offsite for disposal as hazardous waste.

Storm Drain Pollution from Paints, Solvents, and Adhesives

All paints, solvents, and adhesives contain chemicals that are harmful to wildlife in local creeks, San Francisco Bay, and the Pacific Ocean. Toxic chemicals may come from liquid or solid products or from cleaning residues or rags. Paint material and wastes, adhesives and cleaning fluids should be recycled when possible, or disposed of properly to prevent these materials from flowing into storm drains and watercourses.

Painting Cleanup

- ☐ **Never clean brushes or rinse paint containers into a street, gutter, storm drain, French 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 and residue as hazardous waste.

Paint Removal

- ☐ 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 tributyl tin must be disposed of as hazardous wastes. Lead based paint removal requires a certified contractor.
- ☐ When stripping or cleaning building exteriors with high-pressure water, block storm drains. Direct wash water onto a dirt area and spade into soil. Or, check with the local wastewater treatment authority to find out if you can collect (mop or vacuum) building cleaning water and dispose to the sanitary sewer. Sampling of the water may be required to assist the wastewater treatment authority in making its decision.

Recycle/Reuse Leftover Paints Whenever Possible

- ☐ Recycle or donate excess **water-based (latex) paint**, or return to supplier.
- ☐ Reuse leftover **oil-based paint**. Dispose of non-recyclable thinners, sludge and unwanted paint, as hazardous waste.
- ☐ Unopened cans of paint may be able to be returned to the paint vendor. Check with the vendor regarding its "buy-back" policy.

Los Altos Municipal Code Requirements

Los Altos Municipal Code Chapter 10.08.390 Non-storm water discharges

A. Unlawful discharges. It shall be unlawful to discharge any domestic waste or industrial waste into storm drains, gutters, creeks, or San Francisco Bay. Unlawful discharges to storm drains shall include, but not be limited to, discharge from toilets; sinks; industrial processes; cooling systems; boilers; fabric cleaning; equipment cleaning; vehicle cleaning; construction activities, washing, but not limited to, painting, paving, concrete placement, saw cutting and grading; swimming pools; spas; and fountains, unless specifically permitted by a discharge permit or unless exempted pursuant to guidelines published by the superintendent.

B. Threatened discharges. It shall be unlawful to cause hazardous materials, domestic waste, or industrial waste to be deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters, creeks or San Francisco Bay. A "threatened discharge" is a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce or mitigate damages to persons, property or natural resources. Domestic or industrial wastes that are no longer contained in a pipe, tank or other container are considered to be threatened discharges unless they are actively being cleaned up.

Los Altos Municipal Code Section 10.08.430 Requirements for construction operations.

A. A spill response plan for hazardous waste, hazardous materials and uncontained construction materials shall be prepared and available at the construction sites for all projects where the proposed construction site is equal to or greater than one acre of disturbed soil and for any other projects for which the city engineer determines is necessary to protect surface waters. Preparation of the plan shall be in accordance with guidelines published by the city engineer.

B. A storm water pollution prevention plan shall be prepared and available at the construction sites for all projects greater than one acre of disturbed soil and for any other projects for which the city engineer determines that a storm water management plan is necessary to protect surface waters. Preparation of the plan shall be in accordance with guidelines published by the city engineer.

C. Prior approval shall be obtained from the city engineer or designee to discharge water pumped from construction sites to the storm drain. The city engineer or designee may require gravity settling and filtration upon a determination that either or both would improve the water quality of the discharge. Contaminated groundwater or water that exceeds state or federal requirements for discharge to navigable waters may not be discharged to the storm drain. Such water may be discharged to the sewer, provided that the requirements of Section 10.08.240 are met and the approval of the superintendent is obtained prior to discharge.

D. No cleanup of construction debris from the streets shall result in the discharge of water to the storm drain system; nor shall any construction debris be deposited or allowed to be deposited in the storm drain system. (Prior code § 5-5.643)

Criminal and judicial penalties can be assessed for non-compliance.

General Construction And Site Supervision

Best Management Practices For Construction

Best Management Practices for the

- General contractors
- Site supervisors
- Inspectors
- Home builders
- Developers

Storm Drain Pollution from Construction Activities

Construction sites are common sources of storm water pollution. Materials and wastes that blow or wash into a storm drain, gutter, or street have a direct impact on local creeks and the Bay.

As a contractor, or site supervisor, owner or operator of a site, you may be responsible for any environmental damage caused by your subcontractors or employees.

Doing The Job Right

General Principals

- ☐ Keep an orderly site and ensure good housekeeping practices are used.
- ☐ Maintain equipment properly.
- ☐ Cover materials when they are not in use.
- ☐ Keep materials away from streets, storm drains and drainage channels.
- ☐ Ensure dust control water doesn't leave site or discharge to storm drains.

Advance Planning To Prevent Pollution

- ☐ Schedule excavation and grading activities for dry weather periods. To reduce soil erosion, plant temporary vegetation or place other erosion controls before rain begins. Use the *Erosion and Sediment Control Manual*, available from the Regional Water Quality Control Board, as a reference.
- ☐ Control the amount of runoff crossing your site (especially during excavation!) by using berms or temporary or permanent drainage ditches to divert water flow around the site. Reduce storm water runoff velocities by constructing temporary check dams or berms where appropriate.
- ☐ Train your employees and subcontractors. Make these best management practices available to everyone who works on the construction site. Inform subcontractors about the storm water requirements and their own responsibilities.

Good Housekeeping Practices

- ☐ Designate one area of the site for auto parking, vehicle refueling, and routine equipment maintenance. The designated area should be well away from streams or storm drain inlets, bermed if necessary. Make major repairs off site.
- ☐ Keep materials out of the rain – prevent runoff contamination at the source. Cover exposed piles of soil or construction materials with plastic sheeting or temporary roofs. Before it rains, sweep and remove materials from surfaces that drain to storm drains, creeks, or channels.
- ☐ Keep pollutants off exposed surfaces. Place trashcans and recycling receptacles around the site to minimize litter.
- ☐ Clean up leaks, drips and other spills immediately so they do not contaminate soil or groundwater or leave residue on paved surfaces. Use dry cleanup methods whenever possible. If you must use water, use just enough to keep the dust down.
- ☐ Cover and maintain dumpsters. Check frequently for leaks. Place dumpsters under roofs or cover with tarps or plastic sheeting secured around the outside of the dumpster. Never clean out a dumpster by hosing it down on the construction site.
- ☐ Set portable toilets away from storm drains. Make sure portable toilets are in good working order. Check frequently for leaks.

Materials/Waste Handling

- ☐ Practice Source Reduction — minimize waste when you order materials. Order only the amount you need to finish the job.
- ☐ Use recyclable materials whenever possible. Arrange for pick-up of recyclable materials such as concrete, asphalt, scrap metal, solvents, degreasers, cleared vegetation, paper, rock, and vehicle maintenance materials such as used oil, antifreeze, batteries, and tires.
- ☐ Dispose of all wastes properly. Many construction materials and wastes, including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste. Never bury waste materials or leave them in the street or near a creek or stream bed.

Permits

- ☐ In addition to local building permits, you will need to obtain coverage under the State's General Construction Activity Storm water Permit if your construction site disturbs one acre or more. Obtain information from the Regional Water Quality Control Board.

Earth-Moving And Dewatering Activities

Best Management Practices for the Construction Industry

Best Management Practices for the

- Bulldozer, back hoe, and grading machine operators
- Dump truck drivers
- Site supervisors
- General contractors
- Home builders
- Developers

Doing The Job Right

General Business Practices

- ☐ Schedule excavation and grading work during dry weather.
- ☐ Perform major equipment repairs away from the job site.
- ☐ When refueling or vehicle/equipment maintenance must be done on site, designate a location away from storm drains.
- ☐ Do not use diesel oil to lubricate equipment parts, or clean equipment.

Practices During Construction

- ☐ Remove existing vegetation only when absolutely necessary. Plant *temporary* vegetation for erosion control on slopes or where construction is not immediately planned.
- ☐ Protect down slope drainage courses, streams, and storm drains with wattles, or temporary drainage swales. Use check dams or ditches to divert runoff around excavations. Refer to the Regional Water Quality Control Board's *Erosion and Sediment Control Field Manual* for proper erosion and sediment control measures.

Storm Drain Pollution from Earth-Moving Activities and Dewatering

Soil excavation and grading operations loosen large amounts of soil that can flow or blow into storm drains when handled improperly. Sediments in runoff can clog storm drains, smother aquatic life, and destroy habitats in creeks and the Bay. Effective erosion control practices reduce the amount of runoff crossing a site and slow the flow with check dams or roughened ground surfaces.

Contaminated groundwater is a common problem in the Santa Clara Valley. Depending on soil types and site history, groundwater pumped from construction sites may be contaminated with toxics (such as oil or solvents) or laden with sediments. Any of these pollutants can harm wildlife in creeks or the Bay, or interfere with wastewater treatment plant operation.

Discharging sediment-laden water from a dewatering site into any water of the state without treatment is prohibited.

- ☐ Cover stockpiles and excavated soil with secured tarps or plastic sheeting.

Dewatering Operations

1. Check for Toxic Pollutants

- ☐ Check for odors, discoloration, or an oily sheen on groundwater.
- ☐ Call your local wastewater treatment agency and ask whether the groundwater must be tested.
- ☐ If contamination is suspected, have the water tested by a certified laboratory.
- ☐ Depending on the test results, you may be allowed to discharge pumped groundwater to the storm drain (if no sediments present) or sanitary sewer. OR, you may be required to collect and haul pumped groundwater offsite for treatment and disposal at an appropriate treatment facility.

2. Check for Sediment Levels

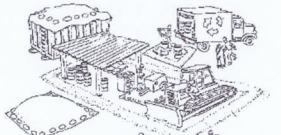
- ☐ If the water is clear, the pumping time is less than 24 hours, and the flow rate is less than 20 gallons per minute, you may pump water to the street or storm drain.
- ☐ If the pumping time is more than 24 hours and the flow rate greater than 20 gpm, call your local wastewater treatment plant for guidance.
- ☐ If the water is not clear, solids must be filtered or settled out by pumping to a settling tank prior to discharge. Options for filtering include:
  - Pumping through a perforated pipe sunk part way into a small pit filled with gravel;
  - Pumping from a bucket placed below water level using a submersible pump;
  - Pumping through a filtering device such as a swimming pool filter or filter fabric wrapped around end of suction pipe.
- ☐ When discharging to a storm drain, protect the inlet using a barrier of burlap bags filled with drain rock, or cover inlet with filter fabric anchored under the grate. OR pump water through a grassy swale prior to discharge.

Blueprint for a Clean Bay

Remember: The property owner and the contractor share ultimate responsibility for the activities that occur on a construction site. You may be held responsible for any environmental damage caused by your subcontractors or employees.

Best Management Practices for the Construction Industry

Santa Clara Urban Runoff Pollution Prevention Program



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MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/4/23
DRAWN BY: A. Tangkilisan
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SHEET TITLE

CLEAN BAY GUIDELINES

GB-0

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
Chapter 1 – ADMINISTRATION	
	Scope
101.3.1	Applies to ALL newly constructed residential buildings: low-rise, high-rise, and hotels/motels.
102.3	Requires a completed Residential Occupancies Application Checklist or alternate method acceptable to the enforcing agency to be used for documentation of conformance.
Chapter 3 – GREEN BUILDING	
	Additions and alterations
301.1.1	• Applies to additions or alterations of residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. • Requirements only apply within the specific area of the addition or alteration.
	Low-rise and high-rise residential buildings
301.2	Banners identify provisions applying to low-rise only [LR] or high-rise only [HR].
	Mixed occupancy buildings
302.1	Requires each portion of mixed occupancy buildings to comply with CALGreen measures applicable for the specific occupancy. **Exceptions:** • Accessory structures and accessory occupancies serving residential buildings to comply with Chapter 4 and Appendix A4, as applicable. • Live/work units complying with the California Building Code Section 419 shall not be considered a mixed occupancy. Live/work units are required to comply with Chapter 4 and Appendix A4, as applicable.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

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2019 CALGREEN CODE

SECTION	REQUIREMENTS
Chapter 4 – RESIDENTIAL MANDATORY MEASURES	
Division 4.1 – PLANNING AND DESIGN	
	Storm water drainage and retention during construction
4.106.2	Projects which disturb less than 1 acre of soil and are not part of a larger common plan of development shall manage storm water drainage during construction.
	Grading and paving
4.106.3	Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. **Exception:** Additions and alterations which do not alter the existing drainage path.
	Electric vehicle (EV) charging for new construction
4.106.4	• Comply with Section 4.106.4.1, 4.106.4.2 or 4.106.4.3 for future installation and use of EV chargers. • Electric vehicle supply equipment (EVSE) shall be installed in accordance with the California Electrical Code, Article 625. **Exceptions:** 1. On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon 1 of the following: 1.1. Where there is no commercial power supply. 1.2. Verification that meeting requirements will alter the local utility infrastructure design requirements on the utility side of the meter increasing costs to the homeowner/developer by more than $400.00 per dwelling unit. 2. Accessory Dwelling Units and Junior Accessory Dwelling Units without additional parking facilities. **Note:** For definitions of Accessory Dwelling Units and Junior Accessory Units, see CALGreen Chapter 2.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

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2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging: 1- & 2-family dwellings/townhouses with attached private garages
4.106.4.1	• Install a listed raceway to accommodate a dedicated 208/240-volt branch circuit for each dwelling unit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. • Raceways are required to be continuous at enclosed, inaccessible, or concealed areas and spaces. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.
	Identification
4.106.4.1.1	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."
	EV charging for multifamily dwellings
4.106.4.2	• Applies to all multifamily dwelling units with parking facilities on the site. • 10% of the total number of parking spaces provided for all types of parking facilities, but in no case less than 1, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the number of EV spaces shall be rounded up to the nearest whole number. **Note:** Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging space (EV space) locations
4.106.4.2.1	Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided at least 1 EV space shall be located in the common use parking areas and shall be available for use by all residents.
	EV charging stations (EVCS)
4.106.4.2.1.1	When EV chargers are installed, EV spaces (required by Section 4.106.4.2.2, Item 3,) shall comply with at least 1 of the following options: 1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the California Building Code, Chapter 11A, to allow use of the EV charger from the accessible parking space. 2. The EV space shall be located on an accessible route to the building, as defined in the California Building Code, Chapter 2. **Exception:** EVCS designed and constructed in compliance with the California Building Code Chapter 11B are not required to comply with Section 4.106.4.2.1.1 and Section 4.106.4.2.2, Item 3.
	EV charging space (EV space) dimensions
4.106.4.2.2	EV spaces shall be designed to comply with the following: 1. The minimum length of each EV space shall be 18 feet. 2. The minimum width of each EV space shall be 9 feet. 3. 1 in every 25 EV spaces, but not less than 1, shall also have an 8-foot wide minimum aisle. A 5-foot wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet. a. Surface slope for this EV space and aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083% slope) in any direction.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Single EV space required
4.106.4.2.3	• Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV space. • Construction documents shall identify the raceway termination point. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.
	Multiple EV spaces required
4.106.4.2.4	• Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics, and electrical load calculations to verify electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. • Plan design shall be based upon a 40-ampere minimum branch circuit. • Required raceways and related components planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.
	Identification
4.106.4.2.5	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging for hotels and motels
4.106.4.3	• Applies to all newly constructed hotels and motels. • Construction documents shall identify the location of EV spaces. **Note:** Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.
	Number of required EV spaces
4.106.4.3.1	**Table 4.106.4.3.1** shows the number of required EV spaces based on the total number of parking spaces provided for all types of parking facilities.
	EV charging space (EV space) dimensions
4.106.4.3.2	EV spaces shall be designed to comply with the following: • Minimum length of each EV space shall be 18 feet. • Minimum width of each EV space shall be 9 feet.
	Single EV space required (similar to 4.106.4.2.3)
4.106.4.3.3	• Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV space. • Construction documents shall identify the raceway termination point. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Multiple EV spaces required (similar to 4.106.4.2.4)
4.106.4.3.4	• Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. • Plan design shall be based upon a 40-ampere minimum branch circuit. • Required raceways and related components planned to be installed underground, enclosed, inaccessible or, in concealed areas and spaces shall be installed at the time of original construction.
	Identification (similar to 4.106.4.2.5)
4.106.4.3.5	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.
	Accessible EV spaces
4.106.4.3.6	In addition to the requirements in Section 4.106.4.3, EV spaces for hotels/motels and all EVSE, when installed, shall comply with the accessibility provisions for EV charging stations in the California Building Code, Chapter 11B.
Division 4.2 – ENERGY EFFICIENCY	
	Scope
4.201.1 & 5.201.1	• Energy efficiency requirements for low-rise residential (Section 4.201.1) and high-rise residential/hotels/motels (Section 5.201.1) are now in both residential and nonresidential chapters of CALGreen. • Standards for residential buildings do not require compliance with levels of minimum energy efficiency beyond those required by the 2019 California Energy Code.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
Division 4.3 – WATER EFFICIENCY AND CONSERVATION	
	Water conserving plumbing fixtures and fittings
4.303.1	Plumbing fixtures and fittings shall comply with the following: **4.303.1.1** – Water closets: ≤ 1.28 gal/flush. **4.303.1.2** – Wall mounted urinals: ≤ 0.125 gal/flush; all other urinals ≤ 0.5 gal/flush. **4.303.1.3.1** – Single showerheads: ≤ 1.8 gpm @ 80 psi. **4.303.1.3.2** – Multiple showerheads: combined flow rate of all showerheads controlled by a single valve shall not exceed 1.8 gpm @ 80 psi, or only 1 shower outlet is to be in operation at a time. **4.303.1.4.1** – Residential lavatory faucets: maximum flow rate ≤ 1.2 gpm @ 60 psi; minimum flow rate ≥ 0.8 gpm @ 20 psi. **4.303.1.4.2** – Lavatory faucets in common and public use areas of residential buildings: ≤ 0.5 gpm @ 60 psi. **4.303.1.4.3** – Metering faucets: ≤ 0.2 gallons per cycle. **4.303.1.4.4** – Kitchen faucets: ≤ 1.8 gpm @ 60 psi; temporary increase to 2.2 gpm allowed but shall default to 1.8 gpm.
	Standards for plumbing fixtures and fittings
4.303.2	Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet applicable standards referenced in Table 1701.1 of the California Plumbing Code.
	Outdoor potable water use in landscape areas
4.304.1	New residential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.
Division 4.4 – MATERIAL CONSERVATION & RESOURCE EFFICIENCY	
	Rodent proofing
4.406.1	Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be closed with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency to prevent passage of rodents.

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MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/4/23
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SHEET TITLE

CALGreen Residential Mandatory Measures

GB-1

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Construction waste management
4.408.1	• Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance. • Provide documentation to the enforcing agency per Section 4.408.5. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternative waste reduction methods developed by working with local enforcing agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite. 3. The enforcing agency may make exceptions to the requirements of this section when isolated jobsites are located in areas beyond the haul boundaries of the diversion facility.
	Construction waste management plan
4.408.2	Submit a construction waste management plan meeting Items 1 through 5 in Section 4.408.2. Plans shall be updated as necessary and shall be available for examination during construction.
	Waste management company
4.408.3	Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that diverted construction and demolition waste materials meet the requirements in Section 4.408.1.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Waste stream reduction alternative [LR]
4.408.4 & 4.408.4.1	• Projects that generate a total combined weight of construction and demolition waste disposed in landfills, which do not exceed 3.4 pounds per square foot of the building area shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1. • Projects that generate a total combined weight of construction and demolition waste disposed in landfills, which do not exceed 2 pounds per square foot of the building area, shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1.
	Operation and maintenance manual
4.410.1	At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which covers 10 specific subject areas shall be placed in the building.
	Recycling by occupants
4.410.2	Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible area(s) that serves all buildings on the site and is identified for the depositing, storage and collection of nonhazardous materials for recycling, including (at minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals, or meet a lawfully enacted local recycling ordinance, if more restrictive. **Exception:** Rural jurisdictions that meet and apply for the exemption in Public Resources Code Section 42649.82 (a)(2)(A) et seq. are not required to comply with the organic waste portion of this section.
Division 4.5 – ENVIRONMENTAL QUALITY	
	Fireplaces - General
4.503.1	Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits. Woodstoves, pellet stoves, and fireplaces shall also comply with all applicable local ordinances.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Protection of mechanical equipment during construction
4.504.1	At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air intake and distribution component openings shall be covered. Tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of water, dust and debris entering the system may be used.
	Adhesives, sealants and caulks
4.504.2.1	Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality management district rules apply: 1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products shall also comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products, as specified in Subsection 2. 2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations (CCR), Title 17, commencing with Section 94507.
	Paints and coatings
4.504.2.2	Architectural paints and coatings shall comply with VOC limits in Table 1 of the Air Resources Board Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat, or Nonflat-high Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat, or Nonflat-high Gloss VOC limit in Table 4.504.3 shall apply.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Aerosol paints and coatings
4.504.2.3 & 4.504.2.4	• Aerosol paints and coatings shall meet the Product-weighted MIR Limits for ROC in Section 94522(a)(2) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(e)(1) and (f)(1) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District shall additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49. • Documentation is required per Section 4.504.2.4.
	Carpet systems
4.504.3	Carpet installed in the building interior shall meet the testing and product requirements of 1 of the following: 1. Carpet and Rug Institute's Green Label Plus Program. 2. California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350). 3. NSF/ANSI 140 at the Gold level. 4. Scientific Certifications Systems Indoor Advantage™ Gold.
	Carpet cushion
4.504.3.1	Carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program.
	Carpet adhesive
4.504.3.2	Carpet adhesives shall meet the requirements of Table 4.504.1.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Resilient flooring systems
4.504.4	Where resilient flooring is installed, at least 80% of floor area receiving resilient flooring shall comply with 1 or more of the following: 1. Products compliant with the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Products Database. 2. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children & Schools program). 3. Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program. 4. Meet the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350).
	Composite wood products
4.504.5 & 4.504.5.1	• Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in the Air Resources Board's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), as shown in Table 4.504.5. • Documentation is required per Section 4.504.5.1. • Definition of Composite Wood Products: Composite wood products include hardwood plywood, particleboard, and medium density fiberboard. "Composite wood products" do not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood I-joists, or finger-joined lumber, all as specified in CCR, Title 17, Section 93120.1(a).

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Concrete slab foundations
4.505.2	Concrete slab foundations or concrete slab-on-ground floors required to have a vapor retarder by the California Building Code, Chapter 19, or the California Residential Code, Chapter 5, respectively, shall also comply with this section.
	Capillary break
4.505.2.1	A capillary break shall be installed in compliance with at least 1 of the following: 1. A 4-inch thick base of ⅜ inch or larger clean aggregate shall be provided with a vapor retarder in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06. 2. Other equivalent methods approved by the enforcing agency. 3. A slab design specified by a licensed design professional.
	Moisture content of building materials
4.505.3	Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content. Moisture content shall be verified in compliance with the following: 1. Moisture content shall be determined with either a probe-type or a contact-type moisture meter. Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements in Section 101.8. 2. Moisture readings shall be taken at a point 2 feet to 4 feet from the grade stamped end of each piece to be verified. 3. At least 3 random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing. Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Manufacturers' drying recommendations shall be followed for wet-applied insulation products prior to enclosure.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Bathroom exhaust fans
4.506.1	Each bathroom shall be mechanically ventilated and shall comply with the following: 1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building. 2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control. a. Humidity controls shall be capable of manual or automatic adjustment between a relative humidity range of ≤ 50% to a maximum of 80%. b. A humidity control may be a separate component to the exhaust fan and is not required to be integral or built-in. **Note:** For CALGreen, a bathroom is a room which contains a bathtub, shower, or tub/shower combination. Fans or mechanical ventilation is required in each bathroom.
	Heating and air-conditioning system design
4.507.2	Heating and air-conditioning systems shall be sized, designed and equipment selected using the following methods: 1. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J – 2016 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods. 2. Duct systems are sized according to ANSI/ACCA 1 Manual D – 2016 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods. 3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S – 2014 (Residential Equipment Selection) or other equivalent design software or methods. **Exception:** Use of alternate design temperatures necessary to ensure the systems function are acceptable.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
CHAPTER 7 – INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS	
	Installer training
702.1	HVAC system installers shall be trained and certified in the proper installation of HVAC systems and equipment by a recognized training or certification program. Examples of acceptable HVAC training and certification programs include, but are not limited to, the following: 1. State certified apprenticeship programs. 2. Public utility training programs. 3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations. 4. Programs sponsored by manufacturing organizations. 5. Other programs acceptable to the enforcing agency.
	Special inspection
702.2	When required by the enforcing agency, special inspectors must be qualified and able to demonstrate competence to the enforcing agency in the discipline in which they are inspecting.
	Documentation
703.1	Documentation of compliance shall include, but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the local enforcing agency. Other specific documentation or special inspections necessary to verify compliance are specified in appropriate sections of CALGreen.

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537 Osprey Dr
Redwood Shores
CA | 94065
650.576.4379
annydesigns.com

Nisha + Sameer **Kelkar**

1769 Jeffrey Ct
Santa Clara
CA | 95051
Phone: 408-480-5831

MARK	DATE	DESCRIPTION

PROJECT NO: 10605
DATE: 1/4/23
DRAWN BY: A. Tangkilisan
D. Rachmadi

SHEET TITLE

CALGreen Residential Mandatory Measures

GB-2

GENERAL NOTES

ALL MATERIAL AND WORKMANSHIP SHALL CONFORM WITH REQUIREMENTS OF THE 2019 EDITION OF THE CALIFORNIA BUILDING CODE. VERIFY ALL EXISTING CONDITIONS AND PROPOSED DIMENSIONS AT JOB SITE.

SAFETY MEASURES:
AT ALL TIMES THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF THE PERSONS AND PROPERTY, AND FOR ALL NECESSARY INDEPENDENT ENGINEERING REVIEWS OF THESE CONDITIONS. THE ARCHITECT'S OR ENGINEER'S JOB SITE REVIEW IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, PROVIDE SHORING WHERE REQ'D.

DESIGN CRITERIA:

DESIGN DEAD LOAD: ROOF = 14.0 PSF
FLOOR = 8.0 PSF

DESIGN LIVE LOAD: ROOF = 20.0 PSF
FLOOR = 40.0 PSF

SEISMIC DESIGN PARAMETERS: LONGITUDE = 37.3551
LATITUDE = −122.9796

SITE CLASS D
SD_s = 1.2
S_1 = 0.6
SEISMIC DESIGN CATEGORY D

WIND: BASIC WIND SPEED = 110 MPH
EXPOSURE B

FOUNDATIONS:
EXCEPT WHERE OTHERWISE SHOWN, EXCAVATIONS SHALL BE MADE AS NEAR AS POSSIBLE TO THE NEAT LINE REQUIRED BY THE SIZE AND SHAPE OF THE STRUCTURE.

ALL FOUNDATIONS SHALL BE POURED IN NEAT EXCAVATIONS WITHOUT THE USE OF SIDE FORMS WHEREVER POSSIBLE.

ALL EXCAVATIONS, FORMS AND REINFORCING ARE TO BE INSPECTED BY THE LOCAL BUILDING INSPECTOR PRIOR TO PLACING CONCRETE.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE LOCATIONS OF THE PROPERTY LINES. ALL WORKS SHALL BE PERFORMED WITHIN THE PROPERTY AND SET BACK LINES.

CONCRETE:
A. CONCRETE FOR ALL SLAB AND FOOTINGS SHALL HAVE A MIN. ULTIMATE COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS.
B. MINIMUM CEMENT CONTENT SHALL BE 5 SACKS PER CUBIC YARD.
C. MAXIMUM AGGREGATE SIZE SHALL BE ¾". MAXIMUM SLUMP SHALL BE 4".

REINFORCING STEEL:
SHALL BE DEFORMED BARS OF BILLET OR AXLE STEEL GRADE 40 FOR #4 AND SMALLER, GRADE 60 FOR #5 BAR AND LARGER PER ASTM A615–68.

EPOXY:
SHALL BE SIMPSON SET–XP OR HILTI–RE500.

PLYWOOD:
A. FLOOR SHALL BE ¾" CDX T&G, GLUED TO TOP OF JOISTS & BEAMS, WITH 10d @ 6"o.c. EDGES, 10"o.c. FIELD.
B. ROOF SHALL BE ½" CDX WITH 10d @ 6"o.c. EDGES, 12"o.c. FIELD.
C. WALL PLYWOOD SHALL BE ½" CDX, NAILING AS SHOWN ON PLAN.

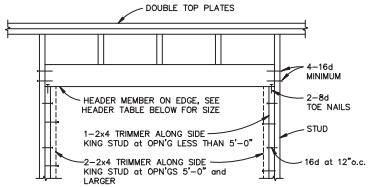
LUMBER:
A. 3x SILLS, TREATED DOUGLAS FIR. PROVIDE SIMPSON BPS ⅝–3 BEARING PLATE AT ALL ANCHOR BOLT. BOTTOM OF MUD SILL MUST BE 8" ABOVE THE ADJACENT GRADE.
B. STRUCTURAL JOISTS, PLANKS AND STRINGERS DOUGLAS FIR. No.2, ALL NAILING SHALL BE CBC BUILDING CODE TABLE No. 2304.9.1 EXCEPT AS NOTED OTHERWISE. ALL LUMBERS SHALL HAVE 19 PERCENT MOISTURE CONTENT OR BETTER BEFORE THE INSTALLATION OF PLYWOOD.
C. ALL CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS SHALL BE MADE WITH SIMPSON STANDARD FASTENERS.
D. MULTIPLE JOISTS AND STUDS, WITH 16d AT 16"O.C. STAGG AT EACH MEMBER.
E. ALL NAILS SHALL BE COMMON NAIL. PRESSURE PROVIDE H.D. GALVANIZED NAILS & CONNECTORS TO MUD SILL AND ALL TREATED MEMBERS.
F. ALL LUMBER IN CONTACT WITH CONCRETE OR EXPOSED TO WEATHER SHALL BE PRESSURE TREATED.

Schedule of Minimun Permissible Nailing

Member to be Nailed	Supporting Member	Nailing
Studs to bearing	2x, 3x studs	2–16d nails (toe–up) or 2–8d toenails each side
Double top plates	Lower plate to stud	2–16d
	Upper to lower staggered	16d at 12"o.c. except at lap
	Lap at splices	8–16d
Joist, Rafter	To bearing	2–16d toenails each side
Upper sole plate	To joist or blocking	16d at 8"o.c.
Blocking	To joist or rafter	2–16d toenails each end
Horizontal blocking	To studs	2–16d toenails each end
Multiple studs	Each layer	16d at 12"o.c. staggered
Multiple members	To adjacent member	16d at 12"o.c. along each edge
Plywood	To blocking	See Roof Sheathing and Floor Sheathing section below.
Plywood nails shown on plans, but not noted for size or spacing	To supporting member	Plywood edge nailing
Nails shown on plans, but not noted for size or spacing	To adjacent member	16d at 12"o.c.

all nails shall be common wire nails. Predrill nail holes to 70% of nail shank diameter where nailing tends to split wood.

SPECIAL INSPECTION:
AS REQUIRED PER BUILDING CODE CHAPTER 17A FOR PLACEMENT OF REINFORCING STEELS, PLYWOOD NAILING, HOLDOWNS AND WELDING.

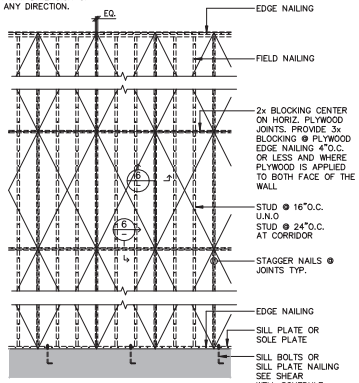


HEADER SCHEDULE

WIDTH OF OPENING	STUD WIDTH SIZE	
	2x4	2x6
5'–0" MAX.	4x8	6x8
8'–0" MAX.	3 ½"x9 ¼" PSL	5 ¼"x9 ¼" PSL
OVER 8'–0"	5 ¼"x11⅞" PSL	

DETAIL 8 — NO SCALE

NOTE:
STRUCTURAL SHEATHING SHALL HAVE A MIN. DIMENSION OF 24" IN ANY DIRECTION.



TYPICAL SHEARWALL

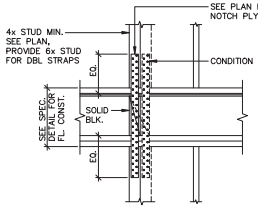
DETAIL 4 — 3/4" = 1'–0"

ZONE	PLYWOOD CDX	EDGE NAILING 10d at	FIELD NAILING 10d at	SOLE & NAILING	FRAMING CLIP at TOP &	A. BOLT TO CONC. ⅝"ø MIN.
6	1/2" PLY.	6"o.c.	12"o.c.	16d at 6"o.c.	A35 at 16"o.c.	at 48"o.c.
4	1/2" PLY.	4"o.c.	12"o.c.	16d at 4"o.c.	A35 at 8"o.c.	at 32"o.c.
3	1/2" PLY.	3"o.c.	12"o.c.	16d at 3"o.c.	A35 at 8"o.c.	at 16"o.c.
2	1/2" PLY.	2"o.c.	12"o.c.	SDS SCREWS @ 4"o.c.	A35 at 6"o.c.	at 16"o.c.
2 2	1/2" PLY. BOTH FACE	2"o.c.	12"o.c.	SDS SCREWS @ 4"o.c.	A35 at 6"o.c.	N.A.

1. PROVIDE 3x STUD AND BLOCKING AT ADJOINING PLYWOOD EDGES WITH NAILING 4"o.c. OR LESS.
2. PROVIDE BLOCKING AT ALL UNSUPPORT PLYWOOD EDGE. USE 3x BLOCK FOR 4" NAILING AND CLOSER.
3. WHERE PANELS ARE APPLIED ON BOTH FACES OF A WALL AND NAIL 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 AND NAILS ON EACH SIDE SHALL BE STAGGERED.
4. WHERE PLYWOOD EDGE NAIL SPACING IS LESS THAN 6"o.c. FOUNDATION SILL PLATES AND ALL FRAMING MEMBERS RECEIVING EDGE NAILING FROM ABUTTING PANELS SHALL NOT BE LESS THAN A SINGLE 3" NOMINAL MEMBER. NAILS SHALL BE STAGGERED.
5. GALVANIZED NAILS SHALL BE HOT DIPPED OR TUMBLED.
6. ALL SCREWS SHALL BE SIMPSON SDS ¼"x6".
7. PLYWOOD SHALL NOT BE LESS THAN 24" IN EITHER DIRECTION AS SHEAR WALLS.
8. ANCHOR BOLTS SHALL HAVE A MINIMUM EMBEDMENT OF 7" INTO THE CONCRETE.
9. PROVIDE SIMPSON BPS⅝–3 BEARING PLATE TO ANCHOR BOLTS AT 1ST FLOOR.
10. EXTEND SHEAR PLYWOOD OVER ALL OPENING TO ADJACENT PARTITION FOR UNIFORM WALL THICKNESS.

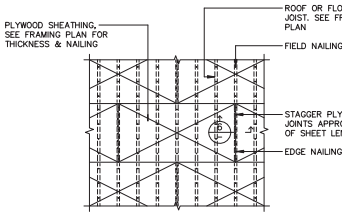
SHEAR WALL NAILING SCHEDULE

SCHEDULE 1 — NO SCALE



TYPICAL TIE STRAP AT FLOOR FRAMING

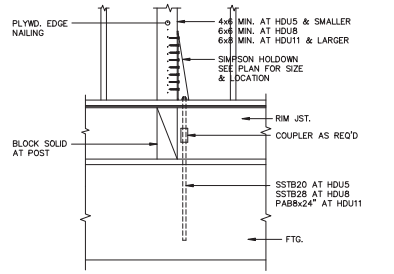
DETAIL 9 — 3/4" = 1'–0"



PLAN VIEW

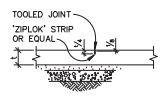
TYPICAL PLYWOOD FLOOR & ROOF SHEATHING DETAIL

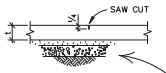
DETAIL 5 — 3/4" = 1'–0"

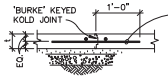


TYPICAL HOLDOWN AT NEW FOUNDATION

DETAIL 2 — 3/4" = 1'–0"





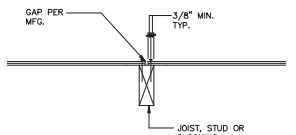


SHRINKAGE JOINT (S.J.)
SEE NOTES 3 AND 4

NOTES:
1. FOR SLAB THICKNESS, REINFORCEMENT, AND CONTROL JOINT LOCATIONS, SEE PLAN.
2. LOCATE W.P.J. TO ENCLOSE APPROXIMATE SQUARE AREAS OF 600 SQ. FT. MAXIMUM.
3. LOCATE S.J. TO ENCLOSE APPROXIMATE AREAS OF 2,400 SQ. FT. MAXIMUM.
4. SHRINKAGE JOINTS (S.J.) MAY BE USED AS CONSTRUCTION JOINTS (C.J.) FOR SLABS ON GRADE, WHERE NEEDED, WD. EDGE FORMS WITH BEVELED 1x KEYS x 12" LONG at 24"o.c., MAY BE USED IN LIEU OF KEYED KOLD JOINTS.

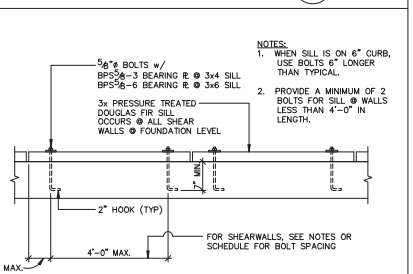
CONTROL JOINTS (C.J.)

DETAIL 10 — 3/4" = 1'–0"



TYPICAL DETAIL AT PLYWOOD JOINT

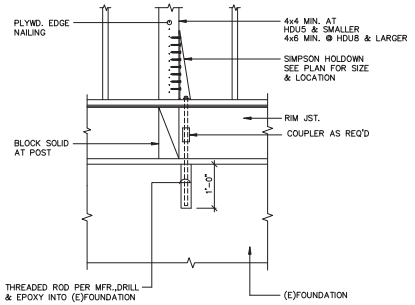
DETAIL 6 — 3/4" = 1'–0"



NOTES:
1. WHEN SILL IS ON 6" CURB, USE BOLTS 6" LONGER THAN TYPICAL.
2. PROVIDE A MINIMUM OF 2 BOLTS FOR SILL @ WALLS LESS THAN 4'–0" IN LENGTH.

BOLT SPACING AT SILL PLATE

DETAIL 7 — 3/4" = 1'–0"



TYPICAL HOLDOWN AT EXISTING FOUNDATION

DETAIL 3 — 3/4" = 1'–0"

REVISIONS	BY

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Consulting Structural Engineer
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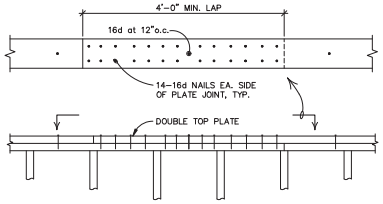
Email: dominic@dominicchu.com

REGISTERED PROFESSIONAL ENGINEER — DOMINIC S.K. CHU — S.E. 2360 — Exp. 03/31/2024 — STRUCTURAL — STATE OF CALIFORNIA

GENERAL NOTES & TYPICAL DETAILS

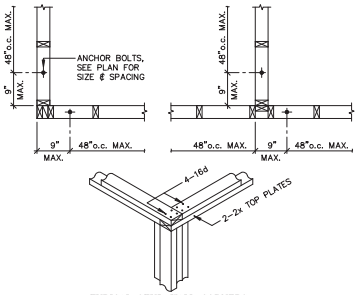
NISHA & SAMEER KELKAR
1769 JEFFREY CT.,
SANTA CLARA, CALIFORNIA

DATE	11/29/2022
SCALE	AS NOTED
DRAWN	D.C./c.a.d.
JOB	22353
SHEET	S1.1
OF	SHEETS



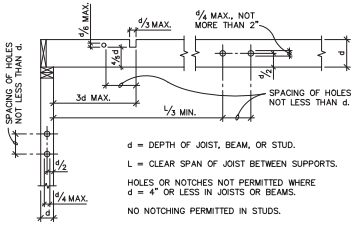
TYPICAL WALL TOP PLATE LAP

DETAIL 1
3/4" = 1'-0"



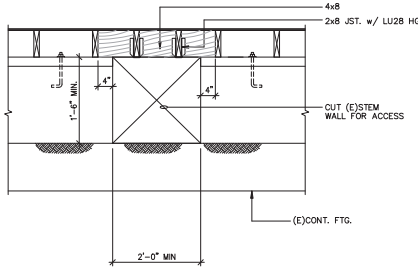
TYPICAL STUD WALL CORNERS

DETAIL 2
3/4" = 1'-0"



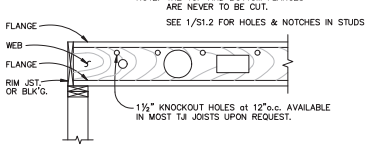
TYPICAL HOLES OR NOTCHES IN JOISTS AND STUDS

DETAIL 3
NO SCALE



TYPICAL DETAIL AT CRAWL SPACE ACCESS

DETAIL 4
3/4" = 1'-0"



INSTRUCTIONS:
1. KNOWNING JOISTS DEPTH AND DESIRED HOLE SIZE, FIND 'FACTOR' ON TABLE 1.
2. REFER TO TABLE 2. THE DIMENSION SHOWN WHERE THE 'FACTOR' INTERSECT IS THE MINIMUM DISTANCE FROM ℄ OF SUPPORT TO ℄ OF HOLE.

EXAMPLE: 12" TJI JOIST, 5"ø HOLE, 17'-0" SPAN
1. FROM TABLE 1, FACTOR IS 'C'
2. FROM TABLE 2, THE ℄ OF HOLE MUST BE AT LEAST 3'-3" FROM ℄ OF SUPPORT.

TABLE 1 (HOLE FACTOR)

JOIST DEPTH	ROUND HOLE	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"
	SQUARE HOLE	1¾"	2¾"	3¾"	4"	4¾"	5½"	6½"	7½"	8"	8¾"
	10"	A	B	C	E						

TABLE 2 (DISTANCE FROM ℄ SUPPORT TO ℄ HOLE)

SPAN	HOLE FACTOR A	B	C	D	E
14'-0"	1'-3"	2'-0"	2'-9"	3'-6"	4'-0"
15'-0"	1'-6"	2'-3"	3'-0"	3'-9"	4'-6"
16'-0"	1'-6"	2'-3"	3'-0"	4'-0"	4'-9"
17'-0"	1'-6"	2'-6"	3'-3"	4'-3"	5'-0"
18'-0"	1'-9"	2'-6"	3'-6"	4'-6"	5'-3"
19'-0"	1'-9"	2'-9"	3'-9"	4'-9"	5'-6"
20'-0"	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"

NOTES:

HOLE SIZES: THE SIZES GIVEN IN THE TABLE ARE HOLE SIZES, NOT DUCT SIZES.

ROUND HOLES: FOR SIMPLE SPANS AND UNIFORM LOADS, USE THE TABLE TO DETERMINE THE HOLE SIZE.

SQUARE HOLES: SQUARE HOLE SIZE ARE DETERMINED BY MUTIPLYING THE MAX. ROUND HOLE DIAMETER BY A FACTOR OF 0.8.

RECTANGULAR HOLES: MUTIPLY THE MAX. ROUND HOLE DIAMETER BY A FACTOR OF 0.8. THIS REPRESENTS THE LONGEST SIDE OF THE RECTANGULAR.

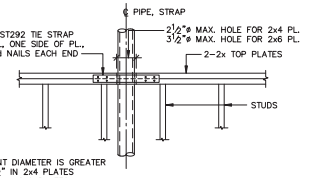
MULTIPLE HOLES: WHERE MORE THAN ONE HOLE IS DESIRED, THE AMOUNT OF WOOD BETWEEN HOLES MUST EQUAL OR EXCEED TWICE THE DIAMETER OF THE LARGEST HOLE OR TWICE THE SIZE OF THE LARGEST SQUARE HOLE.

CANTILEVERS AND CONTINUOUS SPANS: FOR UNIFORMLY LOADED CANTILEVERS ANS CONTINUOUS TJI JOIST SERIES, THE HOLES MUST BE LOCATED ONE INCH FURTHER FROM THE SUPPORT FOR EACH FOOT OF CLEAR SPAN IN ADDITION TO THE VALUES INDICATED IN THE TABLE.

NOTE:
EXCEPTIONS TO THESE RULES MAY BE POSSIBLE THROUGH SPECIAL INQUIRY.

HOLE CHART/OSB WEB MATERIAL

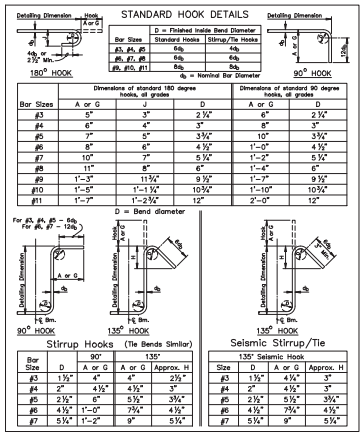
SCHEDULE 5
NO SCALE



NOTE:
WHEN VENT DIAMETER IS GREATER THAN 2½" IN 2x4 PLATES AND 3½" IN 2x6 PLATES, USE TIE STRAP ON BOTH SIDES.

TYPICAL PLATE SPLICE
(WHEN VENT IS > 1/3 THE STUD WIDTH)

DETAIL 6
3/4" = 1'-0"



Bar Sizes	D = Finished Inside Bend Diameter: Standard Hooks	Stirrup/Tie Hooks
#3, #4, #5	$6d_b$	$4d_b$
#6, #7, #8	$6d_b$	$6d_b$
#9, #10, #11	$8d_b$	$8d_b$

d_b = Nominal Bar Diameter

Bar Sizes	Dimensions of standard 180 degree hooks, all grades: A or G	J	D	Dimensions of standard 90 degree hooks, all grades: A or G	D
#3	5"	3"	2½"	6"	2½"
#4	6"	4"	3"	8"	3"
#5	7"	5"	3¾"	10"	3¾"
#6	8"	6"	4½"	1'-0"	4½"
#7	10"	7"	5¼"	1'-2"	5¼"
#8	11"	8"	6"	1'-4"	6"
#9	1'-3"	11¼"	9½"	1'-7"	9½"
#10	1'-5"	1'-1¼"	10¾"	1'-10"	10¾"
#11	1'-7"	1'-2¾"	12"	2'-0"	12"

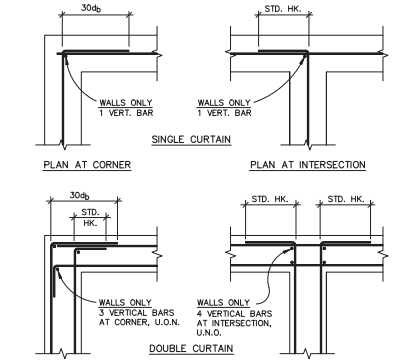
Stirrup Hooks (Tie Bends Similar)

Bar Size	D	90° A or G	135° A or G	135° Approx. H
#3	1½"	4"	4"	2½"
#4	2"	4½"	4½"	3"
#5	2½"	6"	5½"	3¾"
#6	4½"	1'-0"	7¾"	4½"
#7	5¼"	1'-2"	9"	5¼"

Seismic Stirrup/Tie

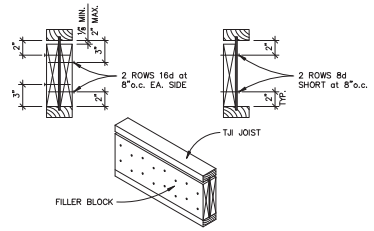
Size	D	135° Seismic Hook A or G	Approx. H
#3	1½"	4¼"	3"
#4	2"	4½"	3"
#5	2½"	5½"	3¾"
#6	4½"	7¾"	4½"
#7	5¼"	9"	5¼"

STANDARD HOOK SCHEDULE 7
NO SCALE



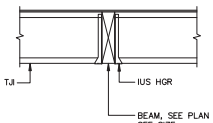
TYPICAL CONCRETE WALL OR FOUNDATION INTERSECTION

DETAIL 8
3/4" = 1'-0"



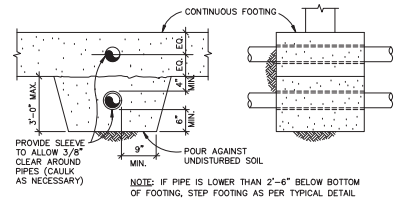
FILLER BLOCK NAILING

DETAIL 9
NO SCALE



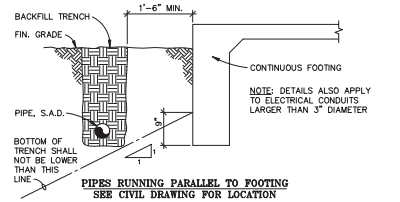
TYPICAL DETAIL AT FLOOR FLUSH BEAM

DETAIL 10
NO SCALE



NOTE: IF PIPE IS LOWER THAN 2'-6" BELOW BOTTOM OF FOOTING, STEP FOOTING AS PER TYPICAL DETAIL

PIPES RUNNING PERPENDICULAR TO FOOTING



PIPES RUNNING PARALLEL TO FOOTING
SEE CIVIL DRAWING FOR LOCATION

DETAIL 11
3/4" = 1'-0"

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TYPICAL DETAILS

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SANTA CLARA, CALIFORNIA

DATE	11/29/2022
SCALE	AS NOTED
DRAWN	D.C./c.a.d.
JOB	22353
SHEET	S1.2
OF	SHEETS

NOTES:

SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, ELEVATIONS & ROOF PITCH NOT SHOWN.

SEE ARCHITECTURAL DRAWINGS FOR ROOF VENT LOCATIONS WHERE OCCURS.

SEE ARCHITECTURAL DRAWINGS FOR CEILING ELEVATIONS & SLOPE.

WALLS SHOWN ON THE FRAMING PLAN REPRESENT WALL BELOW THE REFERENCED LEVEL.

PROVIDE ½" PLYWOOD SHEATHING TO ALL EXTERIOR WALLS WITH 10d @ 6"o.c. EDGES, 12"o.c. FIELD UNLESS OTHERWISE NOTE AT SHEAR WALLS.

SEE 8/S1.1 FOR TYPICAL HEADER U.O.N.

ALL EXPOSE LUMBER SHALL BE REDWOOD OR PRESSURE TREATED U.O.N.

VERIFY ROOF FRAMING PLAN WITH TRUSS MANUFACTURER.

FLOOR PLYWOOD SHOULD BE GLUED DOWN TO FRAMING MEMEBERS.

LEGEND:

DENOTES POST BELOW GIRDER TRUSS AND BEAM. CONTINUE POST TO FOUNDATION U.N.O.
USE DOUBLE STUD OR 4x4 BELOW 4x BEAMS
USE 4x6 OR 6x6 BELOW 6x BEAMS.
USE 4x8 POST BELOW 7"x PSL & STELL BEAM.

(6) (4'-6") DENOTES SHEAR WALL BELOW THE REFERENCED LEVEL. SEE SCHEDULE 1/S1.1

DENOTES MINIMUM SHEAR WALL LENGTH.

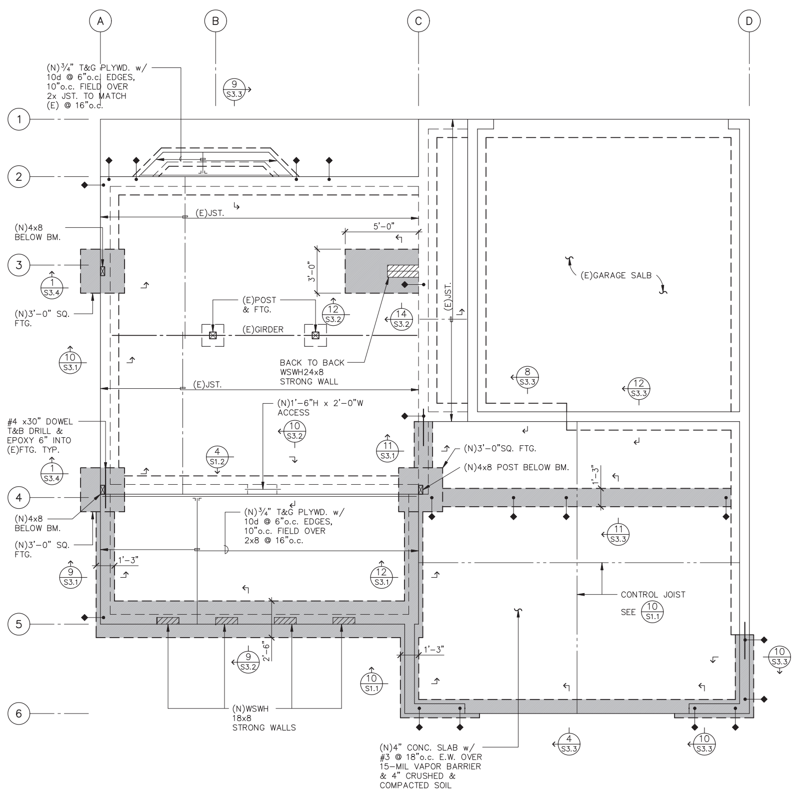
DENOTES MST48 TIE-STRAP FROM SHEAR WALL ABOVE THE REFERENCED LEVEL. SEE 9/S1.1

DENOTES HDU5 HOLDOWN FROM SHEAR WALL ABOVE THE REFERENCED LEVEL. SEE 2/S1.1 & 3/S1.1

DENOTES NEW FOUNDATION.

DENOTES EXISTING FOUNDATION.

DENOTES NEW STRONG WALL, SEE SHEET WSWH1 & WSWH2 FOR TYPICAL DETAILS.

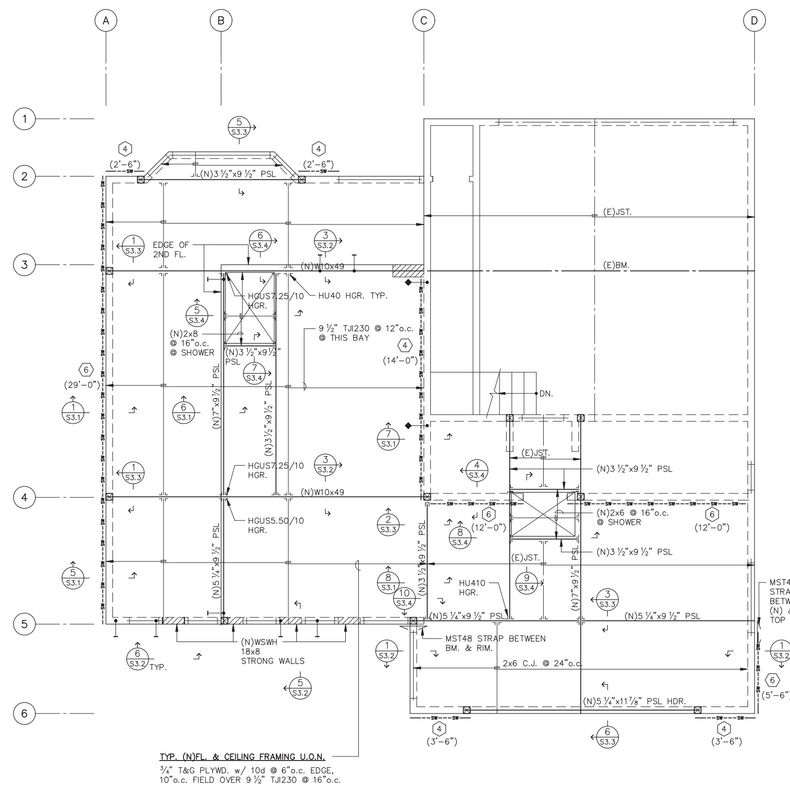


A
B
C
D
1
2
3
4
5
6
(N)¾" T&G PLYWD. w/ 10d @ 6"o.c. EDGES, 10"o.c. FIELD OVER 2x JST. TO MATCH (E) @ 16"o.c.
(N)4x8 BELOW BM.
(N)3'-0" SQ. FTG.
(E)JST.
5'-0"
3'-0"
(E)POST & FTG.
(E)GIRDER
BACK TO BACK WSWH24x8 STRONG WALL
(E)GARAGE SALB
(N)1'-6"H x 2'-0"W ACCESS
#4 x30" DOWEL T&B DRILL & EPOXY 6" INTO (E)FTG. TYP.
(N)3'-0"SQ. FTG.
(N)4x8 POST BELOW BM.
(N)¾" T&G PLYWD. w/ 10d @ 6"o.c. EDGES, 10"o.c. FIELD OVER 2x8 @ 16"o.c.
CONTROL JOIST SEE 10/S1.1
1'-3"
2'-6"
(N)WSWH 18x8 STRONG WALLS
(N)4" CONC. SLAB w/ #3 @ 18"o.c. E.W. OVER 15-MIL VAPOR BARRIER & 4" CRUSHED & COMPACTED SOIL

FIRST FLOOR FRAMING & FOUNDATION PLAN

1/4" = 1'-0"

1/–



A
B
C
D
1
2
3
4
5
6
(N)3½"x9½" PSL
EDGE OF 2ND FL.
(N)W10x49
HGUS7.25/10 HGR.
HU40 HGR. TYP.
9½" TJI230 @ 12"o.c. @ THIS BAY
(N)2x8 @ 16"o.c. @ SHOWER
(E)JST.
(E)BM.
DN.
HGUS7.25/10 HGR.
HGUS5.50/10 HGR.
(N)3½"x9½" PSL
(N)2x6 @ 16"o.c. @ SHOWER
HU410 HGR.
(N)5¼"x9½" PSL
MST48 STRAP BETWEEN BM. & RIM.
2x6 C.J. @ 24"o.c.
(N)5¼"x11⅞" PSL HDR.
MST48 STRAP BETWEEN (N) & (E) TOP PL.
(N)WSWH 18x8 STRONG WALLS
TYP. (N)FL. & CEILING FRAMING U.O.N.
¾" T&G PLYWD. w/ 10d @ 6"o.c. EDGE, 10"o.c. FIELD OVER 9½" TJI230 @ 16"o.c.

SECOND FLOOR FRAMING PLAN

1/4" = 1'-0"

2/–

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FOUNDATION, 1ST FLOOR & 2ND FLOOR FRAMING PLANS

NISHA & SAMEER KELKAR

1769 JEFFREY CT., SANTA CLARA, CALIFORNIA

DATE 11/29/2022

SCALE AS NOTED

DRAWN D.C./c.a.d.

JOB 22353

SHEET S2.1

OF SHEETS

NOTES:

SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, ELEVATIONS & ROOF PITCH NOT SHOWN.

SEE ARCHITECTURAL DRAWINGS FOR ROOF VENT LOCATIONS WHERE OCCURS.

SEE ARCHITECTURAL DRAWINGS FOR CEILING ELEVATIONS & SLOPE.

WALLS SHOWN ON THE FRAMING PLAN REPRESENT WALL BELOW THE REFERENCED LEVEL.

PROVIDE ½" PLYWOOD SHEATHING TO ALL EXTERIOR WALLS WITH 10d @ 6"o.c. EDGES, 12"o.c. FIELD UNLESS OTHERWISE NOTE AT SHEAR WALLS.

SEE 8/S1.1 FOR TYPICAL HEADER U.O.N.

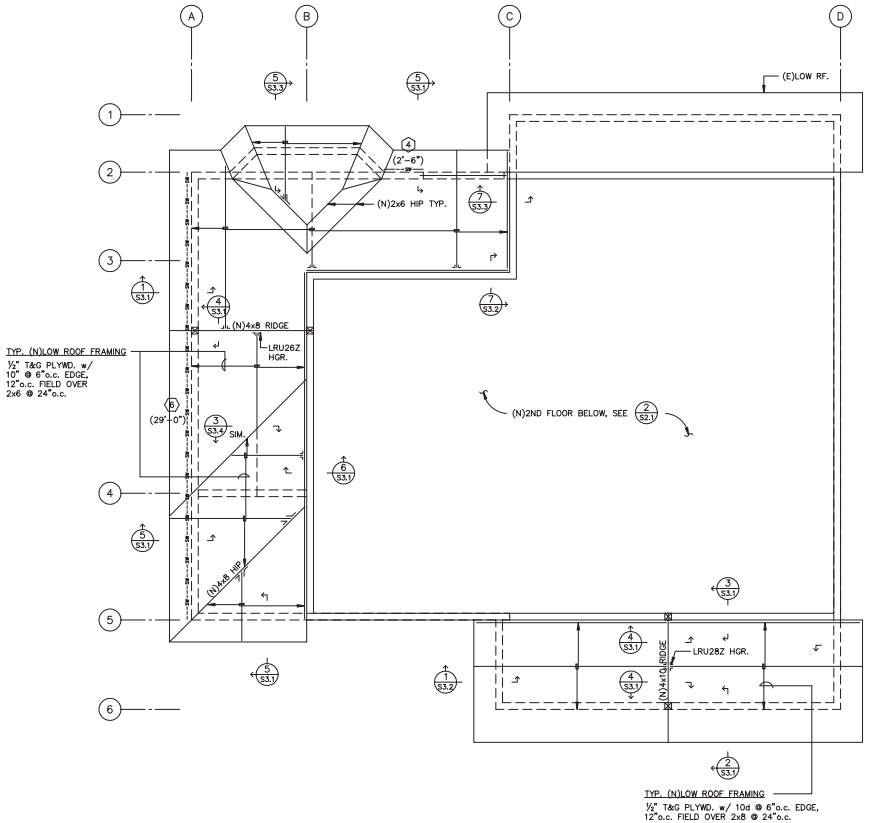
ALL EXPOSE LUMBER SHALL BE REDWOOD OR PRESSURE TREATED U.O.N.

VERIFY ROOF FRAMING PLAN WITH TRUSS MANUFACTURER.

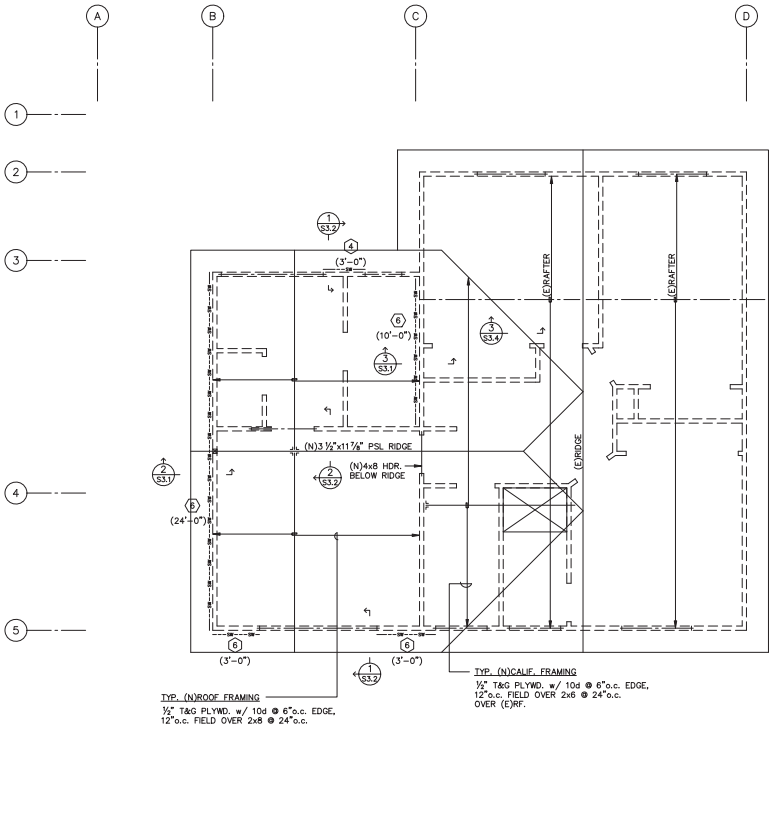
FLOOR PLYWOOD SHOULD BE GLUED DOWN TO FRAMING MEMEBERS.

LEGEND:

- DENOTES POST BELOW GIRDER TRUSS AND BEAM. CONTINUE POST TO FOUNDATION U.N.O.
  - USE DOUBLE STUD OR 4x4 BELOW 4x BEAMS
  - USE 4x6 OR 6x6 BELOW 6x BEAMS.
  - USE 4x8 POST BELOW 7"x PSL & STELL BEAM.
- (6) (4'-6") — DENOTES SHEAR WALL BELOW THE REFERENCED LEVEL. SEE SCHEDULE (1/S1.1)
  - DENOTES MINIMUM SHEAR WALL LENGTH.
- DENOTES MST48 TIE-STRAP FROM SHEAR WALL ABOVE THE REFERENCED LEVEL. SEE (9/S1.1)
- DENOTES HDU5 HOLDOWN FROM SHEAR WALL ABOVE THE REFERENCED LEVEL. SEE (2/S1.1) & (3/S1.1)
- DENOTES NEW FOUNDATION.
- DENOTES EXISTING FOUNDATION.
- DENOTES NEW STRONG WALL, SEE SHEET WSWH1 & WSWH2 FOR TYPICAL DETAILS.



LOW ROOF FRAMING PLAN (1/—)
1/4" = 1'-0"



ROOF FRAMING PLAN (2/—)
1/4" = 1'-0"

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FOUNDATION, 1ST FLOOR & 2ND FLOOR FRAMING PLANS

NISHA & SAMEER KELKAR
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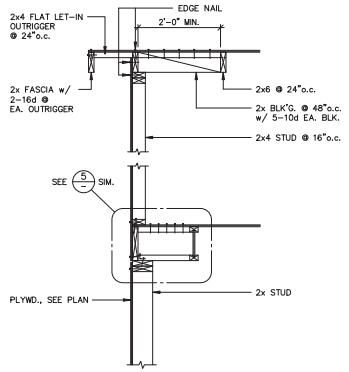
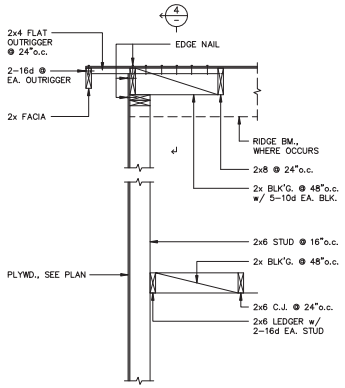
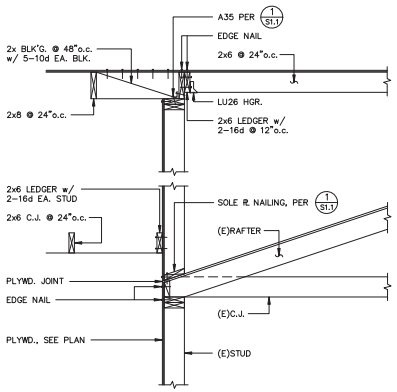
DATE	11/29/2022
SCALE	AS NOTED
DRAWN	D.C./c.a.d.
JOB	22353
SHEET	S2.2
OF	SHEETS



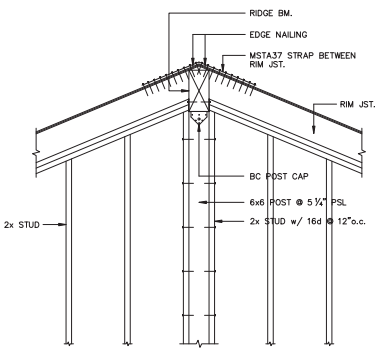
SECTION 1
3/4" = 1'-0"



SECTION 2
3/4" = 1'-0"



SECTION 3
3/4" = 1'-0"



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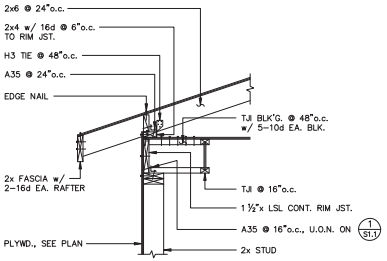

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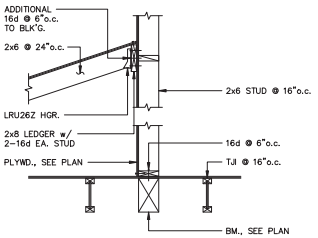
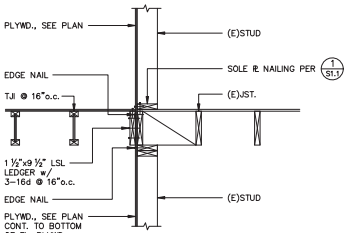


SECTION 6
3/4" = 1'-0"



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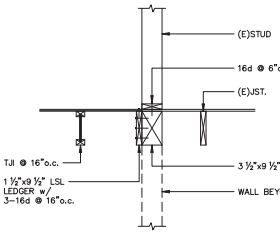
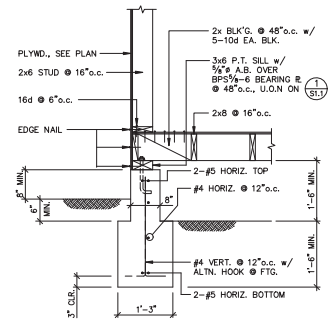


SECTION 8
3/4" = 1'-0"



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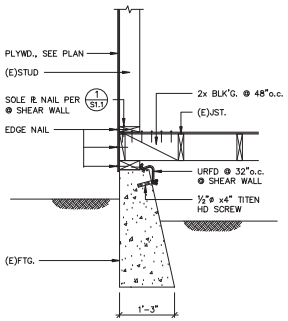
3/4" = 1'-0"



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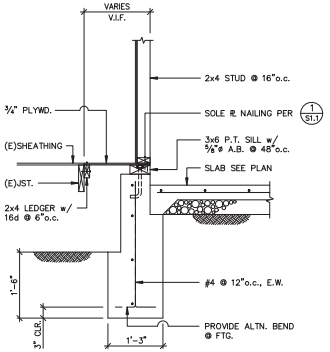
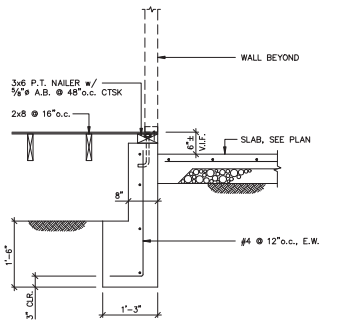
3/4" = 1'-0"



SECTION 11
3/4" = 1'-0"



SECTION 12
3/4" = 1'-0"

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DETAILS & SECTIONS

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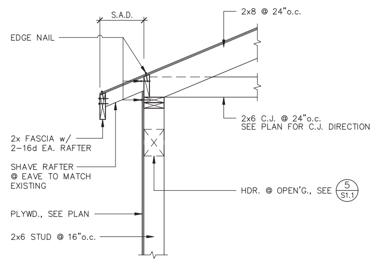
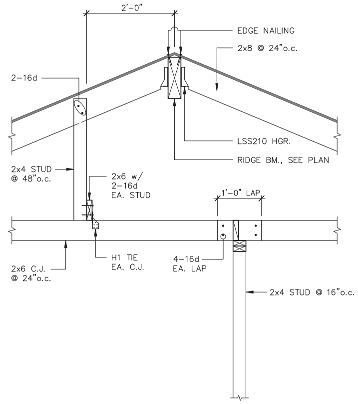
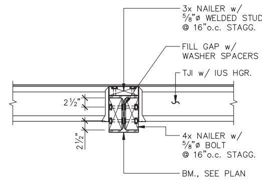
DATE	11/29/2022
SCALE	AS NOTED
DRAWN	D.C./c.a.d.
JOB	22353
SHEET	S3.1
OF	SHEETS



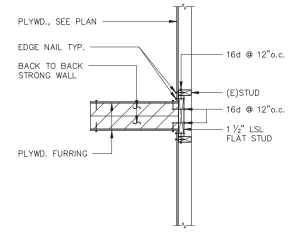
SECTION 1
3/4" = 1'-0"



SECTION 2
3/4" = 1'-0"

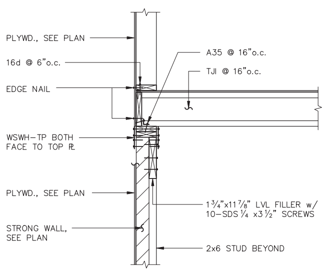


SECTION 3
3/4" = 1'-0"



PLAN VIEW

SECTION 4
3/4" = 1'-0"



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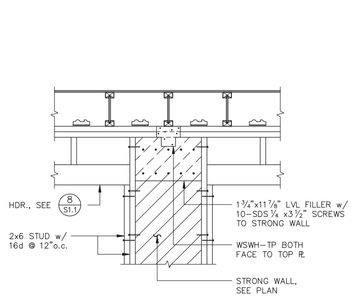

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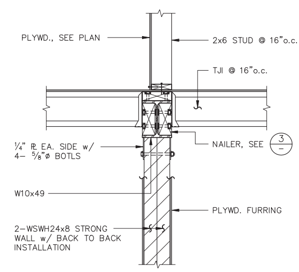

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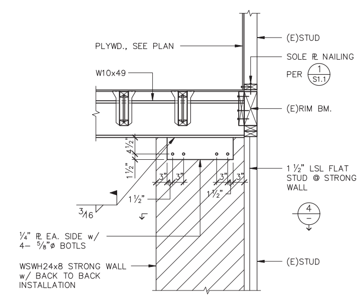

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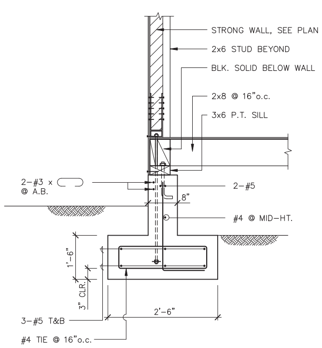

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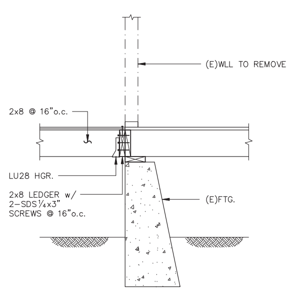

DETAIL 10
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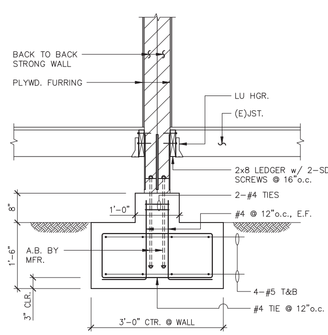

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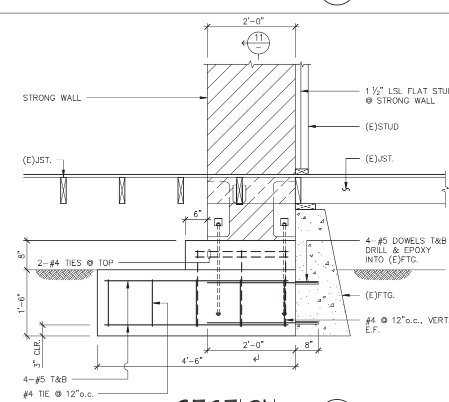

SECTION 12
3/4" = 1'-0"

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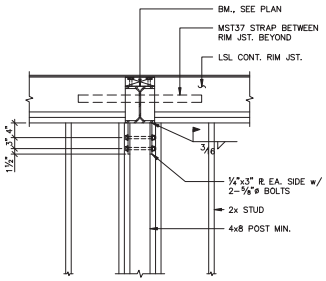
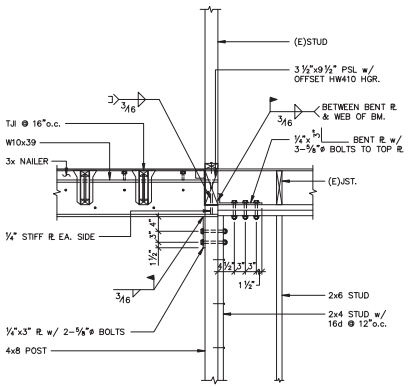
DATE 11/29/2022
SCALE AS NOTED
DRAWN D.C./c.a.d.
JOB 22353
SHEET S3.2
OF SHEETS



SECTION 1
3/4" = 1'-0"



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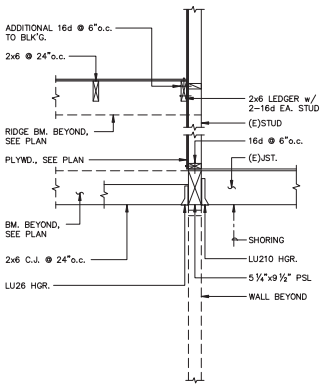

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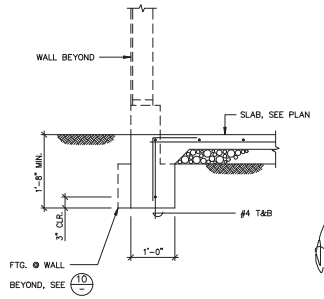
3/4" = 1'-0"



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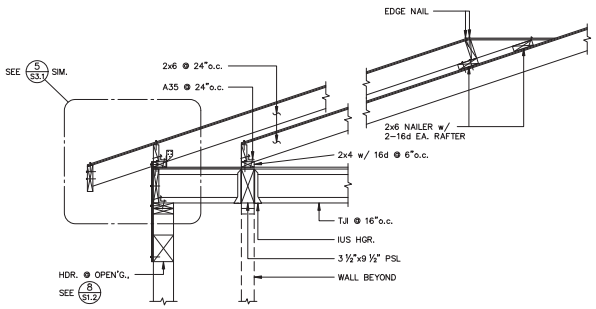

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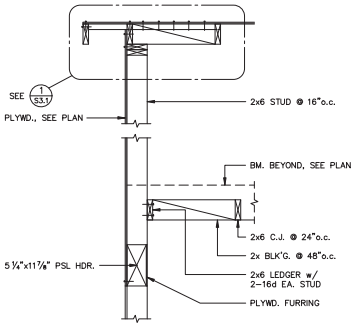
3/4" = 1'-0"



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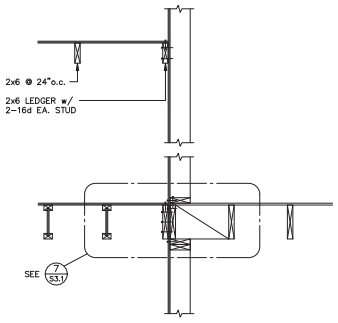
3/4" = 1'-0"



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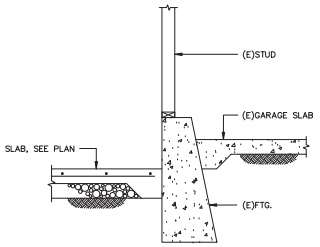
3/4" = 1'-0"



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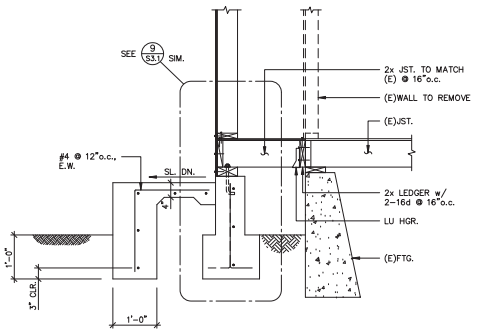
3/4" = 1'-0"



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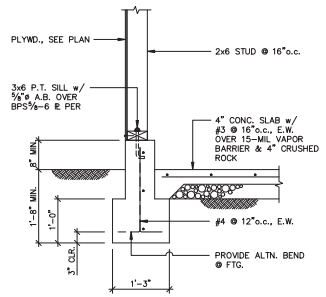
3/4" = 1'-0"



DETAIL
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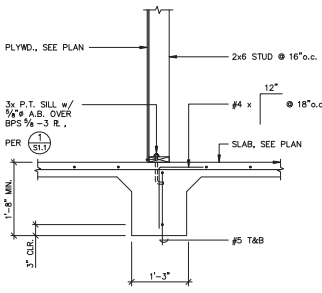

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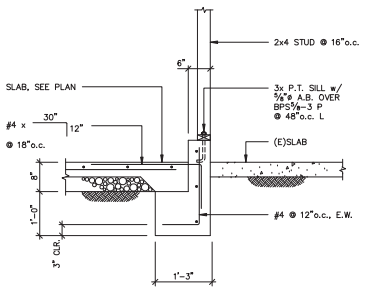
3/4" = 1'-0"



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3/4" = 1'-0"

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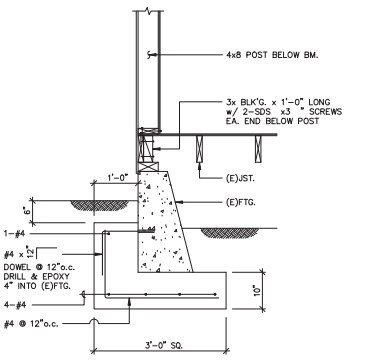
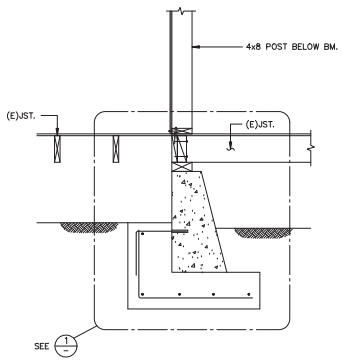


SECTION 1 — 3/4" = 1'-0"



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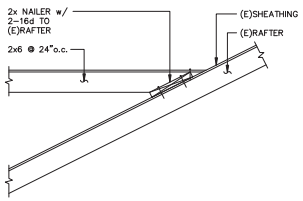
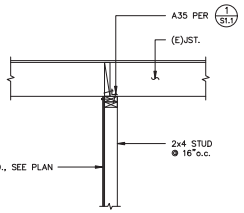
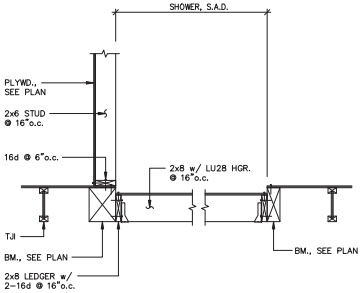


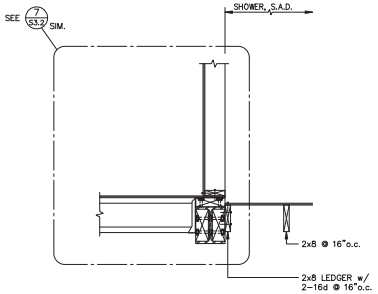
SECTION 3 — 3/4" = 1'-0"



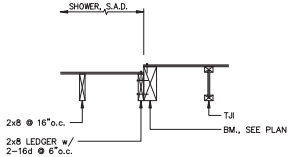
SECTION 4 — 3/4" = 1'-0"



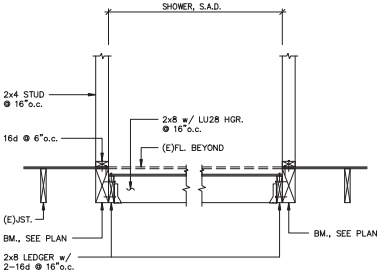
SECTION 5 — 3/4" = 1'-0"



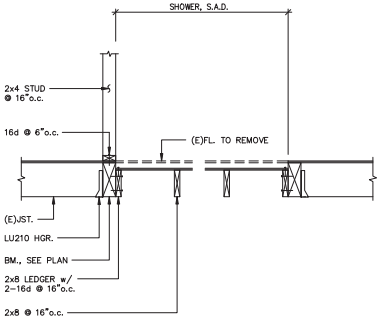
SECTION 6 — 3/4" = 1'-0"



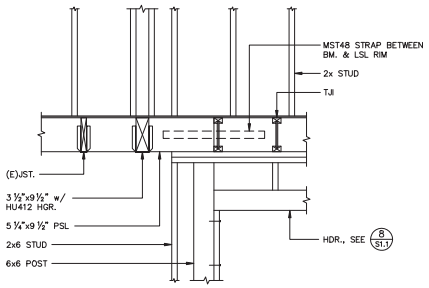
SECTION 7 — 3/4" = 1'-0"



SECTION 8 — 3/4" = 1'-0"



SECTION 9 — 3/4" = 1'-0"



SECTION 10 — 3/4" = 1'-0"

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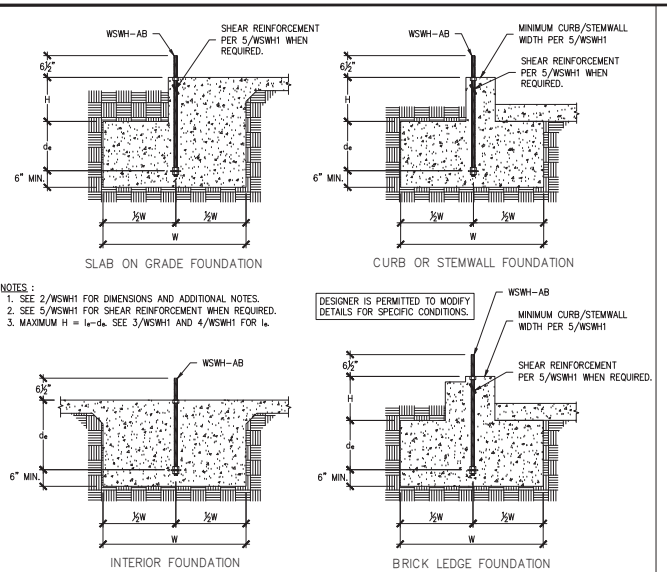
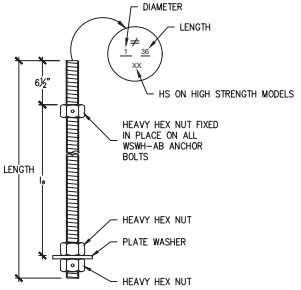


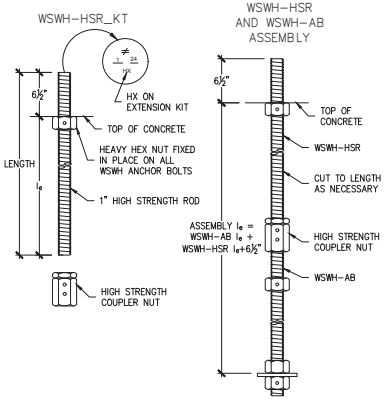
NOTES :
1. SEE 2/WSWH1 FOR DIMENSIONS AND ADDITIONAL NOTES.
2. SEE 5/WSWH1 FOR SHEAR REINFORCEMENT WHEN REQUIRED.
3. MAXIMUM H = l_e-d_e. SEE 3/WSWH1 AND 4/WSWH1 FOR l_e.

STRONG-WALL® WSWH ANCHORAGE – TYPICAL SECTIONS | 1



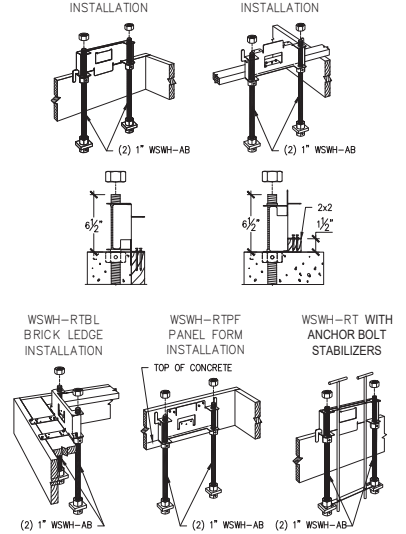
WSWH PANEL MODEL	MODEL NO.	DIAMETER	LENGTH	l_e
WSWH12, WSWH18 AND WSWH24	WSWH-AB1x24	1"	24"	15½"
	WSWH-AB1x24HS	1"	24"	15½"
	WSWH-AB1x30	1"	30"	21½"
	WSWH-AB1x30HS	1"	30"	21½"
	WSWH-AB1x36	1"	36"	27½"
	WSWH-AB1x36HS	1"	36"	27½"
	WSWH-AB1x42	1"	42"	33½"
	WSWH-AB1x42HS	1"	42"	33½"
	WSWH-AB1x48	1"	48"	39½"
	WSWH-AB1x48HS	1"	48"	39½"

WSWH ANCHOR BOLTS | 3

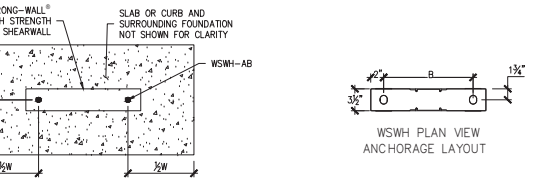


WSWH PANEL MODEL	MODEL NO.	DIAMETER	LENGTH	l_e
WSWH12, WSWH18 AND WSWH24	WSWH-HSR1x24KT	1"	24"	17⅞"
	WSWH-HSR1x36KT	1"	36"	29½"

WSWH ANCHOR BOLT EXTENSION | 4



WSWH ANCHOR BOLT TEMPLATES | 6



ANCHOR BOLT LAYOUT	
STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL MODEL NO.	DISTANCE FROM CENTER-TO-CENTER OF WSWH-AB, B (in)
WSWH12	8⅛
WSWH18	14
WSWH24	20

NOTES :
1. ANCHORAGE DESIGNS CONFORM TO ACI 318-11 APPENDIX D, ACI 318-14 CHAPTER 17 AND ACI 318-19 CHAPTER 17 WITH NO SUPPLEMENTARY REINFORCEMENT FOR CRACKED OR UNCRACKED CONCRETE AS NOTED.
2. ANCHOR STRENGTH INDICATES REQUIRED GRADE OF WSWH-AB ANCHOR BOLT. STANDARD (ASTM F1554 GRADE 36) OR HIGH STRENGTH (HS) (ASTM A193 GRADE B7).
3. SEISMIC INDICATES SEISMIC DESIGN CATEGORY C-F. DETACHED 1 AND 2 FAMILY DWELLINGS IN SDC C MAY USE WIND ANCHORAGE SOLUTIONS. SEISMIC ANCHORAGE DESIGNS CONFORM TO ACI 318-11 SECTION D.3.3.4.3, ACI 318-14 SECTION 17.2.3.4.3 AND ACI 318-19 SECTION 17.10.5.3.
4. WIND INCLUDES SEISMIC DESIGN CATEGORY A AND B AND DETACHED 1 AND 2 FAMILY DWELLINGS IN SDC C.
5. FOUNDATION DIMENSIONS ARE FOR ANCHORAGE ONLY. FOUNDATION DESIGN (SIZE AND REINFORCEMENT) BY OTHERS. THE DESIGNER MAY SPECIFY ALTERNATE EMBEDMENT, FOOTING SIZE OR ANCHOR BOLT.
6. REFER TO 1/WSWH1 FOR d_e.

WSWH ANCHORAGE SOLUTIONS FOR 2500 PSI CONCRETE

DESIGN CRITERIA	CONCRETE CONDITION	ANCHOR STRENGTH	WSWH-AB1 ANCHOR BOLT ASD ALLOWABLE UPLIFT (lbs)	W (in)	d_e (in)
SEISMIC	CRACKED	STANDARD	16,000	33	11
			17,100	35	12
		HIGH STRENGTH	34,100	52	18
			36,800	55	19
	UNCRACKED	STANDARD	15,700	28	10
			17,100	30	10
		HIGH STRENGTH	33,500	45	15
			36,800	48	16
WIND	CRACKED	STANDARD	6,200	16	6
			11,400	24	8
		HIGH STRENGTH	17,100	32	11
			21,100	36	12
			27,300	42	14
			34,100	48	16
			36,800	51	17
	UNCRACKED	STANDARD	6,400	14	6
			12,500	22	8
		HIGH STRENGTH	17,100	28	10
			22,900	33	11
			26,400	36	12
			34,200	42	14
			36,800	44	15

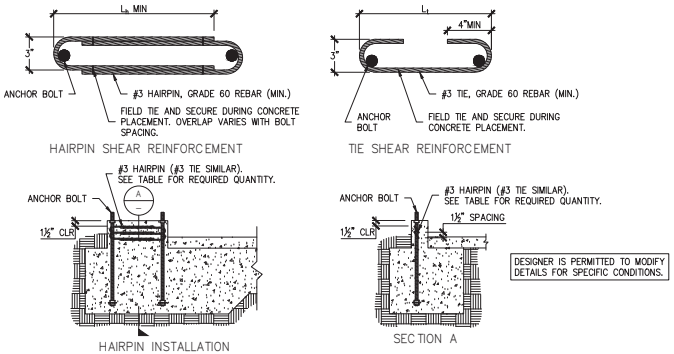
WSWH ANCHORAGE SOLUTIONS FOR 3000 PSI CONCRETE

DESIGN CRITERIA	CONCRETE CONDITION	ANCHOR STRENGTH	WSWH-AB1 ANCHOR BOLT ASD ALLOWABLE UPLIFT (lbs)	W (in)	d_e (in)
SEISMIC	CRACKED	STANDARD	16,000	31	11
			17,100	33	11
		HIGH STRENGTH	33,900	49	17
			36,800	52	18
	UNCRACKED	STANDARD	16,300	27	9
			17,100	28	10
		HIGH STRENGTH	34,000	43	15
			36,800	46	16
WIND	CRACKED	STANDARD	5,600	14	6
			10,200	21	7
		HIGH STRENGTH	17,100	30	10
			20,000	33	11
			26,500	39	13
			33,600	45	15
			36,800	48	16
	UNCRACKED	STANDARD	6,200	13	6
			12,800	21	7
		HIGH STRENGTH	17,100	26	9
			21,800	30	10
			28,900	36	12
			33,100	39	13
			36,800	42	14

WSWH ANCHORAGE SOLUTIONS FOR 4500 PSI CONCRETE

DESIGN CRITERIA	CONCRETE CONDITION	ANCHOR STRENGTH	WSWH-AB1 ANCHOR BOLT ASD ALLOWABLE UPLIFT (lbs)	W (in)	d_e (in)
SEISMIC	CRACKED	STANDARD	16,000	27	9
			17,100	29	10
		HIGH STRENGTH	34,700	44	15
			36,800	46	16
	UNCRACKED	STANDARD	15,700	23	8
			17,100	25	9
		HIGH STRENGTH	33,900	38	13
			36,800	40	14
WIND	CRACKED	STANDARD	6,800	14	6
			11,600	20	7
		HIGH STRENGTH	17,100	26	9
			21,400	30	10
			28,400	36	12
			32,400	39	13
			36,800	43	15
	UNCRACKED	STANDARD	6,800	12	6
			12,400	18	6
		HIGH STRENGTH	17,100	23	8
			22,800	27	9
			26,700	30	10
			30,700	33	11
			36,800	37	13

STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL TENSION ANCHORAGE SCHEDULE 2,500, 3,000 AND 4,500 PSI | 2



STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL SHEAR ANCHORAGE

MODEL	SEISMIC[3] L_t OR L_e (in.)	SEISMIC[3] SHEAR REINFORCEMENT	SEISMIC[3] MIN. CURB/STEMWALL WIDTH (in.)	WIND[4] SHEAR REINFORCEMENT	WIND[4] MIN. CURB/STEMWALL WIDTH (in.)	WIND[4] ASD ALLOWABLE SHEAR LOAD, V (lb.) UNCRACKED	WIND[4] ASD ALLOWABLE SHEAR LOAD, V (lb.) CRACKED
WSWH12	10¾	(1) #3 TIE	6	SEE NOTE 7	6	1,080	770
WSWH18	15	(2) #3 HAIRPINS[5,6]	6	(1) #3 HAIRPIN	6	HAIRPIN REINF. ACHIEVES MAX. ALLOW SHEAR LOAD OF THE WSWH	
WSWH24	19	(2) #3 HAIRPINS[5]	6	(2) #3 HAIRPINS[5]	6		

NOTES :
1. SHEAR ANCHORAGE DESIGNS CONFORM TO ACI 318-19, ACI 318-11 AND ACI 318-14 AND ASSUME MINIMUM 2,500 PSI CONCRETE.
2. SHEAR REINFORCEMENT IS NOT REQUIRED FOR INTERIOR FOUNDATION APPLICATIONS (PANEL INSTALLED AWAY FROM EDGE OF CONCRETE), OR BRACED WALL PANEL APPLICATIONS.
3. SEISMIC INDICATES SEISMIC DESIGN CATEGORY C THROUGH F. DETACHED 1 AND 2 FAMILY DWELLINGS IN SDC C MAY USE WIND ANCHORAGE SOLUTIONS. SEISMIC SHEAR REINFORCEMENT DESIGNS CONFORM TO ACI 318-19, SECTION 17.10.6.3, ACI 318-14, SECTION 17.2.3.5.3
4. WIND INCLUDES SEISMIC DESIGN CATEGORY A AND B.
5. ADDITIONAL TIES MAY BE REQUIRED AT GARAGE CURB OR STEMWALL INSTALLATIONS BELOW ANCHOR REINFORCEMENT PER DESIGNER.
6. USE (1) #3 HAIRPIN FOR WSWH18 WHEN STANDARD STRENGTH ANCHOR IS USED.
7. USE (1) #3 TIE FOR WSWH12 WHEN PANEL DESIGN SHEAR FORCE EXCEEDS TABULATED ANCHORAGE ALLOWABLE SHEAR LOAD.
8. #4 GRADE 40 SHEAR REINFORCEMENT MAY BE SUBSTITUTED FOR WSWH SHEAR ANCHORAGE SOLUTIONS.
9. CONCRETE EDGE DISTANCE FOR ANCHORS MUST COMPLY WITH ACI 318-19 SECTION 17.9.2, ACI 318-14 SECTION 17.7.2 AND ACI 318-11 SECTION D.8.2.
10. THE DESIGNER MAY SPECIFY ALTERNATE SHEAR ANCHORAGE.

STRONG-WALL® WSWH SHEAR ANCHORAGE SCHEDULE AND DETAILS | 5

NO.	DATE	REVISIONS
0	02-26-2021	FIRST RELEASE - 2018 IBC
1	03-15-2021	2021 IBC REVISIONS
2	04-29-2022	ADDED WSWH-AB MODELS

SIMPSON Strong-Tie Co. Inc.
5956 W. Las Positas Blvd.
Pleasanton, CA 94588
Tel: (800) 999-5099
Website: www.strongtie.com

SIMPSON Strong-Tie THERE IS NO EQUAL.

STRONG-WALL® WSWH
ANCHORAGE DETAILS
ENGINEERED DESIGNS

SIMPSON Strong-Tie THERE IS NO EQUAL.

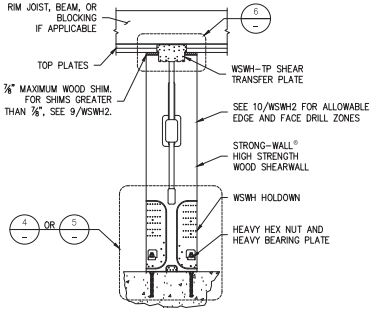
NAME
DATE 04-29-2022
SCALE N.T.S.
CHECKED
SHEET WSWH1
OF SHEETS
JOB NO.

STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL MODELS

MODEL NO.	W (in.)	H (in.)	ANCHOR BOLTS QUANTITY	ANCHOR BOLTS DIA. (in.)	TOTAL WALL WEIGHT (lb.)
WSWH12x7	12	84	2	1	105
WSWH18x7	18	84	2	1	155
WSWH12x8	12	96	2	1	120
WSWH18x8	18	96	2	1	175
WSWH24x8	24	96	2	1	225
WSWH12x9	12	108	2	1	130
WSWH18x9	18	108	2	1	195
WSWH24x9	24	108	2	1	250
WSWH12x10	12	120	2	1	145
WSWH18x10	18	120	2	1	210
WSWH24x10	24	120	2	1	275
WSWH12x12	12	144	2	1	165
WSWH18x12	18	144	2	1	245
WSWH24x12	24	144	2	1	325
WSWH18x14	18	168	2	1	285
WSWH24x14	24	168	2	1	370
WSWH24x16	24	192	2	1	420
WSWH18x20	18	240	2	1	390
WSWH24x20	24	240	2	1	520

NOTES :
1. FOR HEIGHTS NOT LISTED, ORDER THE NEXT TALLEST PANEL AND TRIM TO FIT. MINIMUM TRIMMED HEIGHT FOR ALL PANELS IS 74⅝".
2. ALL PANELS COME WITH PRE-ATTACHED HOLDOWNS, TWO HEAVY HEX NUTS, TWO HEAVY BEARING PLATES, ONE WSWH-TP TOP CONNECTION PLATE WITH REQUIRED FASTENERS AND INSTALLATION INSTRUCTIONS.
3. ALL PANELS ARE 3½" THICK.

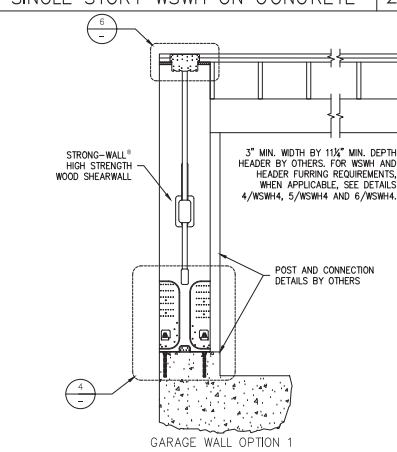
STRONG-WALL® WSWH MODELS | 1



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

ENSURE CONCRETE IS LEVEL AND SMOOTH BENEATH PANEL. GRIND OR FILL AS NECESSARY.

SINGLE STORY WSWH ON CONCRETE | 2



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

WHEN WSWH-PS STRAPS OMITTED, ALLOWABLE SHEAR VALUES FOR STANDARD PANEL APPLY.

GARAGE HEADER ROUGH OPENING HEIGHT

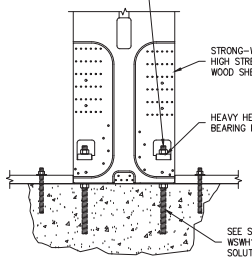
MODEL NO.	TRIMMED PANEL HEIGHT	H CURB	ROUGH OPENING HEIGHT
WSWH12x7 WSWH18x7 WSWH24x7	78"	5½"	6'-11½"
		6"	7'-0"
WSWH12x8 WSWH18x8 WSWH24x8	85½"	0"	7'-1½"
		5½"	8'-2¾"
	93¾"	6"	8'-3¾"

NOTES :
1. IF REQUIRED ROUGH OPENING HEIGHT EXCEEDS TABLE VALUE, SPECIFY NEXT TALLER PANEL AND TRIM AS NECESSARY. THE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL MAY BE TRIMMED TO A MINIMUM HEIGHT OF 74⅝".
2. FURRING DOWN GARAGE HEADER MAY BE REQUIRED FOR CORRECT ROUGH OPENING HEIGHT.

FOR GARAGE WALL OPTION 2, DESIGNER SHALL DESIGN AND DETAIL FOR:
1. SHEAR TRANSFER
2. OUT-OF-PLANE LOADING EFFECT
3. INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

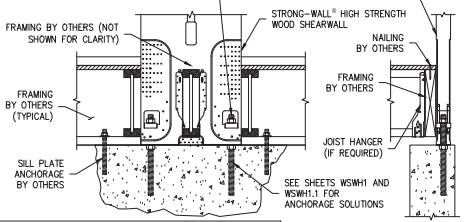
ALTERNATE WSWH GARAGE FRONT OPTIONS | 3

PLACE STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL OVER THE ANCHOR BOLTS AND SECURE WITH HEAVY BEARING PLATES AND HEAVY HEX NUTS (PROVIDED). DO NOT USE AN IMPACT WRENCH. USE 1⅜" WRENCH FOR 1" NUT. TIGHTEN ANCHOR NUTS FINGER TIGHT + ½" TURN.



DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

STANDARD INSTALLATION BASE CONNECTION | 4

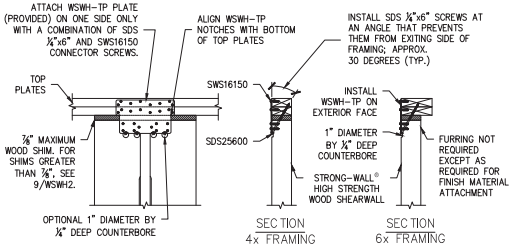


STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL HEIGHT TO INCLUDE THE DEPTH OF THE FLOOR SYSTEM AND SHALL BE INSTALLED DIRECTLY ON THE FOUNDATION. SPECIFY PANEL HEIGHT FROM TOP OF FOUNDATION TO UNDERSIDE OF TOP PLATES OR BEAM.

WOOD FLOOR SYSTEM BASE CONNECTION | 5

WSWH-TP CONNECTION MODEL NO.	FASTENER QUANTITY SWS16150	FASTENER QUANTITY SDS25600
WSWH-TP12	14	2
WSWH-TP18	26	4
WSWH-TP24	46	8

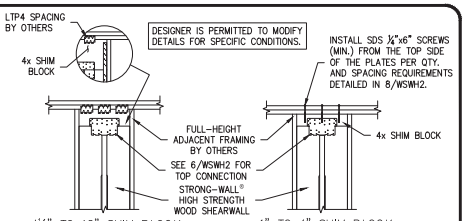
DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



TOP CONNECTION | 6

LTP4 SPACING BY OTHERS

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.

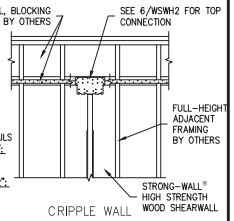


DESIGNER SHALL DESIGN AND DETAIL FOR:
1. SHEAR TRANSFER
2. OUT-OF-PLANE LOADING EFFECT
3. INCREASED OVERTURNING AND DRIFT DUE TO ADDITIONAL HEIGHT

FOR 8" TO 12" BLOCK DEPTHS:
ATTACH SIMPSON STRONG-TIE® CS16 STRAPS AT EDGE OF WSWH PANEL (EACH SIDE) USING 10dx1½" NAILS

SHIM BLOCK HEIGHTS GREATER THAN 8" AND UP TO 10":
- 8 NAILS INTO BLOCK
- 8 NAILS INTO WSWH PANEL

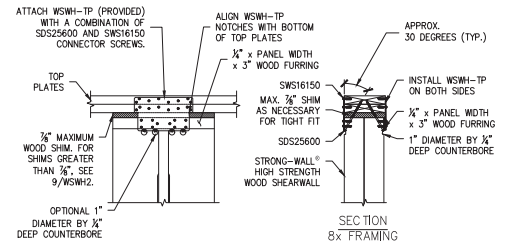
SHIM BLOCK HEIGHTS GREATER THAN 10" AND UP TO 12":
- 10 NAILS INTO BLOCK
- 10 NAILS INTO WSWH PANEL



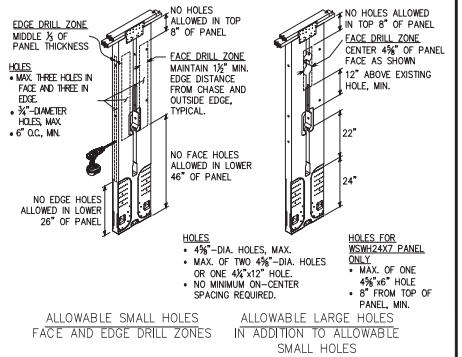
TOP OF WALL HEIGHT ADJUSTMENTS | 9

WSWH-TP CONNECTION MODEL NO.	FASTENER QUANTITY SWS16150	FASTENER QUANTITY SDS25600
WSWH-TP12	28	4
WSWH-TP18	52	8
WSWH-TP24	92	16

DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



BACK-TO-BACK TOP CONNECTION | 7

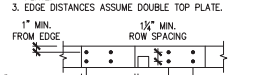


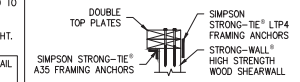
TRIM ZONE AND ALLOWABLE HOLES | 10

QTY. OF SDS¼"x6" SCREWS REQ'D.	
WSWH12	4
WSWH18	8
WSWH24	16

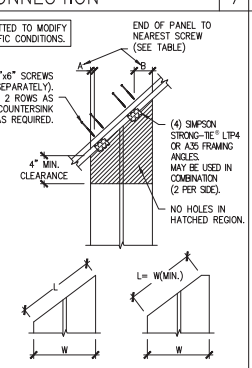
EDGE DISTANCE FOR SCREWS SLOPE	A (in.)	B (in.)
0:12-4:12	2	3
5:12-8:12	1½	4½
9:12-12:12	1½	5½

NOTES :
1. MAINTAIN END DISTANCES TO PREVENT SCREWS FROM PENETRATING THROUGH THE OUTER EDGES.
2. INSTALL SCREWS PERPENDICULAR TO THE TOP PLATE.
3. EDGE DISTANCES ASSUME DOUBLE TOP PLATE.





DESIGNER IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.



INSTALLATION NOTES :
1. ACTUAL CUT LENGTH (L) MUST BE GREATER THAN OR EQUAL TO PANEL WIDTH (W).
2. THIS DETAIL APPLICABLE FOR SLOPES UP TO 12:12.
3. PANELS TALLER THAN 12' MUST BE DESIGNED FOR THE APPLICATION.

RAKE WALL | 8

1. STRONG-WALL® HIGH STRENGTH WOOD SHEARWALL IS MANUFACTURED AND TRADEMARKED BY "SIMPSON STRONG-TIE COMPANY INC." HOME OFFICE: 5956 W. LAS POSITAS BLVD., PLEASANTON, CA 94588 TEL: (800) 999-5099, FAX: (925) 847-1597. "SIMPSON STRONG-TIE COMPANY INC." IS AN ISO 9001-2008 REGISTERED COMPANY.
2. USE OF THIS PRODUCT IS SUBJECT TO THE APPROVAL OF THE LOCAL BUILDING DEPARTMENT.
3. THIS PRODUCT IS PART OF THE OVERALL LATERAL FORCE RESISTING SYSTEM OF THE STRUCTURE. DESIGN OF THE BUILDING'S LATERAL FORCE RESISTING SYSTEM, INCLUDING THE LOAD PATH TO TRANSFER LATERAL FORCES FROM THE STRUCTURE TO THE GROUND, IS THE RESPONSIBILITY OF THE DESIGNER.
4. ENGINEER OF RECORD IS PERMITTED TO MODIFY DETAILS FOR SPECIFIC CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, CONDITIONS, ELEVATIONS, ETC. PRIOR TO INSTALLATION OF ANY COMPONENTS FOR THE STRONG-WALL SB SYSTEM. IF ANY DISCREPANCIES ARE FOUND, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGNER FOR CLARIFICATION PRIOR TO CONSTRUCTION.
6. INSTALLATION OF PRODUCT SHALL BE DONE IN CONFORMANCE TO THESE DRAWINGS. THE PERFORMANCE OF MODIFIED PRODUCTS OR ALTERED INSTALLATION PROCEDURES ARE THE SOLE RESPONSIBILITY OF THE DESIGNER.
7. SIMPSON STRONG-TIE COMPANY INC. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS, DESIGNS, AND MODELS WITHOUT NOTICE OR LIABILITY FOR SUCH CHANGES.
8. ALL HARDWARE CALLED OUT IS SIMPSON STRONG-TIE.
9. SEE ICC-ES ESR-2652 OR CITY OF LOS ANGELES RR25730 AS APPLICABLE FOR ADDITIONAL INFORMATION.

NOTES | 11

NO.	DATE	REVISIONS
0	11-20-2020	FIRST RELEASE - 2018 IBC
1	03-16-2021	2021 IBC REVISIONS

SIMPSON Strong-Tie, Co. Inc.
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STRONG-WALL® WSWH
FRAMING DETAILS
ENGINEERED DESIGNS

SIMPSON Strong-Tie THERE IS NO EQUAL.

NAME
DATE 03-16-2021
SCALE N.T.S.
CHECKED
SHEET WSWH2
OF SHEETS
JOB NO.