SHEET INDEX

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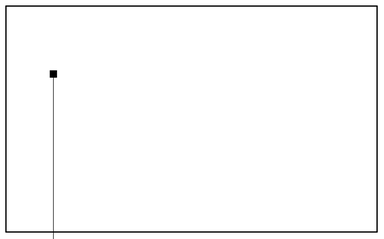
TOTAL: 15

VICINITY MAP:



PROJECT DESCRIPTION	#
scope of work	

1	PROPOSED 87SF ADDITION (KITCHEN)
3	24SF ADDITION TO BEDROOM TWO
4	45SF DECK
5	15SF BATHROOM ADDITION

SITEPLAN CALLOUT LEGEND	#
#	description
1	EXISTING SITE WALL
2	PROPOSED STAIRS
4	EXISTING TREE
5	LINE OF ROOF OVERHANG @ FIRST STORY

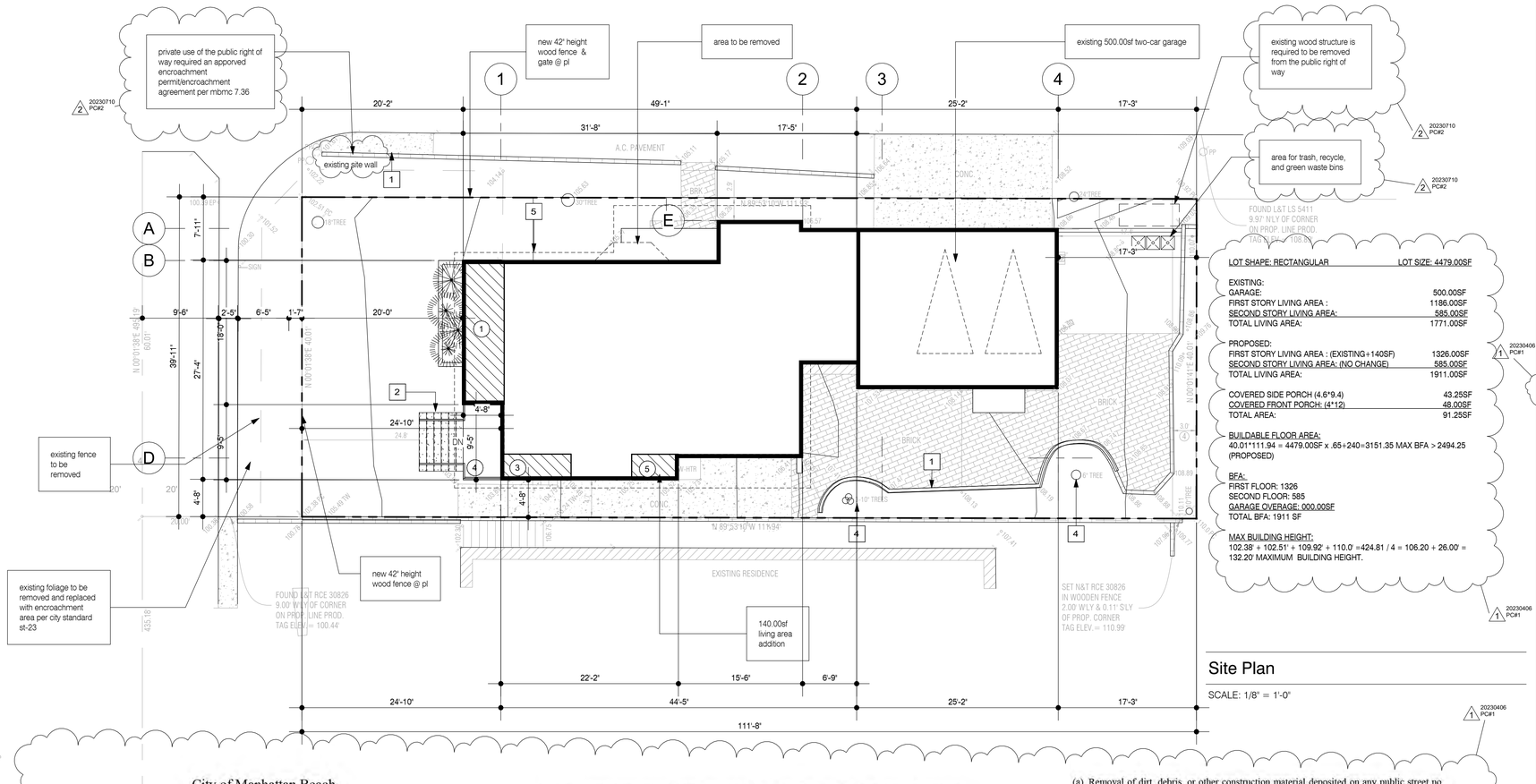
NOTES

ALTHOUGH EVERY EFFORT HAS BEEN MADE IN PREPARING THESE PLANS AND CHECKING THEM FOR ACCURACY, THE CONTRACTOR MUST CHECK ALL DETAILS AND DIMENSIONS AND BE RESPONSIBLE FOR THE SAME. INFORMATION PERTAINING TO EXISTING PROJECT CONDITIONS, SUCH AS PRESENT LOCATIONS OF ARCHITECTURAL AND STRUCTURAL BUILDING COMPONENTS, MECHANICAL AND ELECTRICAL EQUIPMENT, PIPING, DUCTWORK, ROUGH-INS, AND OTHER MISCELLANEOUS CONSTRUCTION, APPEARS IN THE DRAWINGS. WHILE SUCH INFORMATION HAS BEEN BASED ON AVAILABLE RECORDS AND COLLECTED WITH REASONABLE CARE, THE ARCHITECT AND OWNER DO NOT ASSUME ANY EXPRESSED OR IMPLIED GUARANTEE THAT CONDITIONS SO INDICATED ARE SHOWN ENTIRELY COMPLETE, CORRECT, AND REPRESENTATIVE OF THOSE ACTUALLY EXISTING. ALL CONTRACTORS SHALL SATISFY THEMSELVES AS TO ALL EXISTING JOB CONDITIONS PRIOR TO CONSTRUCTION AND VERITY ALL DIMENSIONS AT THE SITE. THE EXACT LOCATION OF ALL UTILITIES MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY CONSTRUCTION. IF ANY DISCREPENCIES ARE FOUND, THE PROJECT TEAM MUST BE CONTACTED PRIOR TO CONTINUING CONSTRUCTION, IF NOT CONTACTED WE ASSUME NO RESPONSIBILITY FOR ANY TIME LOST OR INACCURASIES DUE TO THIS.

PROJECT TEAM:

DESIGN TEAM:
LOERA DESIGNS - Al Loera
loeradesigns@gmail.com
STRUCTURAL ENGINEER:
STRUCTISTE - Michel Blangy
structiste@gmail.com
CIVIL ENGINEER:
N/A

T-24 ENERGY REPORT:
NRG
nrg@nrgcompliance.com
SURVEYOR:
N/A



Site Plan

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

LOT SHAPE: RECTANGULAR — LOT SIZE: 4479.00SF

EXISTING:

GARAGE:	500.00SF
FIRST STORY LIVING AREA :	1186.00SF
SECOND STORY LIVING AREA:	585.00SF
TOTAL LIVING AREA:	1771.00SF

PROPOSED:

FIRST STORY LIVING AREA : (EXISTING+140SF)	1326.00SF
SECOND STORY LIVING AREA: (NO CHANGE)	585.00SF
TOTAL LIVING AREA:	1911.00SF
COVERED SIDE PORCH (4.6*9.4)	43.25SF
COVERED FRONT PORCH: (4*12)	48.00SF
TOTAL AREA:	91.25SF

BUILDABLE FLOOR AREA:
40.01*111.94 = 4479.00SF x .65+240=3151.35 MAX BFA > 2494.25 (PROPOSED)

BFA:
FIRST FLOOR: 1326
SECOND FLOOR: 585
GARAGE OVERAGE: 000.00SF
TOTAL BFA: 1911 SF

MAX BUILDING HEIGHT:
102.38' + 102.51' + 109.92' + 110.0' =424.81 / 4 = 106.20 + 26.00' = 132.20' MAXIMUM BUILDING HEIGHT.

City of Manhattan Beach
Department of Public Works
Standard Notes

From: Michael Guerrero, Principal Civil Engineer (310) 802-5355
Subject:
Permit No.
Date: January 16, 2023

ALL THE PUBLIC WORKS NOTES AND CORRECTIONS MUST BE PRINTED ON THE PLAN IN IT'S ENTIRETY AND IN ORDER SHOWN AND NOTED ON SITE PLAN, WHERE APPLICABLE, NO EXCEPTIONS.
Property was inspected by Public Works on January 31, 2023. And the following items are required and must be listed on plans. Public Works Comments & Conditions subject to change.

1. All landscape irrigation backflow devices must meet current City requirements for proper installation
2. No discharge of construction wastewater, building materials, debris, or sediment from the site is permitted. No refuse of any kind generated on a construction site may be deposited in residential, commercial, or public refuse containers at any time. The utilization of weekly refuse collection service by the City's hauler for any refuse generated at the construction site is strictly prohibited. Full documentation of all materials/trash landfilled and recycled must be submitted to the Permits Division in compliance of the City's Construction and Demolition Recycling Ordinance.
3. Erosion and sediment control devices BMPs (Best Management Practices) must be implemented around the construction site to prevent discharges to the street and adjacent properties. BMPs must be identified and shown on the plan. Control measures must also be taken to prevent street surface water entering the site.
4. All storm water, nuisance water, etc. drain lines installed within the street right of way must be constructed of 3" cast iron pipe and labelled on the Site Plan. Drain lines must be shown on the plans. **Connecting on-site drainage line to sewer lateral is strictly prohibited**.
5. All concentrated runoff water from the roof and side yards and patios must discharge onto Elm Avenue/17th Street through the drain lines and must be shown on the plans with all required outlet flow line elevations at the discharge point.
6. Impervious surface shall be sloped away from the building at 2% minimum slope for a minimum distance of 10 feet; lot shall be graded to drain surface water away from foundation walls – per C.R.C. Section R401.3.
7. Sidewalk, driveway, curb, and gutter construction, repairs or replacement must be completed per Public Works Specifications. See City Standard Plans ST-1, ST-2, ST-3 and ST-10.
8. The parking encroachment area on Elm Avenue and/or 17th Street must be improved per City Standard Plans.
9. Private use of the public right of way requires an Encroachment Permit per M.B.M.C. 7.36.
10. Contractor to protect in place all existing property corners during construction. If any of the property corners are removed or destroyed during construction, it would be the responsibility of the contractor to restore them.
11. All existing or construction related damages or displaced curb/gutter, sidewalk, driveway approach or street must be replaced and shown on the plans. Additional public improvements may be required during and/or near the completion of construction per M.B.M.C. 9.72 as determined by the Public Works Inspector based on conditions of public improvements.
12. It is the responsibility of the contractor to protect all the street signs, street lamps/lights, walls/fences, and/or trees around the property. If they are damaged, lost or removed, it is the responsibility of the contractor to replace them at the contractor's expense. Contact the Public Works Inspector for sign specification and suppliers.
13. **New 6" VCP sewer lateral will be installed if the existing lateral is less than 6" in diameter per M.B.M.C. 5.36 and City Standard Plan ST-5.** Sewer cleanout should be located within private property lines. A backwater valve is required on the sanitary sewer lateral if the discharges from fixtures with flood level rims are located below the next upstream manhole cover of the public sewer (Per City Standard Plan ST-24).
14. If any existing sewer lateral (6" minimum) is used, it must be televised to check its structural integrity **prior to any demolition work**. The tape must be made available for review by the Public Works Department and must show proof of the location of where it was shot. The Public Works Department will review the tape and determine at that time if the sanitary sewer lateral needs repairing, replaced, or that it is structurally sound and can be used in its present condition. Videoing of lateral must be in its original state. No cleaning, flushing or altering prior to videoing is permitted.
15. **If a new sewer lateral is to be installed at a different location on the sewer main line, the old lateral must be capped at the property line and at the main line. Prior to structure demolition a sewer cap verification and approval from Public Works Inspector is required.**
16. Water meters MUST remain accessible for meter readers during construction. Water meters shall be placed near the property line and out of the driveway approach whenever possible. Water meter placement must be shown on the plans. See City Standard Plan ST-15. For existing water service relocations and/or abandonment, water service must be capped at the main and at the meter.
17. The water meter box must be purchased from the City, and must have a traffic rated lid if the box is located in the driveway.
18. Residential properties must provide an enclosed storage area for refuse containers. These areas must be constructed to meet the requirements of M.B.M.C. 5.24.030. The area must be shown in detail on the plans before a permit is issued/finaled.
19. All work done within the public right-of-way shall be done by a licensed contractor with a Class A, C-12 or C-34 license for all trenching and paving or a Class C-08 license for all concrete work. A Class B license may be acceptable for minor curb, gutter and sidewalk work constructed in conjunction with a single-family residential structure. A separate permit is required for work in the public right-of-way.
20. Plan holder must have the plans rechecked and stamped for approval by the Public Works Department before the building permit is issued.
21. The contractor shall monitor, supervise and control all construction and construction supportive activities, so as to prevent these activities from causing a public nuisance, including but not limited to, ensuring strict adherence to the following:
    (a) Removal of dirt, debris, or other construction material deposited on any public street no later than the end of each working day.
    (b) All excavations shall be backfilled at the end of each working day and roads opened to vehicular traffic unless otherwise approved by the City Engineer.
    (c) All dust control measures per South Coast Air Quality management District (SCAQMD) requirements shall be adhered to during construction operations.
    (d) All construction to be in conformance with the regulations of Cal-OSHA.

NOTE* PLEASE INSERT PUBLIC WORKS COMMENTS BELOW IN ITS ENTIRETY AND ORDER SENT

It shall be the duty of every person cutting or making an excavation in or upon any public place, to place and maintain barriers and warning devices for the safety of the general public. M.B.M.C. 7.16.080. If any excavation is made across any public street, alley, or sidewalk, adequate crossings shall be maintained for vehicles and pedestrians. M.B.M.C. 7.16.100.

05.23.2023

LOERA • DESIGNS
118 SOUTH CATALINA AVE
REDONDO BEACH CA. 90277
1.310.379.5900
WWW.LOERADESIGNS.COM

LOT DESCRIPTION:	
LOT SIZE:	4479sf
APN#:	
TRACT:	1638
LOT:	1
BLOCK:	57
CONSTRUCTION TYPE:	V/B
OCCUPANCY:	R-3,U
ZONING:	RS AREA DISTRICT 3
FLOOD ZONE:	X
CLIMATE ZONE:	6
FIRE SPRINKLERS:	No
GOVERNING CA 2022 CODES:	
Building Code, Electrical Code, Mechanical Code	
Plumbing Code, Energy Standards, Green Building Code	
Local Governing City Jursidction Amendments , Res. Code	

PROJECT TITLE:
Remodel

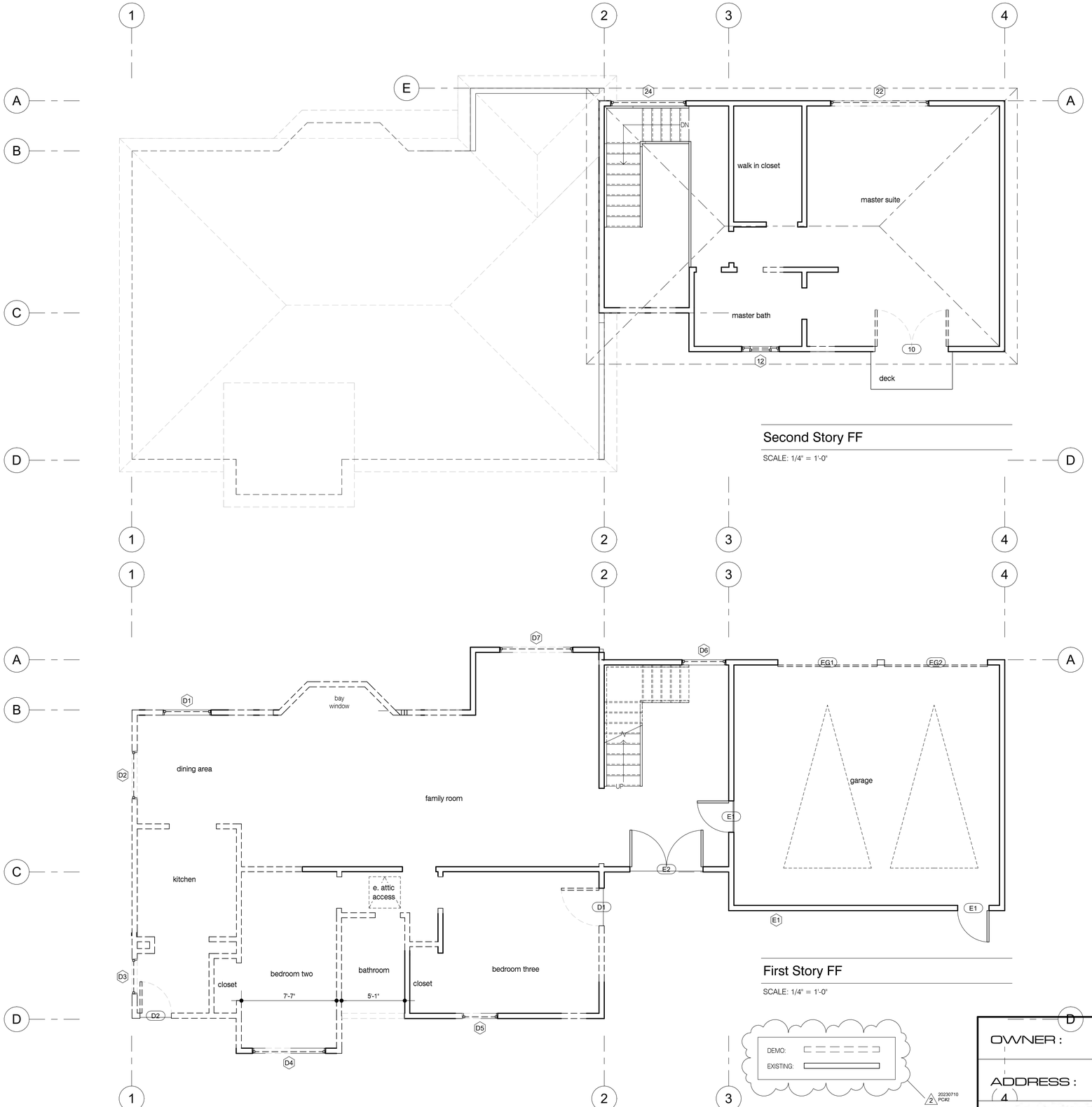
PROJECT ADDRESS:

STATUS:	PC#2
DATE:	20230710
REV#:	2
CASE #	Project Number

SHEET TITLE:

A000
COVER SHEET

8/17/2023 4:27:17 PM



Second Story FF

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

First Story FF

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

DEMO:

EXISTING:

2 20230710 PC#2

CITY NOTES:

Glazing in the following locations shall be safety galzing conforming to the human impact loads of Section R308.3 (see exeptions) (R308.4)

A. Fixed and operable panels of swinging, sliding, and bi-fold door assemblies
B. Glazing in an individual or operable panle adjacent to a door where the nearest verticle edge is within 24in. arc of either verticle edge of the door in a closed position and whose bottom edge is less than 60inches above the floor or walking surface
C. Glazing in an individual fixed or operable panel that meets all of the following conditions:
   a. exposed area of indivdual pane greater than 9sqft
   b. botoom edge less than 18" above the floor
   c. top edge greater than 36" above the floor
   d. one of more walking surfaces within 36" horizontally of the glazing
D. Glazing in guards and railings
E. Glazing in enclosures for or wall walls facings hot tubs, whirlpools, sauans, steam rooms, bathtubs, and showers where the bottom edge of the glazing is less than 60inches measured vertically above andy standing or walking surface
F. Glazing in walls and fences adjcent to indoor and outdoor swimming pools, hot tubs, and spas where the bottom edge is less than 60inches above and walking surface and within 60" measured horizontally and in a straight line of the waters edge
G. Glazing where the bottom exposed edge of the glazing is less than 36inches above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps
H. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36inches above the landing and within 60inch horizontal arc less than 180deg from the bottom treat nosing
I. Lots shall be graded to drain surface water away from foundation walls with a minimum fall of 6 inches within the first 10ft
J. Building shall have approved address numbers, building numbers or approved building indentification placed in a position that is plainly legible and visible from the street or road fronting the property
K. Protection of wood and wood based products from decay shall be provided in the locations specified per section r317.1 by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative, adn end use. Preservatives shall be listed in section 4 of awpa u1.
L. Provide anti-graffiti finish within the first 9ft, measured from grade, at exterior walls and doors. exception: maintnance of building affidavit is recorded by the onwer to convenant and agree with the city of los angeles to remove any graffiti within 7-days of the graffiti being applied. (6306)
M. Bathrooms, water closet compartments and other similar rooms shall be provided natural ventilation or with mechanical ventilation or with mechanical ventilation capable of 50cfm exhuated directly to the outside
N. Heater shall be capable of maintaining a minimum room temperature of 68°F at a point 3ft above the loor and 2ft from exterior walls in all habitable rooms at the design temperature.

EXISTING WINDOW SCHEDULE

Mark	Count	Width	Height	Sill Height	Manufacturer	Comments
12	1	1' - 10"	2' - 10"	3' - 10"		
15	1	3' - 0"	3' - 0"	3' - 8"		
22	1	7' - 10"	3' - 10"	2' - 10"		
24	1	6' - 0"	4' - 0"	2' - 8"		
D1	1	3' - 10"	3' - 10"	2' - 10"	ARCADIA	
D2	1	3' - 10"	3' - 10"	2' - 10"	ARCADIA	
D3	1	2' - 10"	2' - 10"	3' - 10"		
D4	1	5' - 10"	3' - 2"	3' - 6"		
D5	1	2' - 10"	3' - 10"	2' - 10"		
D6	1	5' - 6"	4' - 0"	2' - 8"		
D7	1	5' - 10"	3' - 10"	2' - 10"		
E1	1	4' - 0"	2' - 0"	4' - 8"		

Grand total: 12

EXISTING DOOR SCHEDULE

Mark	Count	Width	Height	Head Height	Comments
10	1	5' - 10"	6' - 8"	6' - 8"	
D1	1	3' - 0"	6' - 8"	6' - 8"	
D2	1	2' - 6"	6' - 8"	6' - 8"	
E1	2	2' - 6"	6' - 8"	6' - 8"	
E2	1	5' - 10"	6' - 8"	6' - 8"	
EG1	1	7' - 11"	6' - 6"	6' - 6"	
EG2	1	8' - 2 1/2"	6' - 6"	6' - 6"	

OWNER :

ADDRESS :

05.23.2020

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RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA,1.310.379.5900

A200

SHEET TITLE:EXISTING + DEMO FIRST STORY PLANS

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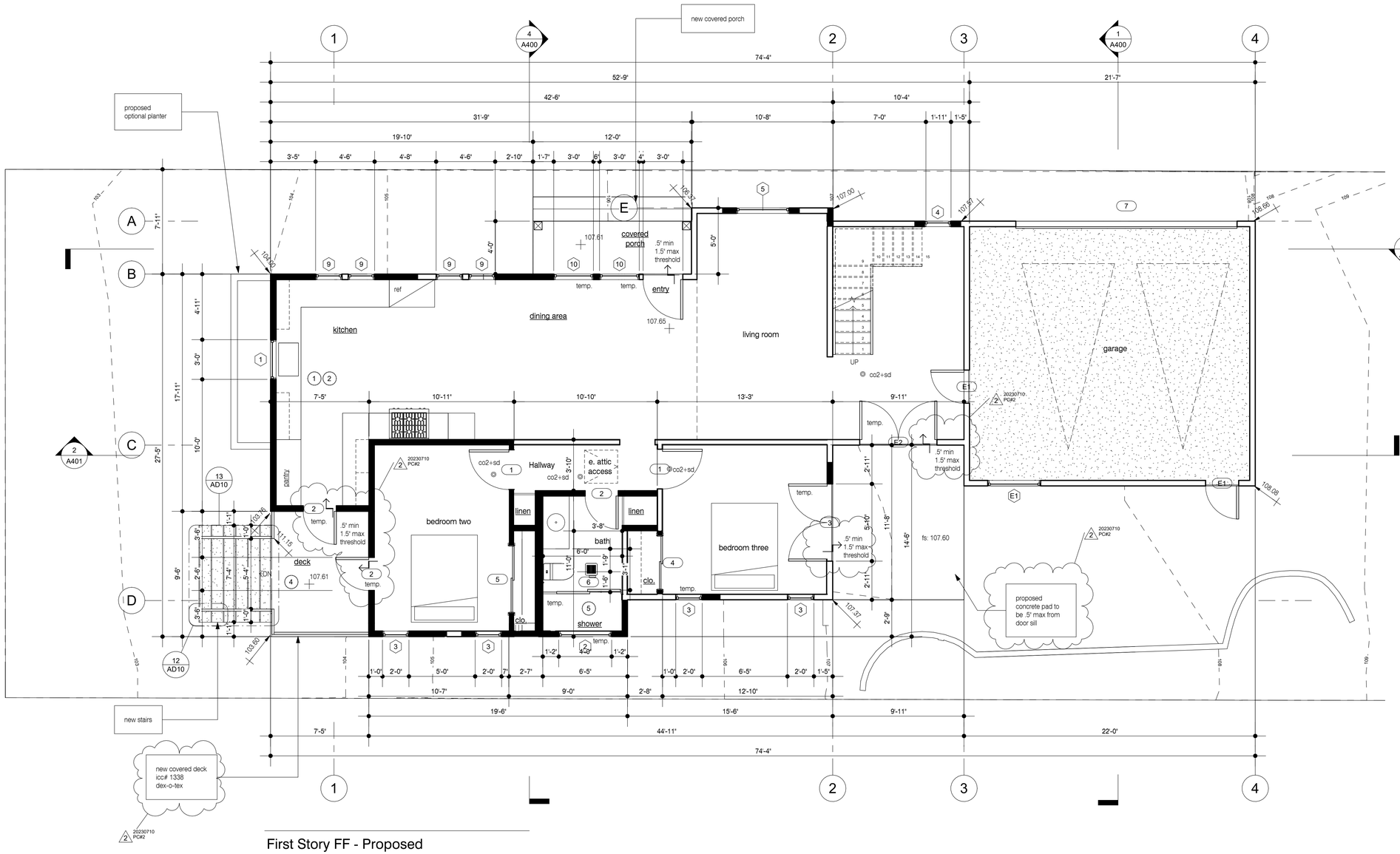

First Story FF - Proposed

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

DEMO:
EXISTING:
NEW:

PROJECT DESCRIPTION

#	scope of work
1	PROPOSED 87SF ADDITION (KITCHEN)
2	92SF KITCHEN REMODEL
4	32SF DECK
5	15SF BATHROOM ADDITION

2 20230710 PC#2

PROPOSED WINDOW SCHEDULE

Mark	Count	Width	Height	Sill Height	Manufacturer	Comments
1	1	3' - 0"	3' - 6"	3' - 2"		casement
2	1	4' - 0"	2' - 0"	4' - 8"		awning
3	4	2' - 0"	4' - 0"	2' - 8"		casement
4	1	2' - 0"	4' - 0"	2' - 8"		casement
5	1	4' - 0"	5' - 0"	1' - 8"		single hung
6	1	2' - 0"	2' - 0"	4' - 8"		awning
7	3	2' - 0"	5' - 0"	1' - 8"		casement
8	4	2' - 0"	4' - 0"	2' - 8"		casement
9	4	2' - 0"	3' - 6"	3' - 2"		single hung
10	2	3' - 0"	4' - 0"	2' - 8"		single hung
11	1	2' - 0"	4' - 0"	2' - 8"		casement

Grand total: 23

PROPOSED DOOR SCHEDULE

Mark	Count	Width	Height	Head Height	Comments
1	3	3' - 0"	6' - 8"	6' - 8"	
2	4	2' - 6"	6' - 8"	6' - 8"	
3	1	5' - 10"	6' - 8"	6' - 8"	
4	1	4' - 0"	6' - 8"	6' - 8"	
5	1	5' - 0"	6' - 8"	6' - 8"	
6	1	4' - 10"	6' - 8"	6' - 8"	
7	1	16' - 8 1/2"	6' - 8"	6' - 8"	
8	1	6' - 0"	6' - 8"	6' - 8"	

OWNER :

05.18.2020

ADDRESS :

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A300

SHEET TITLE:PROPOSED FIRST STORY PLAN

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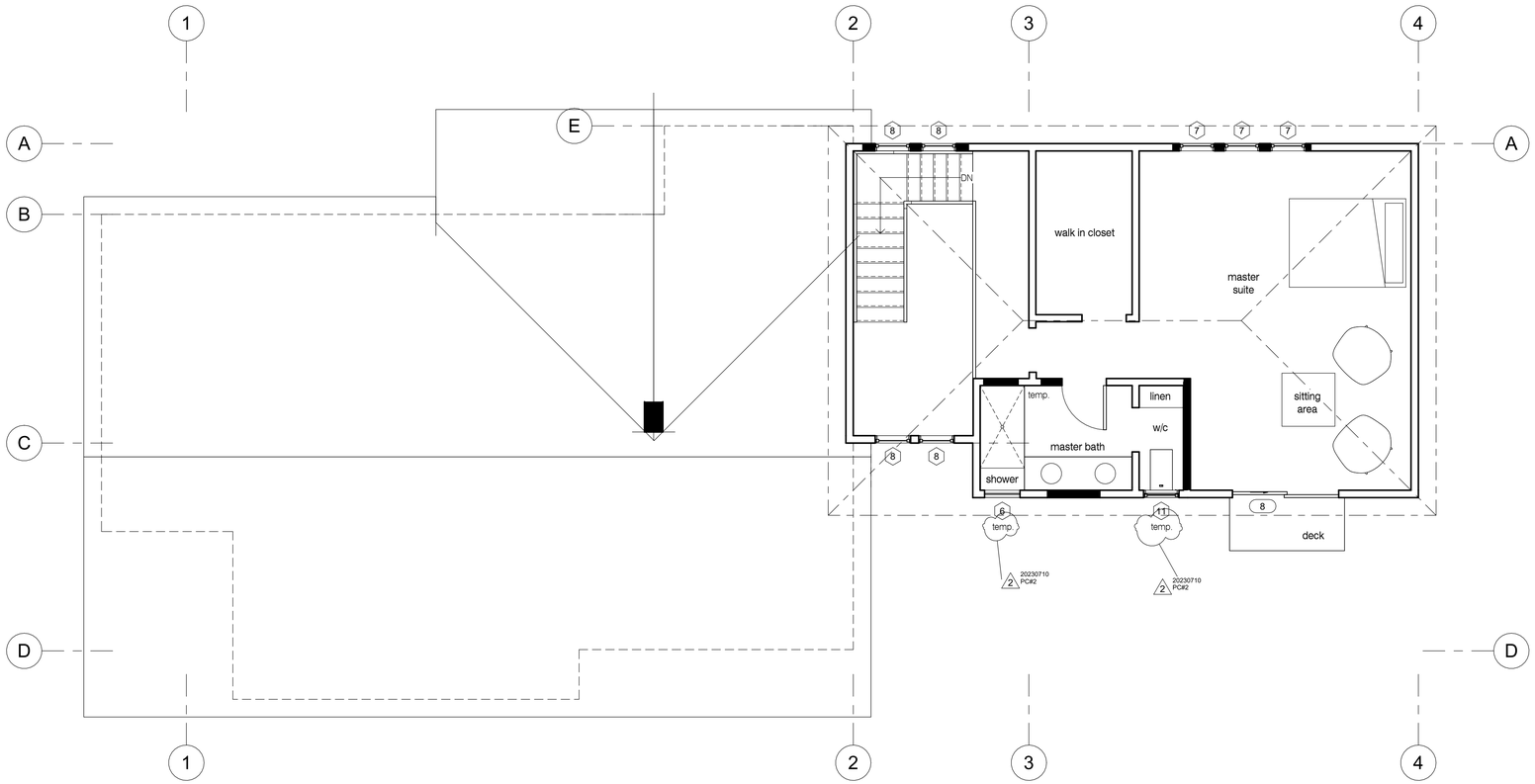

Second Story Proposed

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

2 20230710 PC#2

PROPOSED WINDOW SCHEDULE

Mark	Count	Width	Height	Sill Height	Manufacturer	Comments
1	1	3' - 0"	3' - 6"	3' - 2"		casement
2	1	4' - 0"	2' - 0"	4' - 8"		awning
3	4	2' - 0"	4' - 0"	2' - 8"		casement
4	1	2' - 0"	4' - 0"	2' - 8"		casement
5	1	4' - 0"	5' - 0"	1' - 8"		single hung
6	1	2' - 0"	2' - 0"	4' - 8"		awning
7	3	2' - 0"	5' - 0"	1' - 8"		casement
8	4	2' - 0"	4' - 0"	2' - 8"		casement
9	4	2' - 0"	3' - 6"	3' - 2"		single hung
10	2	3' - 0"	4' - 0"	2' - 8"		single hung
11	1	2' - 0"	4' - 0"	2' - 8"		casement

Grand total: 23

PROPOSED DOOR SCHEDULE

Mark	Count	Width	Height	Head Height	Comments
1	3	3' - 0"	6' - 8"	6' - 8"	
2	4	2' - 6"	6' - 8"	6' - 8"	
3	1	5' - 10"	6' - 8"	6' - 8"	
4	1	4' - 0"	6' - 8"	6' - 8"	
5	1	5' - 0"	6' - 8"	6' - 8"	
6	1	4' - 10"	6' - 8"	6' - 8"	
7	1	16' - 8 1/2"	6' - 8"	6' - 8"	
8	1	6' - 0"	6' - 8"	6' - 8"	

OWNER :

05.23.2020

ADDRESS :

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A310

SHEET TITLE:PROPOSED SECOND STORY PLAN

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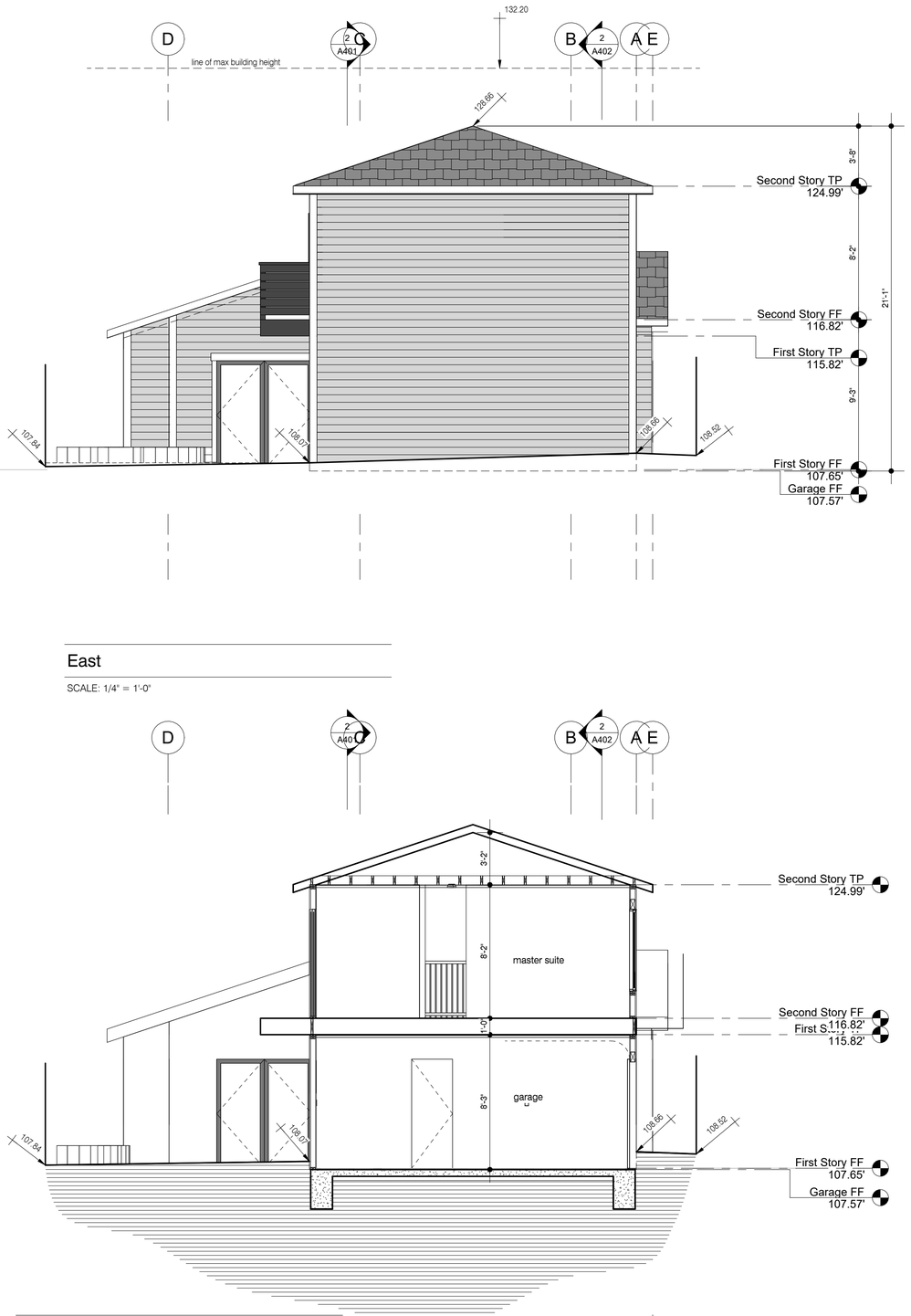
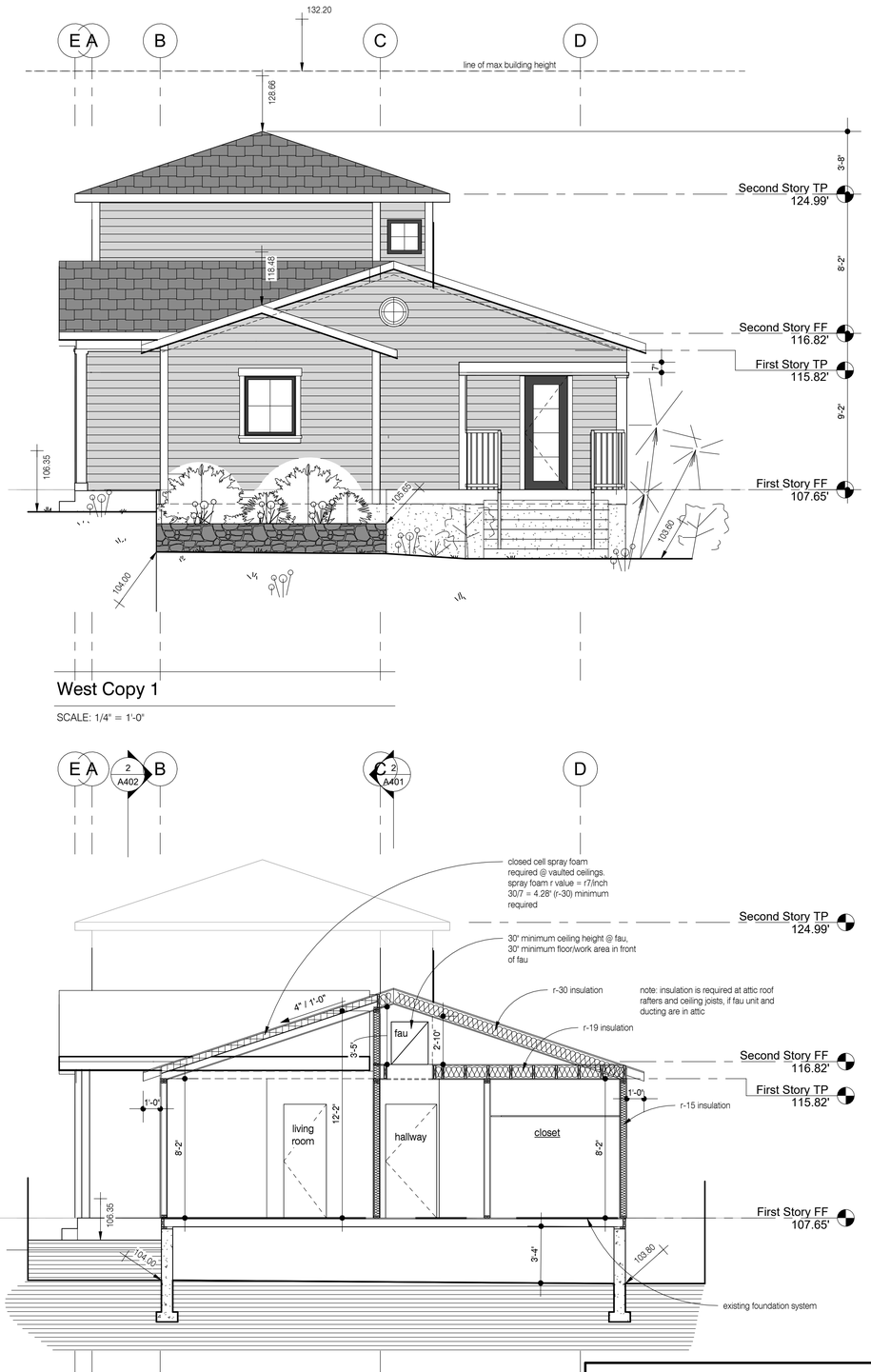


East

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



West Copy 1

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

Section 6

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

Section 7

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

OWNER :

05.23.2020

ADDRESS :

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RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA,1.310.379.5900

A400

SHEET TITLE:EXTERIOR ELEVATIONS

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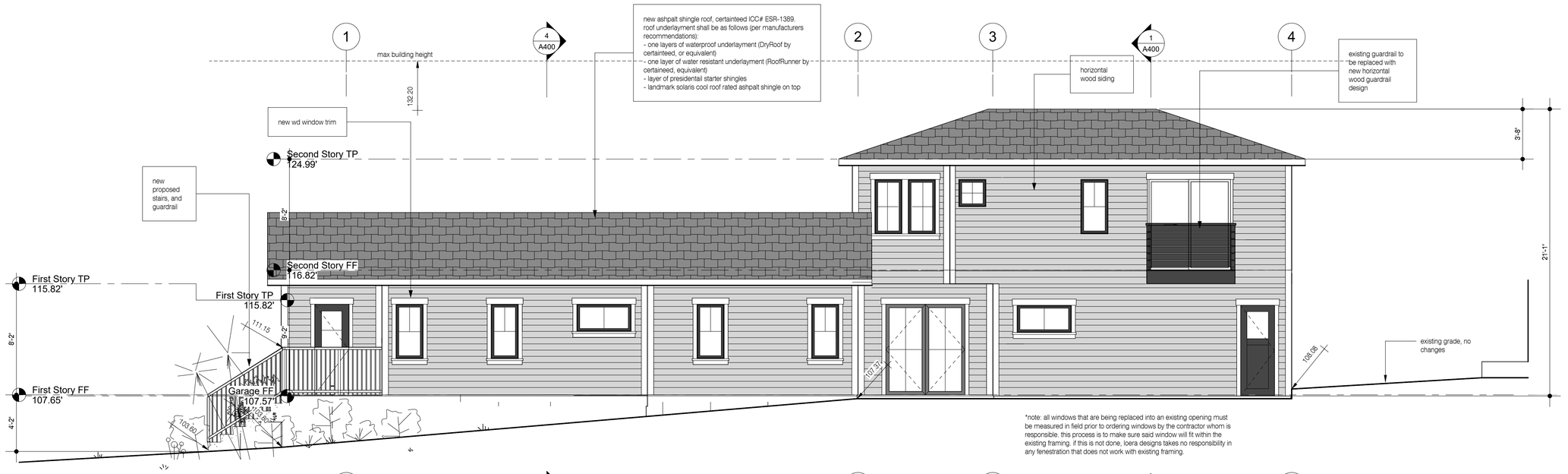
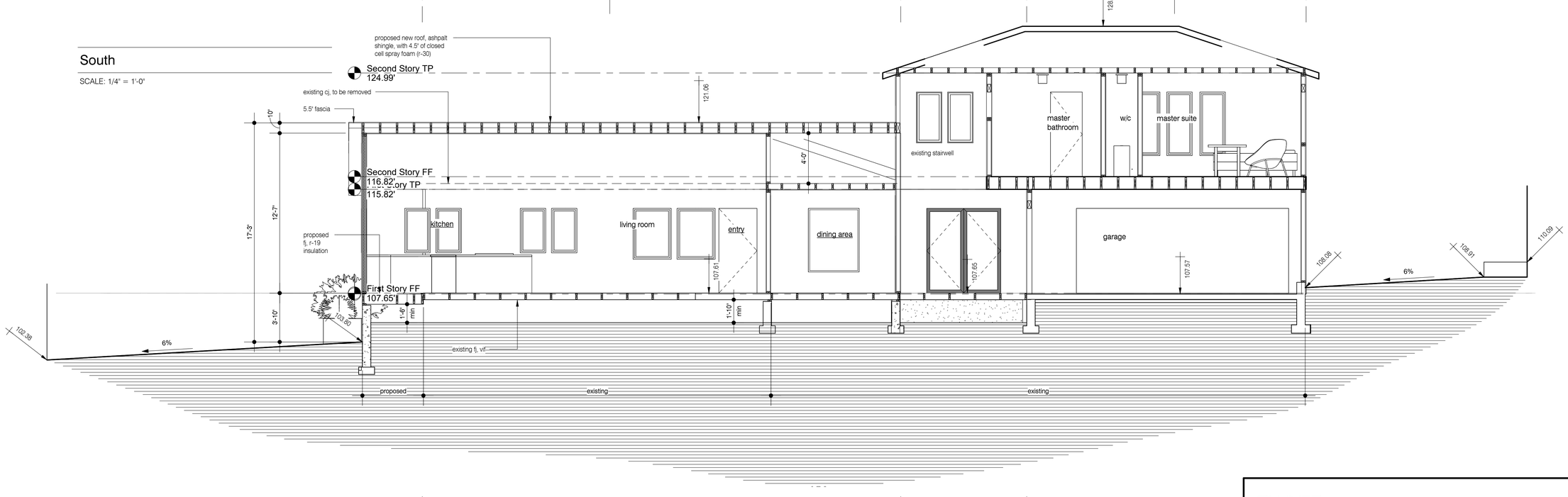


South

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



Section 8

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

OWNER :

ADDRESS :

05.23.2020

LOERA • DESIGNS

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A401

SHEET TITLE:EXTERIOR ELEVATIONS

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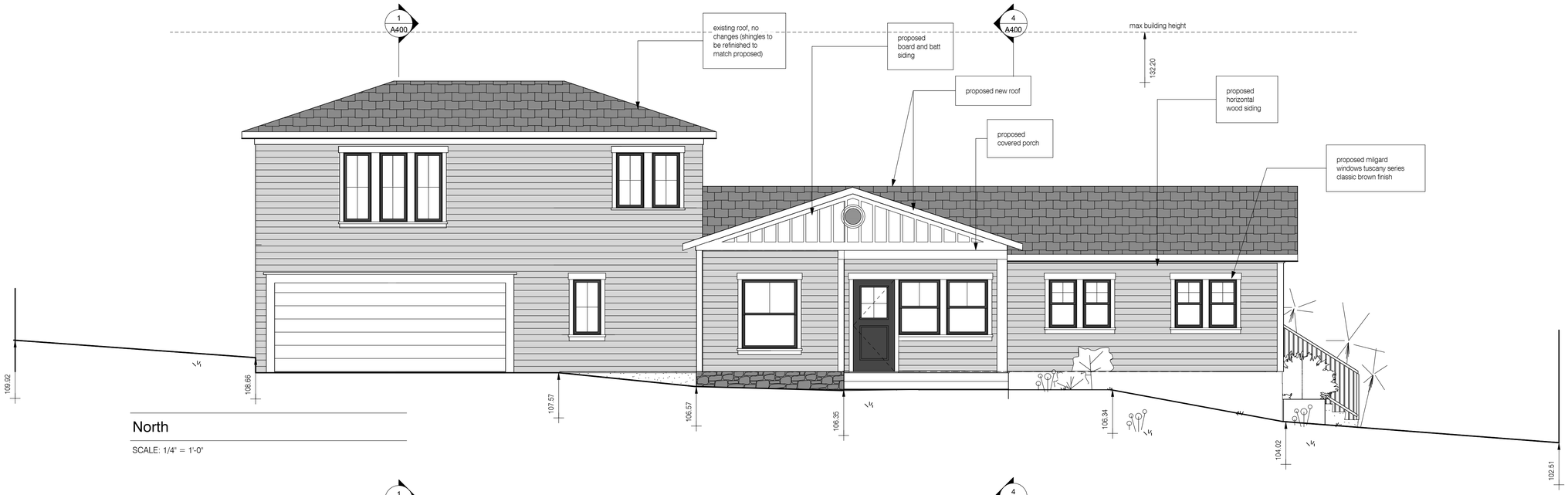
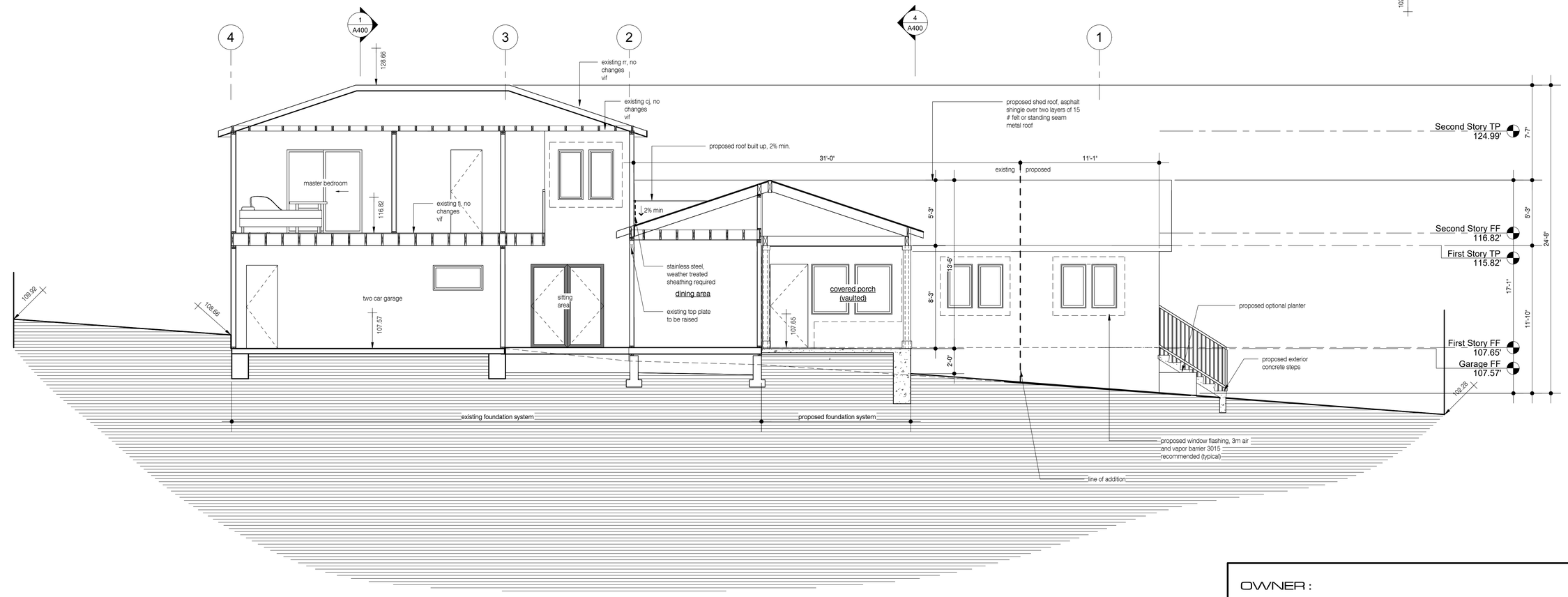


North

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



Section 9

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

OWNER :

05.23.2020

ADDRESS :

LOERA • DESIGNS

RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA,1.310.379.5900

A402

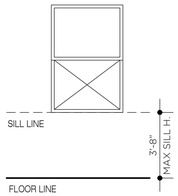
SHEET TITLE:EXTERIOR ELEVATIONS

8/17/2023 4:27:22 PM

AT LEAST ONE OEPRABLE EMERGENCY ESPACPE AND RESCUE WINDOWS,DOORS SHALL BE PRVED A THE BASEMENT AND A TEVERY SLEEPING ROOM IN THE DWELLING UNIT

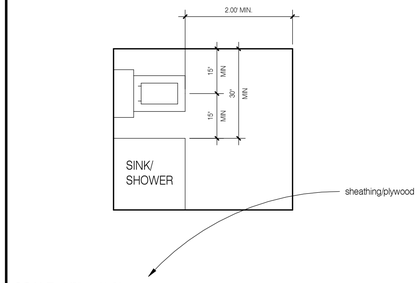
Note :

- The minimum net clear operable area shall be no less than 5.7 sqft(5.0sqft 1st Story)
- The minimum net clear operable are width dimensions shall be 20"
- The minimum net clear operable height shall be 24"
- The finished sill height of windows shall be no more than 44" above the floor
- A window with the required minimum width 20" and the height 24" does not provide the required operable area of 5.7sqft
- The emergency windows/doors shall be operable from inside to provide a full clear opening without the use of seperable tools
- The operable emergency windows/doors shall open directly into a public street, alley way, yard, or exit court



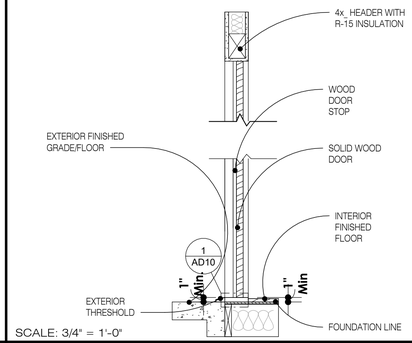
SCALE: 1/4" = 1'-0"

EGRESS WINDOW DETAIL1 3



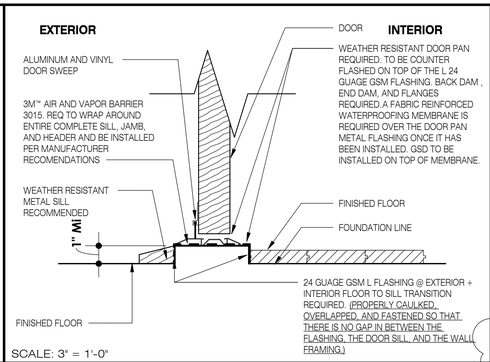
SCALE: 1/2" = 1'-0"

RESIDENTIAL TOILET CLEARANCE DETAIL1 4



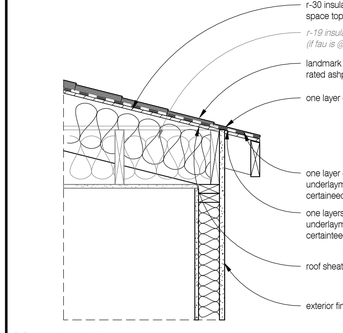
SCALE: 3/4" = 1'-0"

EXTERIOR DOOR DETAIL1 5



SCALE: 3" = 1'-0"

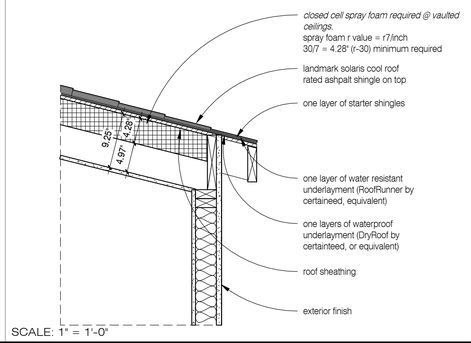
EXT DOOR THRESHOLD DETAIL @ DECK1 1



*notes:
- lap joints and seams in membrane systems a minimum of 2"
- connection of air and vapor barrier to window or door system to be confirmed with windor or door manufacturer
- for negative laps, seal top edge with 3m 525 or 540 sealant
- the primary sealant joint should be adhered to the 3m air and vapor barrier 3015np membrane and the location of the primary sealnt should be discussed with the window/door manufacturer and design professional
- refer to 3m website for compttible sealants

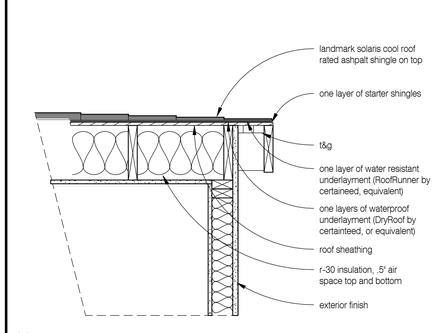
SCALE: 1 1/2" = 1'-0"

EXTERIOR FRAME DETAIL - HEADER1 6



SCALE: 3" = 1'-0"

EXTERIOR FRAME DETAIL - HEADER DET 10



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SCALE: 1 1/2" = 1'-0"

EXTERIOR FRAME DETAIL - SILL1 7

SCALE: 3" = 1'-0"

EXTERIOR FRAME DETAIL - SILL DET 9

SCALE: 1" = 1'-0"

EAVE DETAIL - NON VAULTED1 2

SCALE: 1" = 1'-0"

EAVE DETAIL - VAULTED CEILING 11

SCALE: 1" = 1'-0"

RAKE DETAIL 8

NOTE:
STAIRS AND HANDRAILS MUST MEET THE REQUIREMENTS OF SECTION R311.7:
RISER HEIGHT SHALL BE 7.75"MAX AND 4" MINIMUM; TREAD DEPTH SHALL BE 10" MINIMUM; STAIRS WITH FOUR OR MORE STAIRS SHALL HAVE A HANDRAIL.
STAIR HANDRAIL SHALL BE 34-38" HIGH ABOVE THE TREAD NOSING. CIRCULAR HANDRAIL SHALL HAVE AN OUTSIDE DIA. OF AT LEAST 1.25" AND NOT GREATER THAN 2". IF THE HANDRAIL IS NOT CIRCULAR IT SHALL HAVE A PERIMETER DIMENSIONS OF AT LEST 4" AND NOT GREATER THAN 6.25", WITH A MAX CROSS SECTION OF 2.25". EDGES SHALL HAVE A MINIMUM RADIUS OF 0.0.1" - PER SECTION R311.7.8. *GUARDRAIL SHALL NOT BE LESS THAN 42" HIGH, AND SHALL HAVE BALLUSTERS OR ORNAMENTAL PATTERNS SUCH THAT A 4"DIA. SPHERE CANNOT PASS THROUGH ANY OPENING - SECTION R312*

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

STAIRS DETAIL 13

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

HANDRAIL DETAIL 12

2 20230710 PC#2

2 20230710 PC#2

OWNER :

ADDRESS :

05.18.2020

LOERA • DESIGNS
RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA,1.310.379.5900

AD10

SHEET TITLE:DETAILS

8/17/2023 4:27:22 PM

EMP LEGEND

#=MARK

⊘	LIGHT FIXTURE SEE LIGHT FIXTURE LEGEND FOR LIGHT FIXTURE TYPE
	CEILING MOUNTED EXHAUST FAN W/ HUM. CONTR + LED LIGHT FIXTURE 50 CFM - ENERGY STAR RATED NOTES : 15.3 - 15.3.2.2 PAGE : ~ FAN + LIGHT ON SEPARATE SWITCHES
S	WALL MOUNTED LIGHT SWITCH PLEASE SEE LIGHT FIXTURE LEGEND FOR SWITCH TYPE + SPECIAL COMMENTS INCANDESCENT LIGHTS ARE NOT ALLOWED HIGH EFFICACY LIGHTS ONLY
GFI	110v DUPLEX UTILITY OUTLET GROUND FAULT CIRCUIT INTERRUPTER
AFI	110v DUPLEX UTILITY OUTLET ARCH FAULT CIRCUIT INTERRUPTER
	220v DUPLEX UTULITY OUTLET GROUND FAULT CIRCUIT INTERRUPTER
	COLD/HOT WATER LINE
	COLD WATER ONLY LINE
SD/CO2	SMOKE AND CARBON MONOXIDE DETECTOR COMBO : NOTES : A & B PAGE : ~
	CEILING MOUNTED FAN LIGHT FIXTURE MUST BE ENERGY EFFERCIENT + ON A DIMMER

TITLE-24 COMPLIANCE NOTES

- INSTALLING PROVIDED AT END OF JOB BY CONTRACTOR/INSTALLER TO BUILDING AND SAFETY
- ALL NEW ELECTRICAL SERVICES MUST HAVE PROVISIONS FOR FUTURE UNDER-GROUNDING.
- ALL HARDWIRE LIGHTING MUST BE HIGH EFFICACY.
- ELECTRONIC BALLASTS FOR ALL FLUORESCENT LAMPS ARE TO BE RATED 13W OR GREATER.
- RECESSED LUMINARIES IN ALL INSULATED CEILINGS APPROVED FOR ZERO CLEARANCE INSULATION CONTACT AND IS TO BE CERTIFIED AIR TIGHT. ASTM E283.
- *ALL LIGHTING MUST BE HIGH EFFICACY.*
- HIGH EFFICACY AND LOW EFFICACY LIGHTING MUST BE UNDER SEPARATE CONTROLS.
- SHOWERS AND WALLS ABOVE BATHTUBS AND SHOWER HEADS SHALL BE FINISHED WITH A NON-ABSORBED SURFACE TO A HEIGHT THAT IS NO LESS THAN 72" ABOVE THE DRAIN INLET. 1210.3CBC
- SHOWER AND SHOWER-TUBS SHALL BE PROVIDED WITH INDIVIDUAL CONTROL VALVES FOR THE PRESSURE BALANCE, THERMOSTATIC, OR COMBINATION PRESSURE BALANCE/THERMOSTATIC MIXING VALVE TYPE THAT MUST PROVIDE SCALD AND THERMAL SHOCK PROTECTION. 418CPC.
- PROVIDE ARCH-FAULT INTERRUPTERS FOR ALL OUTLETS IN ALL DWELLING UNIT BEDROOMS.
- GROUND FAULT INTERRUPTER OUTLETS ARE REQUIRED AT EXTERIOR, OUTLETS IN BATHROOMS, KITCHENS, BASEMENTS, CRAWL SPACES, GARAGES, AND WITHIN 6'-0" OF ANY WATER.
- MINIMUM OF TWO-20 AMP CIRCUITS ARE REQUIRED FOR SMALL APPLIANCES AT KITCHEN COUNTER TOPS.
- AT LEAST ONE 20-AMP CIRCUIT SHALL BE PROVIDED TO SUPPLY BATHROOM RECEPTACLE OUTLETS SUCH CIRCUITS SHALL HAVE NO OTHER OUTLETS.

SECTION 4.506 INDOOR AIR QUALITY & EXHAUST

15.4.5.506.1 BATHROOM EXHAUST FANS. EACH BATHROOM SHALL BE MECHANICALLY VENTED AND SHALL COMPLY WITH THE FOLLOWING:
15.3.1. FANS SHALL BE ENERGY STAR COMPLIANT AND DUCTED TO TERMINATE OUTSIDE OF THE BUILDING.
15.3.2. UNLESS FUNCTIONING AS A COMPONENT OF A WHOLE HOUSE VENTILATION SYSTEM, FANS MUST BE CONTROLLED BY A HUMIDITY CONTROL.
15.3.2.1. HUMIDITY CONTROLS SHALL BE CAPABLE OF ADJUSTMENT BETWEEN RELATIVE HUMIDITY RANGE OR GREATER OR LESS THAN 50% TO A MAXIMUM OF 80%. A HUMIDITY CONTROL MAY UTILIZE MANUAL OR AUTOMATIC MEANS OF ADJUSTMENT.
15.3.2.2. A HUMIDITY CONTROL MAY BE SEPARATE COMPONENT TO THE EXHAUST FAN AND IS NOT REQUIRED TO BE INTEGRAL. I.E. BUILT IN. NOTES: LIGHTING INTEGRAL TO THE BATHROOM EXHAUST FANS SHALL COMPLY WITH CALIFORNIA ENERGY CODE.

NOTE: BATHROOMS, WATER CLOSETS, COMPARTMENTS AND OTHER SIMILAR ROOMS SHALL BE PROVIDED WITH A MECHANICAL VENTILATION OF 50-CFM INTERMITTENT OR 20-CFM CONTINUOUS VENTILATION ARE PROVIDED. (R303.3. EX)

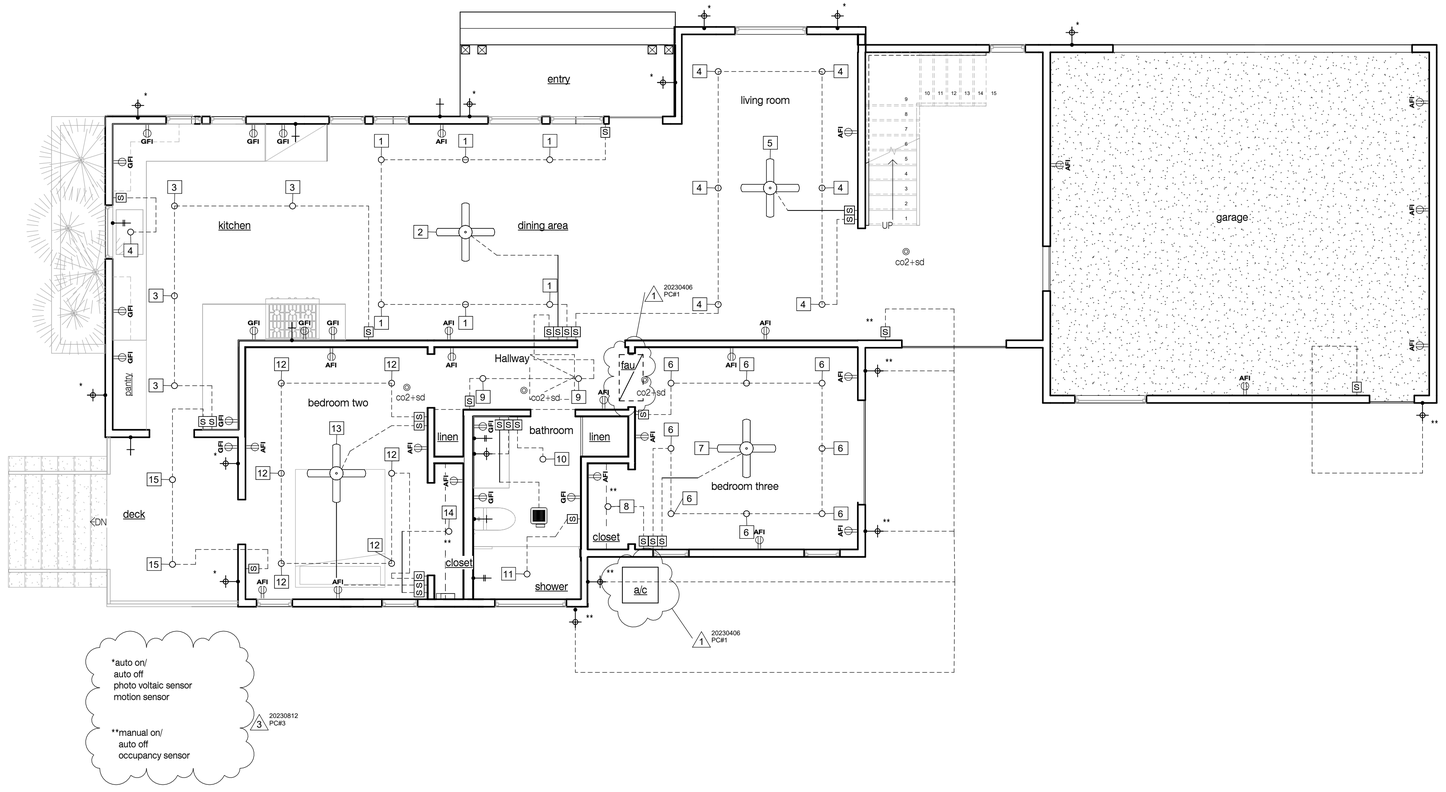
CARBON MONOXIDE + SMOKE DETECTOR NOTES:

A. APPROVED CARBON MONOXIDE ALARMS SHALL BE INSTALLED DWELLING UNITS AND IN SLEEPING UNITS WITHIN FUEL-BURNING APPLIANCES ARE INSTALLED AND IN DWELLING UNIT THAT HAVE ATTACHED GARAGES. CARBON MONOXIDE ALARMS SHALL BE PROVIDED OUTSIDE EACH SEPARATE DWELLING UNIT SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON EVERY LEVEL OF A DOWELING UNIT INCLUDING BASEMENTS. WHERE A PERMIT IS REQUIRED FOR ALTERATIONS, REPAIRS OR ADDITION EXCEEDING $1,000.00, EXISTING DWELLINGS OR SLEEPING UNITS THAT HAVE ATTACHED GARAGES OR FUEL BURNING APPLIANCES SHALL BE PROVIDED WITH A CARBON MONOXIDE ALARMS IN ACCORDANCE WITH SECTION R315.2 CARBON MONOXIDE ALARMS SHALL BE REQUIRED IN SPECIFIC DWELLING/SLEEPING UNITS FOR WHICH THE PERMIT WAS OBTAINED. THEY SHALL ALSO BE INTERCONNECTED SO THAT THE ACTUATION OF ONE ALARMS WILL ACTIVATE ALL ALARMS WILL ACTIVATE ALL ALARMS WITHIN THE INDIVIDUAL DWELLING UNIT. CARBON MONOXIDE DETECTOR SHALL RECEIVE THEIR PRIMARY POWER SOURCE AND BE HARD-WIRED TO THE BUILDING WIRING AND SHALL BE EQUIPPED WITH BATTERY BACKUP AND LOW BATTERY SIGNAL.

B. APPROVED SMOKE ALARMS SHALL BE INSTALLED IN EACH SLEEPING ROOM AND HALLWAYS AREA GIVING ACCESS TO A SLEEPING ROOM, AND ON EACH STORY AND/OR BASEMENT FOR DWELLINGS MORE THAN ONE STORY. SMOKE ALARMS SHALL BE INTERCONNECTED SO THAT THE ACTUATION OF ALARMS WILL ACTIVE ALL ALARMS WITHIN THE INDIVIDUAL DWELLING UNIT. IN NEW CONSTRUCTION SMOKE ALARMS SHALL RECEIVE THEIR PRIMARY POWER SOURCE AND BE HARD-WIRED TO THE BUILDING WIRING AND SHALL BE EQUIPPED WITH BATTERY BACKUP AND LOW BATTERY SIGNAL. SMOKE DETECTORS SHALL BE PROVIDED FOR DWELLINGS UNIT INTENDED FOR HUMAN OCCUPANCY, UPON THE OWNER APPLICATION FOR A PERMIT ALTERATIONS, REPAIRS, OR ADDITIONS EXCEEDING $1,000.00

SEC. 504.3 CLOTHES DRYERS:

1. 504.3.1 MOISTURE EXHAUST DUCTS. MOISTURE EXHAUST DUCTS SHALL TERMINATE ON THE OUTSIDE OF THE BUILDING AND SHALL BE EQUIPPED WITH A BACK-DRAFT DAMPER. SCREENS SHALL NOT BE INSTALLED AT THE DUCT TERMINATION. DUCTS FOR EXHAUSTING CLOTHES DRYERS SHALL NOT BE CONNECTED OR INSTALLED WITH SHEET METAL SCREWS OR OTHER FASTENERS THAT WILL OBSTRUCT THE FLOW. CLOTHES DRYER MOISTURE EXHAUST DUCTS SHALL NOT BE CONNECTED TO A GAS VENT CONNECTOR, GAS VENT, OR CHIMNEY, AND SHALL ONLY SERVE CLOTHES DRYERS. CLOTHES DRYER MOISTURE EXHAUST DUCTS UNDER POSITIVE PRESSURE SHALL NOT EXTEND INTO OR THROUGH DUCTS OR PLENUMS.
2. 504.3.2 DOMESTIC CLOTHES DRYERS. WHEN A COMPARTMENT OR SPACE FOR A DOMESTIC CLOTHES DRYER IS PROVIDED, A MINIMUM 4 INCH DIAMETER MOISTURE EXHAUST DUCT OF APPROVED MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THIS SECTION AND SECTION 504.0. WHEN A CLOSET IS DESIGNED FOR THE INSTALLATION OF A CLOTHES DRYER, A MINIMUM OPENING OF 100 SQUARE INCHES FOR MAKEUP AIR SHALL BE PROVIDED IN THE DOOR OR BY OTHER APPROVED MEANS
3. 504.3.2.1 DOMESTIC DRYER VENTS. DOMESTIC CLOTHES DRYER MOISTURE EXHAUST DUCTS SHALL BE OF METAL AND SHALL HAVE SMOOTH INTERIOR SURFACES. EXCEPTION: LISTED CLOTHES DRYER TRANSITION DUCTS NOT MORE THAN 6 FEET IN LENGTH MAY BE USED IN CONNECTION WITH DOMESTIC DRYER EXHAUSTS. FLEXIBLE CLOTHES DRYER TRANSITION DUCTS SHALL NOT BE CONCEALED WITHIN CONSTRUCTION.
4. 504.3.2.2 LENGTH LIMITATION. UNLESS OTHERWISE PERMITTED OR REQUIRED BY THE DRYER MANUFACTURER 'S INSTALLATION INSTRUCTIONS AND APPROVED BY THE AUTHORITY HAVING JURISDICTION, DOMESTIC DRYER MOISTURE EXHAUST DUCTS SHALL NOT EXCEED A TOTAL COMBINED HORIZONTAL AND VERTICAL LENGTH OF 14 FEET, INCLUDING (2) 90 DEGREE ELBOWS. 2 FEET SHALL BE DEDUCTED FOR EACH 90 DEGREE ELBOW IN EXCESS OF 2.



First Story FF - EMP

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

20230812 PC#3

EMP LIGHT FIXTURE + SWITCH SCHEDULE

#	COMMENTS	COUNT
1	three way switch + dimmer - led light fixture - recessed ceiling mounted	6
2	single switch + dimmer - ceiling fan	1
3	three way switch + dimmer - led light fixture - recessed ceiling mounted	4
4	three way switch + dimmer - led light fixture - recessed ceiling mounted	7
5	single switch + dimmer - ceiling fan	1
6	three way switch + dimmer - led light fixture - recessed ceiling mounted	8
7	single switch + dimmer - ceiling fan	1
8	single switch + occupancy sensor - manual on - auto off - led light fixture - receseed ceiling mounted	1
9	three way switch + occupancy sensor - manual - auto off - led light fixture - recessed ceiling mounted	2
10	single switch + dimmer - led fixture - recessed ceiling mounted	1
11	single switch + dimmer - led fixture - recessed ceiling mounted - water tight	1
12	three way switch + dimmer - led light fixture - recessed ceiling mounted	6
13	single switch + dimmer - ceiling fan	1
14	single switch + occupancy sensor - manual on - auto off - led light fixture - receseed ceiling mounted	1
15	single switch + occupancy sensor - manual on - auto off - led light fixture - receseed ceiling mounted	2
16	single switch + dimmer - led fixture - recessed ceiling mounted	2
17	single switch + dimmer - led fixture - recessed ceiling mounted - water tight	1

Grand total: 46

"All receptacle outlets shall be listed tamper-resistant
receptacle per CEC Section 406.12(A) "

Bathroom receptacles shall be served by a dedicated 20
amp circuit - per CEC Sect. 210.11 (c)3

existing noncompliant
plumbing fixtures shall be replaced with water-conserving plumbing
fixtures for a residential building undergoing addition or alteration"

EMP LIGHT FIXTURE + SWITCH SCHEDULE

#	COMMENTS	COUNT

OWNER :

ADDRESS :

LOERA•DESIGNS
RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA.1.310.379.5900

AE10

SHEET TITLE:EMP

8/17/2023 4:27:23 PM

EMP LEGEND

#=MARK

⊘	LIGHT FIXTURE SEE LIGHT FIXTURE LEGEND FOR LIGHT FIXTURE TYPE
	CEILING MOUNTED EXHAUST FAN W/ HUM. CONTR + LED LIGHT FIXTURE 50 CFM - ENERGY STAR RATED NOTES : 15.3 - 15.3.2.2 PAGE : ~ FAN + LIGHT ON SEPARATE SWITCHES
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	COLD/HOT WATER LINE
	COLD WATER ONLY LINE
SD/CO2	SMOKE AND CARBON MONOXIDE DETECTOR COMBO : NOTES : A & B PAGE : ~
	CEILING MOUNTED FAN LIGHT FIXTURE MUST BE ENERGY EFFERCIENT + ON A DIMMER

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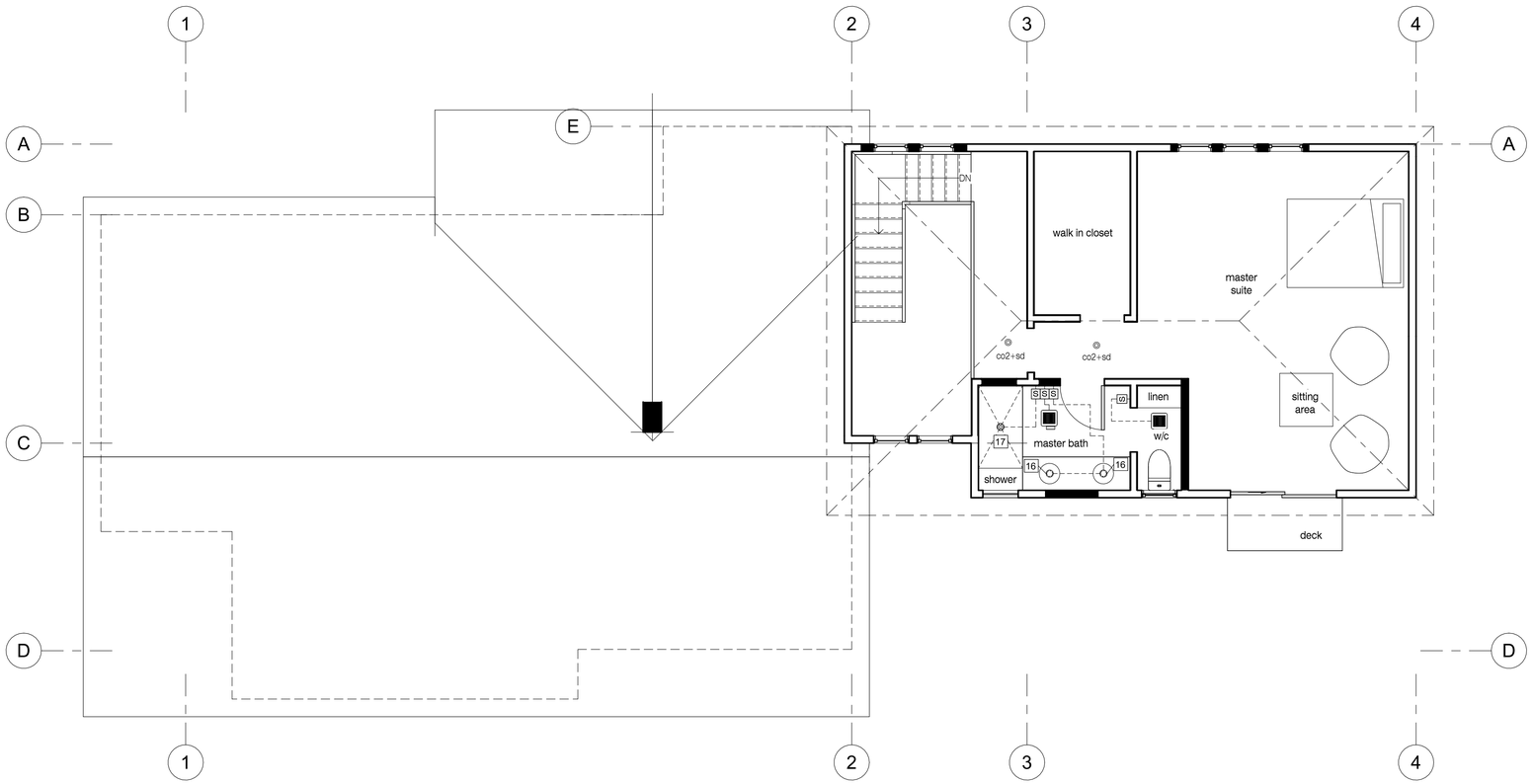

1 Second Story Proposed Copy 1
1/4" = 1'-0" LEVEL:Second Story FF

EMP LIGHT FIXTURE + SWITCH SCHEDULE		
#	COMMENTS	COUNT
1	three way switch + dimmer - led light fixture - recessed ceiling mounted	6
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17	single switch + dimmer - led fixture - recessed ceiling mounted - water tight	1
Grand total: 46		

"All receptacle outlets shall be listed tamper-resistant
receptacle per CEC Section 406.12(A) "

Bathroom receptacles shall be served by a dedicated 20
amp circuit – per CEC Sect. 210.11 (c)3

existing noncompliant
plumbing fixtures shall be replaced with water-conserving plumbing
fixtures for a residential building undergoing addition or alteration"

EMP LIGHT FIXTURE + SWITCH SCHEDULE		
#	COMMENTS	COUNT

OWNER :

ADDRESS :

05.23.2020

LOERA•DESIGNS
RESIDENTIAL & COMMERCIAL DESIGN,116 SOUTH CATALINA AVENUE REDONDO BEACH CA,1.310.379.5900

AE11

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DESIGN CODES & CRITERIA:

1. The design complies to the 2019 edition of the California Building Code (CBC) and amendments made by the local jurisdiction.
2. Construction in accordance with the governing codes and the working drawings does not guarantee protection from loss of life or injury or property damage.
3. Where public utility lines or equipment must be removed and relocated, obtain the necessary approvals prior to starting construction from the respective utility agencies.
4. A separate permit must be secured for all electrical, plumbing, and HVAC work

GRAVITY LIVE LOAD:

• Roof	20 psf	ASCE 7-16 Tab. 4.3-1
• Floor / Balcony	40/60 psf	ASCE 7-16 Tab. 4.3-1

GRAVITY DEAD LOADS:

• Roof	15 psf	"
• Floor / Balcony	12/25 psf	"
• Exterior / Interior Wall	15/10 psf	"

EARTHQUAKE DESIGN DATA:

• Seismic Importance Factor	I	ASCE 7-16 Tab. 1.5-2
• Risk Category	II	ASCE 7-16 Tab. 1.5-1
• Spectral Response Acceleration, SS	1.884	ASCE 7-16 Sect. 11.4.2
• Spectral Response Acceleration, S1	.681	ASCE 7-16 Sect. 11.4.2
• Site Class	D	ASCE 7-16 Sect. 11.4.3
• Spectral Response Coefficient, SDS	1.507	ASCE 7-16 Sect. 11.4.5
• Spectral Response Coefficient, SD1	.772	ASCE 7-16 Sect. 11.4.5
• Seismic Design Category	D	ASCE 7-16 Tab. 11.6-1/-2
• Basic Seismic Force Resisting System	A-15	ASCE 7-16 Table 12.2-1
• Design Base Shear	.232W	ASCE 7-16 Eqtn. 12.8-1
• Seismic Response Coefficient, Cs	.232	ASCE 7-16 Sect. 12.8.1.1
• Response Modification Factor, R	6.5	ASCE 7-16 Tab. 12.2-1
	1.25	@ Cantilevered Column Lines
• Analysis Procedure Used	Equiv. Lat.	ASCE 7-16 Sect. 12.8
• Redundancy Factor Used, Rho	1.3	ASCE 7-16 Sect. 12.3.4

WIND FORCES:

• Risk Category	II	ASCE 7-16 Tab. 1.5-1
• Nom. Wind Speed, V (3-sec gust)	95mph	ASCE 7-16 Fig. 26.5-1B
• Wind Exposure	B	ASCE 7-16 Sect. 26.7.3
• Internal Pressure Coefficient, GCpi	+/-0.18	ASCE 7-16 Tab. 26.11-1
• Components and Cladding, pnet		ASCE 7-16 Sect. 30.5-1

ABREVIATIONS USED ON PLANS:

(N)	NEW	HGR.	HANGER
(E)	EXISTING	HT.	HEIGHT
A.B.	ANCHOR BOLT	HORIZ.	HORIZONTAL
A.F.F.	ABOVE FINISHED FLOOR	JST.	JOIST
B.N.	BOUNDARY NAILING	M.B.	MACHINE BOLT (ABOT U.O.N.)
BOT.	BOTTOM	MFR.	MAUFACTURER'S
BLKG.	BLOCKING	O/	OVER
C.J.	CEILING JOIST	O.C.	ON CENTER
CONC.	CONCRETE	P.A.	POST ABOVE
CONT.	CONTINUOUS	P.C.	PIPE COLUMN
D.J.	DECK JOIST	P.T.	PRESERVATIVE TREATED
DIAPH.	DIAPHRAGM	PL.	PLATE
E.N.	EDGE NAILING	PLYWD.	PLYWOOD
EA.	EACH	RR.	ROOF RAFTER
E/S	EACH SIDE	RFTR.	RAFTER
E/W	EACH WAY	SOG	SLAB ON GRADE
EMBED.	EMBEDMENT	SHTG.	SHEATHING
FLR.	FLOOR	STL.	STEEL (A36 U.O.N.)
FND.	FOUNDATION	T.O.W.	TOP OF WALL
FTG.	FOOTING	T.O.S.	TOP OF SLAB
FIN. GD.	FINISH GRADE	U.O.N.	UNLESS OTHERWISE NOTED
F.J.	FLOOR JOIST	V.I.F.	VERIFY IN FIELD
F.N.	FIELD NAILING	VERT.	VERTICAL
HSS	HOLLOW STRUCT. SECT.	W/	WITH

DRAWING NOTES:

1. All details, sections, and notes on drawings are intended to be typical and shall apply to similar situations, U.N.O.
2. Notes and details on drawings shall take precedence over these general specifications. Dimensions for construction shall not be scaled from the drawings
3. The contractor shall verify all dimensions, elevations and site conditions before starting work. Where actual conditions conflict with the various elements of the working drawings and/or specifications, discrepancies or omissions shall be reported to the engineer of record prior to proceeding with construction.
4. The contractor shall allow reasonable time for the engineer of record to resolve conflicts and/or make revisions to the drawings and/or specifications. Revisions to the drawings shall be reviewed and approved by the building official.
5. The drawings and specifications represent the finished structure, unless otherwise shown, they do not indicate the method of construction. The contractor shall supervise and direct the work and he shall be solely responsible for all construction means, methods, techniques, sequences and procedures.
6. The stamped set of drawings and specifications shall be kept at the job sites and shall be available to the authorized representatives of the building and safety department. There shall be no deviation from the approved plans and specifications without an approved change order.

CONSTRUCTION NOTES:

1. The contractor shall be fully responsible for methods of construction, workmanship, and job safety. Workmanship and materials including falsework, bracings, and other temporary items shall conform to the governing codes and job safety requirements per OSHA standards.
2. Construction safety provisions in accordance with the building code shall be provided and approved by the building inspector prior to starting any work on the building. Permits for protective fences and /or canopies constructed on public property must be secured from the department of building and safety.
3. Construction, inspection and physical testing procedures shall conform to the requirements of the governing codes and the amendments by the local jurisdiction.
4. Construction loading shall not exceed the design the load unless special shoring is provided. Allowable loads shall be reduced in areas where the structure has not attained its full design strength.
5. Any support services performed by the engineer during construction shall be distinguished from continuous and detailed inspection services which are furnished by others. These support services which are furnished by the engineer whether of material or work, and whether performed prior to, during or after completion of construction, are performed for the purpose of assisting in quality control and in achieving conformance with contract drawings and specifications, but they do not warrantee contractor's performance and shall not be construed as supervision of construction.
6. Contractor shall provide a copy of shoring plans to the engineer for review. A permit may be required by the city.

FOUNDATIONS:

1. Unless a soils report and soil properties are referenced below, the subsurface conditions were assumed to be non-expansive clay and the corresponding allowable design values were assumed to be those stated in the governing code:
   - Soils Report by _____, dated _____.

   All aspects of the foundation and associated excavations are required to be inspected in the field by the soils/geology/geotechnical engineer of record, in accordance with the report and/or the requirements of the building official.

Shallow Conventional Line Footings

Presumptive Load Bearing Values from Table 1806.2

- Class: Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH AND CH) / Per Report
- Allowable Vertical Foundation Pressure = 1,500 psf
- Allowable Lateral Bearing Pressure = 100 psf/f
- Allowable Sliding Resistance, Coefficient of Friction = —
- Allowable Sliding Resistance, Cohesion = 0

2. The soils report and log of borings were obtained by the Owner for the Engineer's use in the design of the foundation and is not a part of the Contract Documents. This report and log of borings is available for the Contractor's information, but is not a warranty of the subsurface conditions. The Contractor may use the report at his own risk.
3. Shallow footings shall bear a minimum 18" below adjacent grade or controlled compaction or as noted on the plans. Excavations for the footings shall be free of water prior to placing of concrete. All backfill shall be compacted to a minimum of 90% of maximum density.
4. No person shall descend into trenches or excavations with a depth greater than 5 feet, unless necessary permits have been obtained from the State of California Division of Industrial Safety.
5. The contractor shall be solely responsible for all excavation procedures including logging, shoring and protection of any adjacent property, structures, streets and utilities in accordance with all national, state and local safety ordinances.
6. Contractor shall review existing utility plans and shall verify the location of all utility lines in the area to be excavated prior to excavation for new foundations.

CONCRETE:

1. Concrete mixes shall be submitted to the engineer of record for approval. Material shall be proportioned to produce concrete with a minimum compressive strength of 2,500 psi at 28 days, U.N.O
2. Normal weight concrete shall be 145 to 155 pounds per cubic foot. Lightweight concrete shall be in accordance with the approved design mix shown on the plans.
3. Cement shall conform to ASTM C150, Type II cement. Fine and coarse aggregate shall conform to ASTM C33. When specified, air-entraining admixtures shall comply with ASTM C260. Ready mix concrete shall be mixed and delivered in accordance with ASTM C94.
4. Maximum size of coarse aggregate for slabs shall be 1" and 1½" elsewhere, U.N.O. Sand shall be clean, hard, durable, washed, free from silt, lime or clay. Mixing water shall be clean and free from injurious amounts of oil, acids, alkalis, organic materials or other deleterious substances. Concrete mix may contain a polymer based water reducing admixture. The maximum slump of concrete shall not exceed 6" unless otherwise approved by the engineer.
5. Cement types shall not be mixed in the concrete mix. Calcium chloride or fly ash shall not be used in the concrete mix.
6. Formwork shall comply with standard publication ACI 347 and the project specifications. The contractor shall be responsible for the design, detailing, care, placement and removal of the formwork and shores.
7. Pipes, ducts, sleeves, chases, etc. shall not be placed in slabs, beams, or walls unless specifically shown or noted on plans. Contractor shall obtain approval for installation of any additional pipes, ducts, etc. Refer to architectural and mechanical plans for locations of all pipes, ducts, chases, etc. All suspended equipment to be provided with UBC approved lateral or sway bracing.
8. The contractor shall be responsible for curing of concrete.
9. The contractor shall provide a level top surface for all slabs in accordance with the levelness tolerance required for all finishes, partitions, built-in cabinets and counters, etc. The contractor shall adjust all beam side forms to allow for as-delivered cambers of steel members and to maintain the minimum depth of concrete slab/topping at midspan of the steel members.
10. Provide non-slip finish on all concrete stair treads, exposed flatwork, and where specified on working drawings.
11. Control joints shall be installed in slab on grades so the slab's length to width ratio is not more than 1.25:1. Control joints shall be completed within 12 hours of concrete placement and the joint depth shall be ¼ of the slab thickness.

REINFORCING STEEL:

1. Reinforcing steel shall conform to ASTM 615, Grade 60, U.N.O. Steel bars shall be deformed bars that are free from grease, rust, mill scale or any other foreign material which may affect the bars ability to bond to the concrete. Reinforcing steel shall have minimum protective cover as follows:
   - Concrete cast against and permanently exposed to earth 3"
   - Concrete exposed to earth or weather, # 6 thru #11 bars 2"
   - Concrete not exposed to weather nor in contact with ground 1 ½"
   - Concrete for slabs, walls and joists, #11 bars and smaller ¾"
2. All detailing of reinforcing shall conform to the requirements of ACI 318-11. All reinforcing bar bends shall be made cold. Reinforcement that is partially embedded in concrete shall not be field bent, U.N.O.
3. Contractor shall use chairs or other support devices recommended by the CRSI to support the reinforcing bars or welded wire mesh prior to placing concrete. Welded wire mesh shall be continuously supported at 36" o.c maximum.
4. Lap splices shall have a minimum length of 24" or 40 bar diameters for masonry and 12" or 30 bar diameters for concrete, U.N.O.
5. Reinforcing steel, anchor bolts, dowels, and wall ties shall be secured in position and inspected by the local building inspector prior to pouring of any concrete or grouting masonry.
6. Reinforcement to be welded to steel members shall conform to ASTM 706 and shall require continuous inspection.

WOOD AND CARPENTRY:

1. Lumber shall be coast, region douglas fir-larch grade with a maximum moisture content of 19% and shall conform to the following grades, U.N.O.
   - Beams and post shall be DF-L#1 or better.
   - Joist and Rafters shall be DF-L#2 or better.
   - Framing such as studs, furring and blocking shall be DF-L#2 or better.
   - Sill plates bearing on concrete or masonry shall be preservative-treated DF-L#1.
2. Plywood sheathing shall be douglas fir plywood plies with exterior glue conforming to the latest product standards (PS-2-10) by the U.S. Department of Commerce. "APA" approved "DSB" may be used in lieu of plywood.
3. All nailing to be per CBC 2304.10.1 and are minimum requirements for common wire nails. Where possible, nails shall be driven perpendicular to the grain instead of toenails.
   NAIL TYPES AND SIZES:
   8d common = 2-½"x.131" dia. or 9 gauge; 10d box = 3"x.131" dia. or 10-1/2 gauge
   16d common = 3-½"x.162" dia. or 8 gauge; 20d common = 4"x.192" dia. or 6 gauge
4. Fasteners in preservative-treated or fire-retardant-treated wood shall be of hot-dipped, zinc-coated, galvanized steel, stainless steel, silicone bronze or copper per 402.1.1 CBC. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A153. CBC 2304.9.5
5. Steel fasteners and connectors shall be Simpson, or equal listed make, approved by the Building Official. Full nailing or bolting shall be used on specified hardware, U.O.N.
6. Machine bolt holes in wood members shall have a diameter equal to the nominal bolt diameter. Lag bolts in wood members shall be pre-drilled to the log-bolt diameter minus 1/8". A steel washer shall be provided under all bolt heads and nuts that bear upon wood. Bolts shall be ASTM A-307 or better.
7. Cutting, notching, and boring of studs shall conform to CBC 2308.5.9 and 2308.5.10
8. Notching and boring of wood floor and roof members, unless otherwise detailed or approved by the engineer, shall conform to CBC 2308.4.2.4 and 2308.7.4
9. Notching and boring of engineered wood floor and roof members, unless otherwise detailed or approved by the engineer, shall conform to CBC 2308.4.3
10. Wood members bolted to concrete, masonry or steel shall have a minimum of 2 bolts per member, with at least one bolt within 12" from each member end. Wood in contact with concrete shall be preservative-treated per AWPA U1. Field-cut ends, notches, and drilled holes of preservative-treated wood shall be field-treated per AWPA M4. (2304.11.2.4)
11. Structural Engineered / Composite Lumber
    - ML BEAMS to be Microllam LVL 2.0E, Fb=2,600 psi, ICC-ES ESR-1387, U.N.O. on the plans
    - PSL BEAMS to be Parallam PSL 2.2E, Fb=2,900 psi, ICC-ES ESR-1387, U.N.O. on the plans

WOOD STRUCTURAL PANEL SHEAR WALLS:

1. Wood structural panel sheathing thickness and grade shall be 15/32" Structural 1, 4-ply min., and consist of 4'x 8' sheets, wherever possible. The minimum sheet width shall be 24" with 3x blocking members. Stucco applied over plywood sheathing shall have two layers of grade "D" paper. Panel sheathing and framing shall be nailed with common nails. A minimum edge distance of ⅜" shall be provided for boundary and edge nailing on panel sheathing or framing members.
2. Wood sill plates shall be continuous and free of cuts and notches. Perforations shall be limited to a maximum of 1-1/2" in diameter and shall be located as close to center as possible.
3. Framing members receiving edge nailing from abutting panels shall be dbl.-2x, or better. Framing members including blocking receiving nails spaced at 2" o.c. or less, 4" o.c. or less for framing members with nailing from both sides, shall be 3x nominal or wider. Panel sheathing joints and sill plate nailing shall be staggered.
4. Holdown connectors shall be Simpson or equal installed on 4x end post, or better, U.N.O. framing members and shall follow installation recommendations as specified by manufacturer. Bolts on wood post shall have a maximum oversized hole equal to the bolt diameter plus ⅛" and shall be tightened and verified by inspector just prior to installation of sheathing.
5. All panels to have either 3x min. continuous member, or 3x solid blocking beneath for sill plate attachment purposes on raised wood floors
6. Contractor shall exercise all care necessary when using pneumatic nailing equipment to insure that the face ply of panel sheathing is not broken by nail head penetration. Contractor shall replace all sheathing with more than 10% of the nail heads in any one panel penetrating the face ply. Panels may be re-nailed as an alternate only when approved in writing by both the engineer and inspector.

SHEAR WALL SCHEDULE:

Wall Type	Sides	Nail Size and Spacing	Sill	Wall Anchorage: Anch. Bolt Spacing @ Sill	Wall Anchorage: Nails/Screws Spacing @ Sill	Frmg. Angle @ Top/Sill Plate	Allow. Shear (plf)	Periodic Special Inspect. (1707.3)
1	Sngl.	10d Common 6" edge/12" field	2x	32" o.c.	SDS25500 @ 8" o.c.	A35/LPT4 @ 18" o.c.	340	No
2	Sngl.	10d Common 4" edge/12" field	3x	32" o.c.	SDS25600 @ 12" o.c.	A35/LPT4 @ 12" o.c.	510	Yes
3	Sngl.	10d Common 3" edge/12" field	3x	16" o.c.	SDS25600 @ 8" o.c.	A35/LPT4 @ 12" o.c.	685	Yes
4	Sngl.	10d Common 2" edge/12" field	3x	16" o.c.	SDS25600 @ 6" o.c.	A35/LPT4 @ 8" o.c.	870	Yes
5	Dbl.	10d Common 4" edge/12" field	3x	8" o.c.	SDS25600 @ 4" o.c.	A35/LPT4 @ 6" o.c.	1,020	Yes
6	Dbl.	10d Common 3" edge/12" field	3x	8" o.c.	SDS25600 @ 4" o.c.	A35/LPT4 @ 4" o.c.	1,330	Yes

STRUCTURAL & MISCELLANEOUS STEEL:

1. Structural steel shapes shall conform to the following material specifications per ASTM designations and as amended to date, U.N.O.:
   - Wide flanges: ASTM A-572, grade 50, U.N.O.
   - Angles & other shapes: ASTM A-36, U.N.O.
   - Pipe Columns: ASTM A-53 Type E or S, grade B. U.N.O.
   - Tubes/HSS: ASTM A-500, grade B, U.N.O
   - Shear plates & column base plates: ASTM A-36, U.N.O.
   - Continuity plates & doubler plates: ASTM A-572, grade 50, U.N.O.
   - Miscellaneous steel & plates: ASTM A-36, U.N.O.
2. Structural steel shop drawings shall be submitted to the architect and engineer for review prior to fabrication and erection. Fabricator shall field verify all dimensions prior to fabrication.
3. All steel shall be fabricated and erected in accordance with A.I.S.C. and A.W.S. specifications for the design, fabrication, and erection of structural steel for building, latest edition
4. Bolts shall be A307 with ASTM A563 heavy hex nuts and hardened washers grade A, U.N.O. High strength bolts shall be A325 and shall be installed with special inspection by a city deputy inspector, U.N.O. Holes for bolts in structural steel shall be drilled or punched. Burning of holes shall not be permitted. Holes in steel members shall not be greater than 1/16" of the nominal bolt diameter, U.N.O.
5. Welding procedure specifications shall conform to pre-qualified AWS procedures or as approved by the engineer. Electrodes shall be E70xx, U.N.O. Shop welding shall be performed by a certified fabricator licensed by the local building department. Field welding shall be performed by certified welders licensed by the local building department. Continuous inspection by a registered deputy building inspector is required for all field welds, U.N.O.
6. After fabrication, steel members shall be cleaned and free of rust, loose mill scale and oil. One coat of rust inhibitive primer shall be applied. After erection all unpainted surfaces and areas where paint has been damaged, shall be given a field touch up coat of same primer applied in shop. Steel exposed to weather shall be painted and protected utilizing two coats of exterior metal priming paint and a finish coat.
7. Backup bars shall be removed from the beam top and bottom flange connections to column. The root of the weld shall be back gouged to sound metal to remove all slag and cracks. Weld the back gouged region and finish welding using a reinforcing fillet weld according to AWS section 3.13.4.
8. All steel shapes and plates which are a part of the special moment resisting frame (SMRF) shall have charpy CVN values of 20 foot pounds or greater at 70 degree Fahrenheit. Certificates shall be provided to the engineer.
9. Welded members which are a part of a special moment resisting frame (SMRF) shall be tested by non-destructive methods (ultrasonic or x-ray) in accordance with the CBC. All full penetration field welds shall be performed under continuous inspection. A copy of the weld testing report shall be provided to the engineer of record.

EPOXY ANCHORS AND DOWELS: (SIMPSON SET EPOXY, ICC-ES ESR-2508)

1. Bolts and reinforcement embedded into concrete or masonry with epoxy shall be installed per manufacturer's recommendations and approved ICC reports.
2. Minimum substrate and ambient temperature shall be as recommended by manufacturer prior to placing epoxy. The minimum age of concrete to be bonded shall be 21 days, U.N.O.
3. The holes shall be drilled with an electro-pneumatic rotary hammer drill using carbide tip bits conforming to ANSI specification # B94-12-1977. The holes shall be cleaned of dust and debris with a nylon brush and a jet of compressed air. Hole diameter and depth shall be installed per manufacturers recommendations unless noted otherwise.
4. Clean machine bolts / reinforcing bars shall be placed in clean drilled holes that are partially filled with epoxy so that some excess epoxy comes out of the hole.
5. All epoxy adhesive installations shall have continuous special inspection per the current code requirements.

STRUCTURAL OBSERVATION (1704.6):

1. Structural observation is the visual observation of the elements and connections of the structural system at significant construction stages and the completed structure for general conformance to the approved plans and specifications.
2. The owner shall employ the engineer responsible for the structural design to perform structural observation of the structural system, including but not limited to the elements and connections at significant construction stages and the completed structure for general compliance to the approved plans and specifications.
3. The structural observer shall provide evidence of employment by the owner. A letter from the owner or a copy of the agreement for services shall be sent to the building inspector before the first site visit. The structural observer shall also inform the owner of the requirements for a pre-construction meeting and shall preside over this meeting.
4. A pre-construction meeting including the engineer for structural observation, the contractor, appropriate sub contractors, and special inspector shall be held to review the details of the structural system to be observed.
5. Structural observation neither includes nor waives the inspections by the building official or special inspector. The engineer shall submit a statement in writing to the building official that the site visits have been made and whether or not any observed deficiencies have been corrected to conform to the approved plans or to revised details approved by the building official.
6. The structural observer shall prepare a report for each significant stage of construction observed. The original of the observation report shall be sent to building inspector's office and shall be signed and sealed (wet stamp) by the responsible structural observer. One copy of the observation report shall be attached to the approved plans. The copy attached to the plans need not be sealed but shall be signed by the responsible structural observer or their designee. Copies of the report shall also be given to the owner, contractor, and deputy inspector.
7. A final observation report shall be submitted which shows that all observed deficiencies were resolved and the structural system generally conforms with the approved plans and specifications. The department of building and safety will not accept the structural work without final observation report and the correction of specific deficiencies noted during normal building and deputy inspection.
8. Should the owner elect to change the structural observer of record, the owner shall notify the building inspector in writing before the next inspection, call an additional "pre-construction" meeting , and furnish the replacement structural observer with a copy of all previous observation reports. The replacement structural observer shall approve the correction of the original observed deficiencies unless otherwise approved by plan check supervision. The policy of the building department shall be to correct any properly noted deficiency without consideration of their source.
9. The engineer of record shall develop all changes relating to the structural system. The building department shall review and approve all changes to the approved plans and specifications.
10. The structural observer shall perform site visits at those steps in the progress of the work that allow for correction of deficiencies without substantial effort or uncovering of the work involved. At a minimum, significant construction stages require a site visit and an observation report from the structural observer as shown on the inspection program.

SPECIAL INSPECTION:

1. Special inspection provisions as specified in section 1704 and 1705 of the CBC shall be provided for portions of the structural work shown in the drawings as noted in the inspection schedule.
2. The owner or contractor shall employ one or more special inspectors who shall provide inspections during construction as outlined on the inspection /observation schedule.
3. The special inspector shall be certified as a special inspector by the department of building and safety.
4. The contractor shall notify the special inspector at least 48 hours in advance when special inspection is required for construction.
5. Special inspection does not intend to relieve the general contractor of his responsibilities to complete the project in accordance with the construction documents and to be responsible for safety on job site.
6. The special inspector shall submit a signed final report to the building department, architect, structural engineer, and the owner stating whether the work requiring special inspection was, to the best of his/her knowledge, in conformance with the construction documents and applicable workmanship provisions of the building code.

STRUCTURAL OBSERVATION / SPECIAL INSPECTION SCHEDULE

STAGE	STRUCTURAL OBSERVATION	SPECIAL INSPECTION: CONT.	SPECIAL INSPECTION: PERIOD.
Excavation for Foundations		X	X
Foundations – Compacted Fill		X	X
Reinforcing Steel & Anchors in Concrete Footings	X		X
Placement of Concrete > 2,500psi		X	
Masonry Walls		X	
Steel – Field Welding and Testing		X	
Welding of Reinforcing Steel		X	
Epoxied Bolts or Reinforcing Bars		X	
Mechanical Anchors		X	
Roof / Floor Framing *	X		
Shear Wall Framing – Holddowns, Shear Transfer, Etc.	X		X
Floor and Roof Diaphragm Nailing *			X
Pre-Fabricated Shear Panels – Strongwall, Hardyframe	X	X	

* PLATFORM FRAMING OBSERVATION / INSPECTION REQUIRED: Each floor shall be observed and inspected independently, and prior to erection of walls above, for structural and framing compliance prior to sign off or continuance.

Los Angeles Regional Uniform Code Program

LARUCP

Committee I-3: Structural Observation

STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER

PROJECT ADDRESS: _____ PERMIT APPL. NO.: _____

Description of Work: SINGLE FAMILY RESIDENCE – REMODEL/ADDITION

Owner: _____ Architect: _____ Engineer: MICHEL BLANCY, P.E.

STRUCTURAL OBSERVATION
(only checked items are required)

Firm or Individual to be responsible for the Structural Observation:

Name: _____ Phone: ( ) _____ Calif. Registration: _____

FOUNDATION	WALL	FRAME	DIAPHRAGM
☒ Footing, Stem Walls, Piers	☒ Concrete	☐ Steel Moment Frame	☐ Concrete
☐ Mat Foundation	☐ Masonry	☐ Steel Braced Frame	☐ Steel Deck
☐ Caisson / Piles, Grade Beams	☒ Wood	☐ Concrete Moment Frame	☒ Wood
☐ Stepp'g/Retain'g Foundation, Hillside Special Anchors	☐ Others:	☐ Masonry Wall Frame	☐ Others:
☐ Others:		☐ Others:	

DECLARATION BY OWNER

I, the Owner of the project, declare that the above listed firm or individual is hired by me to be the Structural Observer.

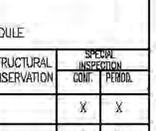
Signature _____ Date _____

DECLARATION BY ARCHITECT OR ENGINEER OF RECORD (required if the Structural Observer is different from the Architect or Engineer of Record)

I, the Architect or Engineer of record for the project, declare that the above listed firm or individual is designated by me to be responsible for the Structural Observation.

Signature _____ License No.: _____ Date: _____

BLANGY
CONSULTING
ENGINEERS
CIVIL -
ARCHITECTURAL
- STRUCTURAL
ENGINEERING DESIGN
118 CATALINA AVE. STE.I
REDONDO BEACH, CA 90277
310-270-5352



8/15/23

SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal:
12/15/22
revision:
22-057
projects no.:

STRUCTURAL NOTES
sheet title:

S1
sheet no.:

EXISTING FOUNDATION/FRAMING PLAN / DEMOLITION NOTES

REFERENCE APPROVED PLANS BY TIMOTHY SMITH, 10/26/82 FOR EXISTING (E) CONDITIONS SHOWN.

PORTIONS OF EXISTING STRUCTURE SHOWN ON THESE PLANS ARE FOR REFERENCE ONLY. SEE APPROVED PLANS FOR BALANCE OF STRUCTURE. ACTUAL FIELD CONDITIONS MAY VARY. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING CONSTRUCTION, AND REPORT IMMEDIATELY TO THE ENGINEER OF RECORD ANY AND ALL DISCREPANCIES, OR CONDITIONS WHICH DEVIATE FROM THOSE SHOWN.

THE BUILDING, INCLUDING FOUNDATION ARE ASSUMED FREE FROM SIGNIFICANT IRREGULARITIES, DAMAGE, DISTRESS OR OTHER SIGNS WHICH MIGHT INDICATE THE STRUCTURAL INTEGRITY OF THE ORIGINALLY CONSTRUCTED BUILDING TO BE COMPROMISED, AND SHALL BE VERIFIED BY THE CONTRACTOR. ALL EXISTING CONSTRUCTION AND DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE PLANS, OR ANY OTHER UNUSUAL FIELD CONDITIONS, SHALL BE REPORTED TO THE PROJECT ARCHITECT/ENGINEER IMMEDIATELY BEFORE PROCEEDING WITH FURTHER WORK. - MICHEL BLANGY, PE 310-270-5352.

CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED BEFORE REMOVING ANY PORTION OF STRUCTURE INDICATED FOR REMOVAL ON THESE PLANS. EXISTING STRUCTURE SHALL NOT BE REMOVED, REPLACED, OR TAMPERED WITH, UNLESS SPECIFICALLY NOTED ON THE PLANS.

CONTRACTOR SHALL VERIFY THAT ALL WALLS MARKED AS TO BE REMOVED ARE NON-LOAD BEARING AND NOT SHEATHED WITH STRUCTURAL PLYWOOD / SHEARWALLS. CONTACT EOR PRIOR TO REMOVAL FOR TO CONFIRM - MICHEL BLANGY, PE 310-270-5352.

PURLIN OR OTHER ROOF SYSTEM BRACES TO BE REMOVED AS PART OF DEMOLITION WORK AT EXISTING STRUCTURE SHALL BE REPLACED AT WALLS OR BEAMS CLOSEST TO THOSE REMOVED - CONTACT ENGINEER OF RECORD FOR OBSERVATION AFTER/DURING DEMOLITION OF CEILING, BUT BEFORE DEMOLITION OF ANY ROOF FRAMING.

EXISTING FRAMING PLAN LEGEND

SEE STRUCTURAL AS-BUILT NOTE

(E) 2X STUD WALL - 2X4 @ 24" MIN. VERIFY

(E) 2X STUD WALL - TO BE REMOVED

2X STUD WALL ABOVE

LINE OF ROOF/FLOOR ABOVE

(E) POST ABOVE

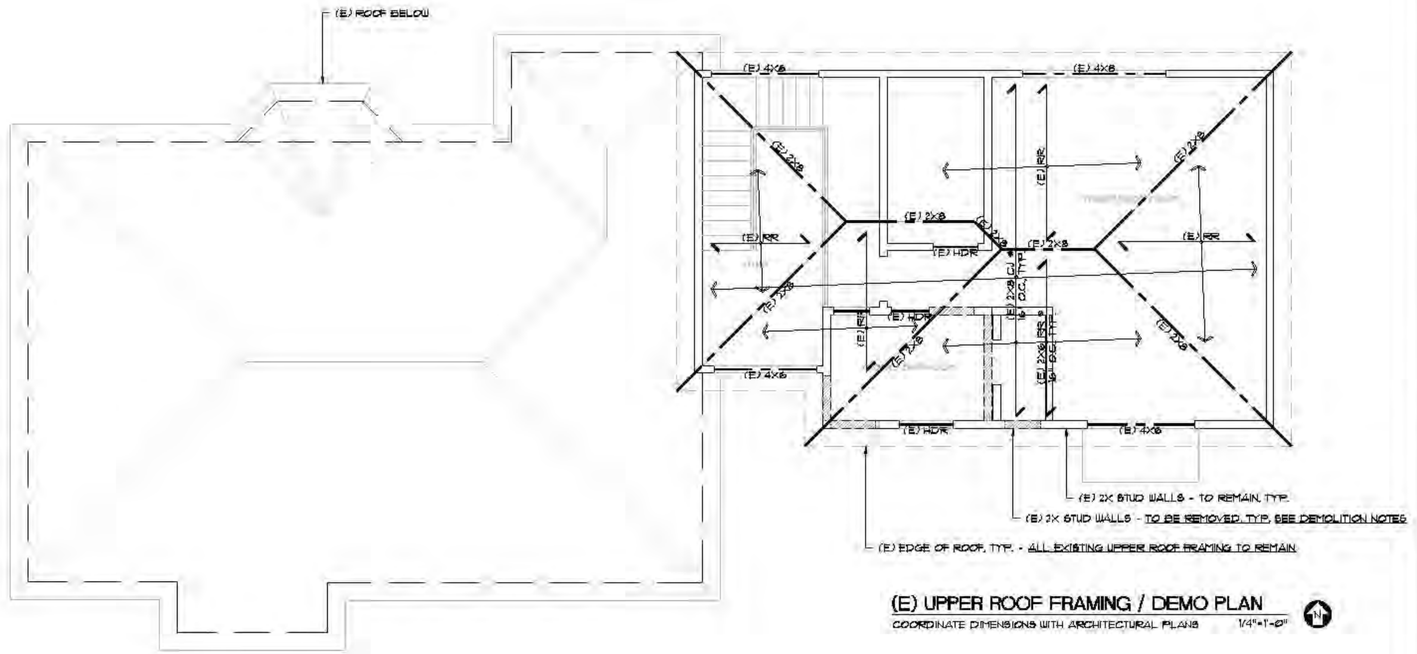
(E) BEAM SIZE / POST SIZE

(E) BEAM / JOIST / RAFTER TO BEAM CONNECTION

(E) ROOF RAFTER / CEILING JOIST SIZE - RR: PER PLAN - V.I.F. CJ: PER PLAN - V.I.F.

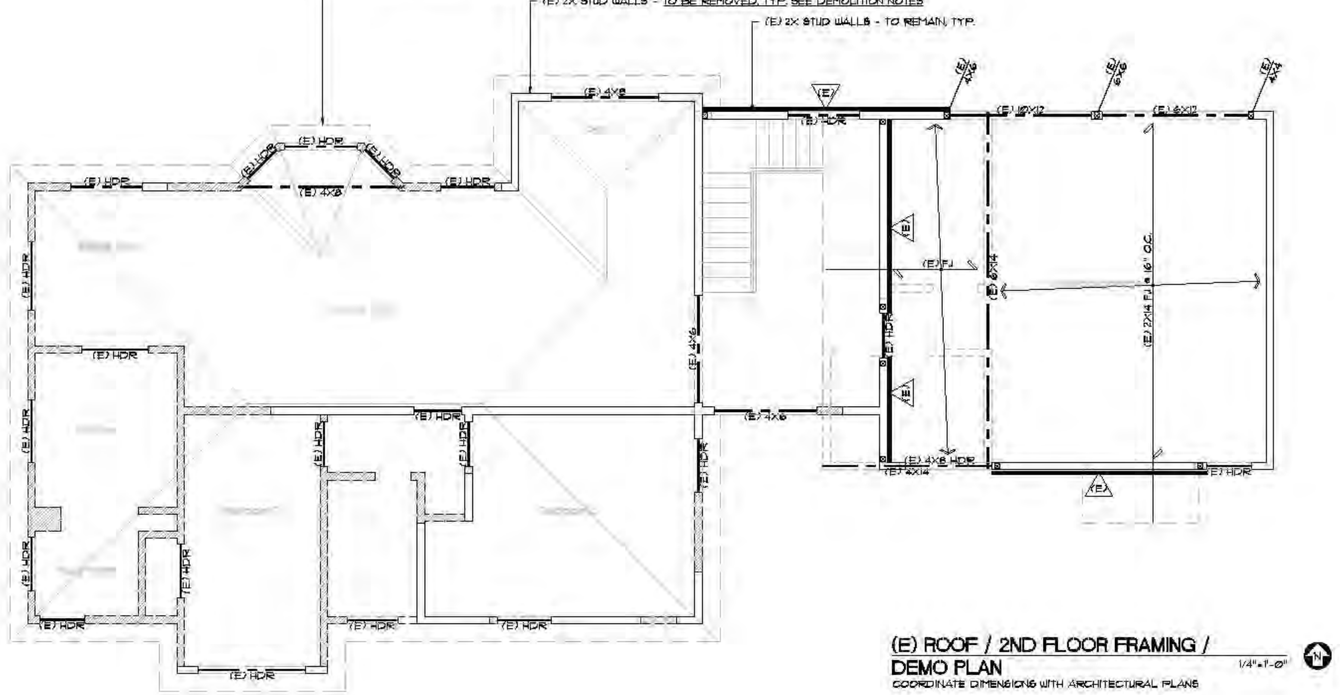
(E) FLOOR JOIST / DECK JOIST SIZE - FJ: PER PLAN - V.I.F.

(E) WOOD SHEAR WALL



(E) UPPER ROOF FRAMING / DEMO PLAN

COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS 1/4"=1'-0"



(E) ROOF / 2ND FLOOR FRAMING / DEMO PLAN

COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS 1/4"=1'-0"

BLANGY

CONSULTING

ENGINEERS

CIVIL - ARCHITECTURAL - STRUCTURAL ENGINEERING DESIGN

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SFR - REMODEL-ADDITION

print date:

drawn by: MPB

submittal:

12/15/22

revision:

22-057

project no.:

STRUCTURAL PLANS

sheet title:

S2

sheet no.:

FOUNDATION / SITE PLAN NOTES

ALL DETAILS SECTIONS, AND NOTES ON DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS, U.N.O.

UNDERGROUND UTILITY LOCATIONS TO BE VERIFIED BY CONTRACTOR AND PROTECTED PRIOR TO THE COMMENCEMENT OF FOUNDATION WORK.

ADJOINING PUBLIC OR PRIVATE PROPERTY SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION, REMODELING AND DEMOLITION WORK PER CBC SECTION 1307.1

FOUNDATION WALL DIMENSIONS AND LOCATIONS SHALL BE COORDINATED AGAINST APPROVED ARCHITECTURAL / CIVIL SITE PLANS

INSPECTION / STRUCTURAL OBSERVATION OF FOOTINGS / CONCRETE REQUIRED. SCHEDULE INSPECTION / OBSERVATION AFTER EXCAVATION IS CLEAN, AND ALL REINF. BARS, ANCHORS, POST BASES, ETC. ARE IN PLACE.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO PLACING CONCRETE AND PROVIDE SURVEY STAKES OR HUBS PRIOR TO INSPECTION TO VERIFY PROPERTY LOT LINES. PROPERTY LINE SURVEY AND PARTY WALL AGREEMENT MAY BE REQUIRED

FOUNDATION DIMENSIONS, INCLUDING ALL ANCHOR BOLTS AND SHEAR WALL HOLDDOWN ANCHORS SHALL BE COORDINATED AGAINST APPROVED ARCHITECTURAL FLOOR PLANS DIMENSIONED WALL LOCATIONS.

FOOTING PLACEMENT TO BE ON UNDISTURBED, NATURAL SOIL, OR COMPACTED FILL, APPROVED MAT'L ONLY TO 90%, MIN. ASTM D1557

THE TOP SURFACE OF FOOTINGS AND GRADE BEMS SHALL BE LEVEL. THE BOTTOM SURFACE OF FOOTINGS OR GRADE BEAMS SHALL BE PERMITTED TO HAVE A SLOPE NOT EXCEEDING ONE UNIT VERTICAL IN 10 UNITS HORIZONTAL (10% SLOPE). FOOTINGS SHALL BE STEPPED WHERE IT IS NECESSARY TO CHANGE THE ELEVATION OF THE TOP SURFACE OF THE FOOTING OR WHERE THE SURFACE OF THE GROUND SLOPES MORE THAN ONE UNIT VERTICAL IN 10 UNITS HORIZONTAL (10% SLOPE) (1809.3) & (MBMC 9.01.110 & 9.03.080 & F1809.3)

CONCRETE TO BE F'C=2,500 PSI MIN. FOR PLAIN CONCRETE, SLABS, STEMWALLS, AND FOOTINGS AND 3,000 PSI FOR PIERS & GRADE BEAMS AT 28 DAYS, UNLESS NOTED OTHERWISE. SPECIAL INSPECTION REQUIRED FOR PIERS, GRADE BEAMS, STRUCTURAL SLABS, AND OTHER CONCRETE WITH SPECIFIED STRENGTH GREATER THAN 2500 PSI. SEE STRUCTURAL NOTES, SHEET S1 FOR FULL CONCRETE AND REINFORCING STEEL SPECIFICATIONS

SLAB ON GRADE TO BE COMPRISED OF STEEL REINFORCED CONC. SLAB, UNDERLAIN BY A VAPOR BARRIER/SAND LAYER, OVER FREE-DRAINING ROCK LAYER, AND PLACED ON COMPACTED SUBGRADE, PER DETAIL */D*. SEE SOIL'S REPORT FOR ADDT'L REQUIREMENTS, AND VERIFY AGAINST CITY REQ'TS.

- CONC. SLAB: 4" THICK MIN. CONC. W/ #4 @ 24" O.C., OR #3 @ 16" O.C., EA WAY, OR 6"X6" - W10XW10 WWF, CENTERED IN SLAB
- VAPOR BARRIER: 6-MIL/10-MIL. PLASTIC VISQUEEN, STEGO, OR EQUIVALENT, CENTERED IN 2" SAND LAYER / 4" LAYER OF MAX 1/2" GRAVEL. SEAL BARRIER AT ALL SPLICES, AROUND PLUMBING/ELECTRICAL/MECHANICAL PENETRATIONS, AND AT THE PERIMETER OF SLAB AREAS, PER MFR'S. RECOMMENDATIONS. BARRIER AT EXTERIOR SLABS OPTIONAL.
- FREE-DRAINING LAYER: 4" OF 3/4" CLEAN, CRUSHED ROCK / GRAVEL - OPTIONAL
- SUBGRADE: PER SOILS REPORT, COMPACTED TO MIN. 90%, PER ASTM D1557, U.O.N.

STEM WALLS REINFORCING TO BE #4 X CONT., TOP AND BOTTOM, MIN. U.O.N. IF STEM WALL EXCEEDS 24" IN HEIGHT FROM TOP OF FOOTING TO TOP OF STEM, PROVIDE ADDITIONAL #4 VERT. BARS @ 16" O.C. (.0015 RATIO FOR 8" STEM), MIN. AND #4 HORZ. BARS @ 10" O.C. (.0025 RATIO FOR 8" STEM), PER CBC 1914.3

TOP OF STEM WALL / SLAB ON GRADE TO BE MIN. 8" ABOVE ADJACENT FINISHED GRADE WHEN WOOD SILL PLATE IS PRESENT

CONCRETE FOOTING AND WALL REINFORCING STEEL SPLICES, TIES, BENDS, AND THE PROPER ARRANGEMENT THEREOF AT WALL CORNER AND INTERSECTIONS TO BE PER DETAIL 1/D1 & 2/D1

HOLDOWN AND POST BASE ANCHORS MUST BE SECURED IN PLACE UTILIZING AN APPROPRIATE TEMPLATE PRIOR TO FOUNDATION INSPECTION. VERIFY LOCATION OF HOLDOWN AND POST BASES WITH FRAMING PLAN. DO NOT SCALE PLANS.

ANCHOR BOLTS TO BE 5/8" X 12" LONG WITH 7" MIN. EMBEDMENT, AS MEASURED FROM TOP OF COLD-JOINT TO LOWER POUR, WHEN 3X SILL PLATE IS REQ'D, AND 5/8" X 10" LONG WITH 7" MIN. EMBEDMENT FOR 2X SILL PLATES. ANCHOR BOLTS SHALL HAVE 3"X3"X.229" THICK MIN. STEEL PLATE WASHER. DIAGONALLY SLOTTED HOLE NO MORE THAN 3/16" LARGER THAN BOLT DIAMETER X 1-3/4" LONG IS PERMITTED, PROVIDED A STANDARD CUT WASHER IS PLACED BENEATH THE NUT. SPACING OF BOLTS TO BE 4'-0" O.C. MAX. AT EXTERIOR WALLS AND 6'-0" O.C. AT INTERIOR WALLS, LOCATED 12" MAX. AND 4" MIN. FROM EACH END. (2) ANCHOR BOLTS PER SILL PLATE SEGMENT MIN. HOLDOWN ANCHORS DO NOT CONSTITUTE ANCHOR BOLTS. SEE SHEAR WALL SCHEDULE ON STRUCTURAL NOTES, SHEET S1 FOR SPACING OF BOLTS AT SHEAR WALL LOCATIONS.

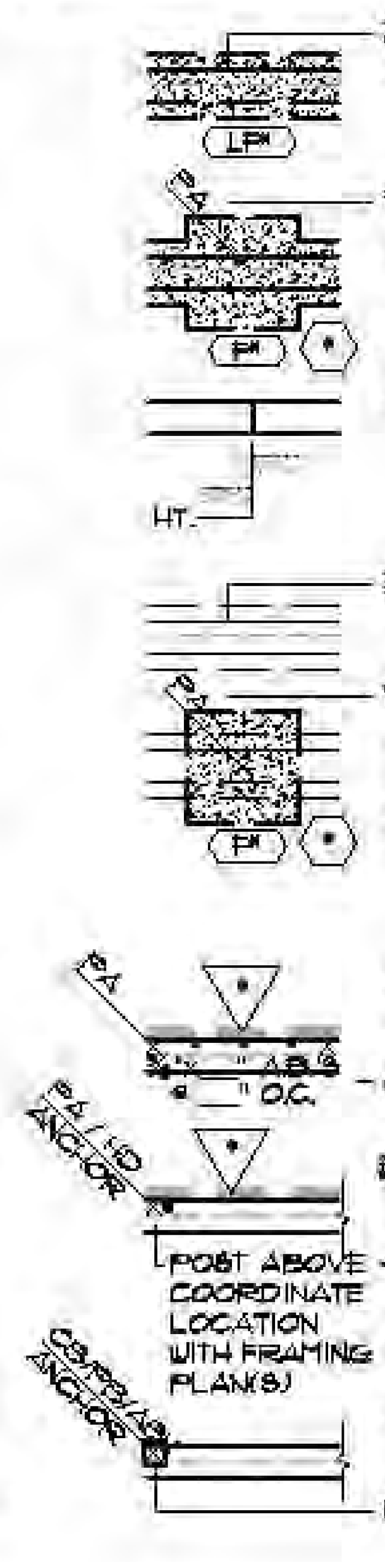
ANCHOR BOLTS IN CONTACT W/ PRESERVATIVE TREATED SILL PLATES OR LEDGERS SHALL BE OF HOT-DIPPED, ZINC-COATED, GALVANIZED, STEEL, STAINLESS STEEL, SILICONE BRONZE, OR COPPER, PER CBC SECT. 2304.10.5.1

PROVIDE ANCHOR BOLTS AT 24" O.C. AT ALL CRIPPLE WALL LOCATIONS.

UNDER FLOOR VENTS TO BE PROVIDED, NOT LESS THAN 1 SF FOR EVERY 150 SF OF UNDER FLOOR AREA.

CORROSION RESISTANT WEEP SCREED TO BE PROVIDED AT SILL PLATE, PROVIDING FOR TRAPPED WATER TO DRAIN TO THE EXTERIOR OF THE BUILDING, TO BE PLACED 4" MIN. ABOVE THE EARTH, OR 2" MIN. ABOVE PAVED AREAS.

FOUNDATION PLAN / RAISED WOOD FLOOR LEGEND



2X STUD WALL ABOVE - SEE FRAMING PLAN
CONC. STEM WALL / LINE FOOTING F'c=2,500 PSI.
(PIECE MARK) WIDTH PER PLAN, 14" MIN. REINF. W/ 2-#4 TOP & BOT.

POST ABOVE - COORDINATE LOCATION WITH FRAMING PLAN(S)

PAD FOOTING REINF. PER SCHEDULE
(PIECE MARK) 24"SQ. X 16" THICK MIN. U.O.N. W/ #5 @ 12" O.C., EA. WAY, MIN. CENTER PAD FOOTINGS UNDER POST ABOVE

STEP IN STEM WALL

2X STUD WALL ABOVE - SEE FRAMING PLAN
(E) CONC. STEM WALL / LINE FOOTING

POST ABOVE - COORDINATE LOCATION WITH FRAMING PLAN(S)

PAD FOOTING UNDER (E) CONC. STEM WALL REINF. PER SCHEDULE, 24"SQ. X 16" THICK MIN. U.O.N. W/ #5 @ 12" O.C., EA. WAY, MIN. CENTER PAD FOOTINGS UNDER POST ABOVE
SEE DETAILS

WOOD SHEAR WALL ABOVE - SEE STRUCTURALAL NOTES SHEET S1 FOR SCHEDULE, AND DETAILS FOR COMPLETE HOLDDOWN AND SHEAR ANCHORAGE REQT'S - SEE DETAILS

ANCHOR BOLT SPACING @ SHEAR WALL - SEE SCHEDULE SHEET S1

END POST ABOVE / BRACKET HOLDOWN (PA/HD) SCHEDULE
TYPE 1 POST: 4X4 MIN. U.O.N. HD: HDU4 & SSTB24 MIN. U.O.N.
TYPE 2 POST: 4X4 MIN. U.O.N. HD: HDU5 & SB5/8X24 MIN. U.O.N.
TYPE 3 POST: 4X6 MIN. U.O.N. HD: HDU8 & SSTB34 MIN. U.O.N.
TYPE 4 POST: 4X6 MIN. U.O.N. HD: HDU11 & SB1X30 MIN. U.O.N.
TYPE 5 POST: 4X8 MIN. U.O.N. HD: HDU11 & SB1X30 MIN. U.O.N.
- SEE DETAILS 10/D1, 11/D1, 12/D1, 13/D1, 14/D1

POST ABOVE - COORDINATE LOCATION WITH FRAMING PLAN(S)

COLUMN BASE IN WALL - SEE DETAILS

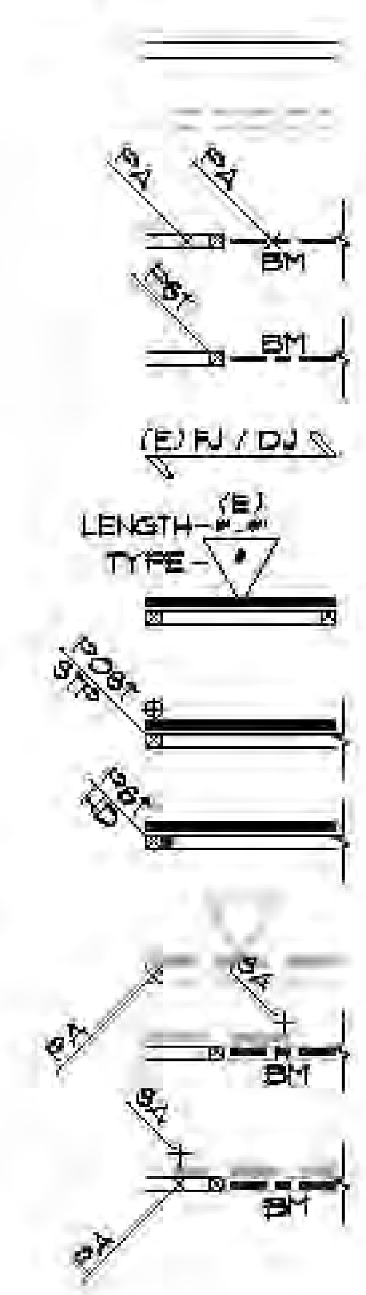
POST ABOVE - COORDINATE LOCATION WITH FRAMING PLAN(S)

PAD FOOTING SCHEDULE			
FTG	SIZE	THICK.	REINF.
1	12"/15"/16" SQ	12"	2-#4 BARS E.W.
A	1'-6" SQ	12"	2-#5 BARS E.W.
B	2'-0" SQ.	12"	2-#5 BARS E.W.
C	2'-6" SQ.	12"	3-#5 BARS E.W.
D	3'-0" SQ.	12"	3-#5 BARS E.W.
E	3'-6" SQ	12"	3-#5 BARS E.W.

PADS TO BE CENTERED BENEATH POST ABOVE
EXTERIOR FOOTINGS TO EXTEND 24" INTO NATURAL SOIL
INTERIOR FOOTINGS TO EXTEND 18" INTO NATURAL SOIL

EXISTING FRAMING PLAN LEGEND

SEE STRUCTURAL AS-BUILT NOTE



(E) 2X STUD WALL - 2X4 @ 24" MIN., VERIFY

2X STUD WALL ABOVE

(E) POST ABOVE

(E) BEAM SIZE / POST SIZE

(E) FLOOR JOIST / DECK JOIST SIZE - FJ: 2X6 @ 16" O.C. - V.I.F.

(E) WOOD SHEAR WALL

(E) WOOD SHEAR WALL END POST / STRAP HOLDOWN

(E) WOOD SHEAR WALL END POST / BRACKET HOLDOWN (HD)

(E) WOOD SHEAR WALL ABOVE

(E) STRAP HOLDOWN AND SHEARWALL ENDPOST ABOVE TO BEAM BELOW

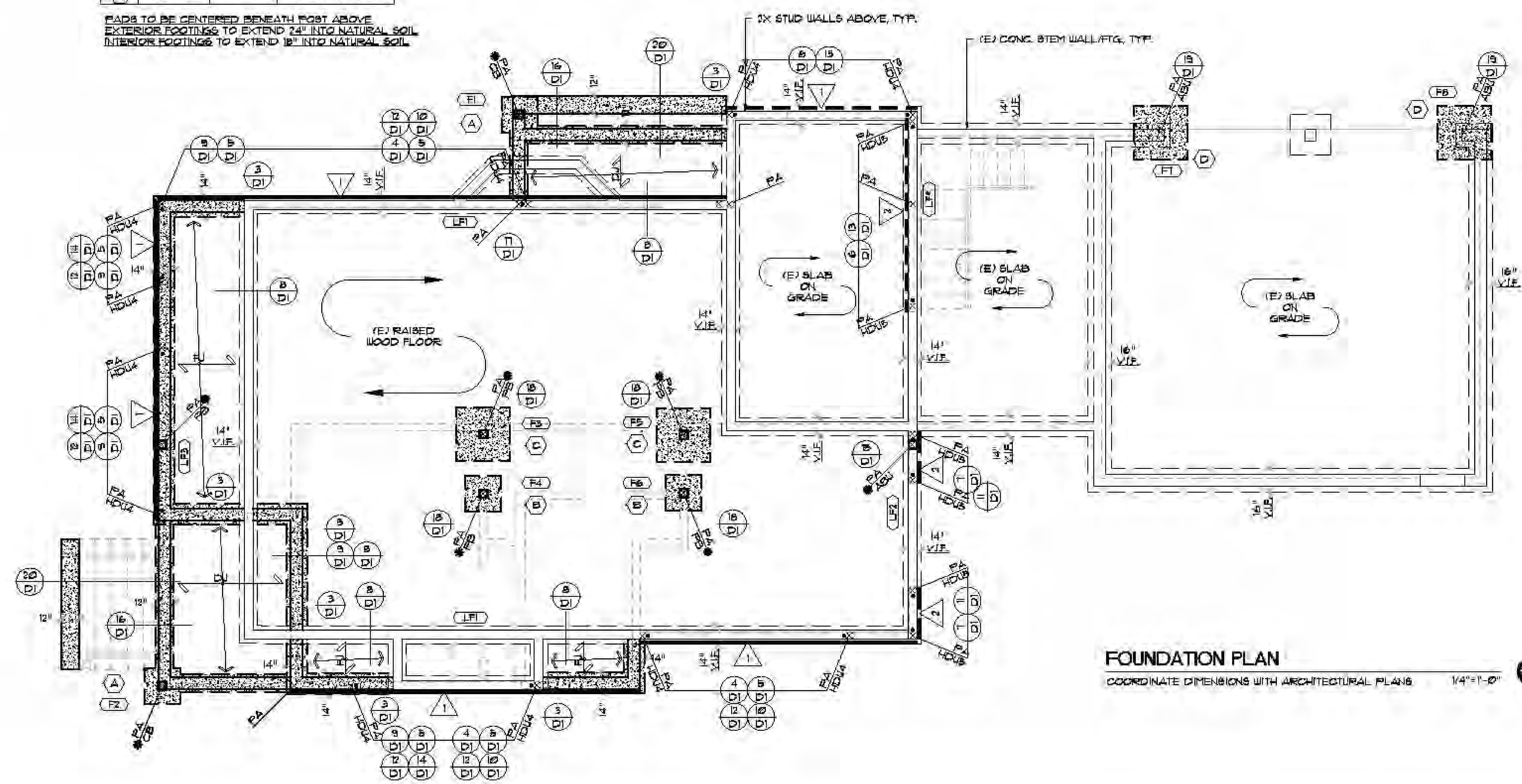
(E) STRAP HOLDOWN AND SHEARWALL ENDPOST ABOVE

FLOOR FRAMING NOTES

SEE SHEET S4 FOR FRAMING PLAN NOTES

FJ / DJ (FJ* / DJ*) FLOOR JOIST / DECK JOIST SIZE - FJ: 2X6 @ 16" O.C. U.O.N.
(PIECE MARK) DJ: 2X8 @ 16" O.C. U.O.N.
SEE DETAIL 13/D2 WHEN RIP STRIPS ARE USED WITH JSTS.

* EXTEND NEW POSTS THROUGH FLOOR, ANDREST DIRECTLY ON STEM WALL BELOW, WHERE INDICATED, TYP.



FOUNDATION PLAN

COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS 1/4"=1'-0"

BLANGY CONSULTING ENGINEERS

CIVIL - ARCHITECTURAL - STRUCTURAL ENGINEERING DESIGN

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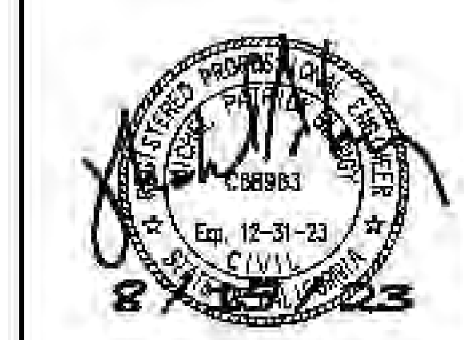


SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal:
12/15/22
8/15/23
revision:

project no.: 22-057

sheet title: STRUCTURAL PLANS

sheet no.: S3

FRAMING PLAN NOTES

ALL DETAILS, SECTIONS, AND NOTES ON DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS, U.N.O.

FINISHED RIDGE/PARAPET HEIGHT SHALL NOT EXCEED THE ELEVATION SHOWN ON THE PLOT PLAN, OR THOSE LIMITS AS SET FORTH BY THE BUILDING OFFICIAL, INCLUDING ALLOWANCES FOR THICKNESS OF ROOFING MATERIALS/ASSEMBLY. RIDGE/PARAPET HEIGHT SHALL BE CERTIFIED BY A LICENSED SURVEYOR OR REGISTERED ENGINEER AND VERIFIED BY THE BUILDING OFFICIAL PRIOR TO APPROVAL OF THE ROOF FRAMING/SHEATHING BY THE BUILDING OFFICIAL.

ALL STRUCTURAL ELEMENTS SHOWN ON PLANS ARE TO BE CONSIDERED NEW (N) U.O.N. AS EXISTING (E). CONTRACTOR TO VERIFY ALL EXISTING (E) CONSTRUCTION PRIOR TO COMMENCING WORK.

CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/COMPONENT LISTED IN THE "STATEMENT OF SPECIAL INSPECTION" SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS / BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH SYSTEM OR COMPONENT PER CBC 1706.1

SPECIAL INSPETION IS REQUIRED FOR WOOD SHEAR WALLS AND DIAPHRAGMS, INCLUDING CONNECTIONS TO OTHER COMPONENTS OF THE SEISMIC-FORCE-RESISTING SYSTEM WHEN NAIL SPACING OF THE SHEATHING IS 4" OR LESS O.C. - PER CBC SECT. 1707.3

NOTCHING AND DRILLING OF STUDS, JOISTS, AND RAFTERS SHALL CONFORM TO CBC 2308.5.9, 2308.5.10, 2308.4.2.4, AND 2308.7.4 - SEE DETAIL 7/D2 & 8/D2

OPENINGS AND/OR HOLES IN WOOD SHEAR WALLS AND/OR FLOOR/ROOF DIAPHRAGMS GREATER THAN 10' SHALL BE BLOCKED WITH 3X BLOCKING FOR 2-STUD/JOIST/RAFTER BAYS BEYOND THE OPENING, BOTH DIRECTIONS, AND STRAPPED CONTINUOUSLY WITH SIMPSON CS16, END TO END OF BLOCKING - SEE DETAIL 2/D2

TOP PLATE SPLICES SHALL BE NAILED WITH 8-16d FACE NAILS, EACH SIDE OF EACH BREAK, PER CBC 2308.3.2, OR USE SIMPSON ST6236, MIN. - SEE DETAIL 9/D2

PLATE BREAKS AT BEAM POCKETS AND OVER RIDGES AT SHEARLINES TO BE STRAPPED WITH MST48 MIN., U.O.N. ON THE PLANS - SEE DETAIL 10/D2 & 11/D2

BOLT HOLES IN WOOD TO BE DRILLED 1/32-1/16" OVERSIZED.

FOUNDATION PLATES OR SILLS AND SLEEPERS ON A CONCRETE OR MASONRY SLAB, WHICH IS IN DIRECT CONTACT WITH EARTH, AND SILLS THAT REST ON CONCRETE OR MASONRY FOUNDATIONS SHALL BE PRESERVATIVE TREATED WOOD. FOUNDATION PLATES OR SILLS AND SLEEPERS ON A CONCRETE OR MASONRY SLAB, WHICH IS IN DIRECT CONTACT WITH EARTH, AND SILLS THAT REST ON CONCRETE OR MASONRY FOUNDATIONS SHALL BE PRESERVATIVE TREATED WOOD.

FASTENERS IN PRESERVATIVE-TREATED WOOD OR FIRE-RETARDENT TREATED WOOD SHALL BE OF HOT-DIPPED, ZINC-COATED, GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE, OR COPPER PER 402.1.1 CRC. THE COATING WEIGHTS FOR ZINC-COATED FASTENERS SHALL BE IN ACCORDANCE WITH ASTM A153 CBC 2304.9.5.

POST BASES AND POST CAPS SIMPSON CBSQ, ECCQ, AND CCQ WITH SIMPSON SDS SCREWS. DO NOT USE NAILS.

CRIPPLE WALLS EXCEEDING 4'-0" IN HEIGHT SHALL BE 2X6 STUDS, OR 3X4 @ 16" O.C., MIN, WITH BRACING. CRIPPLE STUDS LESS THAN 14" IN HEIGHT SHALL BE SOLID BLOCKED, OR SHEATHED WITH 3/8" CDX NAILED WITH 8d'S AT 6" O.C. EDGE & 12" O.C. FIELD, PER 2326.1.5

CRIPPLE WALL STUDS SHALL BE 4'-0" IN LENGTH MAX. AND SHALL MATCH THE STUDDING OF FRAMED WALLS ABOVE, 2X6, OR 3X4 STUDS @ 16" O.C. MIN., AND NOT BE LESS THAN 14" IN LENGTH. CRIPPLE WALLS OF STUDS LESS THAN 14" IN HEIGHT SHALL BE FRAMED OF SOLID BLOCKING. CRIPPLE WALLS OF STUDS EXCEEDING 4'-0" IN HEIGHT SHALL BE FRAMED OF STUDS HAVING THE SIZE REQUIRED FOR AND ADDITIONAL STORY AND BRACED (2308.5.6) (2308.6.6)

STUD WALLS TO BE 2X4 STUDS @ 16" O.C. 10'-0" MAX. HEIGHT. BEARING WALLS GREATER THAN 10' IN HEIGHT TO BE 3X4, OR 2X6 STUDS @ 16" O.C., MIN.

EXTERIOR WALL STUDS SHALL BE CONTINUOUS FROM SILL TO ROOF DIAPHRAGM WHEN LATTERALLY UNSUPPORTED BY CEILINGS.

FOR INTERIOR WALLS SUPPORTED ON FLOOR JOIST USE DBL. JOIST, OR 3x BLKG. BENEATH THE WALLS

FLOOR JOIST HANGERS LUS210 (FACEMOUNT), OR, JB212 (TOP FLANGE) @ ALL DOUG-FIR FLOOR JOIST TO BEAM CONNECTIONS, OR IUS (FACEMOUNT), OR, ITS (TOP FLANGE) @ ALL TJI FLOOR JOIST TO BEAM CONNECTIONS, U.N.O.

FLOOR SHEATHING (CBC 2304.7.1) 3/4" CDX APA, STURD-I-FLOOR, STRUCT-1, EXPOSURE 1, 48/24 SPAN RATING, NAILED W/ 10d NAILS @ 6" O.C. @ PANEL EDGES AND 4" O.C. @ BOUNDARIES AND 12" O.C. FIELD NAILING, COMMON NAILS ONLY. PLYWOOD SPANS SHALL CONFORM WITH TABLE 2304.7. FACE GRAIN OF PLYWOOD SHALL BE PERPENDICULAR TO SUPPORTS, AND ALL JOINTS STAGGERED. SHEATHING TO BE TONGUE AND GROOVE OR HAVE PANEL EDGES BLOCKED WITH 2x4 MIN. USE BOUNDARY NAILING @ ALL SHEAR WALL, DRAG LINE, PERIMETER WALLS, RIDGES, VALLEYS, AND OPENINGS, MIN. - SEE DETAIL 4/D2

UPPER FLOOR POSTS TO BE CONTINUOUS DOWN THROUGH FLOORS TO SUPPORTING BEAMS, OR FOUNDATION BELOW. SOLID/SQUASH BLOCK AT FLOOR LEVEL.

WOOD SHEAR WALLS ARE TO BE CONTINUOUS FROM SUPPORTING FOUNDATION AND/OR RAISED WOOD FLOOR DIAPHRAGM TO FLOOR DIAPHRAGM / ROOF DIAPHRAGM ABOVE

WOOD SHEAR WALL HOLDOWN BRACKET AND POST BASE CONNECTOR BOLTS SHALL BE RETIGHTENDED JUST PRIOR TO COVERING/FINISHING THE WALL FRAMING.

HOLDOWN CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE APPROVED PLATE WASHERS IN ACCORDANCE WITH TABLE 2306.5 OF THE LABC. HOLD-DOWN CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE 0.229-IN. X 3-IN. X 3-IN. PLATE WASHERS ON THE POST OPPOSITE THE HOLD-DOWN. HOLD-DOWNS SHALL BE TIGHTENED TO FINGER TIGHT PLUS ONE-HALF WRENCH TURN JUST PRIOR TO COVERING THE WALL FRAMING.

RAFTER HANGERS USE MIN. LUS/LUC210 @ ALL RFTR. TO RIDGE, VALLEY AND HIP BEAMS, U.N.O. USE LUS/LUC210-2 @ DBL RFTRS., U.N.O., OR IUS (FACEMOUNT), OR, ITS (TOP FLANGE) @ ALL TJI ROOF RAFTERS, U.N.O.

HEADERS 4x6, MIN. FOR HEADERS AT DOOR AND WINDOW OPENINGS IN WALLS SUPPORTING ROOF FRAMING AND 4x8, MIN. FOR THOSE SUPPORTING ROOF AND/OR FLOOR ABOVE - SEE DETAIL 1/D2

ROOF SHEATHING (CBC 2304.7.2) 15/32" CDX APA, EXPOSURE 1, 24/0 SPAN RATING, WITH 8d COMMON NAILS @ 6" O.C. EDGE & BOUNDARY AND 12 O.C. FIELD. STAGGER ALL JOINTS. USE BOUNDARY NAILING @ ALL SHEAR WALL, DRAGLINE, PERIMETER WALLS, RIDGES, VALLEYS, AND OPENINGS, MIN. - SEE DETAIL 4/D2

ROOF DIAPHRAGM NAILING TO BE INSPECTED BEFORE COVERING.

EXPOSED WOOD TO BE NATURALLY DURABLE OR PRESERVATIVE TREATED PER CRC 317.1, OR EXPOSED BEAMS & POSTS SHALL BE PRESSURE-TREATED - CBC SECT. 2304.12.2.3

EXPOSED FASTENERS AND HARDWARE TO BE HOT-DIP GALVANIZED, STAINLESS-STEEL, ZINC COATED, OR SUPPLIED WITH EXTRA CORROSION RESISTANT COATING, ZMAX, OR EQUIVALENT.

CEILING JOIST SCHEDULE
PER CBC 2308.7.2

SIZE	SPACING	MAX. SPAN
2X4	24"	9'-10"
2X4	16"	11'-3"
2X4	12"	12'-5"
2X6	24"	14'-10"
2X6	16"	17'-8"
2X6	12"	19'-6"
2X8	24"	18'-9"
2X8	16"	23'-0"
2X8	12"	25'-8"
2X10	24"	22'-11"

1. MIN. CEILING JOIST SIZE, UNLESS OTHERWISE NOTED ON THE PLANS
2. TYP. CEILING JOISTS NOT SHOWN ON FRAMING PLANS FOR CLARITY

FRAMING PLAN LEGEND

2X STUD WALL - 2X4 STUDS @ 16" O.C., MIN., 2X6 STUDS @ 16" O.C., MIN @ ALL EXTERIOR WALLS. ALL BEARING WALLS GREATER THAN 10' IN HEIGHT TO BE 3X4, OR 2X6 STUDS @ 16" O.C., MIN. - SEE DETAIL 5/D2

(E) 2X STUD WALL - 2X4 @ 24" MIN., VERIFY

2X STUD WALL ABOVE

LINE OF ROOF/FLOOR ABOVE

PA / PA / BM — POST ABOVE - MATCH POST ABOVE AND SQUASH BLOCK AT FLOOR LEVEL

POST / BM — BEAM SIZE / POST SIZE - POST: 4X4 @ MIN., U.O.N. (PIECE MARK)

KP — KING POST SIZE - KP: 4X4 U.O.N. - DETAIL PER PLAN

HGR / SUPPORTING BEAM / BM / HANGER — BEAM / JOIST / RAFTER TO BEAM HANGER CONNECTION - SKEW/SLOPE/TOP FLANGE OFFSET AS REQ'D.

RR / CJ — ROOF RAFTER / CEILING JOIST SIZE - RR: 2X8 @ 16" O.C., U.O.N. DBL-RR: 2-2X8 @ 16" O.C. W/ 10d @ 6" O.C. T&B, STAGGERED, U.O.N. CJ: 2X6 @ 16" O.C., U.O.N. (PIECE MARK)

FJ / DJ — FLOOR JOIST / DECK JOIST SIZE - FJ: PER PLAN - V.I.F. (PIECE MARK)

MIN. LENGTH / TYPE — WOOD SHEAR WALL - SEE STRUCTURALAL NOTES SHEET S1 FOR SCHEDULE, AND DETAILS FOR COMPLETE NAILING, HOLDDOWN, AND SHEAR ANCHORAGE REQT'S. MIN. SHEARWALL LENGTH INDICATED FOR STRUCTURAL CALCULATION PURPOSES ONLY - SEE ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS - SEE DETAIL 2/D2

MIN. LENGTH / TYPE — WOOD SHEAR WALL W/ OPENING - SEE STRUCTURALAL NOTES SHEET FOR SCHEDULE, AND DETAILS FOR COMPLETE NAILING, HOLDDOWN, AND SHEAR ANCHORAGE REQT'S. MIN. SHEARWALL LENGTH INDICATED FOR STRUCTURAL CALCULATION PURPOSES ONLY - SEE ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS - SEE DETAIL 3/D2

PST / SS — WOOD SHEAR WALL END POST (PST) / STRAP HOLDOWN (SS) SCHEDULE
TYPE 1 POST: 4X4 MIN., U.O.N., STRAP HD: MST48 MIN., U.O.N
TYPE 2 POST: 4X4 MIN., U.O.N., STRAP HD: MST60 MIN., U.O.N
TYPE 3 POST: 4X4 MIN., U.O.N., STRAP HD: MST72 MIN., U.O.N
- SEE DETAILS

PST / HD — SHEAR WALL END POST (PST) / BRACKET HOLDOWN (HD) SCHEDULE
TYPE 1 POST: 4X4 MIN., U.O.N., HD: HDU4 & SSTB24 MIN., U.O.N.
TYPE 2 POST: 4X4 MIN., U.O.N., HD: HDU5 & SB5/8X24 MIN., U.O.N.
TYPE 3 POST: 4X6 MIN., U.O.N., HD: HDU8 & SSTB34 MIN., U.O.N.
TYPE 4 POST: 4X6 MIN., U.O.N., HD: HDU11 & SB1X30 MIN., U.O.N.
TYPE 5 POST: 4X8 MIN., U.O.N., HD: HDU11 & SB1X30 MIN., U.O.N.
- SEE DETAILS 10/D1, 11/D1, 12/D1, 13/D1, 14/D1

PA — WOOD SHEAR WALL ABOVE - SEE STRUCTURALAL NOTES SHEET S1 FOR SCHEDULE, AND DETAILS FOR COMPLETE HOLDDOWN AND SHEAR ANCHORAGE REQT'S - SEE DETAIL

PA / SS / BM — END POST & STRAP HOLDOWN ABOVE (PA/SS) TO BEAM BELOW
MST48 MIN., U.O.N. - SEE DETAILS

PA / SS / BM — END POST & STRAP HOLDOWN ABOVE (PA/SS) TO POST BELOW
MST48 MIN., U.O.N. & MATCH POST ABOVE IN WALL BELOW - SEE DETAILS

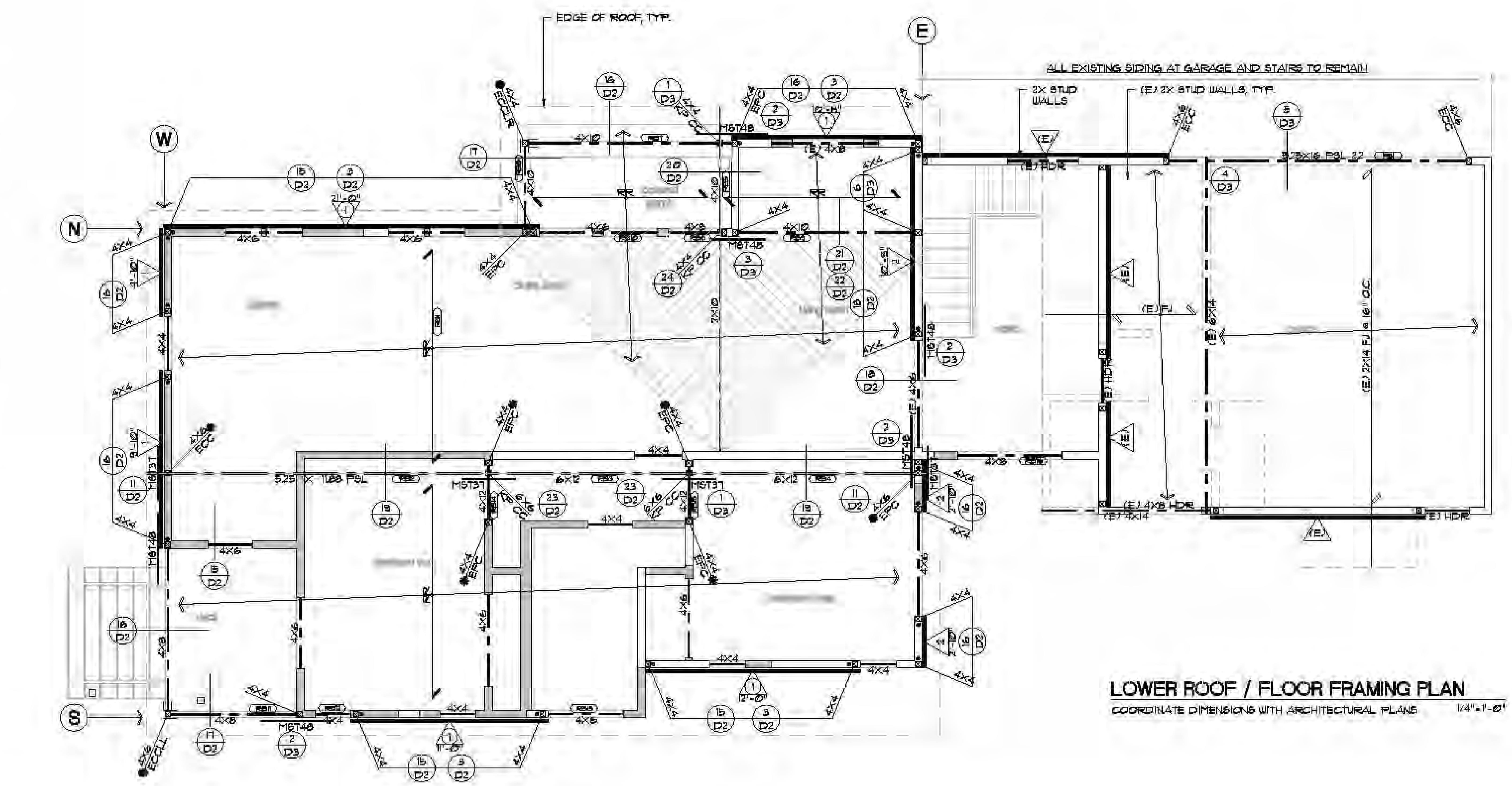
/ X / DX — SHEAR / DRAG LINE - MAINTAIN CONTINUITY FOR FOR LENGTH/WIDTH OF BLDG, OR AS INDICATED ON PLANS, PER DETAILS. BOUNDARY NAIL AT DIAPHRAGM TO DRAG STRUT / BEAM FOR ENTIRE LENGTH OF DRAG LINE

DRAG STRAP, MST48 MIN., U.O.N. — MST** — DS X ** — DRAG STRUT - EXTEND FULL LENGTH OF BLDG., U.O.N.
2X STUD WALL
ROOF - CS16 STRAP W/ 10d'S OVER DBL. 2X BLKG. NAIL W/ 10d @ 8" O.C. STAGGERED
FLOOR - CMST14 STRAP W/ 16d'S OVER 4X BLKG. NAIL W/ 16d @ 6" O.C., STAGGERED

DRAG STRAP, MST48 MIN., U.O.N. — MST** — BEAM / D.S. — DRAG BEAM - PER PLAN, DBL. RF. RFTR. / FLR. JST., MIN. W/ EDGE NAILING, EN. FROM ABOVE
2X STUD WALL

AREA OF OVER-FRAMING - ROOF RFTRS. TO BE 2x8 @ 16" O.C. MIN. WITH 2x8 @ ALL RIDGE/HIP/ VALLEYS - SEE DETAIL 14/D2

● EXTEND NEW POSTS THROUGH FLOOR, ANDREST DIRECTLY ON STEM WALL BELOW, WHERE INDICATED, TYP.



LOWER ROOF / FLOOR FRAMING PLAN

COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS 1/4"=1'-0"

BLANGY CONSULTING ENGINEERS
CIVIL - ARCHITECTURAL - STRUCTURAL ENGINEERING DESIGN
118 CATALINA AVE. STE. 1
REDONDO BEACH, CA 90277
310-270-5352

REGISTERED PROFESSIONAL ENGINEER C88983 Exp. 12-31-23 CIVIL STATE OF CALIFORNIA
8/15/23

SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal:
12/15/22
8/15/23
revision:

project no.: 22-057

sheet title: STRUCTURAL PLANS

sheet no.: S4

FRAMING PLAN NOTES

ALL DETAILS, SECTIONS, AND NOTES ON DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS, U.N.O.

FINISHED RIDGE/PARAPET HEIGHT SHALL NOT EXCEED THE ELEVATION SHOWN ON THE PLOT PLAN, OR THOSE LIMITS AS SET FORTH BY THE BUILDING OFFICIAL, INCLUDING ALLOWANCES FOR THICKNESS OF ROOFING MATERIALS/ASSEMBLY. RIDGE/PARAPET HEIGHT SHALL BE CERTIFIED BY A LICENSED SURVEYOR OR REGISTERED ENGINEER AND VERIFIED BY THE BUILDING OFFICIAL PRIOR TO APPROVAL OF THE ROOF FRAMING/SHEATHING BY THE BUILDING OFFICIAL

ALL STRUCTURAL ELEMENTS SHOWN ON PLANS ARE TO BE CONSIDERED NEW (N) U.O.N. AS EXISTING (E). CONTRACTOR TO VERIFY ALL EXISTING (E) CONSTRUCTION PRIOR TO COMMENCING WORK.

CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/COMPONENT LISTED IN THE "STATEMENT OF SPECIAL INSPECTION" SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS / BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH SYSTEM OR COMPONENT PER CBC 1705.1

SPECIAL INSPETION IS REQUIRED FOR WOOD SHEAR WALLS AND DIAPHRAGMS, INCLUDING CONNECTIONS TO OTHER COMPONENTS OF THE SEISMIC-FORCE-RESISTING SYSTEM WHEN NAIL SPACING OF THE SHEATHING IS 4" OR LESS O.C. - PER CBC SECT. 1705.13

NOTCHING AND DRILLING OF STUDS, JOISTS, AND RAFTERS SHALL CONFORM TO CBC 2308.5.9, 2308.5.10, 2308.4.2.4, AND 2308.7.4 - SEE DETAIL 7/D2 & 8/D2

OPENINGS AND/OR HOLES IN WOOD SHEAR WALLS AND/OR FLOOR/ROOF DIAPHRAGMS GREATER THAN 10" SHALL BE BLOCKED WITH 3X BLOCKING FOR 2-STUD/JOIST/RAFTER BAYS BEYOND THE OPENING, BOTH DIRECTIONS, AND STRAPPED CONTINUOUSLY WITH SIMPSON CS16, END TO END OF BLOCKING - SEE DETAIL 2/D2

TOP PLATE SPLICES SHALL BE NAILED WITH 8-16d FACE NAILS, EACH SIDE OF EACH BREAK, PER CBC 2308.3.2, OR USE SIMPSON ST6236, MIN. - SEE DETAIL 9/D2

PLATE BREAKS AT BEAM POCKETS AND OVER RIDGES AT SHEARLINES TO BE STRAPPED WITH MST48 MIN. U.O.N. ON THE PLANS - SEE DETAIL 10/D2 & 11/D2

BOLT HOLES IN WOOD TO BE DRILLED 1/32-1/16" OVERSIZED.

FOUNDATION PLATES OR SILLS AND SLEEPERS ON A CONCRETE OR MASONRY SLAB, WHICH IS IN DIRECT CONTACT WITH EARTH, AND SILLS THAT REST ON CONCRETE OR MASONRY FOUNDATIONS SHALL BE PRESERVATIVE TREATED WOOD. FOUNDATION PLATES OR SILLS AND SLEEPERS ON A CONCRETE OR MASONRY SLAB, WHICH IS IN DIRECT CONTACT WITH EARTH, AND SILLS THAT REST ON CONCRETE OR MASONRY FOUNDATIONS SHALL BE PRESERVATIVE TREATED WOOD.

FASTENERS IN PRESERVATIVE-TREATED WOOD OR FIRE-RETARDENT TREATED WOOD SHALL BE OF HOT-DIPPED, ZINC-COATED, GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE, OR COPPER PER 1402.1 CBC. THE COATING WEIGHTS FOR ZINC-COATED FASTENERS SHALL BE IN ACCORDANCE WITH ASTM A153 CBC 2304.9.5.

POST BASES AND POST CAPS: SIMPSON CBSQ, ECCQ, AND CCQ WITH SIMPSON SDS SCREWS. DO NOT USE NAILS.

CRIPPLE WALLS EXCEEDING 4'-0" IN HEIGHT SHALL BE 3X6 STUDS, OR 3X4 @ 16" O.C. MIN, WITH BRACING. CRIPPLE STUDS LESS THAN 14" IN HEIGHT SHALL BE SOLID BLOCKED, OR SHEATHED WITH 3/8" CDX NAILED WITH 8d'S AT 6" O.C. EDGE & 12" O.C. FIELD, PER 2326.11.5

CRIPPLE WALL STUDS SHALL BE 4'-0" IN LENGTH MAX, AND SHALL MATCH THE STUDDING OF FRAMED WALLS ABOVE, 2X6, OR 3X4 STUDS @ 16" O.C. MIN, AND NOT BE LESS THAN 14" IN LENGTH. CRIPPLE WALLS OF STUDS LESS THAN 14" IN HEIGHT SHALL BE FRAMED OF SOLID BLOCKING. CRIPPLE WALLS OF STUDS EXCEEDING 4'-0" IN HEIGHT SHALL BE FRAMED OF STUDS HAVING THE SIZE REQUIRED FOR AND ADDITIONAL STORY AND BRACED. (2308.5.6) (2308.6.6)

STUD WALLS TO BE 2X4 STUDS @ 16" O.C. 10'-0" MAX. HEIGHT. BEARING WALLS GREATER THAN 10' IN HEIGHT TO BE 3X4, OR 2X6 STUDS @ 16" O.C. MIN.

EXTERIOR WALL STUDS SHALL BE CONTINUOUS FROM SILL TO ROOF DIAPHRAGM WHEN LATTERALLY UNSUPPORTED BY CEILINGS.

FOR INTERIOR WALLS SUPPORTED ON FLOOR JOIST USE DBL. JOIST, OR 3x BLKG. BENEATH THE WALLS

FLOOR JOIST HANGERS: LUS210 (FACEMOUNT), OR, JB212 (TOP FLANGE) @ ALL DOUG-FIR FLOOR JOIST TO BEAM CONNECTIONS, OR IUS (FACEMOUNT), OR, ITS (TOP FLANGE) @ ALL TJI FLOOR JOIST TO BEAM CONNECTIONS, U.N.O.

FLOOR SHEATHING (CBC 2304.7.1): 3/4" CDX APA, STURD-I-FLOOR, STRUCT-I, EXPOSURE 1, 48/24 SPAN RATING, NAILED w/ 10d NAILS @ 6" O.C. @ PANEL EDGES AND 4" O.C. @ BOUNDARIES AND 12" O.C. FIELD NAILING. COMMON NAILS ONLY. PLYWOOD SPANS SHALL CONFORM WITH TABLE 2304.7. FACE GRAIN OF PLYWOOD SHALL BE PERPENDICULAR TO SUPPORTS, AND ALL JOINTS STAGGERED. SHEATHING TO BE TONGUE AND GROOVE OR HAVE PANEL EDGES BLOCKED WITH 2x4 MIN. USE BOUNDARY NAILING @ ALL SHEAR WALL, DRAG LINE, PERIMETER WALLS, RIDGES, VALLEYS, AND OPENINGS, MIN. - SEE DETAIL 4/D2

UPPER FLOOR POSTS TO BE CONTINUOUS DOWN THROUGH FLOORS TO SUPPORTING BEAMS, OR FOUNDATION BELOW. SOLID/SQUASH BLOCK AT FLOOR LEVEL.

WOOD SHEAR WALLS ARE TO BE CONTINUOUS FROM SUPPORTING FOUNDATION AND/OR RAISED WOOD FLOOR DIAPHRAGM TO FLOOR DIAPHRAGM / ROOF DIAPHRAGM ABOVE

WOOD SHEAR WALL HOLDOWN BRACKET AND POST BASE CONNECTOR BOLTS SHALL BE RETIGHTENED JUST PRIOR TO COVERING/FINISHING THE WALL FRAMING.

HOLDOWN CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE APPROVED PLATE WASHERS IN ACCORDANCE WITH TABLE 2304.9.5 OF THE LABC. HOLD-DOWN CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE Ø.229-IN. X 3-IN. X 3-IN. PLATE WASHERS ON THE POST OPPOSITE THE HOLD-DOWN. HOLD-DOWNS SHALL BE TIGHTENED TO FINGER TIGHT PLUS ONE-HALF WRENCH TURN JUST PRIOR TO COVERING THE WALL FRAMING.

RAFTER HANGERS: USE MIN. LUS/LUC210 @ ALL RFTR. TO RIDGE, VALLEY AND HIP BEAMS, U.N.O. USE LUS/LUC210-2 @ DBL. RFTRS., U.N.O., OR IUS (FACEMOUNT), OR, ITS (TOP FLANGE) @ ALL TJI ROOF RAFTERS, U.N.O.

HEADERS: 4x6, MIN. FOR HEADERS AT DOOR AND WINDOW OPENINGS IN WALLS SUPPORTING ROOF FRAMING AND 4x8, MIN. FOR THOSE SUPPORTING ROOF AND/OR FLOOR ABOVE - SEE DETAIL 1/D2

ROOF SHEATHING (CBC 2304.7.2): 15/32" CDX APA, EXPOSURE 1, 24/0 SPAN RATING, WITH 8d COMMON NAILS @ 6" O.C. EDGE & BOUNDARY AND 12 O.C. FIELD. STAGGER ALL JOINTS. USE BOUNDARY NAILING @ ALL SHEAR WALL, DRAGLINE, PERIMETER WALLS, RIDGES, VALLEYS, AND OPENINGS, MIN. - SEE DETAIL 4/D2

ROOF DIAPHRAGM NAILING TO BE INSPECTED BEFORE COVERING.

EXPOSED WOOD TO BE NATURALLY DURABLE OR PRESERVATIVE TREATED PER CBC 317.1, OR EXPOSED BEAMS & POSTS SHALL BE PRESSURE-TREATED - CBC SECT. 2304.12.2.3

EXPOSED FASTENERS AND HARDWARE TO BE HOT-DIP GALVANIZED, STAINLESS-STEEL, ZINC COATED, OR SUPPLIED WITH EXTRA CORROSION RESISTANT COATING, ZMAX, OR EQUIVALENT.

CEILING JOIST SCHEDULE
PER CBC 2308.7.2

SIZE	SPACING	MAX. SPAN
2X4	24"	9'-10"
2X4	16"	11'-3"
2X4	12"	12'-3"
2X6	24"	14'-10"
2X6	16"	17'-8"
2X6	12"	19'-6"
2X8	24"	18'-9"
2X8	16"	23'-0"
2X8	12"	25'-8"
2X10	24"	22'-11"

1. MIN. CEILING JOIST SIZE, UNLESS OTHERWISE NOTED ON THE PLANS
2. TYP. CEILING JOISTS NOT SHOWN ON FRAMING PLANS FOR CLARITY

FRAMING PLAN LEGEND

2X STUD WALL - 2X4 STUDS @ 16" O.C. MIN, 2X6 STUDS @ 16" O.C. MIN @ ALL EXTERIOR WALLS, ALL BEARING WALLS GREATER THAN 10' IN HEIGHT TO BE 3X4, OR 2X6 STUDS @ 16" O.C. MIN. - SEE DETAIL 5/D2

(E) 2X STUD WALL - 2X4 @ 24" MIN, VERIFY

2X STUD WALL ABOVE

LINE OF ROOF/FLOOR ABOVE

POST ABOVE - MATCH POST ABOVE AND SQUASH BLOCK AT FLOOR LEVEL

BEAM SIZE / POST SIZE - POST: 4X4 @ MIN. U.O.N. (PIECE MARK)

KING POST SIZE - KP: 4X4 U.O.N. - DETAIL PER PLAN

BEAM / JOIST / RAFTER TO BEAM HANGER CONNECTION - SKEW/SLOPE/TOP FLANGE OFFSET AS REQ'D.

RFR / CJ - ROOF RAFTER / CEILING JOIST SIZE (PIECE MARK) - RFR: 2X8 @ 16" O.C. U.O.N. DBL. RFR: 2-2X8 @ 16" O.C. W/ 10d @ 6" O.C. TYP, STAGGERED, U.O.N. CJ: 2X6 @ 16" O.C. U.O.N.

FJ / DJ - FLOOR JOIST / DECK JOIST SIZE (PIECE MARK) - FJ: PER PLAN - V.I.F.

MIN. LENGTH - TYPE

MIN. LENGTH - TYPE

WOOD SHEAR WALL - SEE STRUCTURALAL NOTES SHEET S1 FOR SCHEDULE, AND DETAILS FOR COMPLETE NAILING, HOLDDOWN, AND SHEAR ANCHORAGE REQ'TS. MIN. SHEARWALL LENGTH INDICATED FOR STRUCTURAL CALCULATION PURPOSES ONLY - SEE ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS - SEE DETAIL 3/D2

WOOD SHEAR WALL W/ OPENING - SEE STRUCTURALAL NOTES SHEET FOR SCHEDULE, AND DETAILS FOR COMPLETE NAILING, HOLDDOWN, AND SHEAR ANCHORAGE REQ'TS. MIN. SHEARWALL LENGTH INDICATED FOR STRUCTURAL CALCULATION PURPOSES ONLY - SEE ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS - SEE DETAIL 3/D2

WOOD SHEAR WALL END POST (PBT) / STRAP HOLDOWN (SS) SCHEDULE
TYPE ▽ POST: 4X4 MIN, U.O.N., STRAP HD: MST48 MIN, U.O.N
TYPE ▽ POST: 4X4 MIN, U.O.N., STRAP HD: MST60 MIN, U.O.N
TYPE ▽ POST: 4X4 MIN, U.O.N., STRAP HD: MST72 MIN, U.O.N
- SEE DETAILS

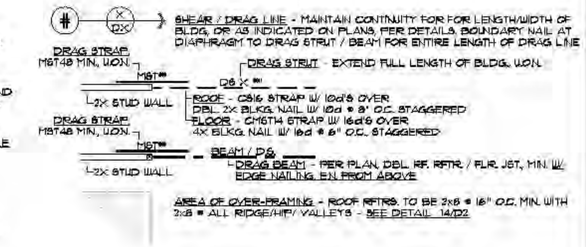
SHEAR WALL END POST (PBT) / BRACKET HOLDOWN (HD) SCHEDULE
TYPE ▽ POST: 4X4 MIN, U.O.N., HD: HDU4 & SBTB24 MIN, U.O.N.
TYPE ▽ POST: 4X4 MIN, U.O.N., HD: HDU5 & SBTBX24 MIN, U.O.N.
TYPE ▽ POST: 4X6 MIN, U.O.N., HD: HDU8 & SBTB34 MIN, U.O.N.
TYPE ▽ POST: 4X6 MIN, U.O.N., HD: HDU11 & SBTBX30 MIN, U.O.N.
TYPE ▽ POST: 4X8 MIN, U.O.N., HD: HDU11 & SBTBX30 MIN, U.O.N.
- SEE DETAILS 10/D1, 11/D1, 12/D1, 13/D1, 14/D1

WOOD SHEAR WALL ABOVE - SEE STRUCTURALAL NOTES SHEET S1 FOR SCHEDULE, AND DETAILS FOR COMPLETE HOLDDOWN AND SHEAR ANCHORAGE REQ'TS - SEE DETAIL

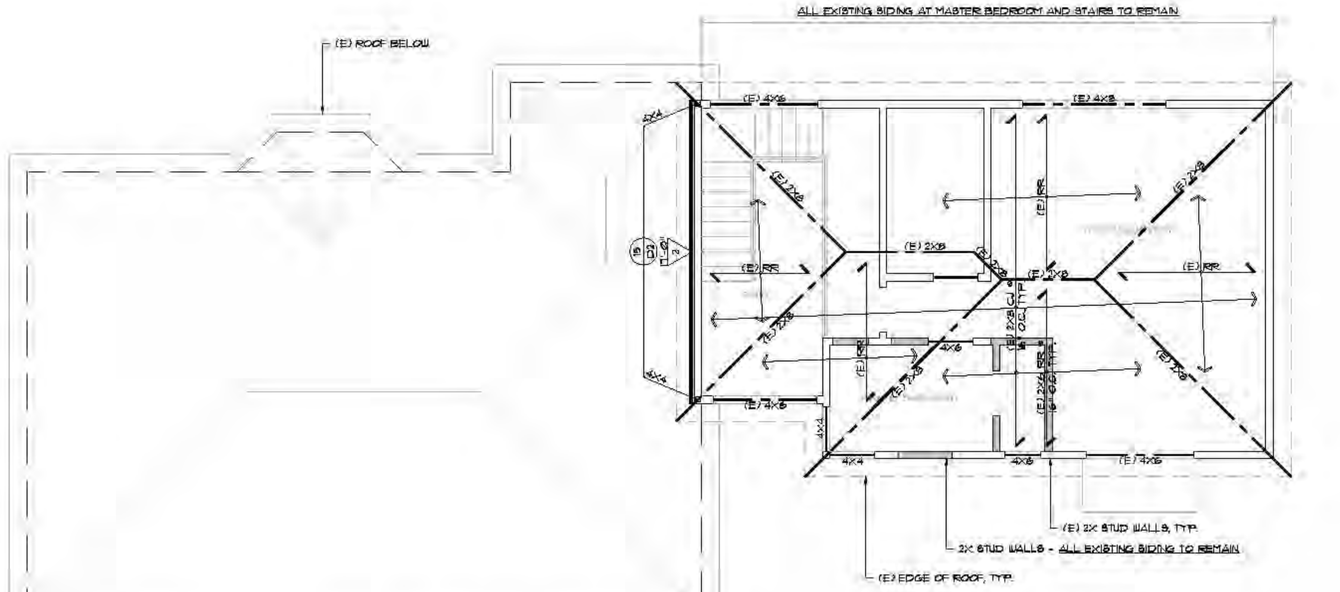
END POST & STRAP HOLDOWN ABOVE (PA/SS) TO BEAM BELOW
MST48 MIN, U.O.N. - SEE DETAILS

END POST & STRAP HOLDOWN ABOVE (PA/SS) TO POST BELOW
MST48 MIN, U.O.N. & MATCH POST ABOVE IN WALL BELOW
- SEE DETAILS

SHEAR / DRAG LINE - MAINTAIN CONTINUITY FOR FOR LENGTH/WIDTH OF BLDG, OR AS INDICATED ON PLANS, PER DETAILS. BOUNDARY NAIL AT DIAPHRAGM TO DRAG STRUT / BEAM FOR ENTIRE LENGTH OF DRAG LINE



AREA OF OVER-FRAMING - ROOF RFTRS. TO BE 2X8 @ 16" O.C. MIN. WITH 2X8 @ ALL RIDGE/HIP/ VALLEYS - SEE DETAIL 14/D2



UPPER ROOF FRAMING PLAN

COORDINATE DIMENSIONS WITH ARCHITECTURAL PLANS 1/4"=1'-0"

BLANGY
CONSULTING
ENGINEERS
CIVIL -
ARCHITECTURAL
- STRUCTURAL
ENGINEERING DESIGN
118 CATALINA AVE. STE.I
REDONDO BEACH, CA 90277
310-270-5352

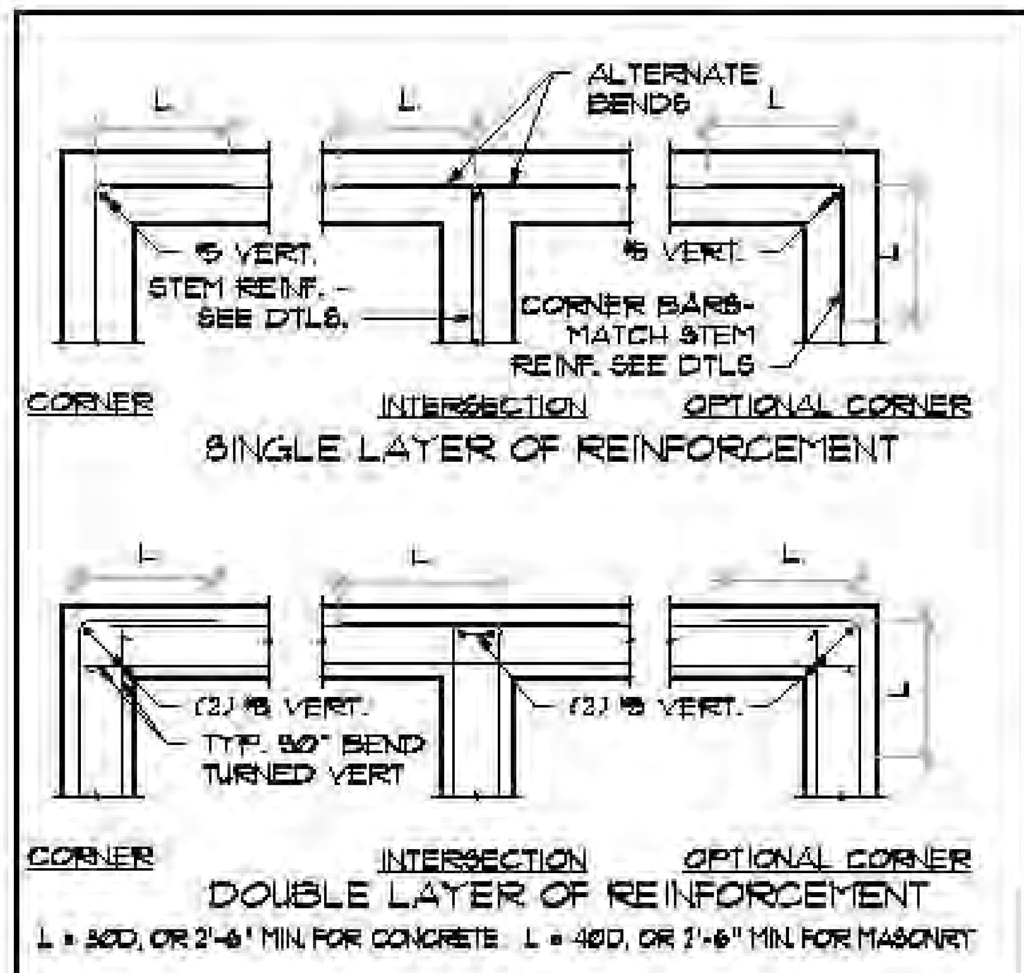
SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal:
12/15/22
8/15/23
revision:

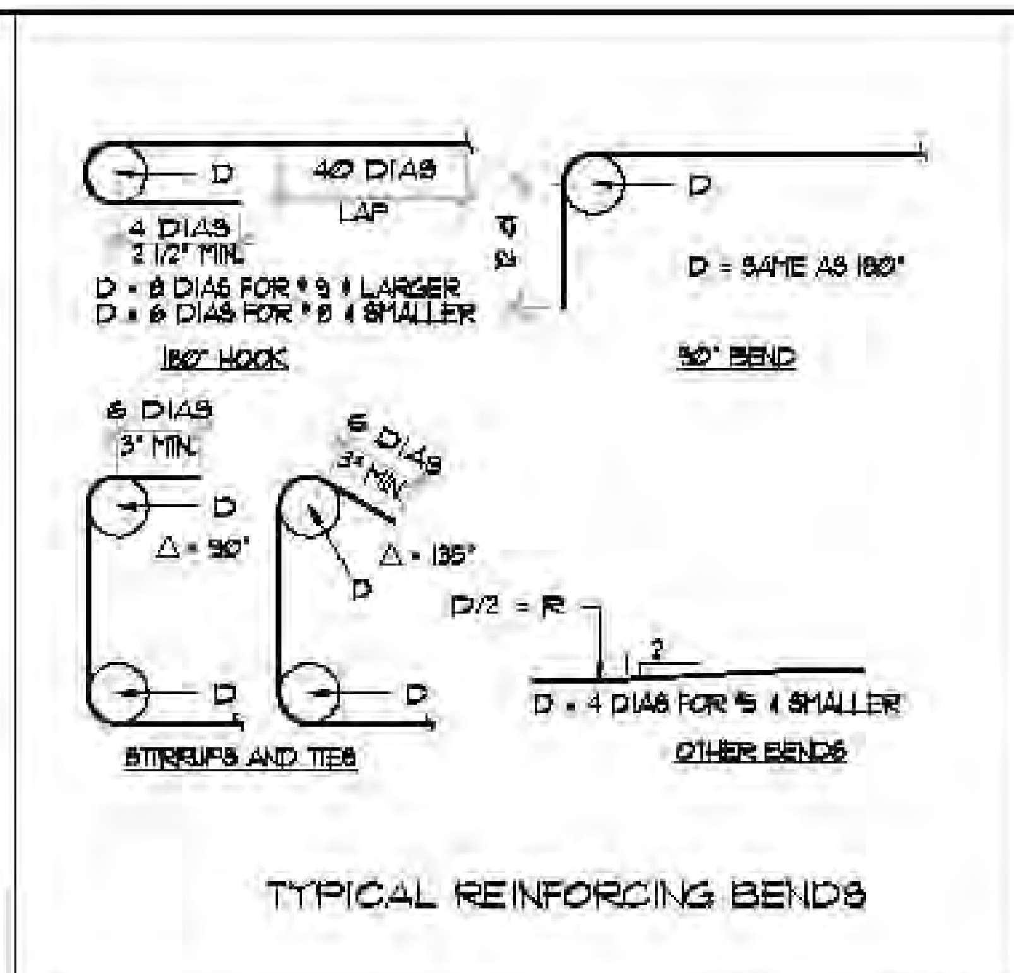
22-057
project no.:

STRUCTURAL PLANS
sheet title:

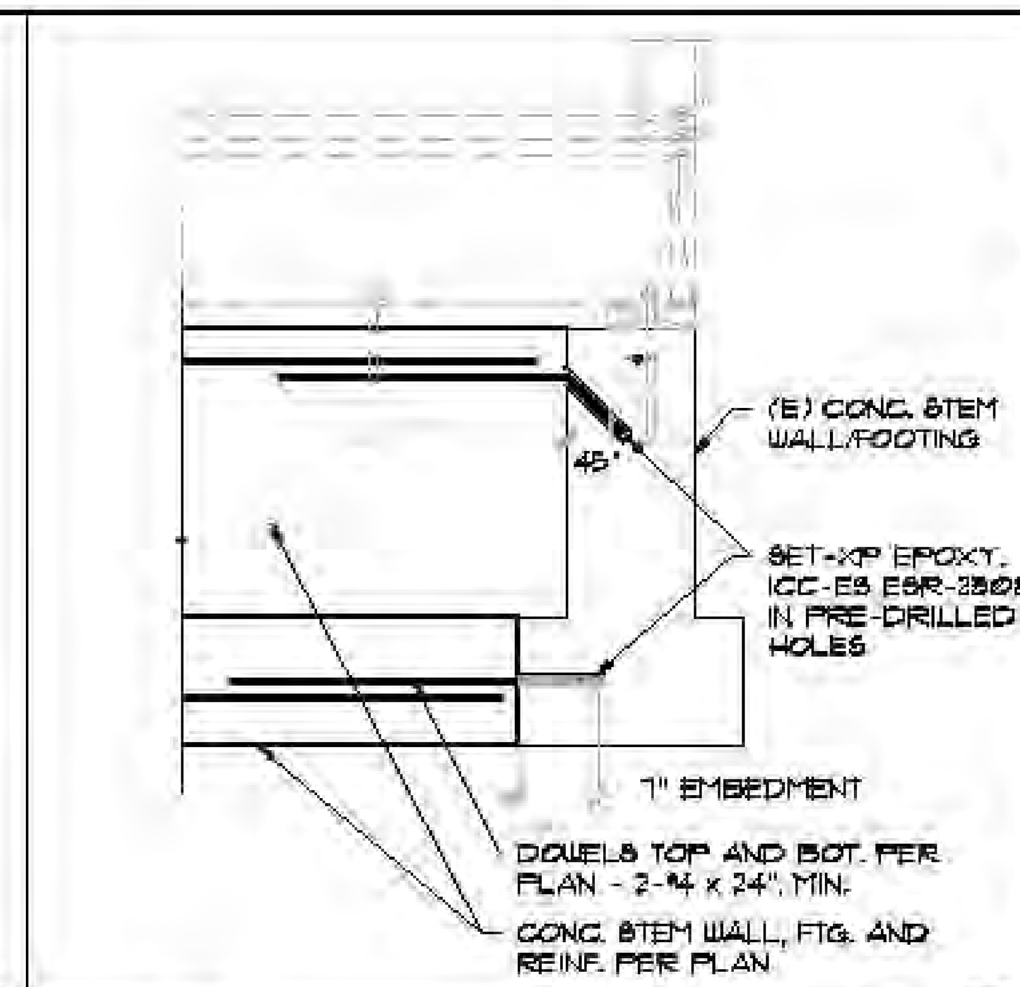
S5
sheet no.:



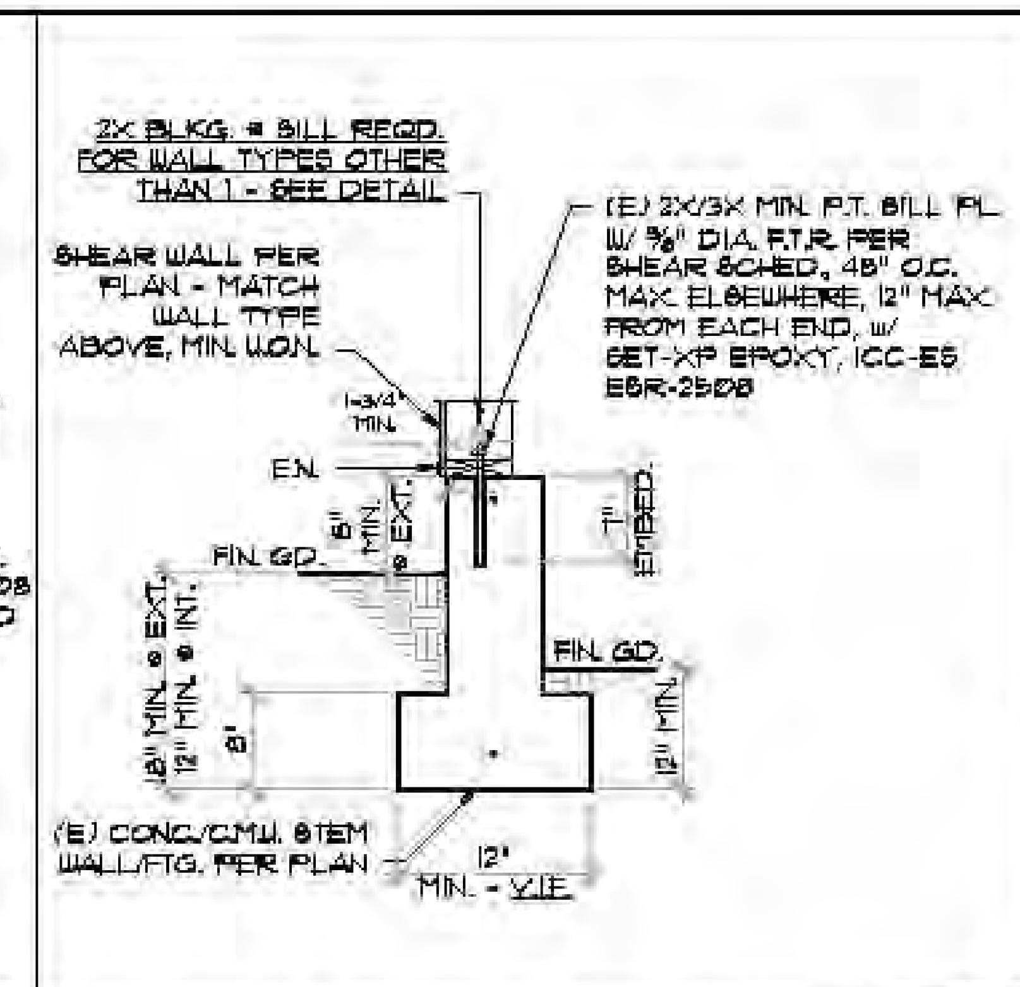
DETAIL 1 — 17013ONC 3/4"=1'-0"



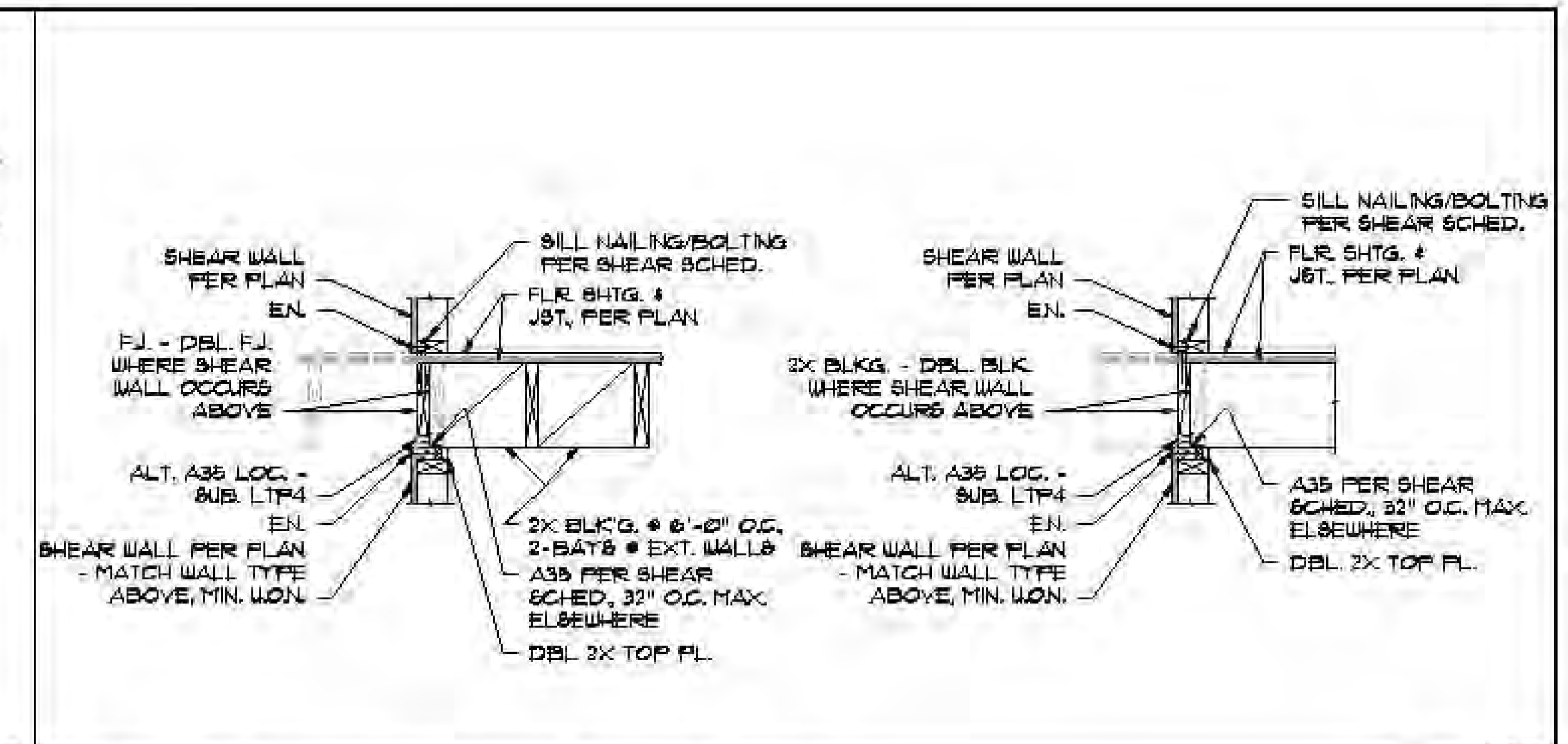
DETAIL 2 — 17013ONC 3/4"=1'-0"



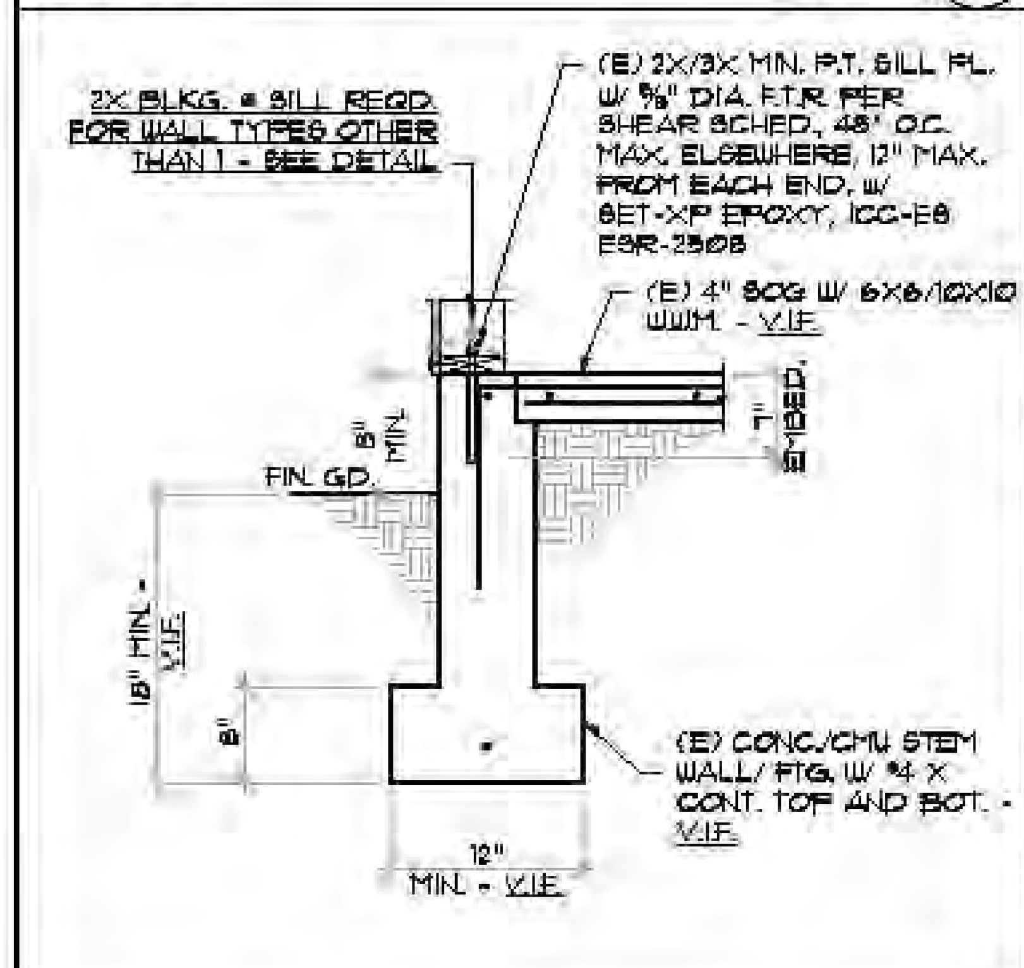
DETAIL 3 — 17013ONC 1"=1'-0"



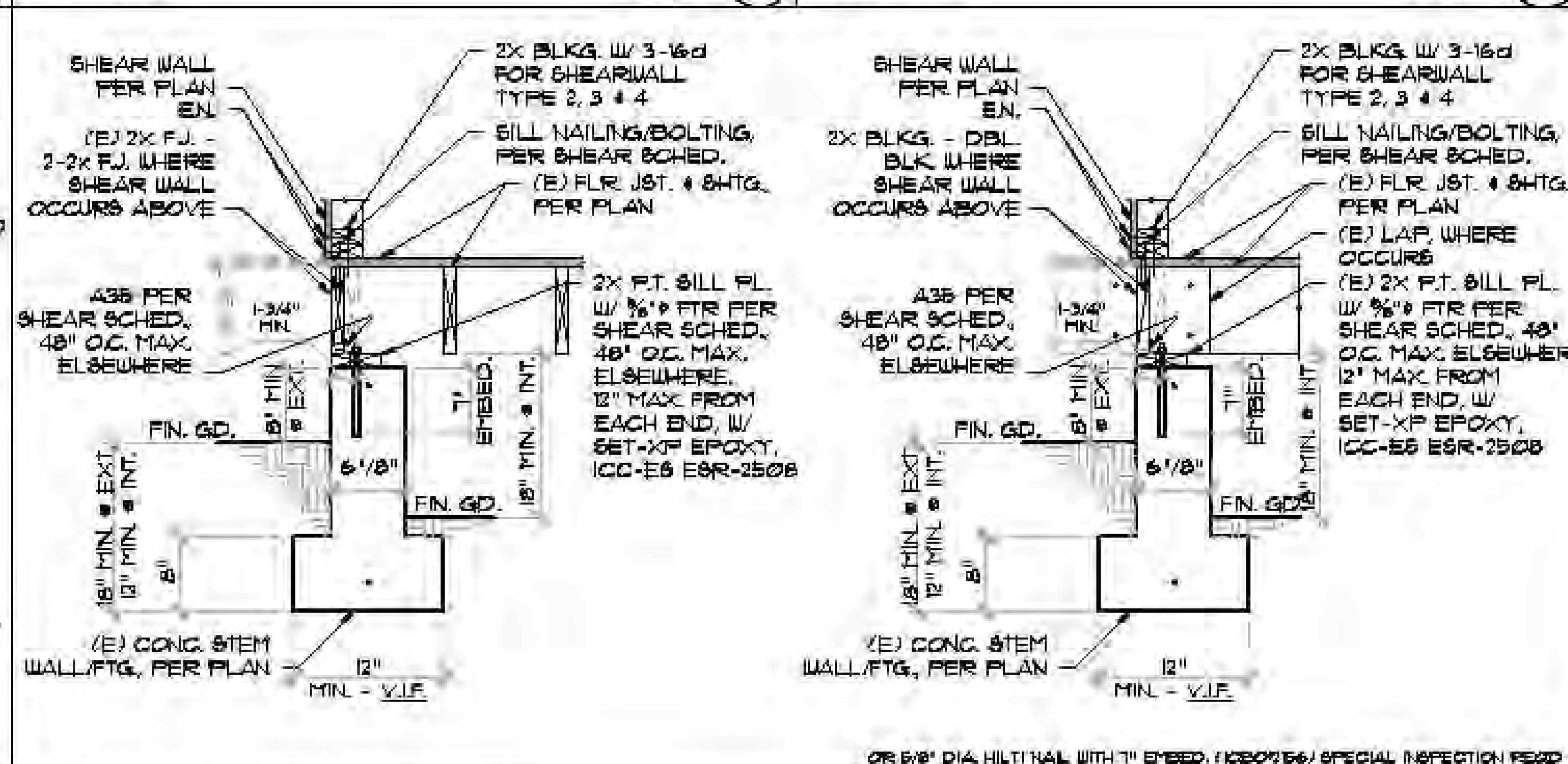
CRIPPLE STUD WALL @ (E) FOOTING — 17101ONC 3/4"=1'-0" — 4



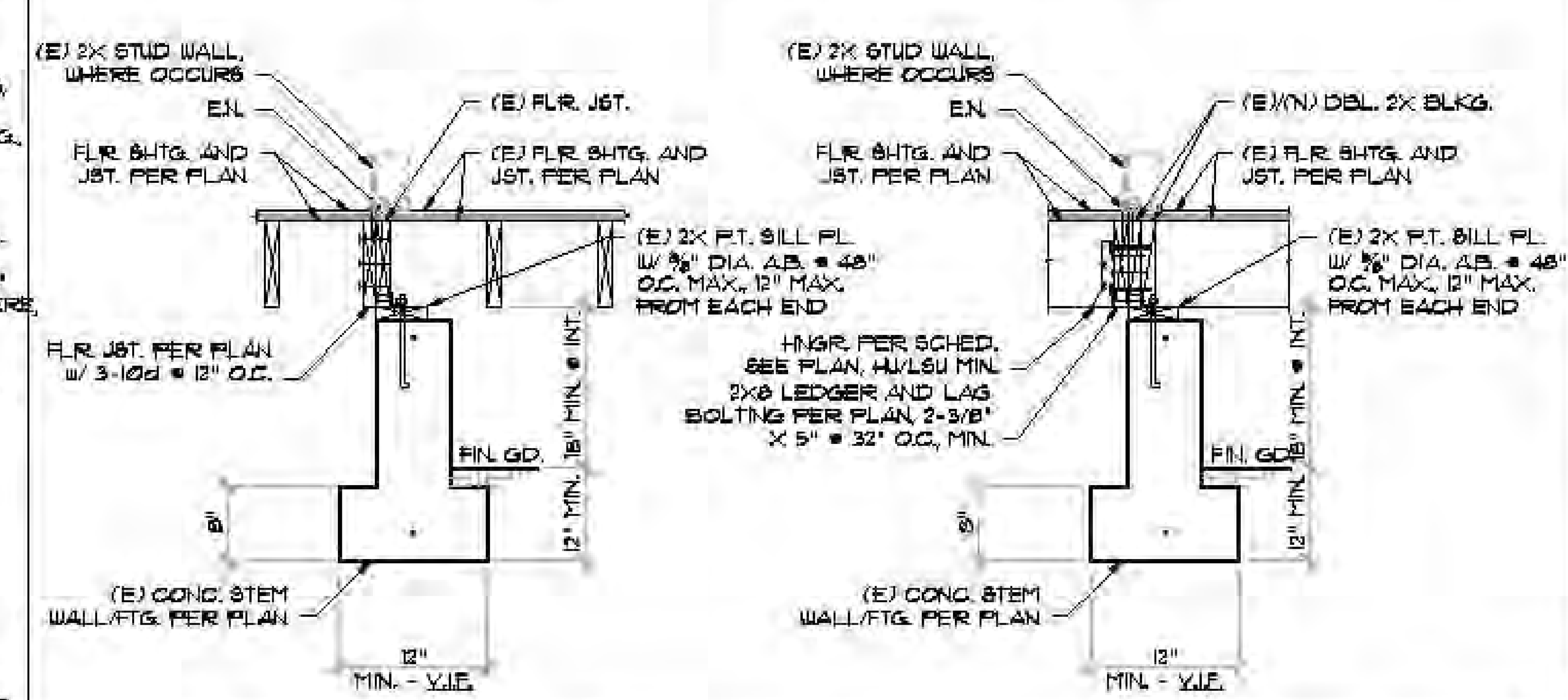
SHEAR TRANSFER - CRIPPLE STUD WALL — 17101ONC 3/4"=1'-0" — 5



SHEAR TRANSFER — 19031ONC 3/4"=1'-0" — 6

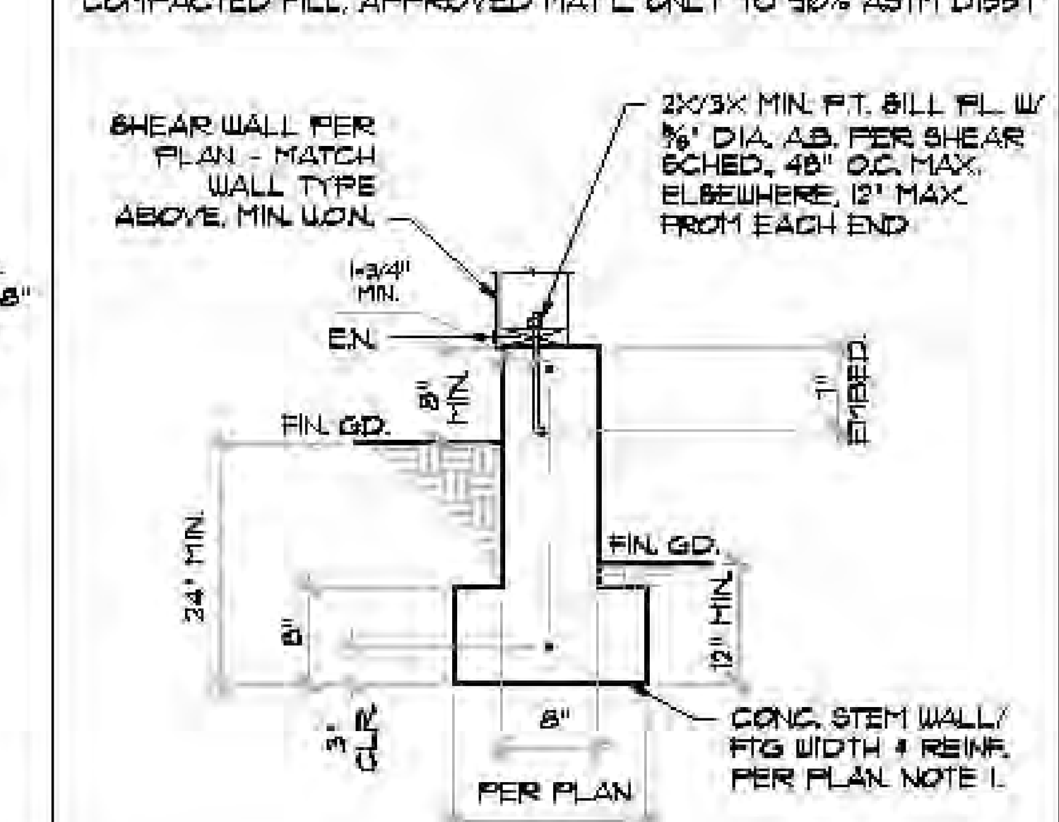


RAISED FLOOR @ STEM WALL — 17013ONC 3/4"=1'-0" — 7

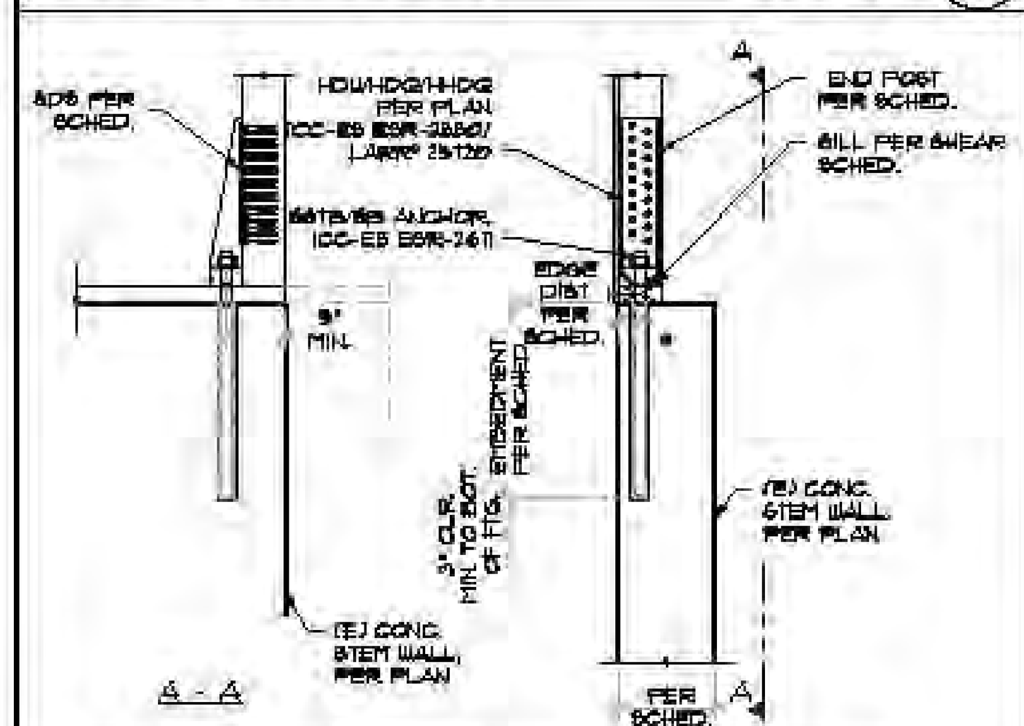


RAISED FLOOR @ STEM WALL — 17013ONC 3/4"=1'-0" — 8

NOTES
1. PLACE FOOTING ON UNDISTURBED, NATURAL SOIL, OR COMPACTED FILL, APPROVED MAT'L ONLY TO 90% ASTM D1557



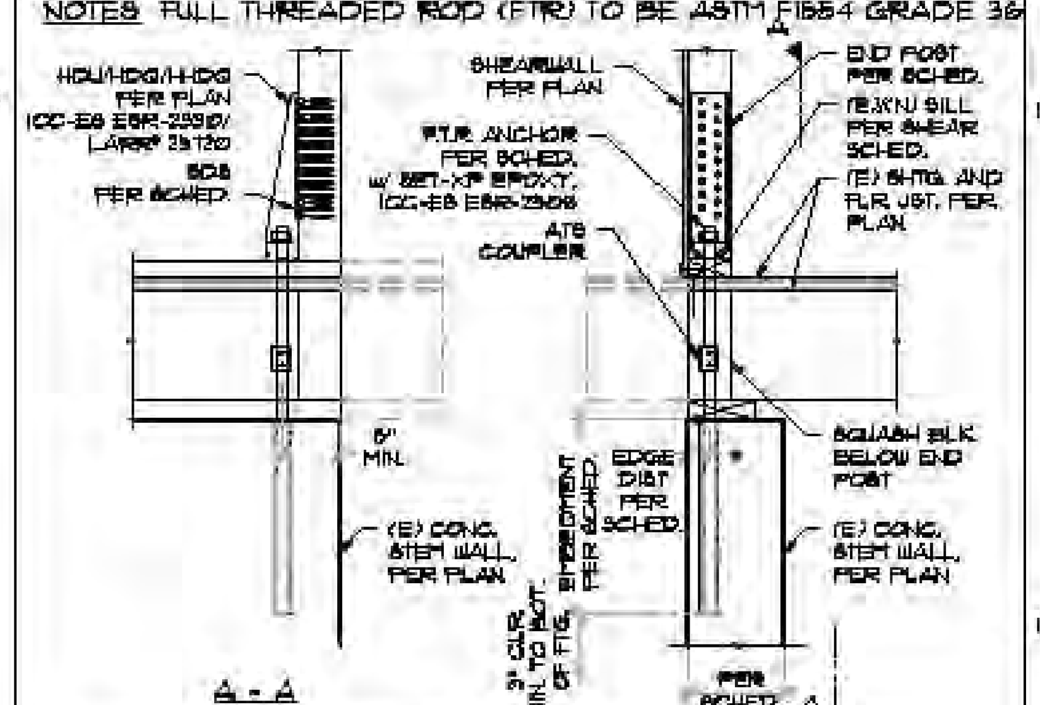
EXTERIOR FOOTING — 17013ONC 3/4"=1'-0" — 9



HOLDOWN	SDS 1/4x2.5" SCREWS	END POST THK. MIN.	FTR DIA.	EMBEDMENT	EDGE DIST.
HDU2-SDS2.5	6	3.5	5/8"	12"	1-7/8"
HDU4-SDS2.5	10	3.5	5/8"	18"	1-7/8"
HDU5-SDS2.5	14	3.5	5/8"	18"	1-7/8"
HDU8-SDS2.5	20	3.5	7/8"	26"	2-5/8"
HDU11-SDS2.5	30	5.5	1"	24"	3"
HDU14-SDS2.5	36	5.5	1"	28"	3"

HOLDOWN — 17021ONC 3/4"=1'-0" — 10

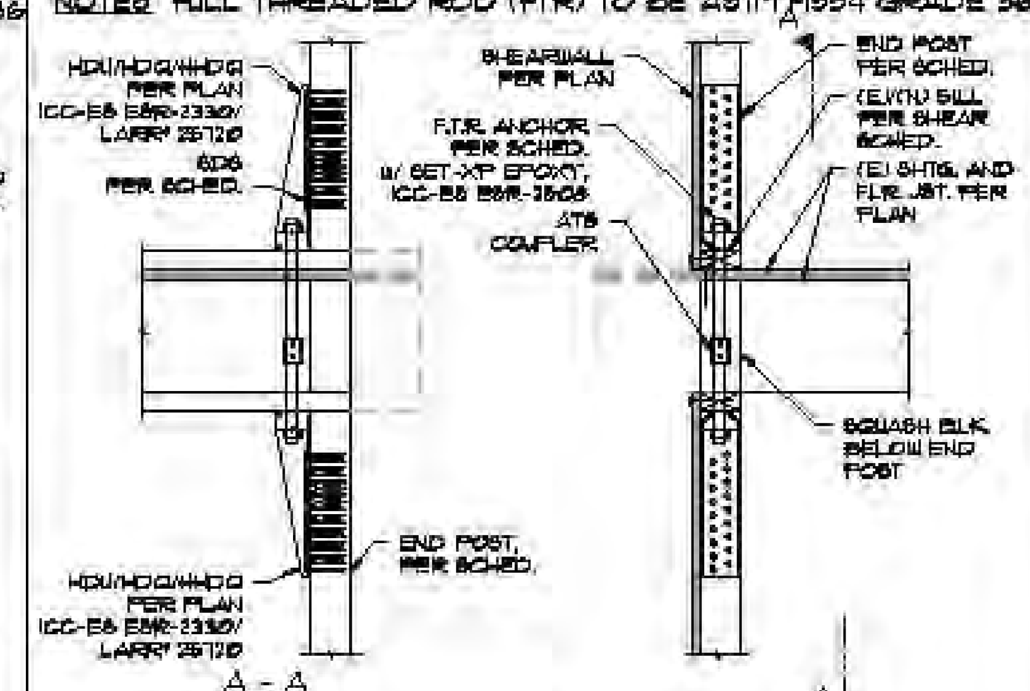
NOTES: FULL THREADED ROD (FTR) TO BE ASTM F1554 GRADE 36



HOLDOWN	SDS 1/4x2.5" SCREWS	END POST THK. MIN.	FTR DIA.	EMBEDMENT	EDGE DIST.
HDU2-SDS2.5	6	3.5	5/8"	12"	1-7/8"
HDU4-SDS2.5	10	3.5	5/8"	18"	1-7/8"
HDU5-SDS2.5	14	3.5	5/8"	18"	1-7/8"
HDU8-SDS2.5	20	3.5	7/8"	26"	2-5/8"
HDU11-SDS2.5	30	5.5	1"	24"	3"
HDU14-SDS2.5	36	5.5	1"	28"	3"

HOLDOWN — 17013ONC 3/4"=1'-0" — 11

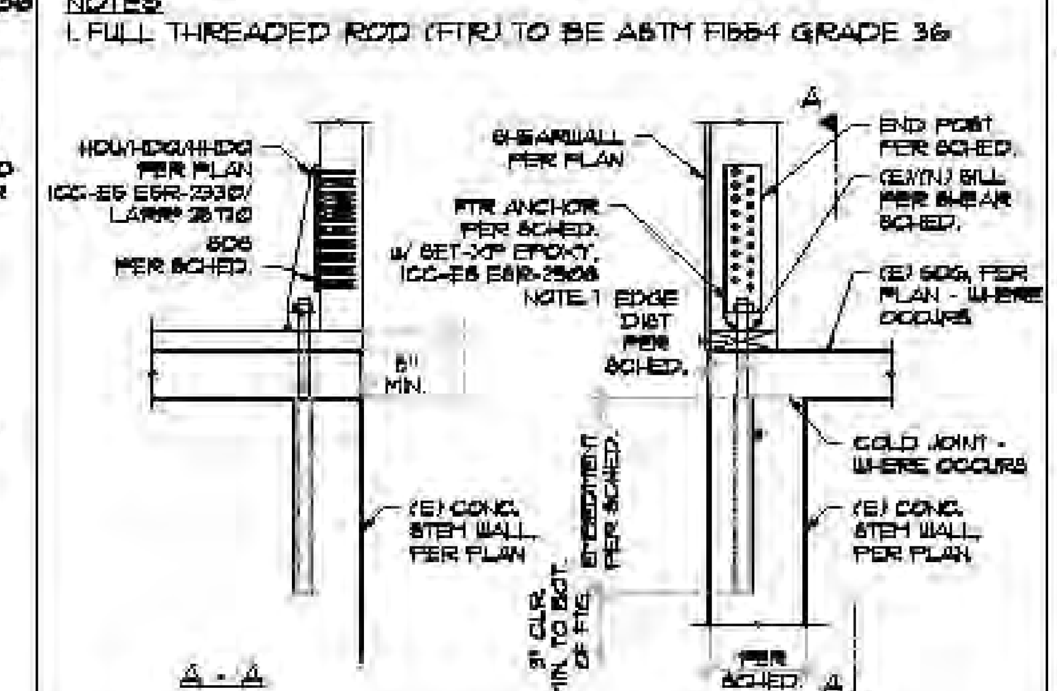
NOTES: FULL THREADED ROD (FTR) TO BE ASTM F1554 GRADE 36



HOLDOWN	SDS 1/4x2.5" SCREWS	END POST THK. MIN.	FTR DIA.
HDU2-SDS2.5	6	3.5	5/8"
HDU4-SDS2.5	10	3.5	5/8"
HDU5-SDS2.5	14	3.5	5/8"
HDU8-SDS2.5	20	3.5	7/8"
HDU11-SDS2.5	30	5.5	1"
HDU14-SDS2.5	36	5.5	1"

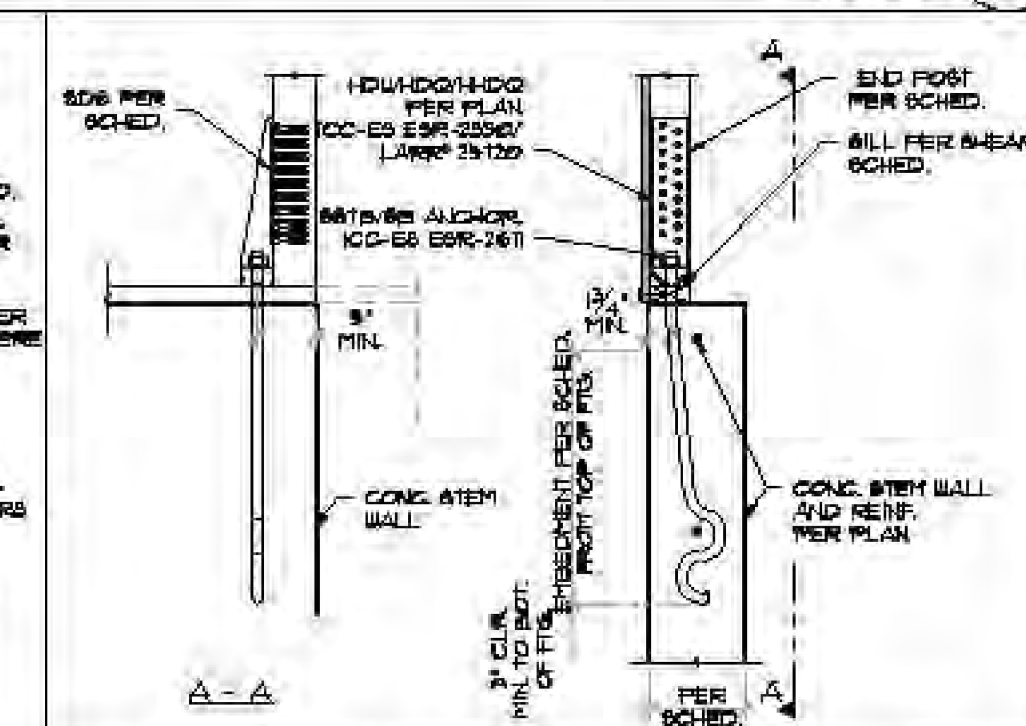
HOLDOWN — 19101ONC 3/4"=1'-0" — 12

NOTES
1. FULL THREADED ROD (FTR) TO BE ASTM F1554 GRADE 36



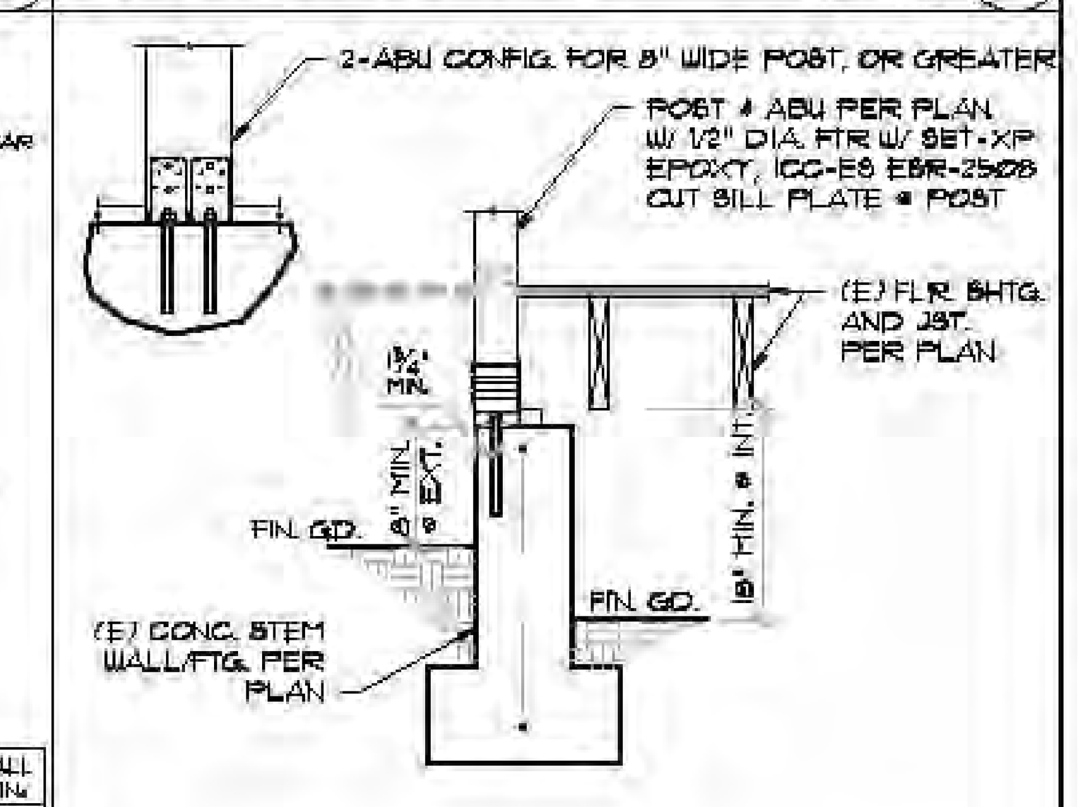
HOLDOWN	SDS 1/4x2.5" SCREWS	END POST THK. MIN.	FTR DIA.	EMBEDMENT	EDGE DIST.
HDU2-SDS2.5	6	3.5	5/8"	12"	1-7/8"
HDU4-SDS2.5	10	3.5	5/8"	18"	1-7/8"
HDU5-SDS2.5	14	3.5	5/8"	18"	1-7/8"
HDU8-SDS2.5	20	3.5	7/8"	26"	2-5/8"
HDU11-SDS2.5	30	5.5	1"	24"	3"
HDU14-SDS2.5	36	5.5	1"	28"	3"

HOLDOWN — 17013ONC 3/4"=1'-0" — 13



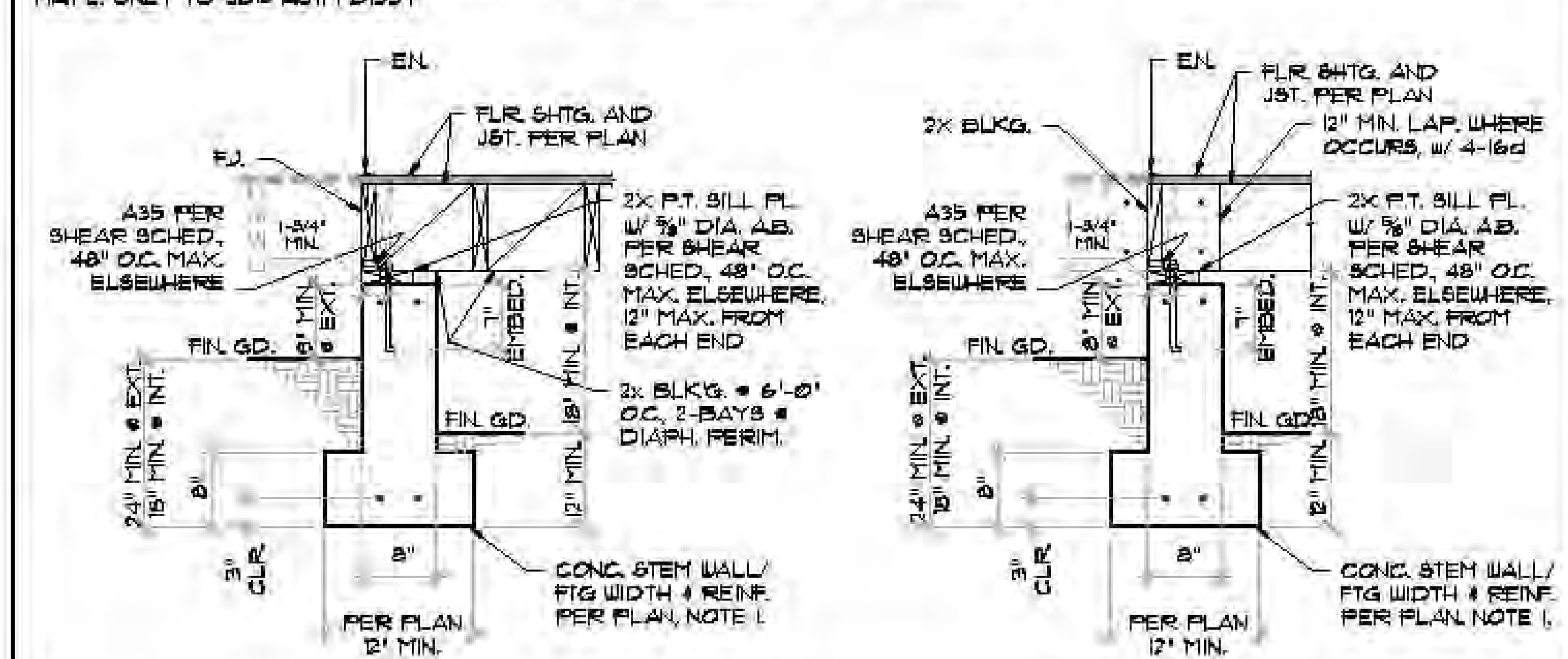
HOLDOWN	SDS 1/4x2.5" SCREWS	END POST THK. MIN.	ABOLT DIA.	ABOLT	EMBEDMENT	STEMWALL THK. MIN.
HDU2-SDS2.5	6	3.5	5/8"	SSTB16	12 5/8"	6"
HDU4-SDS2.5	10	3.5	5/8"	SSTB24	20 5/8"	6"
HDU5-SDS2.5	14	3.5	5/8"	SB5/8X24	18"	8"
HDU8-SDS2.5	20	3.5	7/8"	SSTB28	24 7/8"	8"
HDU11-SDS2.5	30	5.5	1"	SB1X30	24"	8"
HDU11-SDS2.5	30	7.25	1"	SB1X30	24"	8"
HDU14-SDS2.5	36	5.5	1"	SB1X30	24"	8"

HOLDOWN — 17021ONC 3/4"=1'-0" — 14

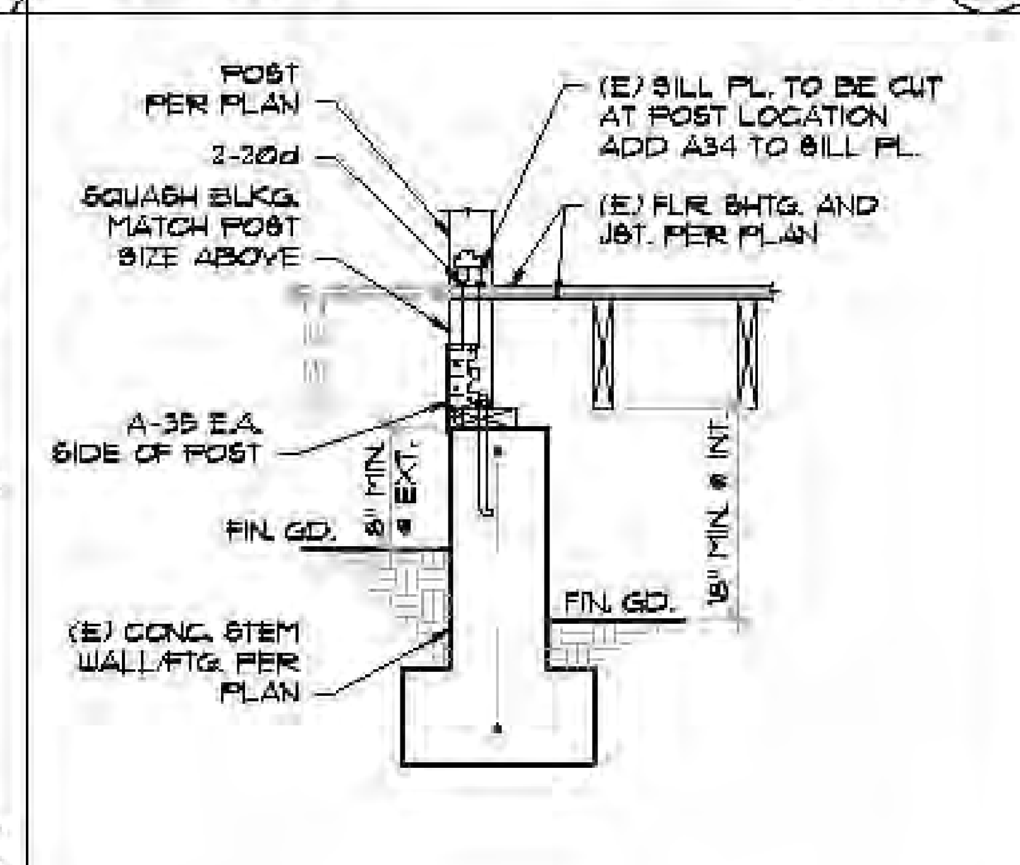


POST AT EXISTING FOOTING — 17013ONC 3/4"=1'-0" — 15

NOTES
1. PLACE FOOTING ON UNDISTURBED, NATURAL SOIL, OR COMPACTED FILL, APPROVED MAT'L. ONLY TO 90% ASTM D1557

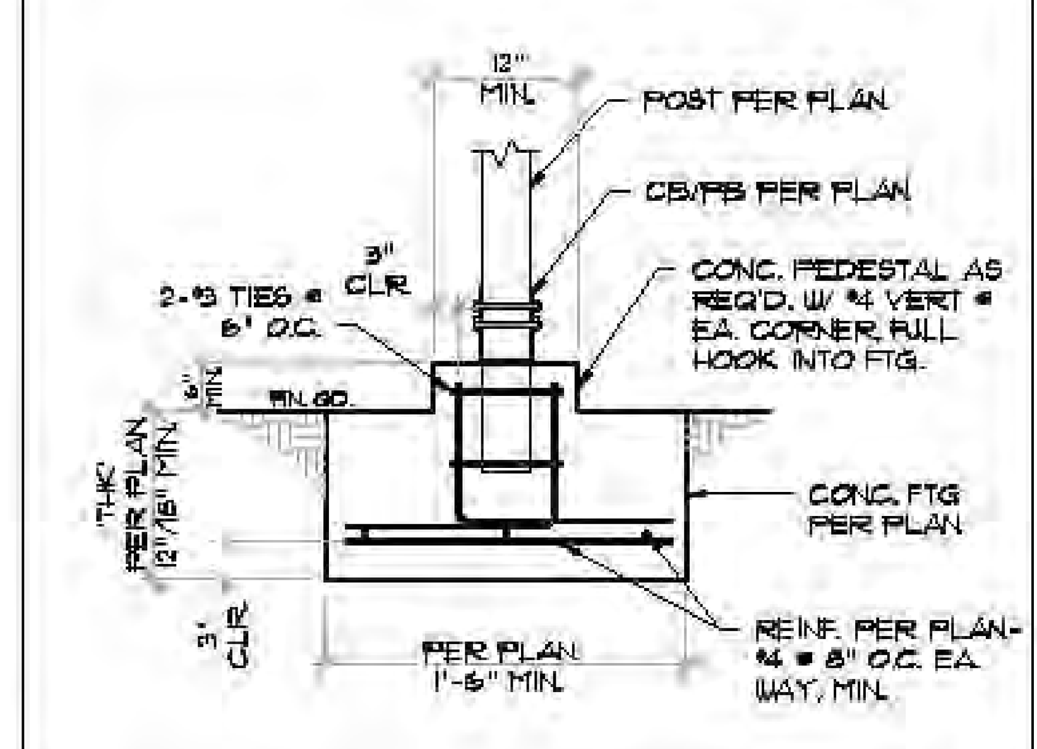


RAISED FLOOR @ STEM WALL — 19110TNC 3/4"=1'-0" — 16

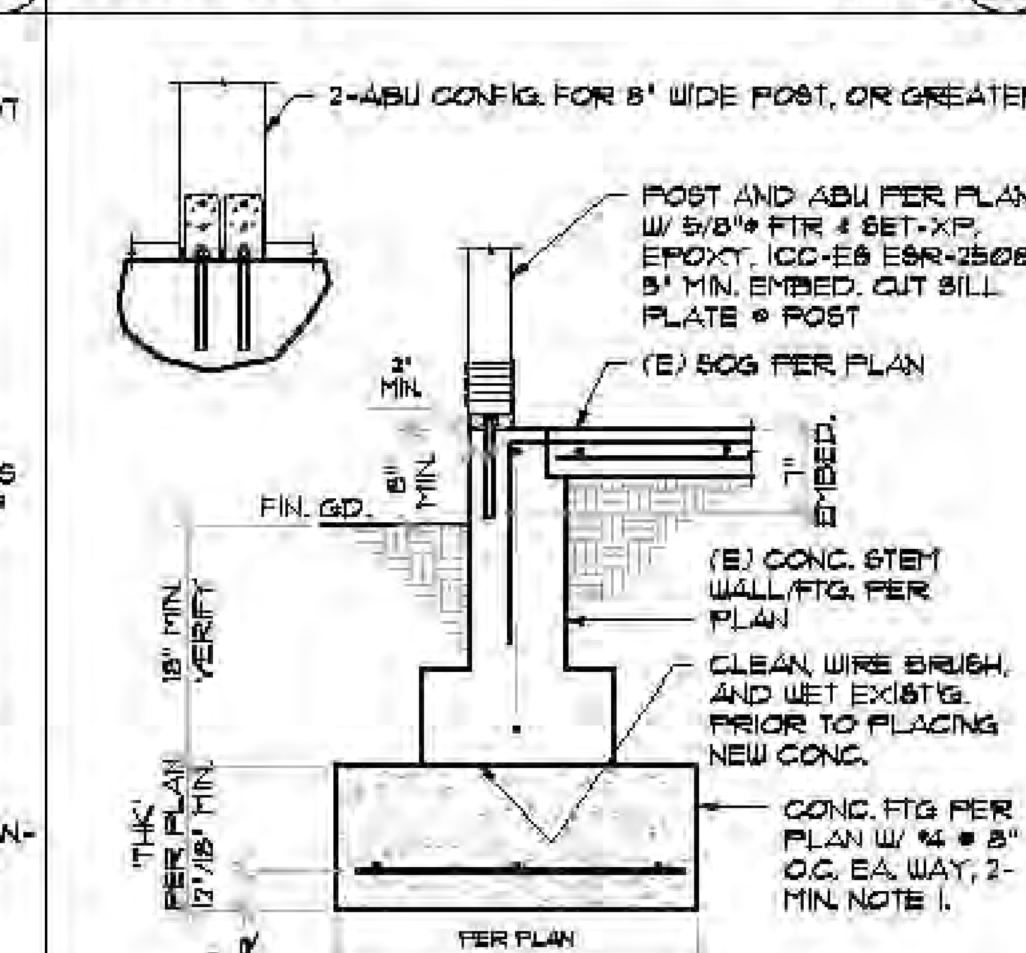


POST AT EXISTING FOOTING — 17013ONC 3/4"=1'-0" — 17

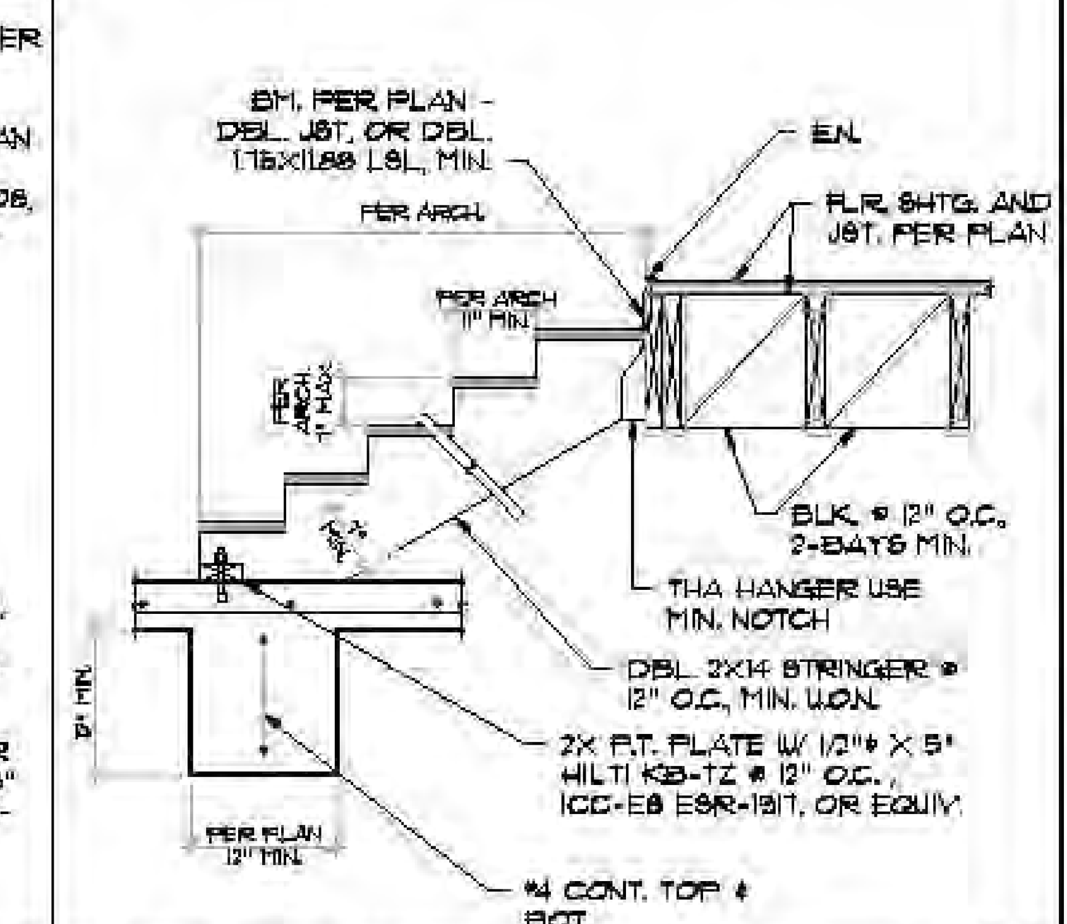
NOTES
1. PLACE FOOTING ON UNDISTURBED, NATURAL SOIL, OR COMPACTED FILL, APPROVED MAT'L. ONLY TO 90% ASTM D1557



COLUMN FOOTING — 17013ONC 3/4"=1'-0" — 18



EXTERIOR FOOTING PAD — 17013ONC 3/4"=1'-0" — 19



STAIR DETAIL — 17013ONC 3/4"=1'-0" — 20

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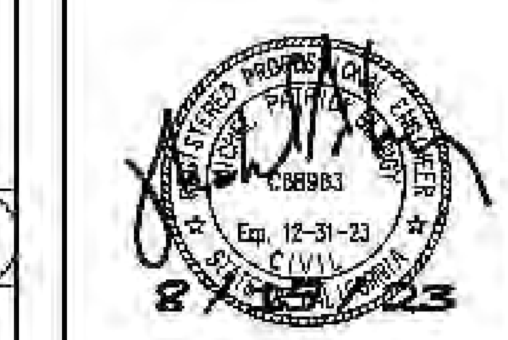
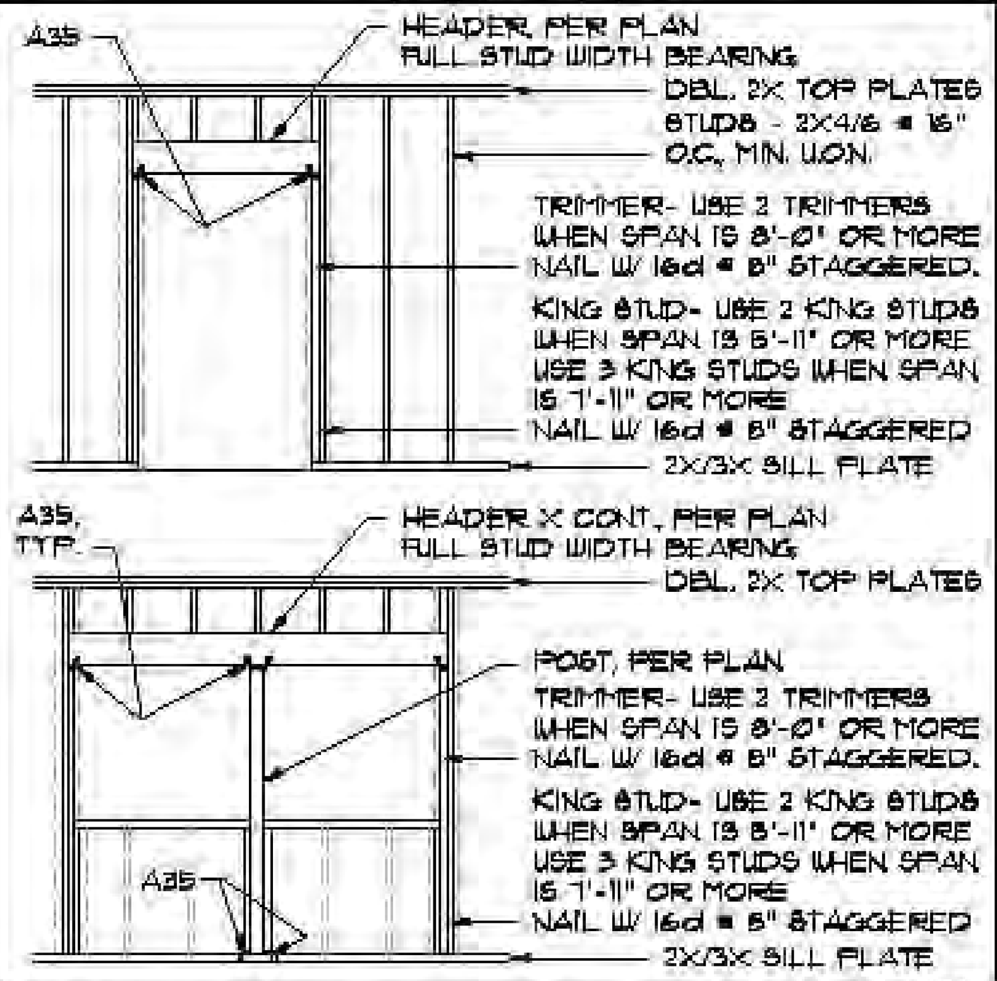


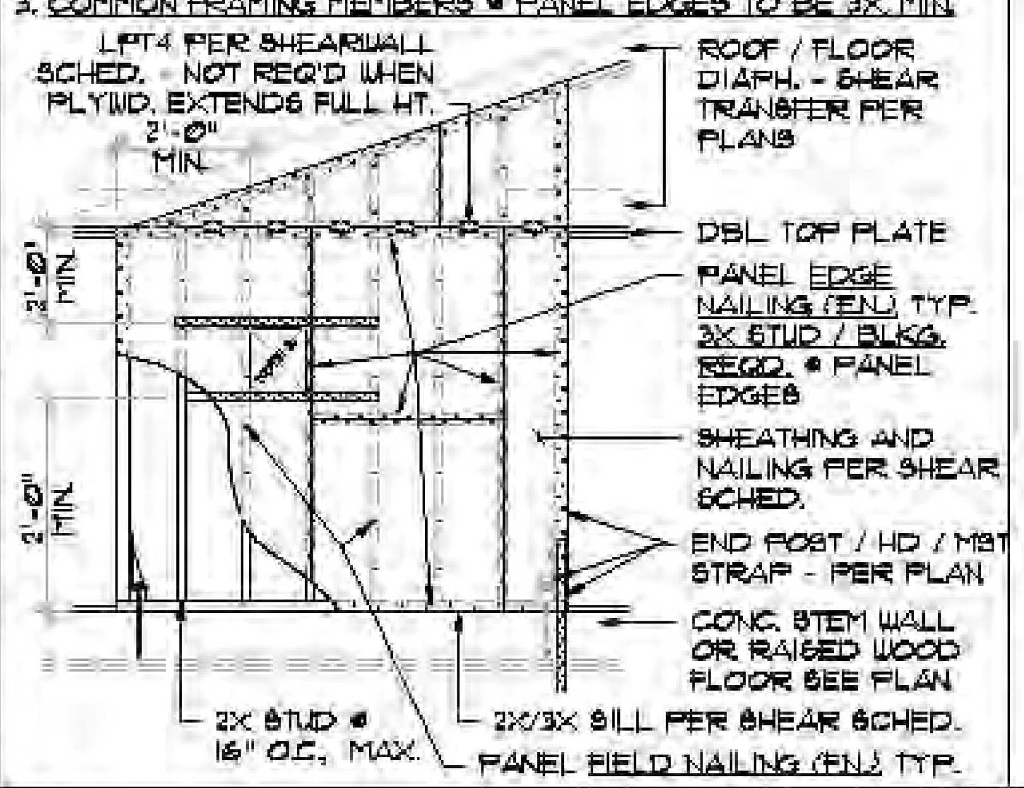
SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal: 12/15/22
8/15/23
revision:
22-057
project no.:
STRUCTURAL DETAILS
sheet title:
sheet no.: D1



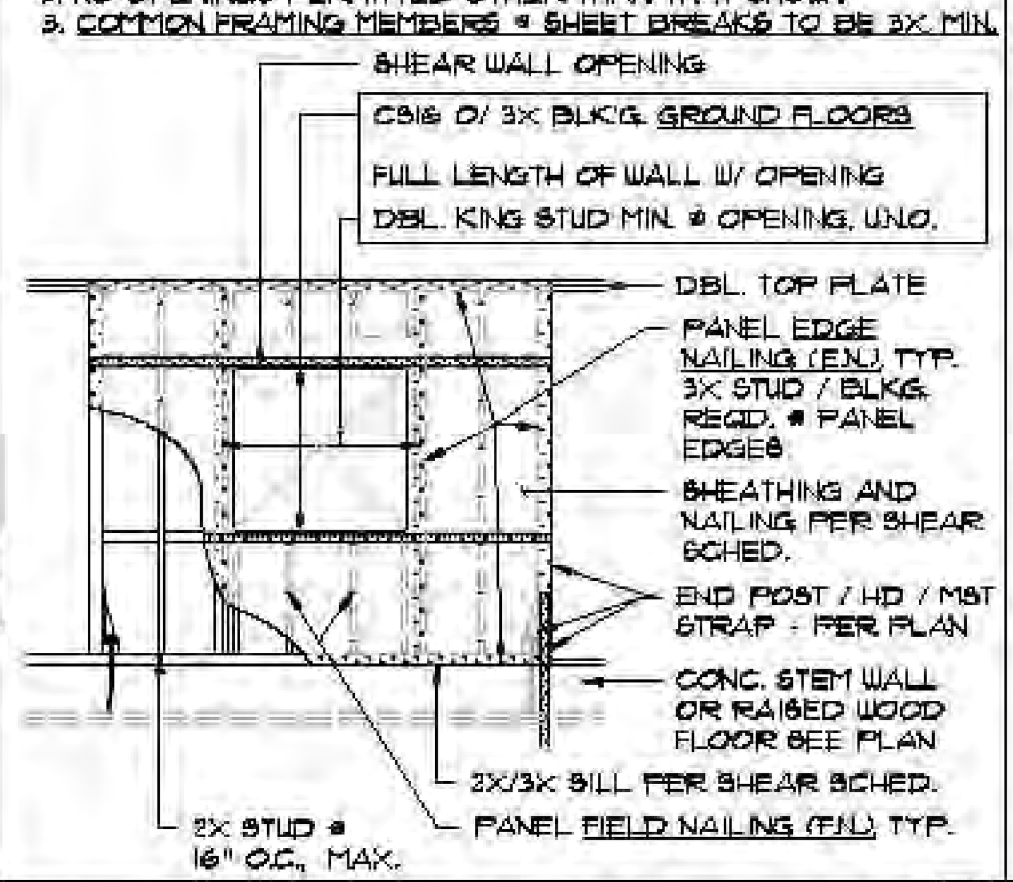
TYPICAL HEADER 170130NC 1/4"=1'-0" (1)

NOTES
1. NAILS SHALL BE COMMON ONLY
2. 16"X16" MAX. OPENING NO OPENINGS PERMITTED IN LOCATIONS WHERE BEAM, POST, AND/OR HOLDOWN ABOVE OCCURS. USE CS16 OVER 3X BLK'G. ABOVE AND BELOW OPENING, AND EXTEND 1-STUD BAY BEYOND
3. COMMON FRAMING MEMBERS @ PANEL EDGES TO BE 3X MIN.



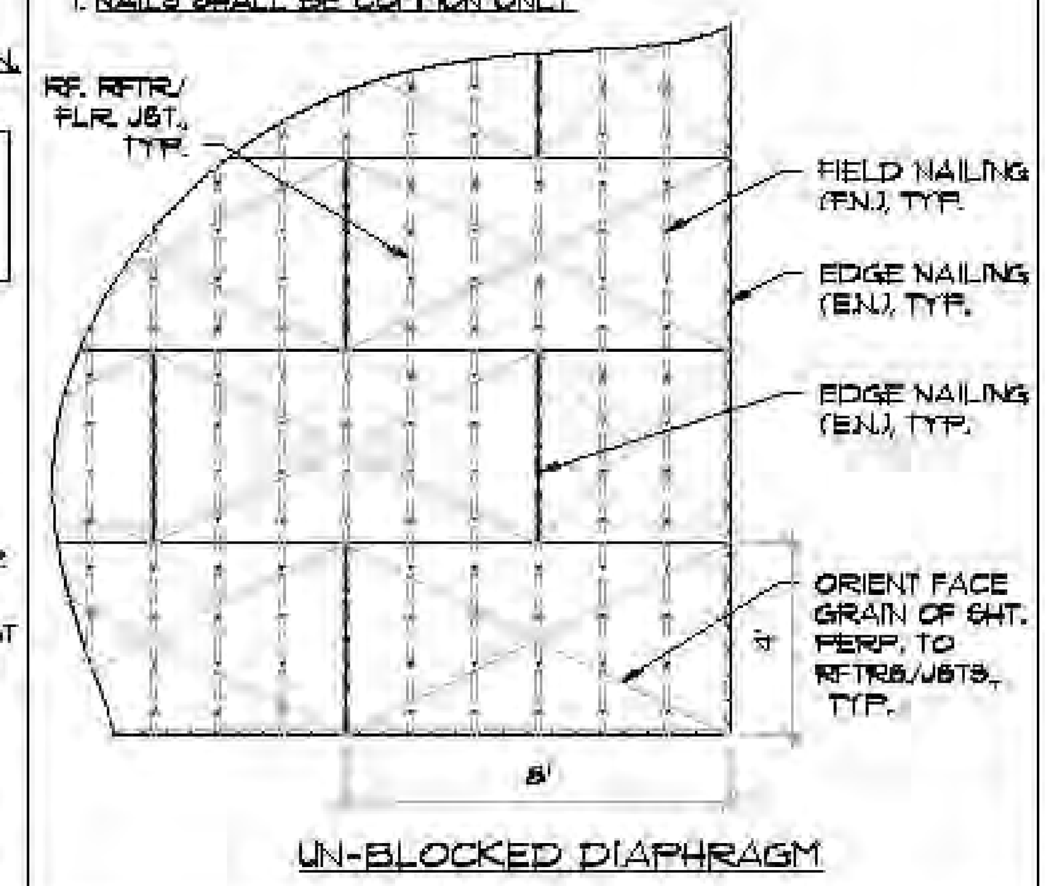
SHEAR WALL 170130NC 1/4"=1'-0" (2)

NOTES
1. NAILS SHALL BE COMMON ONLY
2. NO OPENINGS PERMITTED OTHER THAN THAT SHOWN
3. COMMON FRAMING MEMBERS @ SHEET BREAKS TO BE 3X MIN.

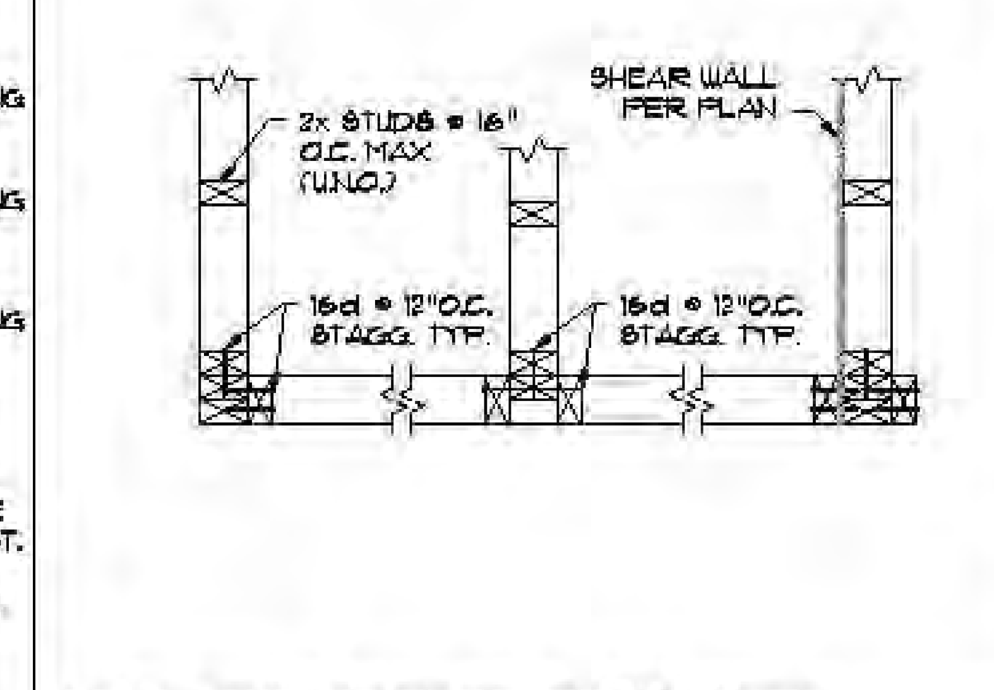


SHEAR WALL W/ OPENING 170130NC 1/4"=1'-0" (3)

NOTES
1. NAILS SHALL BE COMMON ONLY

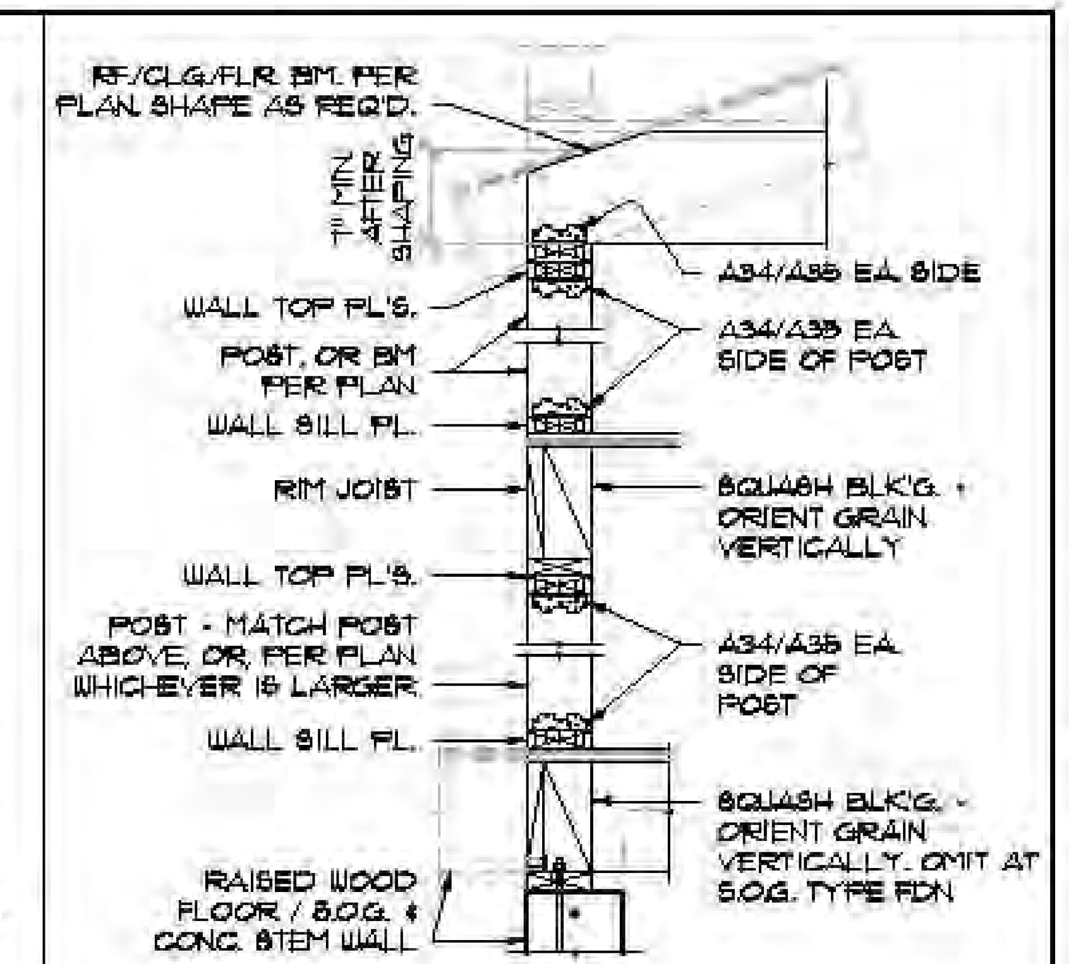


FLOOR / ROOF SHEATHING LAYOUT 170130NC 1/4"=1'-0" (4)

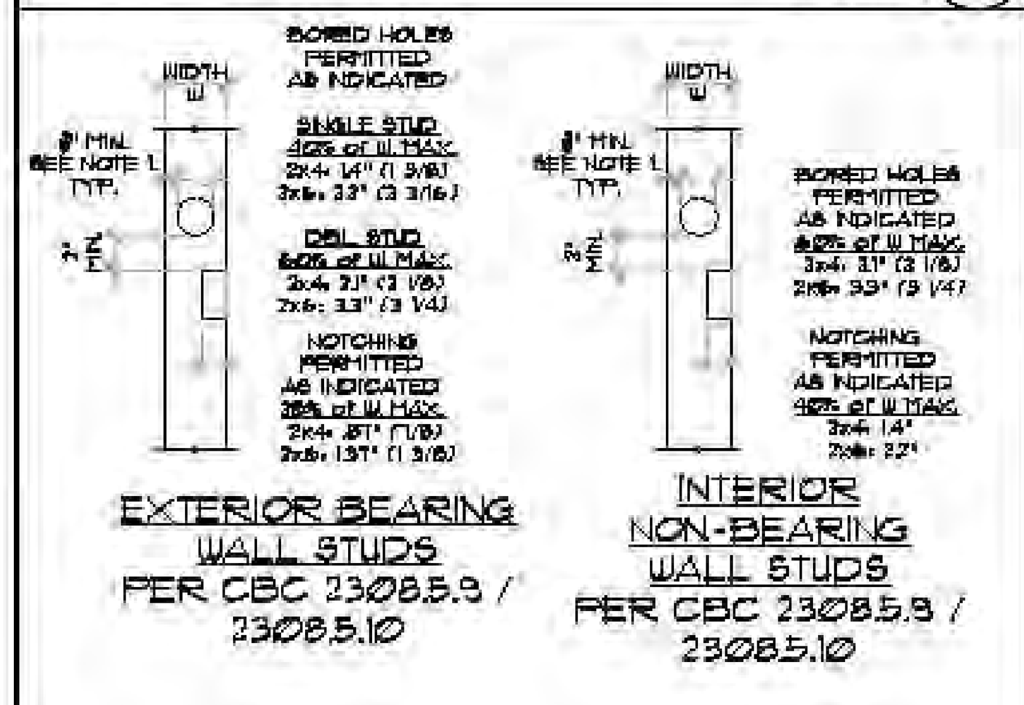


NOTE: PROVIDE REQ'D. POSTS WHERE SHEARWALL ENDPOST AND HOLDOWN ANCHOR OCCUR AT CORNERS & INTERSECTIONS

TYP. STUD WALL FRAMING 3/4"=1'-0" (5)

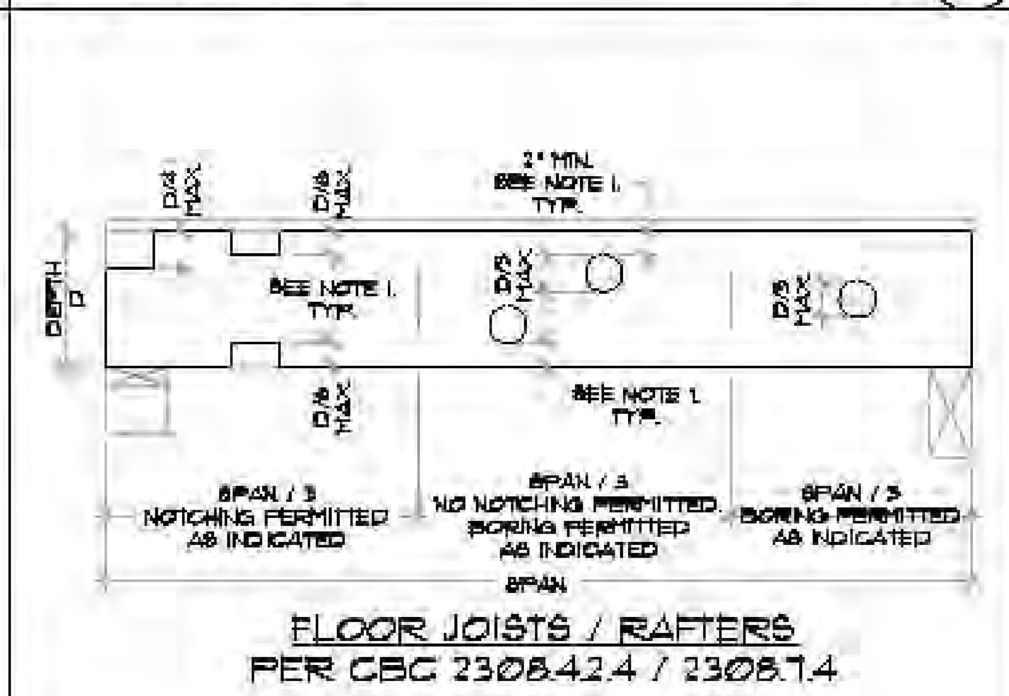


POST IN WALL 170130NC 3/4"=1'-0" (6)



NOTE: PORTION OF STUD REMAINING PROXIMAL TO NOTCH/BORING SHALL BE SOUND WOOD WITHOUT OBVIOUS STRENGTH-REDUCING PROPERTIES, SUCH AS, KNOTS, BREAKS, SPLITS, EXCESSIVE GRAIN SLOPING, ETC.

NOTCHING AND BORING OF STUDS 170130NC 3/4"=1'-0" (7)



NOTE: PORTION OF JST./RFTR. REMAINING PROXIMAL TO NOTCH/BORING SHALL BE SOUND WOOD WITHOUT OBVIOUS STRENGTH-REDUCING PROPERTIES, SUCH AS, KNOTS, BREAKS, SPLITS, EXCESSIVE GRAIN SLOPING, ETC.

NOTCHING AND BORING OF FLOOR JOISTS AND RAFTERS 170130NC 3/4"=1'-0" (8)

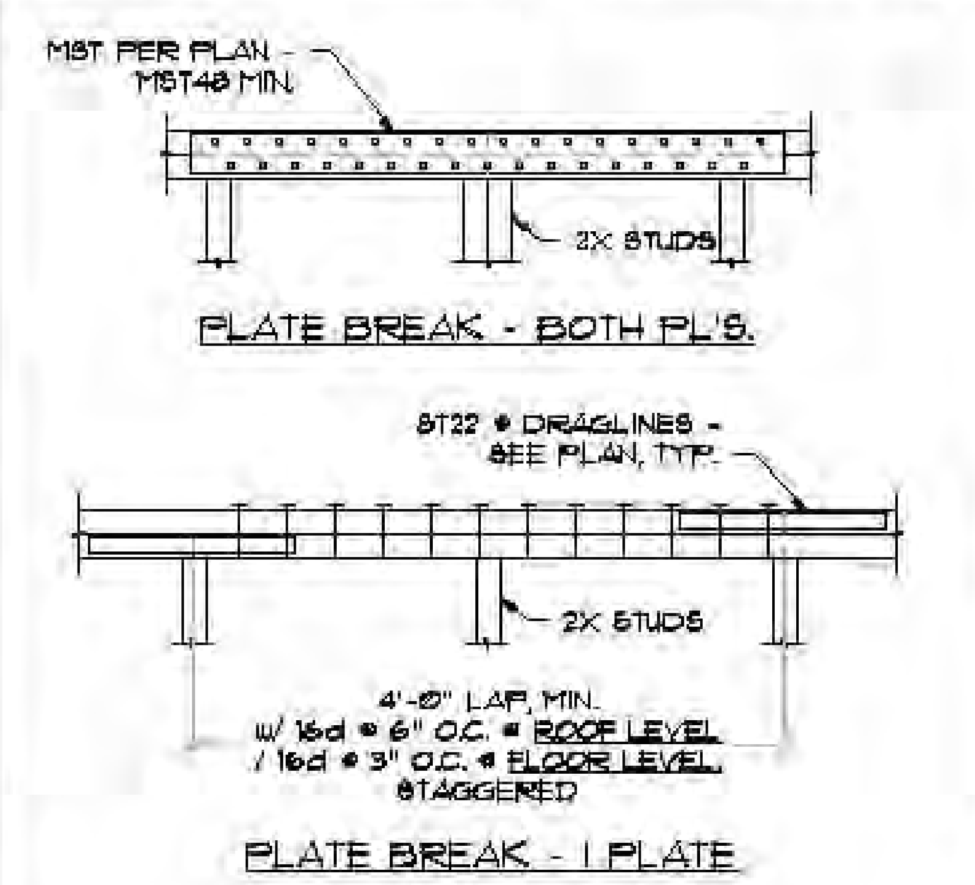
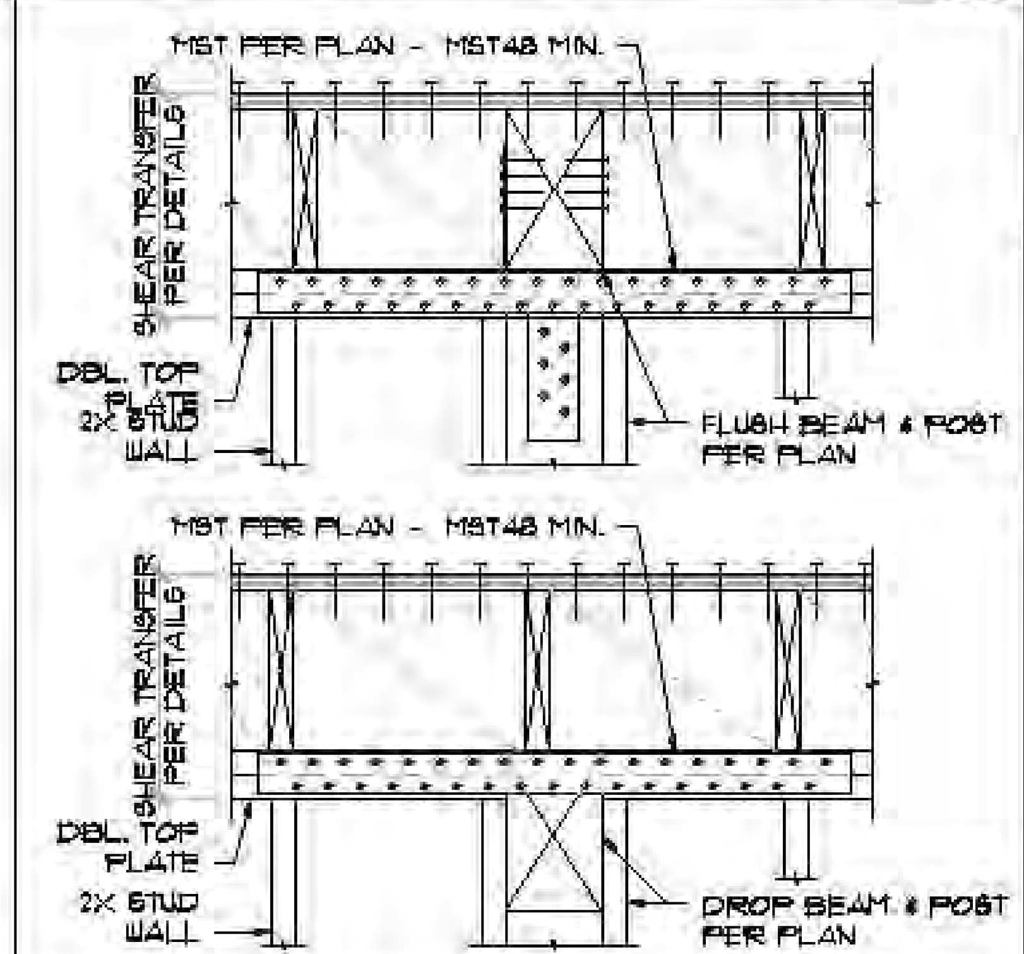
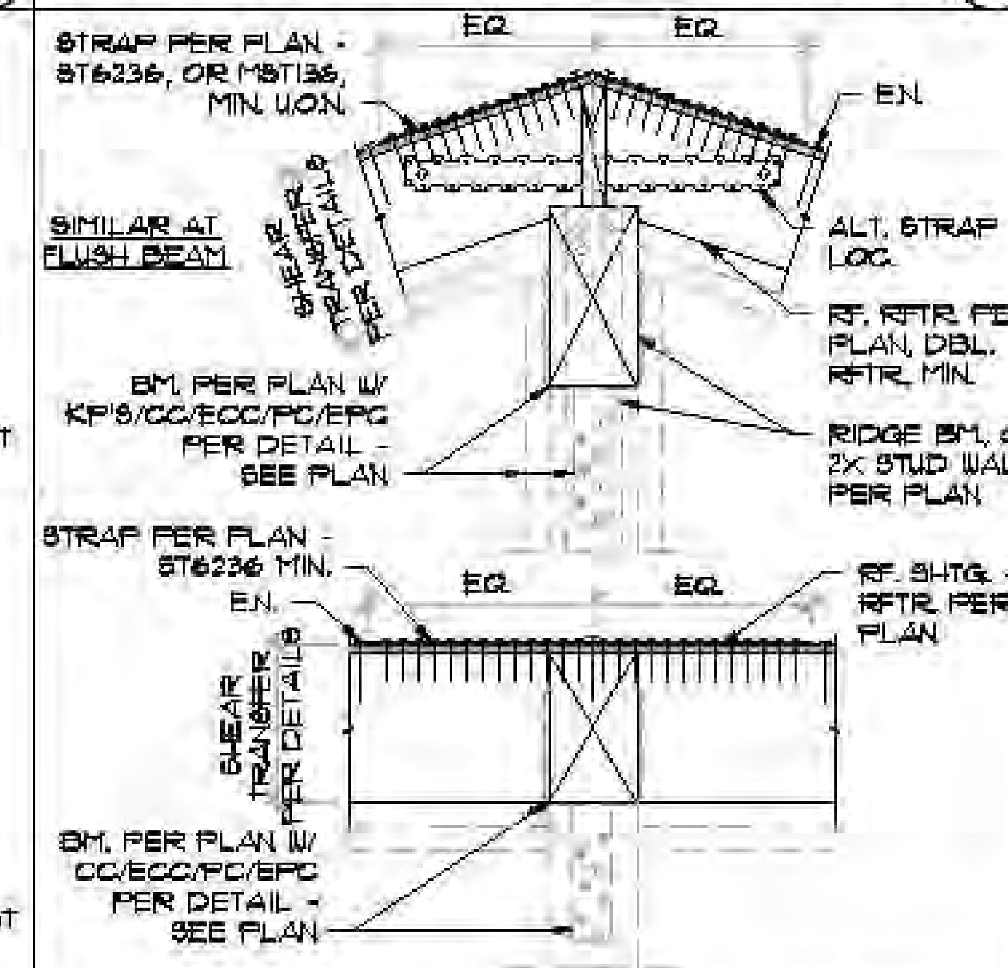


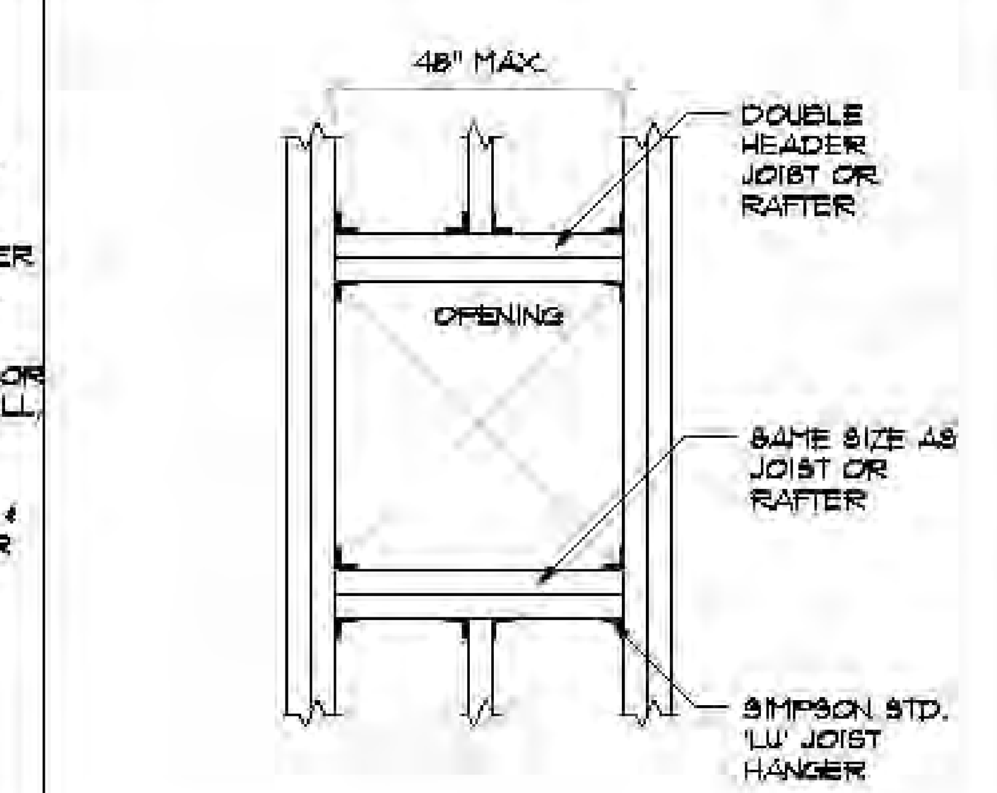
PLATE BREAK 170130NC 1"=1'-0" (9)



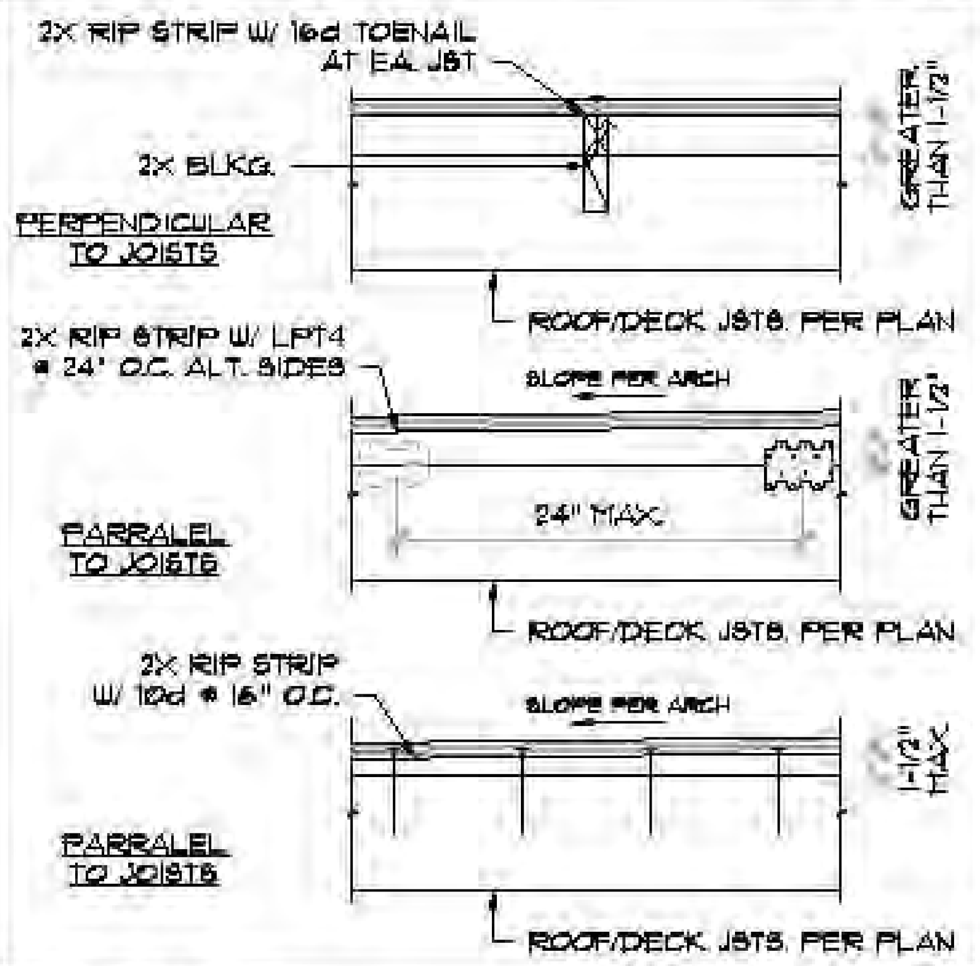
DRAG LINE STRAPPING AT BEAM 170130NC 1"=1'-0" (10)



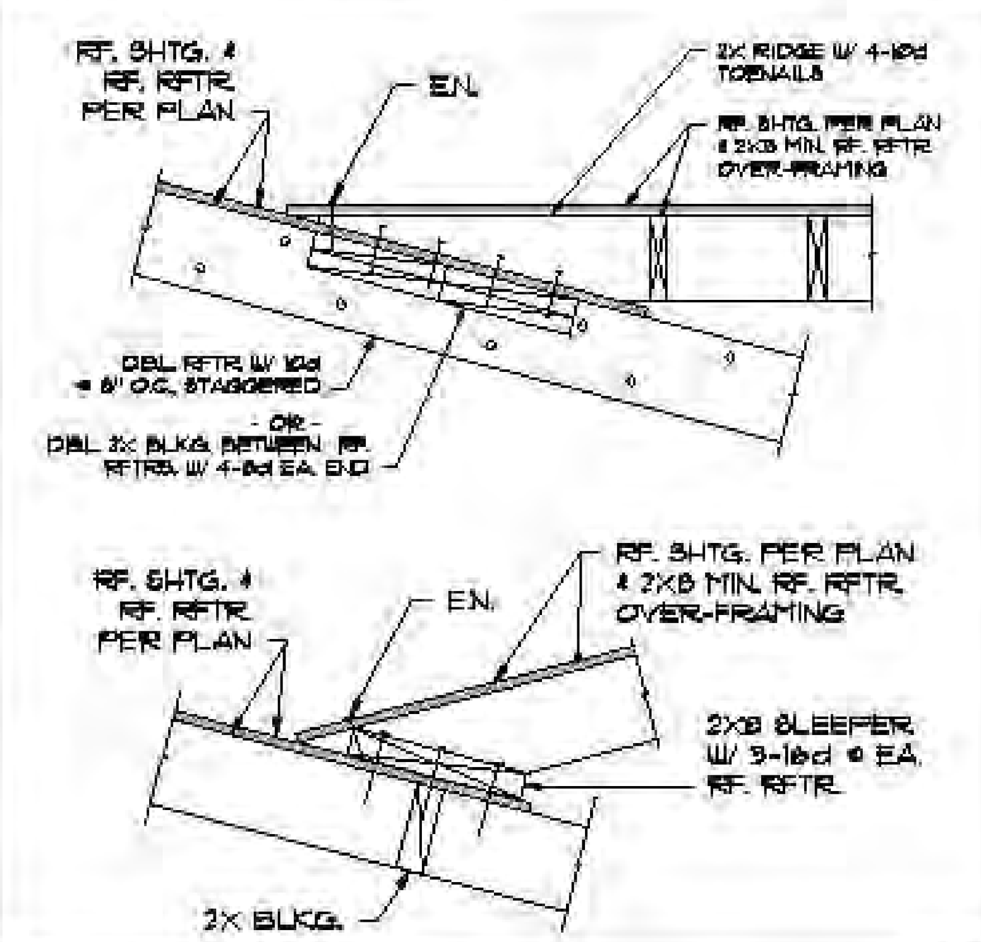
DRAG LINE STRAPPING AT RIDGE 170130NC 1"=1'-0" (11)



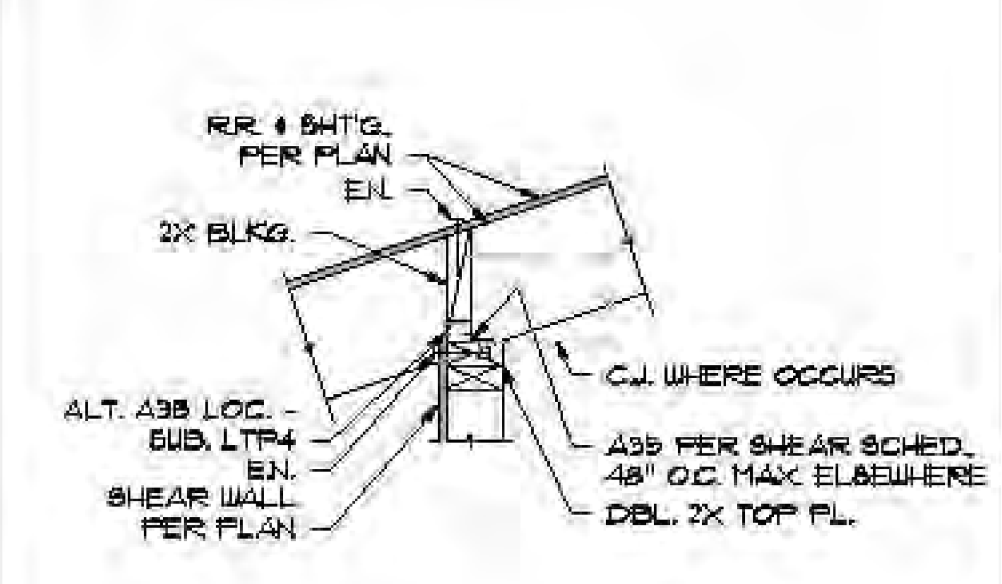
ROOF OPENING 170130NC 3/4"=1'-0" (12)



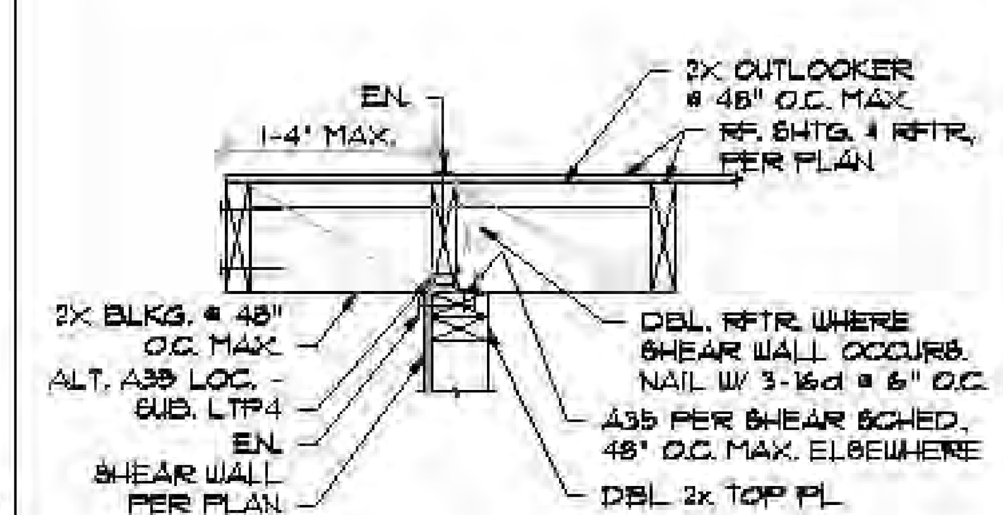
RIP STRIPS 170130NC 1"=1'-0" (13)



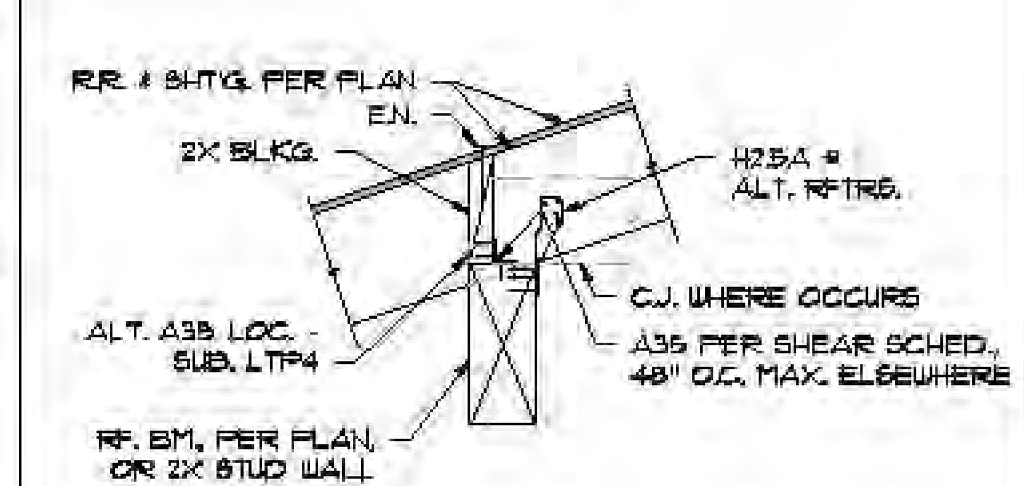
OVER-FRAMING 3/4"=1'-0" (14)



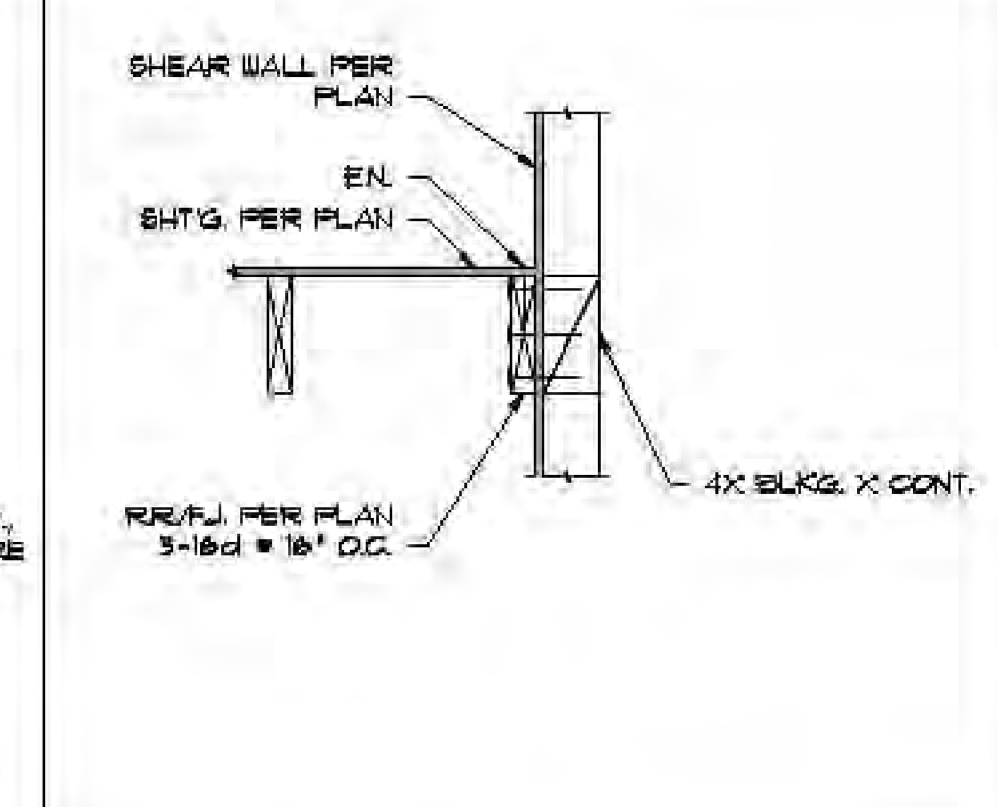
SHEAR TRANSFER 170130NC 1"=1'-0" (15)



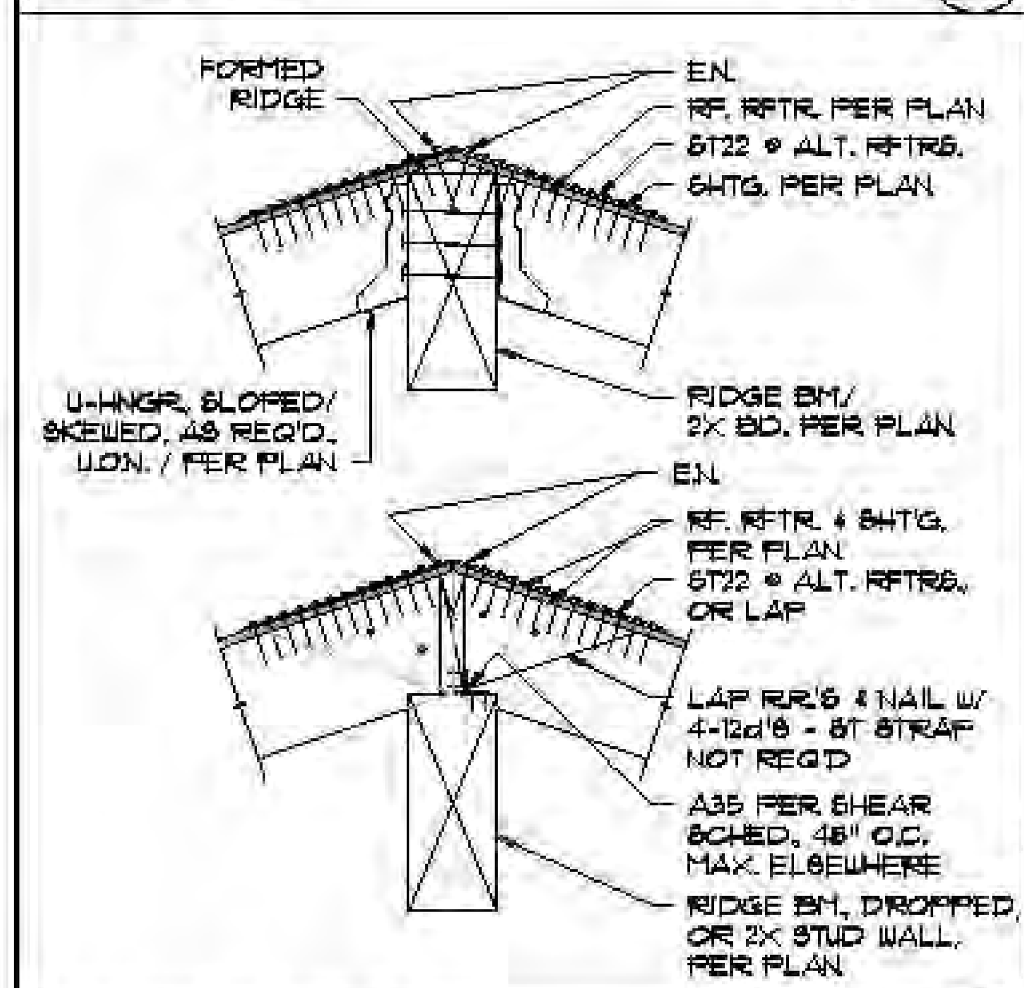
SHEAR TRANSFER 170130NC 1"=1'-0" (16)



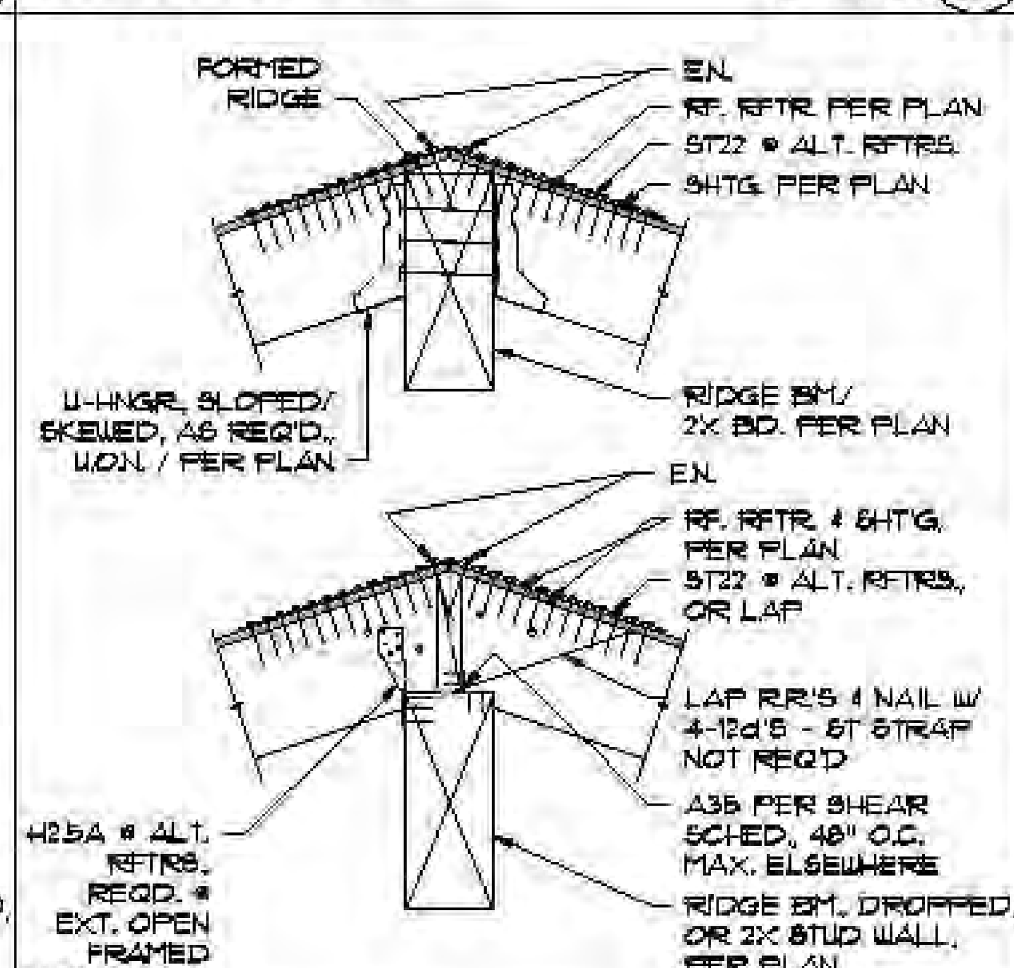
SHEAR TRANSFER 170130NC 1"=1'-0" (17)



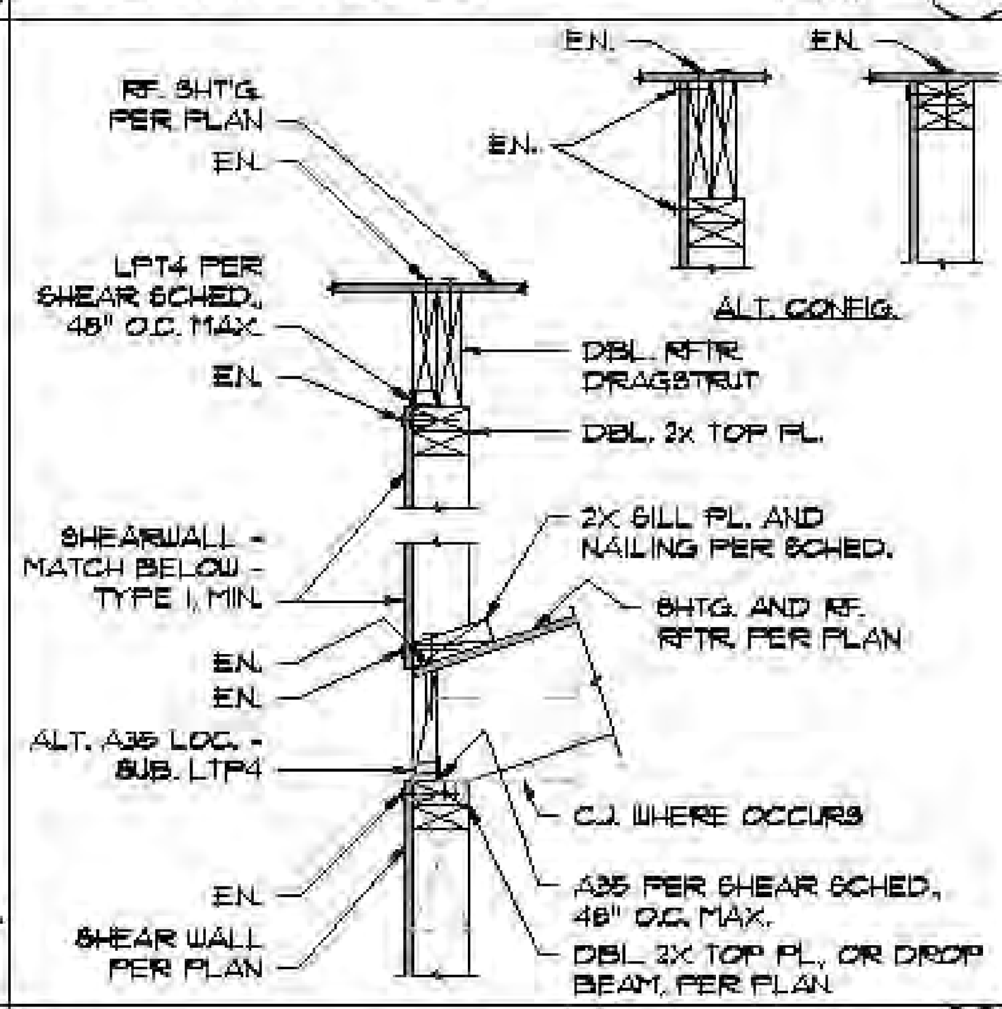
SHEAR TRANSFER 170130NC 1"=1'-0" (18)



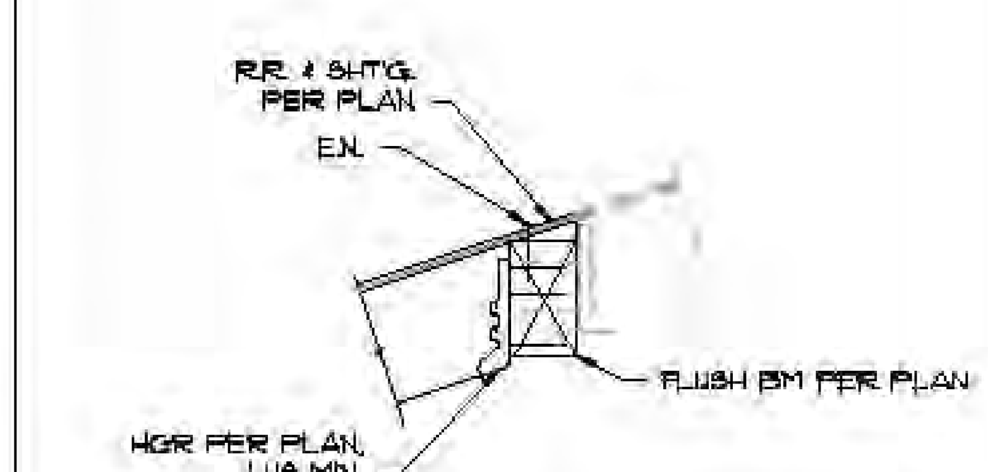
ROOF FRAMING 170130NC 1"=1'-0" (19)



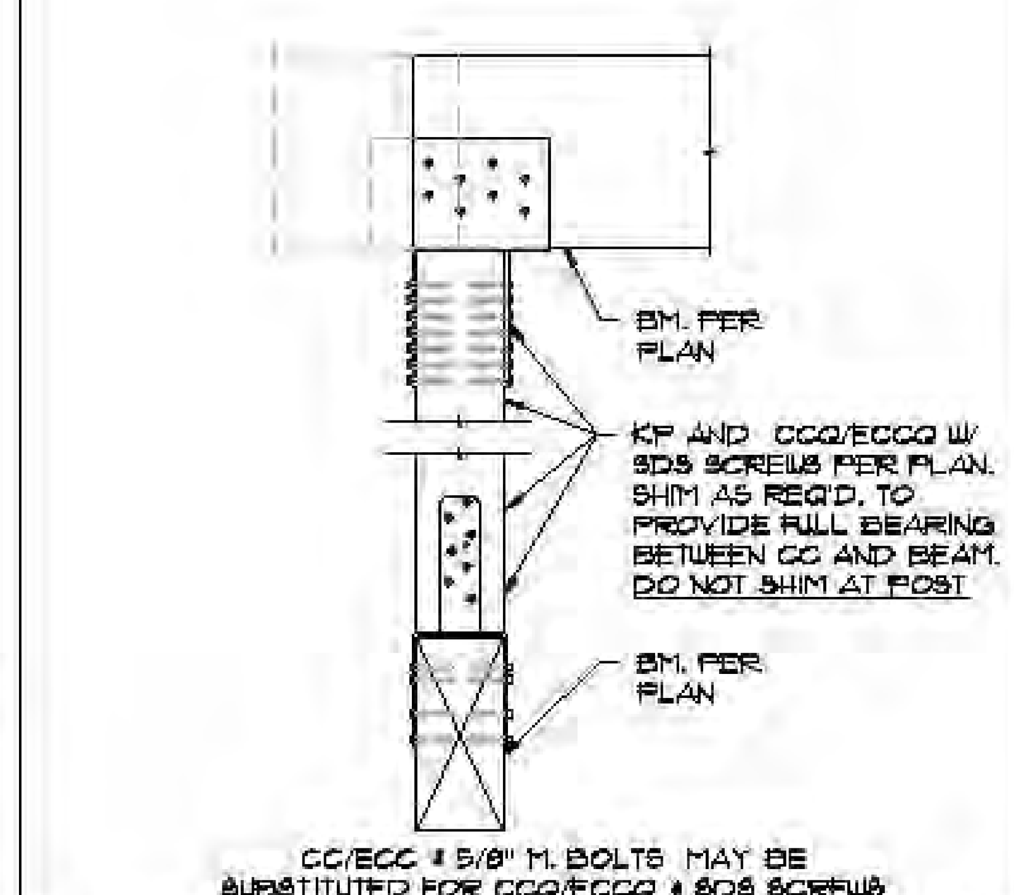
ROOF FRAMING 170130NC 1"=1'-0" (20)



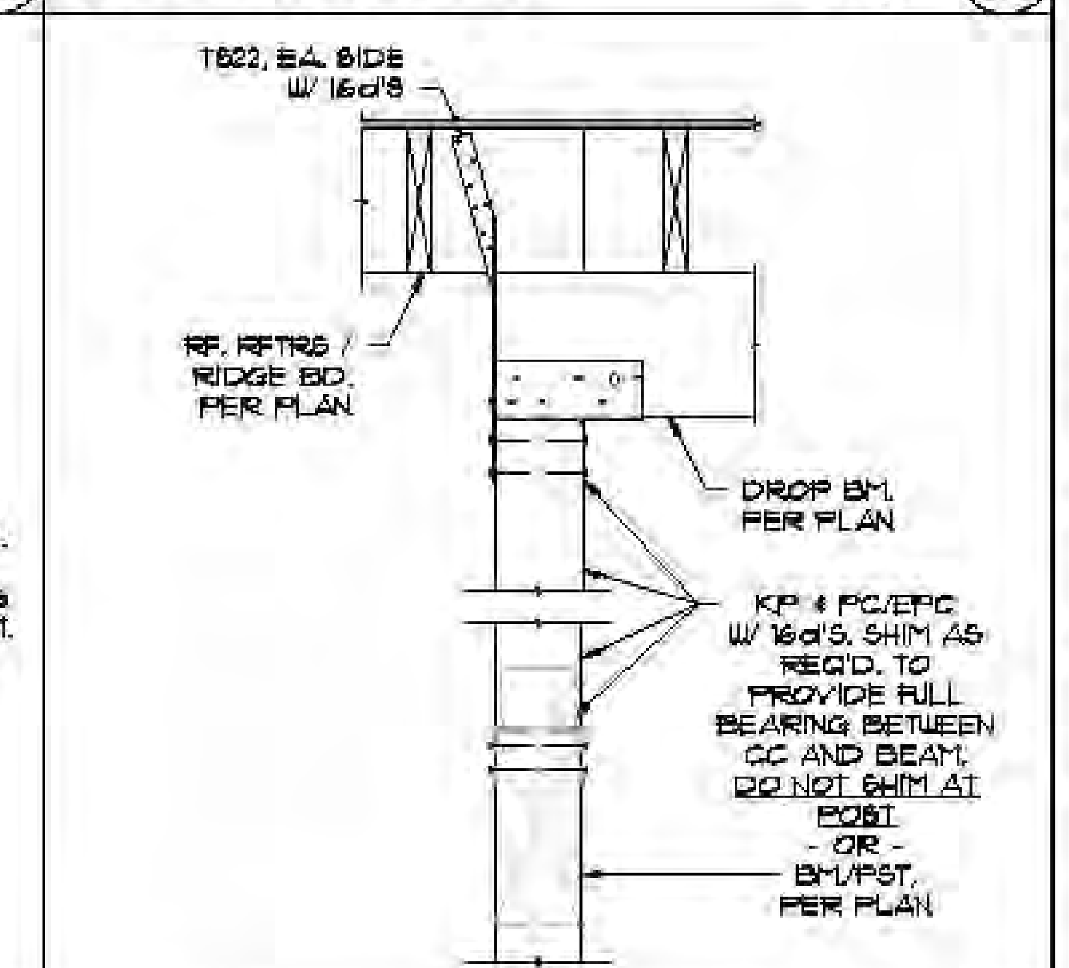
SHEAR TRANSFER 170130NC 1"=1'-0" (21)



SHEAR TRANSFER 200401NC 1"=1'-0" (22)



DETAIL 170130NC 1"=1'-0" (23)



DETAIL 170130NC 1"=1'-0" (24)

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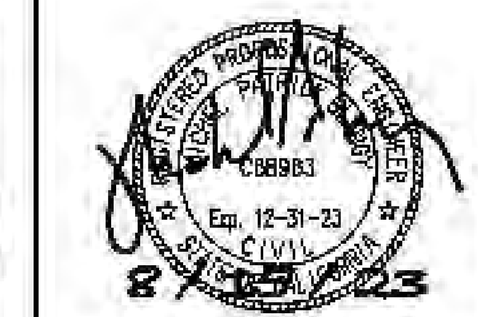
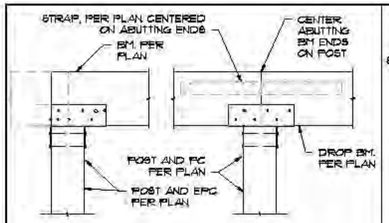


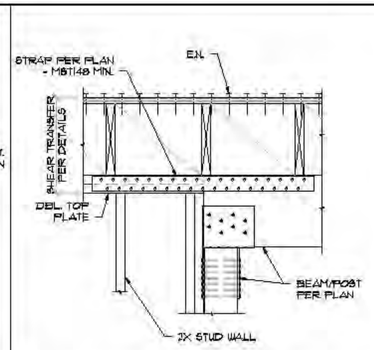
SFR - REMODEL-ADDITION

print date:
drawn by: MPB
submittal:
12/15/22
revision:
22-057
project no.:
STRUCTURAL DETAILS
sheet title:
sheet no.: D2

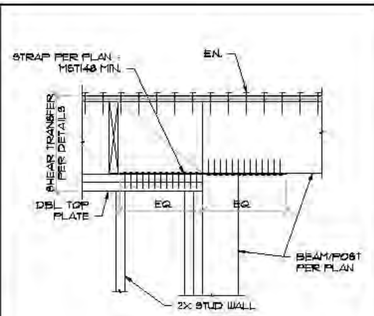


SHIM AS REQ'D. TO PROVIDE FULL BEARING BETWEEN CCQ/ECCQ AND BEAM. DO NOT SHIM AT POST.

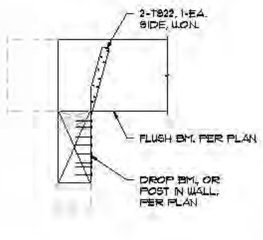
POST TO BEAM - PC/EPC E1234X 1"=1'-0" (1)



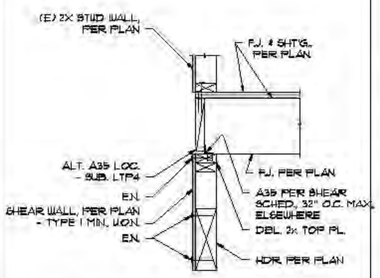
DRAG STRUT - DROP BEAM 1161836NG 1"=1'-0" (2)



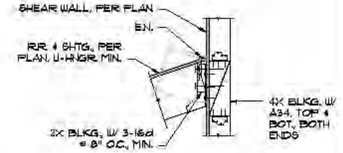
DRAG STRUT - FLUSH BEAM 1161836NG 1"=1'-0" (3)



BEAM HOLDOWN 19122NG 1"=1'-0" (4)



SHEAR TRANSFER 1161836NG 1"=1'-0" (5)



SHEAR TRANSFER 21126NG 1"=1'-0" (6)

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8/25/23

SFR - REMODEL-ADDITION

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STRUCTURAL DETAILS
sheet title:
D3
sheet no.:

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
RESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y | N/A | RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.1.1 Additions and alterations. [HCD] The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

The mandatory provision of Section 4.106.4.2 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing multifamily buildings. See Section 4.106.4.3 for application.

Note: Repairs including, but not limited to, resurfacing, restriping and repairing or maintaining existing lighting fixtures are not considered alterations for the purpose of this section.

Note: On and after January 1, 2014, residential buildings undergoing permitted alterations, additions, or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

301.2 LOW-RISE AND HIGH-RISE RESIDENTIAL BUILDINGS. [HCD] The provisions of individual sections of CALGreen may apply to either low-rise residential buildings high-rise residential buildings, or both. Individual sections will be designated by banners to indicate where the section applies specifically to low-rise only (LR) or high-rise only (HR). When the section applies to both low-rise and high-rise buildings, no banner will be used.

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.
Exceptions:
1. [HCD] Accessory structures and accessory occupancies serving residential buildings shall comply with Chapter 4 and Appendix A4, as applicable.
2. [HCD] For purposes of CALGreen, live/work units, complying with Section 419 of the *California Building Code*, shall not be considered mixed occupancies. Live/Work units shall comply with Chapter 4 and Appendix A4, as applicable.

DIVISION 4.1 PLANNING AND DESIGN

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

SECTION 4.102 DEFINITIONS

4.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

FRENCH DRAIN. A trench, hole or other depressed area loosely filled with rock, gravel, fragments of brick or similar pervious material used to collect or channel drainage or runoff water.

WATTLES. Wattles are used to reduce sediment in runoff. Wattles are often constructed of natural plant materials such as hay, straw or similar material shaped in the form of tubes and placed on a downflow slope. Wattles are also used for perimeter and inlet controls.

4.106 SITE DEVELOPMENT

4.106.1 GENERAL. Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

4.106.2 STORM WATER DRAINAGE AND RETENTION DURING CONSTRUCTION. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.
2. Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.
3. Compliance with a lawfully enacted storm water management ordinance.

Note: Refer to the State Water Resources Control Board for projects which disturb one acre or more of soil, or are part of a larger common plan of development which in total disturbs one acre or more of soil.

(Website: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html)

4.106.3 GRADING AND PAVING. Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales
2. Water collection and disposal systems
3. French drains
4. Water retention gardens
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Sections 4.106.4.1 or 4.106.4.2 to facilitate 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 one or more of the following conditions:
   1.1 Where there is no local utility power supply or the local utility is unable to supply adequate power.
   1.2 Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 4.106.4, may adversely impact the construction cost of the project.
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.

4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall 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. The service panel and/or subpanel shall provide capacity to install a 40-ampere 208/240-volt minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exemption: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the *California Electrical Code*.

4.106.4.1.1 Identification. The 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".

4.106.4.2 New multifamily dwellings, hotels and motels and new residential parking facilities.
When parking is provided, parking spaces for new multifamily dwellings, hotels and motels shall meet the requirements of Sections 4.106.4.2.1 and 4.106.4.2.2. Calculations for spaces shall be rounded up to the nearest whole number. A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by a local jurisdiction. See Vehicle Code Section 22511.2 for further details.

4.106.4.2.1Multifamily development projects with less than 20 dwelling units; and hotels and motels with less than 20 sleeping units or guest rooms.
The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.

1.EV Capable. Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. Electrical load calculations shall demonstrate that the 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 a minimum of 40 amperes.

The 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.

Exceptions:

1.When EV chargers (Level 2 EVSE) are installed in a number equal to or greater than the required number of EV capable spaces.

2.When EV chargers (Level 2 EVSE) are installed in a number less than the required number of EV capable spaces, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed.

Notes:

a.Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.

b.There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2.EV Ready. Twenty-five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

4.106.4.2.2 Multifamily development projects with 20 or more dwelling units, hotels and motels with 20 or more sleeping units or guest rooms.
The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.

1.EV Capable. Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. Electrical load calculations shall demonstrate that the 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 a minimum of 40 amperes.

The 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.

Exception: When EV chargers (Level 2 EVSE) are installed in a number greater than five (5) percent of parking spaces required by Section 4.106.4.2.2, Item 3, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed over the five (5) percent required.

Notes:

a.Construction documents shall show locations of future EV spaces.

b.There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2.EV Ready. Twenty-five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

3.EV Chargers. Five (5) percent of the total number of parking spaces shall be equipped with Level 2 EVSE. Where common use parking is provided, at least one EV charger shall be located in the common use parking area and shall be available for use by all residents or guests.

When low power Level 2 EV charging receptacles or Level 2 EVSE are installed beyond the minimum required, an automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to each space served by the ALMS. The electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EVSE shall have a capacity of not less than 30 amperes. ALMS shall not be used to reduce the minimum required electrical capacity to the required EV capable spaces.

4.106.4.2.2.1 Electric vehicle charging stations (EVCS).
Electric vehicle charging stations required by Section 4.106.4.2.2, Item 3, shall comply with Section 4.106.4.2.2.1.

Exception: Electric vehicle charging stations serving public accommodations, public housing, motels and hotels shall not be required to comply with this section. See California Building Code, Chapter 11B, for applicable requirements.

4.106.4.2.2.1.1 Location.
EVCS shall comply with at least one of the following options:

1.The charging 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 charging space shall be located on an accessible route, as defined in the California Building Code, Chapter 2, to the building.

Exception: Electric vehicle charging stations designed and constructed in compliance with the California Building Code, Chapter 11B, are not required to comply with Section 4.106.4.2.2.1.1 and Section 4.106.4.2.2.1.2, Item 3.

4.106.4.2.2.1.2 Electric vehicle charging stations (EVCS) dimensions.
The charging spaces shall be designed to comply with the following:

1.The minimum length of each EV space shall be 18 feet (5486 mm).

2.The minimum width of each EV space shall be 9 feet (2743 mm).

3.One in every 25 charging spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).

a.Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

4.106.4.2.2.1.3 Accessible EV spaces.
In addition to the requirements in Sections 4.106.4.2.2.1.1 and 4.106.4.2.2.1.2, all EVSE, when installed, shall comply with the accessibility provisions for EV chargers in the California Building Code, Chapter 11B. EV ready spaces and EVCS in multifamily developments shall comply with California Building Code, Chapter 11A, Section 1109A.

4.106.4.2.3 EV space requirements.
1.Single EV space required. Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the location or the proposed location of the EV space. Construction documents shall identify the raceway termination point, receptacle or charger location, as applicable. The service panel and/ or subpanel shall have a 40-ampere minimum dedicated branch circuit, including branch circuit overcurrent protective device installed, or space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space, at the time of original construction in accordance with the California Electrical Code.

2.Multiple EV spaces required. Construction documents shall indicate the raceway termination point and the location of installed or future EV spaces, receptacles or EV chargers. Construction documents shall also provide information on amperage of installed or future receptacles or EVSE, raceway method(s), wiring schematics and electrical load calculations. Plan design shall be based upon a 40-ampere minimum branch circuit. Required raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.

Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space at the time of original construction in accordance with the California Electrical Code.

4.106.4.2.4 Identification.
The 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.

4.106.4.2.5 Electric Vehicle Ready Space Signage.
Electric vehicle ready spaces shall be identified by signage or pavement markings, in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

4.106.4.3 Electric vehicle charging for additions and alterations of parking facilities serving existing multifamily buildings.
When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, ten (10) percent of the total number of parking spaces added or altered shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE.

Notes:

1.Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.

2.There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

DIVISION 4.2 ENERGY EFFICIENCY

4.201 GENERAL

4.201.1 SCOPE. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

DIVISION 4.3 WATER EFFICIENCY AND CONSERVATION

4.303 INDOOR WATER USE

4.303.1 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the sections 4.303.1.1, 4.303.1.2, 4.303.1.3, and 4.303.4.4.

Note: All noncompliant plumbing fixtures in any residential real property shall be replaced with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy, or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

4.303.1.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

4.303.1.2 Urinals. The effective flush volume of wall mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.

4.303.1.3 Showerheads.

4.303.1.3.1 Single Showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

4.303.1.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to only allow one shower outlet to be in operation at a time.

Note: A hand-held shower shall be considered a showerhead.

4.303.1.4 Faucets.

4.303.1.4.1 Residential Lavatory Faucets. The maximum flow rate of residential lavatory faucets shall not exceed 1.2 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.

4.303.1.4.2 Lavatory Faucets in Common and Public Use Areas. The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi.

4.303.1.4.3 Metering Faucets. Metering faucets when installed in residential buildings shall not deliver more than 0.2 gallons per cycle.

4.303.1.4.4 Kitchen Faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

4.303.1.4.5 Pre-rinse spray valves.
When installed, shall meet the requirements in the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Sections 1605.1 (h)(4) Table H-2, Section 1605.3 (h)(4)(A), and Section 1607 (d)(7) and shall be equipped with an integral automatic shutoff.

FOR REFERENCE ONLY: The following table and code section have been reprinted from the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations),Section 1605.1 (h)(4) and Section 1605.3 (h)(4)(A).

TABLE H-2

STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALVES MANUFACTURED ON OR AFTER JANUARY 28, 2019

PRODUCT CLASS [spray force in ounce force (ozf)]	MAXIMUM FLOW RATE (gpm)
Product Class 1 (≤ **5.0 ozf**)	1.00
Product Class 2 (> 5.0 ozf and ≤ **8.0 ozf**)	1.20
Product Class 3 (> 8.0 ozf)	1.28

Title 20 Section 1605.3 (h)(4)(A): Commercial prerinse spray values manufactured on or after January 1, 2006, shall have a minimum spray force of not less than 4.0 ounces-force (ozf)[113 grams-force(gf)]

4.303.2 Submeters for multifamily buildings and dwelling units in mixed-used residential/commercial buildings.
Submeters shall be installed to measure water usage of individual rental dwelling units in accordance with the *California Plumbing Code*.

4.303.3 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code*.

NOTE:
THIS TABLE COMPILES THE DATA IN SECTION 4.303.1, AND IS INCLUDED AS A CONVENIENCE FOR THE USER.

TABLE - MAXIMUM FIXTURE WATER USE

FIXTURE TYPE	FLOW RATE
SHOWER HEADS (RESIDENTIAL)	1.8 GMP @ 80 PSI
LAVATORY FAUCETS (RESIDENTIAL)	MAX. 1.2 GPM @ 60 PSI MIN. 0.8 GPM @ 20 PSI
LAVATORY FAUCETS IN COMMON & PUBLIC USE AREAS	0.5 GPM @ 60 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI
METERING FAUCETS	0.2 GAL/CYCLE
WATER CLOSET	1.28 GAL/FLUSH
URINALS	0.125 GAL/FLUSH

4.304 OUTDOOR WATER USE

4.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. 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.

NOTES:

1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the *California Code Regulations*, Title 23, Chapter 2.7, Division 2. MWELO and supporting documents, including water budget calculator, are available at: https://www.water.ca.gov/

DIVISION 4.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

4.406 ENHANCED DURABILITY AND REDUCED MAINTENANCE

4.406.1 RODENT PROOFING. Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency.

4.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

4.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65 percent of the non-hazardous 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.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local 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.

4.408.2 CONSTRUCTION WASTE MANAGEMENT PLAN. Submit a construction waste management plan in conformance with Items 1 through 5. The construction waste management plan shall be updated as necessary and shall be available during construction for examination by the enforcing agency.

1. Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.
2. Specify if construction and demolition waste materials will be sorted on-site (source separated) or bulk mixed (single stream).
3. Identify diversion facilities where the construction and demolition waste material collected will be taken.
4. Identify construction methods employed to reduce the amount of construction and demolition waste generated.
5. Specify that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

4.408.3 WASTE MANAGEMENT COMPANY. Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 4.408.1.

Note: The owner or contractor may make the determination if the construction and demolition waste materials will be diverted by a waste management company.

4.408.4 WASTE STREAM REDUCTION ALTERNATIVE [LR]. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 3.4 lbs./sq.ft. of the building area shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1

4.408.4.1 WASTE STREAM REDUCTION ALTERNATIVE. Projects that generate a total combined weight of construction and demolition waste disposed of 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

4.408.5 DOCUMENTATION. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 4.408.2, items 1 through 5, Section 4.408.3 or Section 4.408.4..

Notes:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Residential)" located at www.hcd.ca.gov/CALGreen.html may be used to assist in documenting compliance with this section.
2. Mixed construction and demolition debris (C & D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

4.410 BUILDING MAINTENANCE AND OPERATION

4.410.1 OPERATION AND MAINTENANCE MANUAL. At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the following shall be placed in the building:

1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.
2. Operation and maintenance instructions for the following:
   a. Equipment and appliances, including water-saving devices and systems, HVAC systems, photovoltaic systems, electric vehicle chargers, water-heating systems and other major appliances and equipment.
   b. Roof and yard drainage, including gutters and downspouts.
   c. Space conditioning systems, including condensers and air filters.
   d. Landscape irrigation systems.
   e. Water reuse systems.
3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations.
4. Public transportation and/or carpool options available in the area.
5. Educational material on the positive impacts of an interior relative humidity between 30-60 percent and what methods an occupant may use to maintain the relative humidity level in that range.
6. Information about water-conserving landscape and irrigation design and controllers which conserve water.
7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation.
8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc.
9. Information about state solar energy and incentive programs available.
10. A copy of all special inspections verifications required by the enforcing agency or this code.
11. Information from the Department of Forestry and Fire Protection on maintenance of defensible space around residential structures.
12. Information and/or drawings identifying the location of grab bar reinforcements.

4.410.2 RECYCLING BY OCCUPANTS. 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 are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waster, 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 note required to comply with the organic waste portion of this section.

DIVISION 4.5 ENVIRONMENTAL QUALITY

SECTION 4.501 GENERAL

4.501.1 Scope
The provisions of this chapter shall outline means of reducing the quality of air contaminants that are odorous, irritating and/or harmful to the comfort and well being of a building's installers, occupants and neighbors.

SECTION 4.502 DEFINITIONS

5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

AGRIFIBER PRODUCTS. Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including furniture, fixtures and equipment (FF&E) not considered base building elements.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood I-joists or finger-jointed lumber, all as specified in California Code of regulations (CCR), title 17, Section 93120.1.

DIRECT-VENT APPLIANCE. A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

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RESIDENTIAL MANDATORY MEASURES, SHEET 2 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base Reactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram (g O^3/g ROC).
Note: MIR values for individual compounds and hydrocarbon solvents are specified in CCR, Title 17, Sections 94700 and 94701.

MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).
Note: PWMIR is calculated according to equations found in CCR, Title 17, Section 94521 (a).

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

VOC. A volatile organic compound (VOC) broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).

4.503 FIREPLACES
4.503.1 GENERAL. 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 applicable local ordinances.

4.504 POLLUTANT CONTROL
4.504.1 COVERING OF DUCT OPENINGS & PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION. 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 distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of water, dust or debris which may enter the system.

4.504.2 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with this section.

4.504.2.1 Adhesives, Sealants and Caulks. Adhesives, sealant 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 also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and tricloroethylene), except for aerosol products, as specified in Subsection 2 below.
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*, Title 17, commencing with section 94507.

4.504.2.2 Paints and Coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB 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.

4.504.2.3 Aerosol Paints and Coatings. 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 additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.

4.504.2.4 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification.
2. Field verification of on-site product containers.

TABLE 4.504.1 - ADHESIVE VOC LIMIT[1,2]
(Less Water and Less Exempt Compounds in Grams per Liter)

ARCHITECTURAL APPLICATIONS	VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVE	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

TABLE 4.504.2 - SEALANT VOC LIMIT
(Less Water and Less Exempt Compounds in Grams per Liter)

SEALANTS	VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NON-POROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

TABLE 4.504.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]
GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	VOC LIMIT
FLAT COATINGS	50
NON-FLAT COATINGS	100
NONFLAT-HIGH GLOSS COATINGS	150
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

TABLE 4.504.5 - FORMALDEHYDE LIMITS[1]
MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIF. AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIF. CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16" (8 MM).

DIVISION 4.5 ENVIRONMENTAL QUALITY (continued)
4.504.3 CARPET SYSTEMS. All carpet installed in the building interior shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.3.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 4.504.1.

4.504.4 RESILIENT FLOORING SYSTEMS. Where resilient flooring is installed , at least 80% of floor area receiving resilient flooring shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.5 COMPOSITE WOOD PRODUCTS. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5

4.504.5.1 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, European 636 3S standards, and Canadian CSA 0121, CSA 0151, CSA 0153 and CSA 0325 standards.
5. Other methods acceptable to the enforcing agency.

4.505 INTERIOR MOISTURE CONTROL
4.505.1 General. Buildings shall meet or exceed the provisions of the *California Building Standards Code*.

4.505.2 CONCRETE SLAB FOUNDATIONS. Concrete slab foundations required to have a vapor retarder by California Building Code, Chapter 19, or concrete slab-on-ground floors required to have a vapor retarder by the California Residential Code, Chapter 5, shall also comply with this section.

4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following:

1. A 4-inch (101.6 mm) thick base of 1/2 inch (12.7mm) or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and 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.

4.505.3 MOISTURE CONTENT OF BUILDING MATERIALS. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent moisture content. Moisture content shall be verified in compliance with the following:

1. Moisture content shall be determined with either a probe-type or contact-type moisture meter.Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements found in Section 101.8 of this code.
2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece verified.
3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.

Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Wet-applied insulation products shall follow the manufacturers' drying recommendations prior to enclosure.

4.506 INDOOR AIR QUALITY AND EXHAUST
4.506.1 Bathroom exhaust fans. 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 adjustment between a relative humidity range less than or equal to 50% to a maximum of 80%. A humidity control may utilize manual or automatic means of adjustment.
   b. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in)

Notes:

1. For the purposes of this section, a bathroom is a room which contains a bathtub, shower or tub/shower combination.
2. Lighting integral to bathroom exhaust fans shall comply with the *California Energy Code*.

4.507 ENVIRONMENTAL COMFORT
4.507.2 HEATING AND AIR-CONDITIONING SYSTEM DESIGN. Heating and air conditioning systems shall be sized, designed and have their equipment selected using the following methods:

1. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J - 2011 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.
2. Duct systems are sized according to ANSI/ACCA 1 Manual D - 2014 (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 system functions are acceptable.

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS
702 QUALIFICATIONS
702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. 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.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

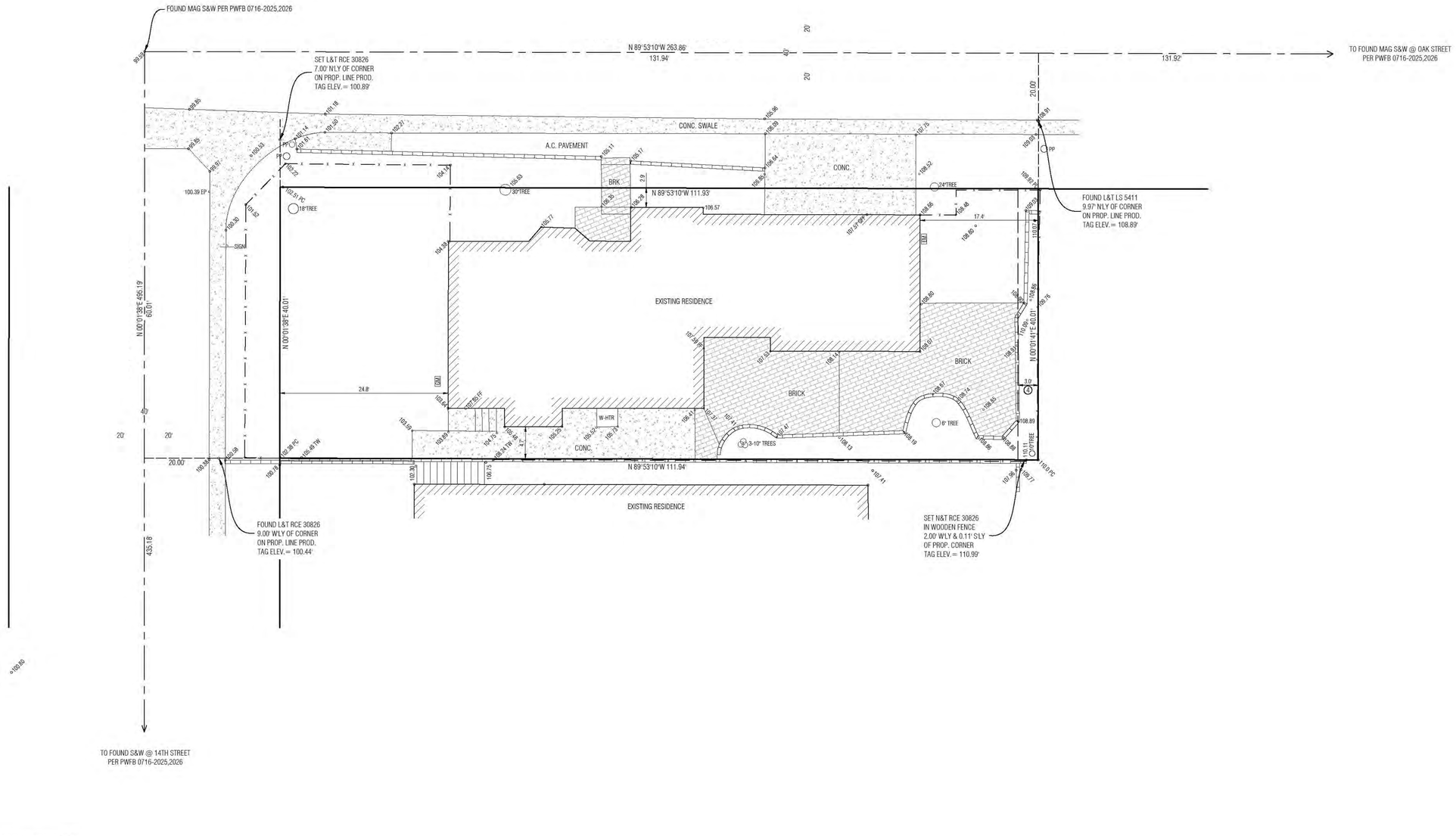
1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:
1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS
703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.



NOTE:
A TITLE POLICY HAS BEEN PROVIDED AND REVIEWED BY DENN ENGINEERS AT THE TIME OF THIS SURVEY. ANY READILY AVAILABLE ITEMS AFFECTING THIS PROPERTY HAVE BEEN PLOTTED BASED ON PROVIDED DOCUMENTS.

ITEM #3 - EASEMENT FOR SHADE TREES AND RIGHTS INCIDENTAL PURPOSES
RECORDED IN BOOK 16525 PAGE 17 OF O.R. (NOT PLOTTED)
④ ITEM #4 - EASEMENT FOR PUBLIC UTILITIES AND RIGHTS INCIDENTAL PURPOSES
RECORDED IN BOOK 27602, PAGE 223 OF O.R.

SOUTHLAND TITLE CORPORATION
ORDER NO. 241160.2
DATED JUNE 10, 1998

SCALE 1" = 8'

DENN ENGINEERS
3914 DEL AMO BLVD, SUITE 921
TORRANCE, CA 90503 (310) 542-9433

SURVEY AND TOPOGRAPHY

FOR

JOB ADDRESS

LEGAL DESCRIPTION
LOT 1, BLOCK 57,
TRACT NO. 1638,
M.B. 23-34-35,
APN 4170-005-001

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF PROFESSIONAL LAND SURVEYORS' ACT

REGISTERED PROFESSIONAL ENGINEER
GARY J. ROEHL
R.C.E. 30826
CIVIL
STATE OF CALIFORNIA

GARY J. ROEHL R.C.E. 30826

DRAWN BY KW CHECK BY TS

DRAWN ON JULY 22, 2021

REVISIONS:
REVISIONS

LEGEND

EXISTING BUILDING	BRICK
CONCRETE	WOOD DECK
×106.76	EXISTING ELEVATION
102	EXISTING CONTOUR
	BLOCK WALL
— x —	EXISTING FENCE

BCR	BEGINNING OF CURB RETURN
C/L	CENTERLINE
C.L.F.	CHAIN-LINK
ELY	EASTERLY
EM	ELECTRIC METER
FD	FOUND
FE	FENCE
FF	FINISH FLOOR
FH	FIRE HYDRANT
FL	FLOW LINE
GFF	GARAGE FINISH FLOOR
GM	GAS METER
GW	GUY WIRE
L&T	LEAD AND TAG
MH	MANHOLE
N'LY	NORTHERLY
PC	PROPERTY CORNER / PROP. CORNER
PL, P/L	PROPERTY LINE / PROP. LINE
PP	POWER POLE
PPT	PARAPET
S&W	SPIKE AND WASHER
S'LY	SOUTHERLY
SPK	SPIKE
SSCO	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
STK	STAKE / STAKE & TAG
STLT / LT	STREET LIGHT / LIGHT
TC	TOP OF CURB
TW	TOP OF WALL / T.O.W.
TX / BX	TOP OF / BOTTOM OF DRIVEWAY APRON
W'LY	WESTERLY
WM	WATER METER

NOTE: ALL SETBACK DIMENSIONS SHOWN ARE MEASURED TO EXTERIOR SURFACE OF BUILDINGS UNLESS OTHERWISE NOTED.

BOUNDARY MONUMENTS ARE NOT NECESSARILY SET ON PROPERTY CORNERS. PLEASE REFER TO THE NOTATION ON THE PLANS FOR OFFSET DISTANCES. IF THERE ARE ANY QUESTIONS, PLEASE DO NOT HESITATE TO CONTACT DENN ENGINEERS FOR CLARIFICATION AT : (310) 542-9433, M-F 8:00 AM TO 5:00 PM.

SHEET 1 OF 1

JOB NO. 21-307

GENERAL INFORMATION

01	Project Name	Residential Building			
02	Run Title	Title 24 Analysis			
03	Project Location	1608 Elm Avenue			
04	City	Manhattan Beach	05	Standards Version	2022
06	Zip code	90266	07	Software Version	CBECC-Res 2022.2.1
08	Climate Zone	6	09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Addition and/or Alteration	13	Number of Bedrooms	3
14	Addition Cond. Floor Area (ft^2)	138	15	Number of Stories	2
16	Existing Cond. Floor Area (ft^2)	1771	17	Fenestration Average U-Factor	0.34
18	Total Cond. Floor Area (ft^2)	1909	19	Glazing Percentage (%)	16.00%
20	ADU Bedroom Count	n/a			

COMPLIANCE RESULTS

01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	Building does not incorporate Special Features

ENERGY USE SUMMARY

Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft^2 -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft^2 -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft^2 -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft^2 -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	0	30.92	0	26.79	0	4.13
Space Cooling	0	18.53	0	20.72	0	-2.19
IAQ Ventilation	0	0	0	0	0	0
Water Heating	0	30.54	0	30.54	0	0
Self Utilisation/Flexibility Credit						
Efficiency Compliance Total	0	79.99	0	78.05	0	1.94
Photovoltaics		0		0		
Battery				0		
Flexibility						
Indoor Lighting	0	7.68	0	7.68		
Appl. & Cooking	0	21.9	0	21.9		
Plug Loads	0	29.97	0	29.97		
Outdoor Lighting	0	1.74	0	1.74		
TOTAL COMPLIANCE	0	141.28	0	139.34		

ENERGY USE INTENSITY

	Standard Design (kBtu/ft^2 - yr)	Proposed Design (kBtu/ft^2 - yr)	Compliance Margin (kBtu/ft^2 - yr)	Margin Percentage
Gross EUI[1]	26.09	25.18	0.91	3.49
Net EUI[2]	26.09	25.18	0.91	3.49

Notes
1. Gross EUI is Energy Use Total (not including PV) / Total Building Area.
2. Net EUI is Energy Use Total (including PV) / Total Building Area.

REQUIRED SPECIAL FEATURES

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

- NO SPECIAL FEATURES REQUIRED

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

- Kitchen range hood
- Minimum Airflow
- Fan Efficacy Watts/CFM
- Duct leakage testing

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft^2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Residential Building	1909	1	3	3	0	1

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft^2)	Avg. Ceiling Height	Water Heating System 1	Status
First Floor	Conditioned	HVAC System1	138	8.2	DHW Sys 1	New

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft^2)	Avg. Ceiling Height	Water Heating System 1	Status
First Floor (Existing)	Conditioned	HVAC System1	1186	10.4	DHW Sys 1	Existing Unchanged
Second Floor	Conditioned	HVAC System1	585	8.2	DHW Sys 1	Existing Unchanged

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)	Wall Exceptions	Status	Verified Existing Condition
South Wall	First Floor	R-13 Wall	180	Back	131.9	28.7	90	none	New	n/a
West Wall	First Floor	R-13 Wall	270	Right	172.2	10.5	90	none	New	n/a
North Wall	First Floor	R-13 Wall	0	Front	42.3	7	90	none	New	n/a
East Wall	First Floor	R-13 Wall	90	Left	23.2	0	90	none	New	n/a
South Wall 2	First Floor (Existing)	Default Wall Prior to 197	180	Back	387.7	20	90	none	Existing	No
West Wall 2	First Floor (Existing)	Default Wall Prior to 197	270	Right	121.8	26.7	90	none	Existing	No
North Wall 2	First Floor (Existing)	Default Wall Prior to 197	0	Front	497.2	83	90	none	Existing	No
East Wall 2	First Floor (Existing)	Default Wall Prior to 197	90	Left	122.2	38.9	90	none	Existing	No
South Wall 3	Second Floor	Default Wall Prior to 197	180	Back	265.5	64	90	none	Existing	No
West Wall 3	Second Floor	Default Wall Prior to 197	270	Right	164	0	90	none	Existing	No
North Wall 3	Second Floor	Default Wall Prior to 197	0	Front	265.5	46	90	none	Existing	No
East Wall 3	Second Floor	Default Wall Prior to 197	90	Left	164	0	90	none	Existing	No

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)	Wall Exceptions	Status	Verified Existing Condition
Interior Surface Wall	First Floor (Existing)>>__Garage__	Default Wall Prior to 1971	n/a	n/a	140.3	16.7	n/a		Existing	No
Roof (Slope 4/12)	First Floor	R-30 Roof Attic	n/a	n/a	46	n/a	n/a		New	n/a
Roof (Slope 4/12) 2	First Floor (Existing)	Default Roof Prior to 197	n/a	n/a	751	n/a	n/a		Existing	No
Roof (Slope 4/12) 3	Second Floor	Default Roof Prior to 197	n/a	n/a	585	n/a	n/a		Existing	No
Raised Floor	Second Floor	Default Floor No Crawlspa	n/a	n/a	10	n/a	n/a		Existing	No
Raised Floor 2	First Floor	R-19 Floor Crawlspace	n/a	n/a	138	n/a	n/a		New	n/a
Raised Floor 3	First Floor (Existing)	Default Floor Crawlspace	n/a	n/a	1186	n/a	n/a		Existing	No
Interior Surface Floor	Second Floor	Default Floor No Crawlspa1	n/a	n/a	500	n/a	n/a		Existing	No
Interior Surface Floor 2	Second Floor	Default Floor No Crawlspa1	n/a	n/a	75	n/a	n/a		Existing	No
South Wall 4	__Garage__	R-0 Wall	180	Back	179.1	0	90	none	Existing	No
West Wall 4	__Garage__	R-0 Wall	270	Right	25.7	0	90	none	Existing	No
North Wall 4	__Garage__	R-0 Wall	0	Front	179.1	0	90	none	Existing	No
East Wall 4	__Garage__	R-0 Wall	90	Left	166	0	90	none	Existing	No

OPAQUE SURFACES - CATHEDRAL CEILINGS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Zone	Construction	Azimuth	Orientation	Area (ft^2)	Skylight Area (ft^2)	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Cool Roof	Status	Verified Existing Condition	Existing Construction
Roof (No Attic)	First Floor	R-30 Roof No Attic	0	Front	92	0	4	0.1	0.85	No	New	n/a	
Roof (No Attic) 2	First Floor (Existing)	R-30 Roof No Attic	0	Front	360	0	4	0.1	0.85	No	Altered	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 First Floor	Attic RoofFirst Floor	Ventilated	4	0.1	0.85	No	No	New	n/a
Attic First Floor (Existing)	Attic RoofFirst Floor (Existing)	Ventilated	4	0.1	0.85	No	No	Existing	No
Attic Second Floor	Attic RoofSecond Floor	Ventilated	4	0.1	0.85	No	No	Existing	No

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 (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Window	Window	South Wall	Back	180			1	28.7	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window 2	Window	West Wall	Right	270			1	10.5	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window 3	Window	North Wall	Front	0			1	7	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window (New)	Window	South Wall 2	Back	180			1	20	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window (New) 2	Window	West Wall 2	Right	270			1	26.7	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA

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 (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Window (New) 3	Window	North Wall 2	Front	0			1	63	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window (New) 4	Window	East Wall 2	Left	90			1	38.9	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window (New) 5	Window	South Wall 3	Back	180			1	64	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA
Window (New) 6	Window	North Wall 3	Front	0			1	46	0.34	NFRC	0.34	NFRC	Bug Screen	New	NA

OPAQUE DOORS

01	02	03	04	05	06
Name	Side of Building	Area (ft^2)	U-factor	Status	Verified Existing Condition
Door (New)	North Wall 2	20	0.5	New	n/a
Door	Interior Surface Wall	16.7	0.5	Existing	No

SLAB FLOORS

01	02	03	04	05	06	07	08	09	10
Name	Zone	Area (ft^2)	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__	500	83.2	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
R-0 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.302	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Exterior Finish: Wood Siding/sheathing/decking
R-13 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-13	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-13 / 2x4 Exterior Finish: Wood Siding/sheathing/decking
Default Wall Prior to 197	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.302	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Exterior Finish: Wood Siding/sheathing/decking
R-30 Roof No Attic	Cathedral Ceilings	Wood Framed Ceiling	2x10 @ 24 in. O. C.	R-30	None / None	0.035	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-30 / 2x10 Inside Finish: Gypsum Board
Default Wall Prior to 1971	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 RoofFirst Floor	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
Attic RoofFirst Floor (Existing)	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4

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
Attic RoofSecond Floor	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
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
Default Floor Crawlspace	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-30 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-30	None / None	0.032	Over Ceiling Joists: R-20.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
Default Roof Prior to 197	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
Default Floor No Crawlspa	Exterior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.24	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12
Default Floor No Crawlspa1	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

OWNER :

05.23.2023

ADDRESS :

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BUILDING ENVELOPE - HERS VERIFICATION

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

WATER HEATING SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12
Name	System Type	Distribution Type	Water Heater Name	Number of Units	Solar Heating System	Compact Distribution	HERS Verification	Water Heater Name (#)	Status	Verified Existing Condition	Existing Water Heating System
DHW Sys 1	Domestic Hot Water (DHW)	Standard	DHW Heater 1	1	n/a	None	n/a	DHW Heater 1 (1)	Existing	No	

WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Name	Heating Element Type	Tank Type	# of Units	Tank Vol. (gal)	Heating Efficiency Type	Efficiency	Rated Input Type	Input Rating or Pilot	Tank Insulation R-value (Int/Ext)	Standby Loss or Recovery Eff	1st Hr. Rating or Flow Rate	Tank Location	Status	Verified Existing Condition
DHW Heater 1	Gas	Small Storage	1	50	EF	0.57	Btu/Hr	75000	0	80	n/a		Existing	No

WATER HEATING - HERS VERIFICATION

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

SPACE CONDITIONING SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12
Name	System Type	Heating Unit Name	Heating Equipment Count	Cooling Unit Name	Cooling Equipment Count	Fan Name	Distribution Name	Required Thermostat Type	Status	Verified Existing Condition	Existing HVAC System
HVAC System1	Heating and cooling system other	Heating Component 1	1	Cooling Component 1	1	HVAC Fan 1	Air Distribution System 1	Setback	New	No	

HVAC - HEATING UNIT TYPES

01	02	03	04
Name	System Type	Number of Units	Heating Efficiency
Heating Component 1	Central gas furnace	1	AFUE-90

HVAC - COOLING UNIT TYPES

01	02	03	04	05	06	07	08	09
Name	System Type	Number of Units	Efficiency Metric	Efficiency EER/EER2/CEER	Efficiency SEER/SEER2	Zonally Controlled	Multi-speed Compressor	HERS Verification
Cooling Component 1	Central split AC	1	EER/SEER	11.7	14	Not Zonal	Single Speed	Cooling Component 1-hers-cool

HVAC COOLING - HERS VERIFICATION

01	02	03	04	05	06
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEERSEER2	Verified Refrigerant Charge
Cooling Component 1-hers-cool	Required	350	Not Required	Not Required	Not Required

HVAC - DISTRIBUTION SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Design Type	Duct Ins. R-value		Duct Location		Surface Area		Bypass Duct	Duct Leakage	HERS Verification	Status	Verified Existing Condition	Existing Distribution system	New Ducts 25 ft
			Supply	Return	Supply	Return	Supply	Return							
Air Distribution System 1	Unconditioned attic	Non-Verified	R-6	R-6	Attic	Attic	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 1-hers-dist	New	n/a		No

HVAC DISTRIBUTION - HERS VERIFICATION

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

HVAC - FAN SYSTEMS

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

HVAC FAN SYSTEMS - HERS VERIFICATION

01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficacy (Watts/CFM)
HVAC Fan 1-hers-fan	Required	0.45

HERS RATER VERIFICATION OF EXISTING CONDITIONS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name:	Documentation Author Signature:
Mario Bertacco	Mario Bertacco
Company: NRG Compliance LP	Signature Date: 05/03/2023
Address: PO Box 3777	CEA/ HERS Certification Identification (If applicable):
City/State/Zip: Santa Rosa, CA 95402	Phone: 707-237-6957

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:
John Loera	John Loera
Company: Loera Designs	Date Signed: 05/03/2023
Address: 118 S Catalina Ave	License:
City/State/Zip: Redondo Beach, CA 90277	Phone: (310) 379-5900

2022 Single-Family Residential Mandatory Requirements Summary

§ 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)2A:	**Accessible Controls.** Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned on and off. *
§ 150.0(k)2B:	**Multiple Controls.** Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the dimmer or sensor is installed to comply with § 150.0(k).
§ 150.0(k)2C:	**Mandatory Requirements.** Lighting controls must comply with the applicable requirements of § 110.9.
§ 150.0(k)2D:	**Energy Management Control Systems.** An energy management control system (EMCS) may be used to comply with dimming, occupancy, and control requirements if it provides the functionality of the specified control per § 110.9 and the physical controls specified in § 150.0(k)2A.
§ 150.0(k)2E:	**Automatic Shutoff Controls.** In bathrooms, garages, laundry rooms, utility rooms and walk-in closets, at least one installed luminaire must be controlled by an occupancy or vacancy sensor providing automatic-off functionality. Lighting inside drawers and cabinets with opaque fronts or doors must have controls that turn the light off when the drawer or door is closed.
§ 150.0(k)2F:	**Dimmers.** Lighting in habitable spaces (e.g., living rooms, dining rooms, kitchens, and bedrooms) must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.
§ 150.0(k)2K:	**Independent controls.** Integrated lighting of exhaust fans shall be controlled independently from the fans. Lighting under cabinets or shelves, lighting in display cabinets, and switched outlets must be controlled separately from ceiling-installed lighting.
§ 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 have a manual on/off switch and either a photocell and motion sensor or automatic time switch control) or an astronomical time clock. An energy management control system that provides the specified control functionality and meets all applicable requirements may be used to meet these requirements.
§ 150.0(k)4:	**Internally illuminated address signs.** Internally illuminated address signs must either comply with § 140.8 or consume no more than 5 watts of power.
§ 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 §§ 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.

Solar Readiness:

§ 110.10(b)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)i-iii.
§110.10(b)1A:	**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. *
§ 110.10(b)2:	**Azimuth.** All sections of the solar zone located on steep-sloped roofs must have an azimuth between 90-300° 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 horizontal distance 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)-(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."

Electric and Energy Storage Ready:

2022 Single-Family Residential Mandatory Requirements Summary

§ 150.0(s)	**Energy Storage System (ESS) Ready.** All single-family residences must meet all of the following: Either ESS-ready interconnection equipment with backed up capacity of 60 amps or more and four or more ESS supplied branch circuits, or a dedicated raceway from the main service to a subpanel that supplies the branch circuits in § 150.0(s); at least four branch circuits must be identified and have their source collocated at a single panelboard suitable to be supplied by the ESS, with one circuit supplying the refrigerator, one lighting circuit near the primary exit, and one circuit supplying a sleeping room receptacle outlet; main panelboard must have a minimum busbar rating of 225 amps; sufficient space must be reserved to allow future installation of a system isolation equipment/transfer switch within 3' of the main panelboard, with raceways installed between the panelboard and the switch location to allow the connection of backup power source.
§ 150.0(t)	**Heat Pump Space Heater Ready.** Systems using gas or propane furnaces to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the furnace with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(u)	**Electric Cooktop Ready.** Systems using gas or propane cooktop to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the cooktop with circuit conductors rated at least 50 amps with the blank cover identified as "240V ready," and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(v)	**Electric Clothes Dryer Ready.** Clothes dryer locations with gas or propane plumbing to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the dryer location with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."

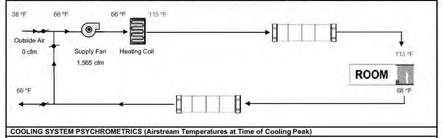
*Exceptions may apply.

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

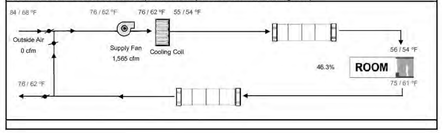
Project Name | Date: 5/3/2023
System Name: HVAC System | Floor Area: 1,909

ENGINEERING CHECKS		SYSTEM LOAD	COIL COOLING PEAK			COIL HTG. PEAK	
Number of Systems	1		CFM	Sensible	Latent	CFM	Sensible
Heating System		Total Room Loads	1,581	32,388	1,317	1,042	50,854
Output per System	64,800	Return Vented Lighting		0			0
Total Output (Btuh)	64,800	Return Air Ducts		1,596			2,679
Output (Btuh/sqft)	33.9	Return Fan		0			0
Cooling System		Ventilation	0	0	0	0	0
Output per System	42,000	Supply Fan		0			0
Total Output (Btuh)	42,000	Supply Air Ducts		1,596			2,679
Total Output (Tons)	3.5						
Total Output (Btuh/sqft)	22.0						
Total Output (sqft/Ton)	545.4	TOTAL SYSTEM LOAD		35,580	1,317		56,212
Air System							
CFM per System	1,566	HVAC EQUIPMENT SELECTION					
Airflow (cfm)	1,566	Central Heating System w/ AC		40,796	0		64,800
Airflow (cfm/sqft)	0.82						
Airflow (cfm/Ton)	447.1						
Outside Air (%)	0.0%	Total Adjusted System Output (Adjusted for Peak Design conditions)		40,796	0		64,800
Outside Air (cfm/sqft)	0.00						
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK		Aug 3 PM			Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



OWNER :

ADDRESS :

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RESIDENTIAL MEASURES SUMMARY — RMS-1

Project Name	Building Type	Date
[illegible]	☑ Single Family ☐ Addition Alone ☐ Multi Family ☑ Existing+ Addition/Alteration	5/3/2023

Project Address	California Energy Climate Zone	Total Cond. Floor Area	Addition	# of Units
[illegible]	CA Climate Zone 06	1,909	138	1

INSULATION

Construction	Type	Cavity	Area (ft^2)	Special Features	Status
Floor	Wood Framed w/Crawl Space	R 19	138		New
Wall	Wood Framed	R 13	323		New
Roof	Wood Framed Attic	R 30	46		New
Roof	Wood Framed Rafter	R 30	92		New
Floor	Wood Framed w/Crawl Space	- no insulation	1,186		Existing
Wall	Wood Framed	- no insulation	368		Existing
Wall	Wood Framed	- no insulation	95		Existing
Wall	Wood Framed	- no insulation	414		Existing

FENESTRATION

Total Area: 305 | Glazing Percentage: 16.0% | New/Altered Average U-Factor: 0.34

Orientation	Area(ft^2)	U-Fac	SHGC	Overhang	Sidefins	Exterior Shades	Status
Rear (S)	112.1	0.340	0.34	none	none	N/A	New
Right (W)	37.2	0.340	0.34	none	none	N/A	New
Front (N)	116.0	0.340	0.34	none	none	N/A	New
Left (E)	38.9	0.340	0.34	none	none	N/A	New

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	Gas Central Furnace	90% AFUE	Split Air Conditioner	14.0 SEER	Setback	New

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status
HVAC System	Ducted	Ducted	Attic	6.0	New

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status

RESIDENTIAL MEASURES SUMMARY — RMS-1

Project Name [illegible] | Building Type ☑ Single Family ☐ Addition Alone ☐ Multi Family ☑ Existing+ Addition/Alteration | Date 5/3/2023

Project Address [illegible] | California Energy Climate Zone CA Climate Zone 06 | Total Cond. Floor Area 1,909 | Addition 138 | # of Units 1

INSULATION

Construction	Type	Cavity	Area (ft^2)	Special Features	Status
Door	Opaque Door	- no insulation	20		New
Wall	Wood Framed	- no insulation	83		Existing
Roof	Wood Framed Attic	R 11	751		Existing
Roof	Wood Framed Rafter	R 30	360		Altered
Demising	Wood Framed	- no insulation	124		Existing
Floor	Wood Framed w/o Crawl Space	- no insulation	10		Existing
Wall	Wood Framed	- no insulation	202		Existing
Wall	Wood Framed	- no insulation	164		Existing

FENESTRATION

Total Area: 305 | Glazing Percentage: 16.0% | New/Altered Average U-Factor: 0.34

Orientation	Area(ft^2)	U-Fac	SHGC	Overhang	Sidefins	Exterior Shades	Status

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status

RESIDENTIAL MEASURES SUMMARY — RMS-1

Project Name [illegible] | Building Type ☑ Single Family ☐ Addition Alone ☐ Multi Family ☑ Existing+ Addition/Alteration | Date 5/3/2023

Project Address [illegible] | California Energy Climate Zone CA Climate Zone 06 | Total Cond. Floor Area 1,909 | Addition 138 | # of Units 1

INSULATION

Construction	Type	Cavity	Area (ft^2)	Special Features	Status
Wall	Wood Framed	- no insulation	220		Existing
Wall	Wood Framed	- no insulation	164		Existing
Roof	Wood Framed Attic	R 11	585		Existing
Demising	Wood Framed w/o Crawl Space	- no insulation	500		Existing
Demising	Wood Framed w/o Crawl Space	- no insulation	75		Existing

FENESTRATION

Total Area: 305 | Glazing Percentage: 16.0% | New/Altered Average U-Factor: 0.34

Orientation	Area(ft^2)	U-Fac	SHGC	Overhang	Sidefins	Exterior Shades	Status

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status

2022 Single-Family Residential Mandatory Requirements Summary

NOTE: Single-family residential buildings subject to the Energy Codes must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information.
(04/2022)

Building Envelope:

§ 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):	**Roof Deck, Ceiling and Rafter Roof Insulation.** Roof decks in newly constructed attics in climate zones 4 and 8-16 area-weighted average U-factor not exceeding U-0.184. Ceiling and rafter roofs minimum R-22 insulation in wood-frame ceiling; or area-weighted average U-factor must not exceed 0.043. Rafter roof alterations minimum R-19 or area-weighted average U-factor of 0.054 or less. 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 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(j):	**Fenestration Products.** Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.45, or area-weighted average U-factor of all fenestration must not exceed 0.45.

Fireplaces, Decorative Gas Appliances, and Gas Log:

§ 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:

§ 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-N. *
§ 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)3:	**Insulation.** Unfired service water heater storage tanks and solar water-heating backup tanks must have adequate insulation, or tank surface heat loss rating.
§ 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.

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§ 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.
§ 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:	**Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation.** All domestic hot water piping must be insulated as specified in § 609.11 of the California Plumbing Code. *
§ 150.0(j)2:	**Insulation Protection.** Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by § 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(j)1:	**Gas or Propane Water Heating Systems.** Systems using gas or propane water heaters to serve individual dwelling units must designate a space at least 2.5' x 2.5' x 7' suitable for the future installation of a heat pump water heater, and meet electrical and plumbing requirements, based on the distance between this designated space and the water heater location; and a condensate drain no more than 2" higher than the base of the water heater
§ 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:

§ 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 CMC §§ 601.0-605.0 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 R-6.0 or higher; ducts located entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8) do not require insulation. 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 UL requirements, or aerosol sealant that meets UL 723. The combination of mastic and either mesh or tape must be used to seal openings greater than ¼". If mastic or tape is used. Building cavities, air handler support platforms, 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 these spaces must not be compressed. *
§ 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 due tosunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service (e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover). Cellular foam insulation must be protected as above or painted with a water retardant and solar radiation-resistant coating.
§ 150.0(m)10:	**Porous Inner Core Flex Duct.** Porous inner cores of flex ducts must have a non-porous layer or air barrier 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 Reference Residential Appendix RA3.1.
§ 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. Clean-filter pressure drop and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service. Filter racks or grilles must use gaskets, sealing, or other means to close gaps around the inserted filters to and prevents air from bypassing the filter. *

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§ 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. *

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)1B:	**Central Fan Integrated (CFI) Ventilation Systems.** Continuous operation of CFI air handlers is not allowed to provide the whole-dwelling unit ventilation airflow required per §150.0(o)1C. A motorized damper(s) must be installed on the ventilation duct(s) that prevents all airflow through the space conditioning duct system when the damper(s) is closed andcontrolled per §150.0(o)1Biiiiv. CFI ventilation systems must have controls that track outdoor air ventilation run time, and either open or close the motorized damper(s) for compliance with §150.0(o)1C.
§ 150.0(o)1C:	**Whole-Dwelling Unit Mechanical Ventilation for Single-Family Detached and townhouses** , 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 specified in § 150.0(o)1C-iii.
§ 150.0(o)1G:	**Local Mechanical Exhaust.** Kitchens and bathrooms must have local mechanical exhaust; nonenclosed kitchens must have demand-controlled exhaust system meeting requirements of §150.0(o)1Giii,enclosed kitchens and bathrooms can use demand-controlled or continuous exhaust meeting §150.0(o)1Giii-iv. Airflow must be measured by the installer per §150.0(o)1Giv, and rated for sound per §150.0(o)1Gvi. *
§ 150.0(o)1H&I:	**Airflow Measurement and Sound Ratings of Whole-Dwelling Unit Ventilation Systems.** The airflow required per § 150.0(o)1C must be measured by using a flow hood, flow grid, or other airflow measuring device at the fan's inlet or outlet terminals/grilles per Reference Residential Appendix RA3.7. Whole-Dwelling unit ventilation systems must be rated for sound per ASHRAE 62.2 §7.2 at no less than the minimum airflow rate required by §150.0(o)1C.
§ 150.0(o)2:	**Field Verification and Diagnostic Testing.** Whole-Dwelling Unit ventilation airflow, vented range hood airflow and sound rating, and HRV and ERV fan efficacy must be verified in accordance with Reference Residential Appendix RA3.7. Vented range hoods must be verified per Reference Residential Appendix RA3.7.4.3 to confirm if it is rated by HVI or AHAM to comply with the airflow rates and sound requirements per §150.0(o)1G

Pool and Spa Systems and Equipment:

§ 110.4(a):	**Certification by Manufacturers.** Any pool or spa heating system or equipment must be certified to have all of the following: compliance with the Appliance Efficiency Regulations and listing in MAEDbS; 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:

§ 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 except lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers; navigation lighting less than 5 watts; and lighting internal to drawers, cabinets, and linen closets with an efficacy of at least 45 lumens per watt.
§ 150.0(k)1B:	**Screw based luminaires.** Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *
§ 150.0(k)1C:	**Recessed Downlight Luminaires in Ceilings.** Luminaires recessed into ceilings must not contain screw based sockets, must be airtight, and must be sealed with a gasket or caulk. California Electrical Code § 410.116 must also be met.
§ 150.0(k)1D:	**Light Sources in Enclosed or Recessed Luminaires.** Lamps and other swappable 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)1E:	**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 shall be no more than the number of bedrooms. These boxes must be served by a dimmer, vacancy sensor control, low voltage wiring, or fan speed control.
§ 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). *

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