SUBMISSION TO:

CITY OF CORONA

PROJECT ADDRESS:

915 W 8TH STREET
CORONA, CA 92882

OWNER INFORMATION:
SAULO JIMINEZ
915 W 8TH STREET
CORONA, CA 92882

DESIGNER INFORMATION:
NAVEN MEAS
6331 CHARLWOOD ST
LAKEWOOD, CA 90713
NAVEN.MEAS@GMAIL.COM
(562) 215-3863

PROJECT ADDRESS:
915 W 8TH STREET
CORONA, CA 92882

LEGAL DESCRIPTION:

APN(GEOCODE):	110-083-021
LEGAL DESCRIPTION:	LOT 33 MB 006/091, BUENA VISTA ADD
PROPERTY TYPE:	SINGLE FAMILY DWELLING
TYPE OF CONSTRUCTION:	TYPE VB
OCCUPANCY GROUP:	R3, U
ZONING:	R2

GOVERNING CODES:

1. 2019 CALIFORNIA BUILDING CODE (CBC)
2. 2019 CALIFORNIA RESIDENTIAL CODE (CRC)
3. 2019 CALIFORNIA MECHANICAL CODE (CMC)
4. 2019 CALIFORNIA PLUMBING CODE (CPC)
5. 2019 CALIFORNIA ELECTRICAL CODE (CEC)
6. 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CGBSC)
7. 2019 CALIFORNIA ENERGY CODE (CEC)
8. CORONA MUNICIPAL CODE

* PROJECT IS NOT LOCATED IN A FIRE HAZARD SEVERITY ZONE, FUEL MODIFICATION ZONE, OR FLOOD HAZARD ZONE.
* PROJECT SHALL COMPLY WITH CORONA BURGLARY ORDINANCE NO. 15.52.

PROJECT DESCRIPTION:

1. NEW DETACHED 839 SQ. FT. ACCESSORY DWELLING UNIT.
2. NEW 540 SQ. FT. GARAGE.

* DEFERRED SUBMITTALS
- PHOTO-VOLTAIC (PV) SYSTEM DRAWINGS [CF1 R-PRF-01 E]

REQUIRED SPECIAL FEATURES
· VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION

HERS FEATURE SUMMARY:

· BUILDING - LEVEL VERIFICATIONS:
1. QUALITY INSULATION INSTALLATION (QII)
2. INDOOR AIR QUALITY VENTILATION
3. KITCHEN RANGE HOOD

· COOLING SYSTEM VERIFICATIONS:
1. VERIFIED EER
2. VERIFIED SEER
3. VERIFIED REFRIGERANT CHARGE
4. AIRFLOW IN HABITABLE ROOMS

· HEATING SYSTEM VERIFICATIONS:
1. VERIFIED HSPF
2. VERIFIED HEAT PUMP RATED HEATING CAPACITY
3. WALL - MOUNTED THERMOSTAT IN ZONES GREATER THAN 150 SF
4. DUCTLESS INDOOR UNITS LOCATED ENTIRELY IN CONDITIONED SPACE

· HVAC DISTRIBUTION SYSTEM VERIFICATIONS:
1. - NONE -

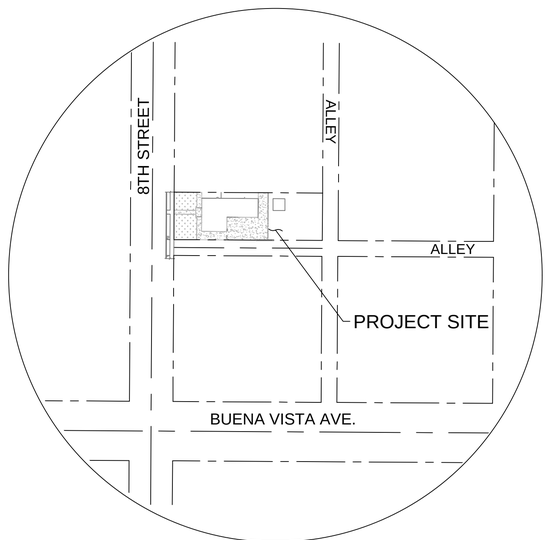
· DOMESTIME HOT WATER SYSTEM VERIFICATIONS:
1. - NONE -

LOT COVERAGE ANALYSIS:

TOTAL LOT AREA: 7,200 SQ. FT.

(E) LOT AREA USED: 1,596 SF [(E) HOME = 1452 SF , SHED TO BE DOMOLISHED = 144 SF]
(N) LOT AREA PROPOSED: 2,831 SF [W/ PROP. 2-CAR GARAGE]

PERCENTAGE LOT AREA COVERED: 39.3%



VICINITY MAP

N

REVISIONS BY	
SUBMITTAL NO. 4	

COVER SHEET

MR. S. JIMENEZ
915 W 8TH STREET
CORONA, CA

DRAWN
N. MEAS

TEL. NUMBER
(714) 492-2826

DATE
03/13/2023

SCALE
AS SHOWN

JOB NO.
1002

SHEET
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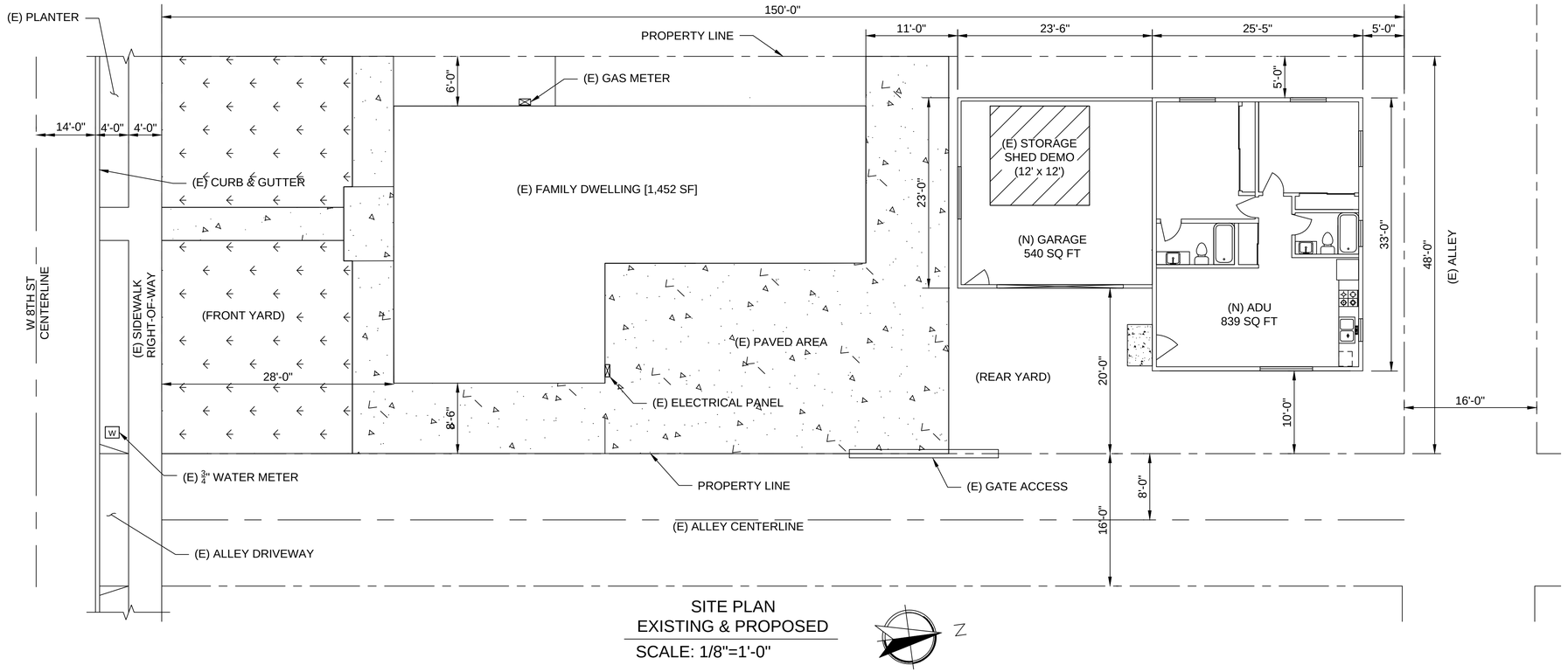

SITE PLAN
EXISTING & PROPOSED

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

SHEET INDEX

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SITE PLAN

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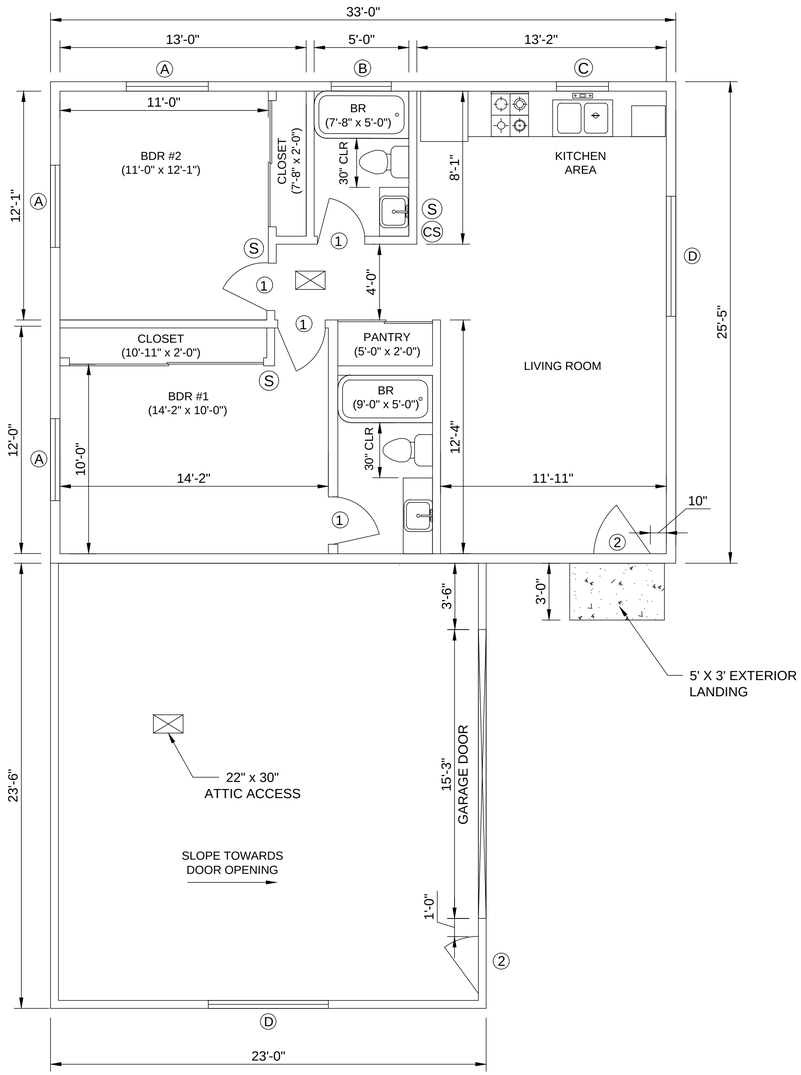
GENERAL NOTES

1. THE DISCHARGE OF POLLUTANTS TO ANY STORM DRAINAGE SYSTEM IS PROHIBITED. NO SOLID WASTE, PETROLEUM BY-PRODUCTS, SOIL PARTICULATE, CONSTRUCTION WASTE MATERIALS, OR WASTEWATER GENERATED ON CONSTRUCTION SITES OR BY CONSTRUCTION ACTIVITIES SHALL BE PLACED, CONVEYED OR DISCHARGED INTO THE STREET, GUTTER OR STORM DRAIN SYSTEM.
2. ANY CONTRACTOR PERFORMING WORK AS INDICATED HEREON FOR THIS PROJECT SHALL FAMILIARIZE HIMSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS OR HER OPERATIONS, WHETHER OR NOT SUCH FACILITIES ARE SHOWN ON THESE PLANS.
3. THE CONTRACTOR AGREES THAT HE OR SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY, THE CITY ENGINEER AND THEIR REPRESENTATIVE, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CITY OR THE CITY ENGINEER.
4. ALL ELECTRICAL AND PLUMBING INSTALLATIONS TO BE IN COMPLIANCE WITH GOVERNING CODES.
5. ALL ELECTRICAL OUTLETS TO BE TAMPER PROOF AND LOCATED MINIMUM 12' ABOVE FINISHED FLOOR (TYP) U.N.O.
6. LOW CONSUMPTION 1.28 GPF WATER CLOSET SHALL BE INSTALLED.
7. SHOWER SHALL HAVE EITHER PRESSURE BALANCE OR THERMOSTATIC MIXING VALVE.
8. 6' MIN HIGH, NONABSORBENT SURFACE AT SHOWER PERIMETER WALLS.
9. FASTENERS FOR PRESERVATIVE TREATED OR FIRE RETARDANT TREATED WOOD SHALL BE OF HOT DIPPED ZINC COATED GALVANIZED STEEL AS PER ASTM-A153.
10. ALL EXTERIOR OUTLETS SHALL BE GFI-WATER PROTECTED CODE APPROVED.
11. FINISHED GRADE AROUND THE PROPOSED STRUCTURES SHALL SLOPE A MINIMUM OF 2 PERCENT AWAY FOR THE FIRST 10 FEET.

GRADING NOTES

1. EXCAVATIONS BELOW EXISTING FINISHED GRADE ARE FOR FOOTINGS FOR THE CONSTRUCTION OF A BUILDING ONLY AND WILL BE AUTHORIZED BY A BUILDING PERMIT.
2. ANY CUT OR FILL SHALL NOT EXCEED ONE HUNDRED CUBIC YARDS OF MATERIAL NOR EXCEED ONE FOOT IN DEPTH OR HEIGHT.
3. IF MORE THAN 100 CUBIC YARDS OF CUT AND FILL IS BEING MOVED ON THE PROJECT SITE, A GRADING PERMIT SHALL BE REQUIRED FROM THE PUBLIC WORKS DEPARTMENT.
4. WE, THE ARCHITECT, ENGINEER, CONTRACTOR AND PROPERTY OWNER(S) OF A PROJECT HEREIN THE ATTACHED SET OF DRAWINGS, UNDERSTAND THAT SAID INFORMATION WILL BE A BASIS FOR SUBSEQUENT CITY ACTION ON THE PROJECT PROPOSED AND DESCRIBED HEREON. WE, THE ARCHITECT, ENGINEER, CONTRACTOR AND PROPERTY OWNER(S) ALSO UNDERSTAND THAT APPROVAL OF THIS REQUEST DOES NOT RELIEVE US FROM RESPONSIBILITIES TO PROVIDE NECESSARY PROTECTION TO "LIFE, LIMB, AND PROPERTY" AS INTENDED BY CORONA MUNICIPAL CODE SECTION NO. 15.36, WHICH RETENTION OF A SOILS ENGINEER'S SERVICE IS CONSIDERED AN ESSENTIAL PART OF THIS PROTECTION. WE CERTIFY THAT ALL INFORMATION SUBMITTED WITH AND WITHIN THIS SET OF DRAWINGS ATTACHED HERETO IS TRUE AND ACCURATE TO THE BEST OF OUR KNOWLEDGE AND BELIEF.
5. EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE IMPLEMENTED AND MAINTAINED TO MINIMIZE AND/OR PREVENT THE TRANSPORT OF SOIL FROM THE CONSTRUCTION SITE.
6. APPROPRIATE BMPS FOR CONSTRUCTION RELATED MATERIALS, WASTES, SPILLS, OR RESIDUES SHALL BE IMPLEMENTED TO ELIMINATE OR REDUCE TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES, OR ADJOINING PROPERTIES BY WIND OR RUNOFF.

EARTHWORK
CUT = 0 cubic yards
FILL = 0 cubic yards



PROPOSED FLOOR PLAN

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

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WINDOW SCHEDULE

PER ENERGY STANDARDS 150.1 C3

	WIDTH	HEIGHT	REMARKS	U-FACTOR/SHGC
A	4'-0"	4'-0"	NEW SLIDING	0.30/0.23
B	2'-8"	1'-6"	NEW SLIDING (TEMPERED)	0.30/0.23
C	2'-0"	3'-0"	NEW DOUBLE HUNG	0.30/0.23
D	6'-0"	4'-0"	NEW SLIDING	0/30/0.23

DOOR SCHEDULE

	WIDTH	HEIGHT	REMARKS
1	2'-6"	6'-8"	HOLLOW CORE
2	3'-0"	6'-8"	SOLID CORE

LEGEND:

S	SMOKE DETECTOR (HARDWIRED WITH BATTERY PACK BACK-UP PER NFPA 72
CS	CARBON MONOXIDE ALARM/SMOKE DETECTOR COMBINATION
⊠	22" x 30" ATTIC ACCESS

REVISIONS BY	

FLOOR PLAN

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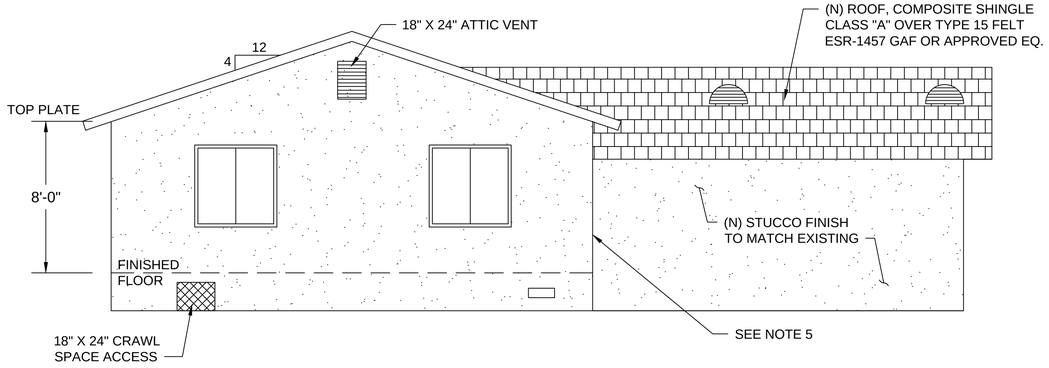
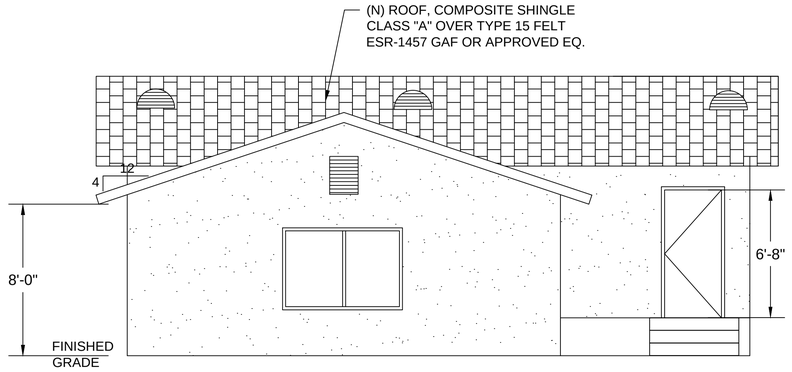
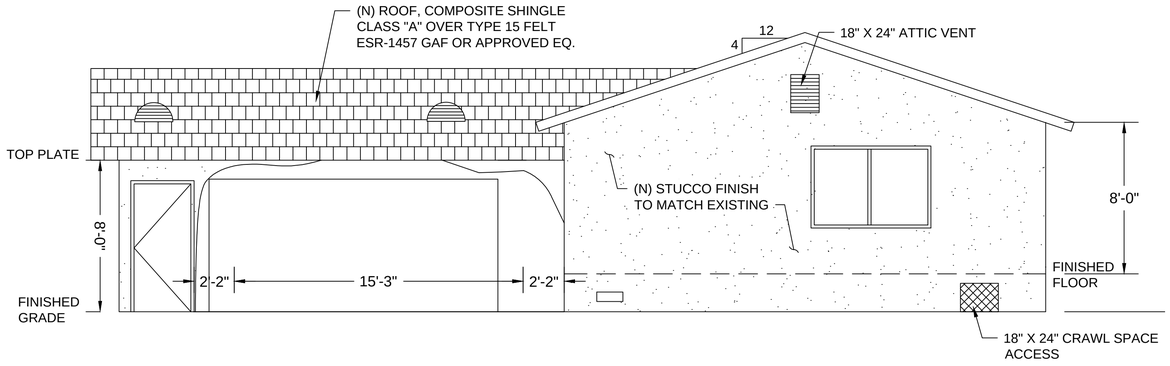


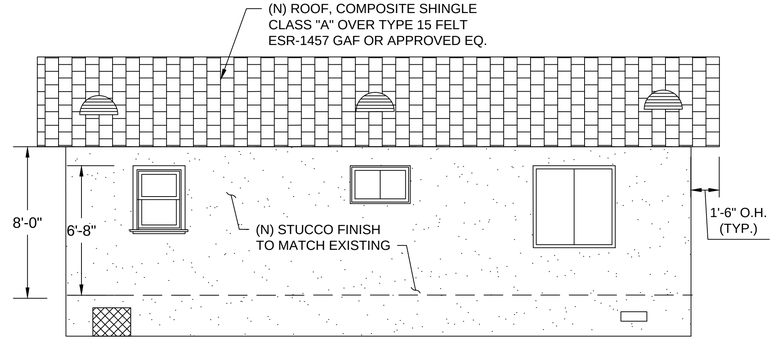
WEST ELEVATION
SCALE: 1/4"=1'-0"



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



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



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

ATTIC VENTILATION REQUIREMENTS:

THE REQUIRED OPENING SHALL BE DISTRIBUTED ON AT LEAST TWO OPPOSITE SIDES AND CLOSE TO CORNERS WITH CORROSION-RESISTANT METAL WIRE MESH.

AREA OF VENTS REQUIRED = 839/150 *144 = 805.4 SQ. IN

(1) SIZE OF LOUVER VENTS :18"X24" (118.8 SQ IN NFVA) ..... 2 TOTAL
(2) SIZE OF ROOF DORMER VENTS 12" X 24" (100 SQ. IN NFVA) .... 6 TOTAL
837.6 SQ. IN > 805.4 SQ. IN

GARAGE ATTIC VENTILATION REQ'D = (23'-0" x 23'-6") = 540.5 SQ FT/150*144 = 519 SQ IN
(1) SIZE OF LOUVER VENTS :18"X24" (118.8 SQ IN NFVA) ..... 1 TOTAL
(2) SIZE OF ROOF DORMER VENTS 12" X24" (100 SQ. IN NFVA)...4 TOTAL

GARAGE ATTIC VENTILATION = 558.8 SQ IN > 519 SQ IN

FLOOR VENTILATION REQUIREMENTS:

UNDER FLOOR AREA: 781 SQ FT

AREA VENTS REQUIRED: 781/150 X 144 = 750 SQ. IN

(1) SIZE OF UNDER FLOOR ACCESS = 24" X 18" (200 SQ IN NFVA)
NUMBER OF UNDER FLOOR ACCESS: 3
(2) SIZE OF FLAT SCREEN VENT 14.5" X 6.5" (70.7 SQ. IN NFVA)
NUMBER OF FLAT SCREEN VENTS: 3

812.1SQ. IN > 750 SQ. IN.

NOTES:

1. STAIR TREADS SHALL HAVE MINIMUM DEPTH OF 10 INCHES AND RISER SHALL NOT BE MORE THAN 7-3/4 INCHES.
2. 1-INCH GAP SHALL BE PROVIDED BETWEEN THE INSULATION AND THE ROOF SHEATHING AND AT THE LOCATION OF THE VENTS.
3. (N) ADU, GARAGE, ROOF, STUCCO AND TRIM SHALL MATCH COLOR AND MATERIAL OF EXISTING HOME.
4. ROOF MATERIAL SHALL BE CLASS 'A' FIRE RATING ASPHALT SHINGLES GAF. UNDERLAYMENT SHALL BE #30 GRADED BUILDING PAPER.
5. NOT LESS THAN 1/2-INCH GYPSUM BOARD OR EQUIVALENT SHALL BE APPLIED TO THE INTERIOR SIDE OF EXTERIOR WALL BETWEEN THE GARAGE, DWELLING UNIT AND ATTIC.
6. GARAGE AND ADU ROOF, STUCCO, AND WINDOW TRIMMINGS SHALL BE ADDED TO MATCH THE EXISTING COLORS AND MATERIALS OF EXISTING HOME.

REVISIONS BY	
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PROPOSED ELEVATIONS

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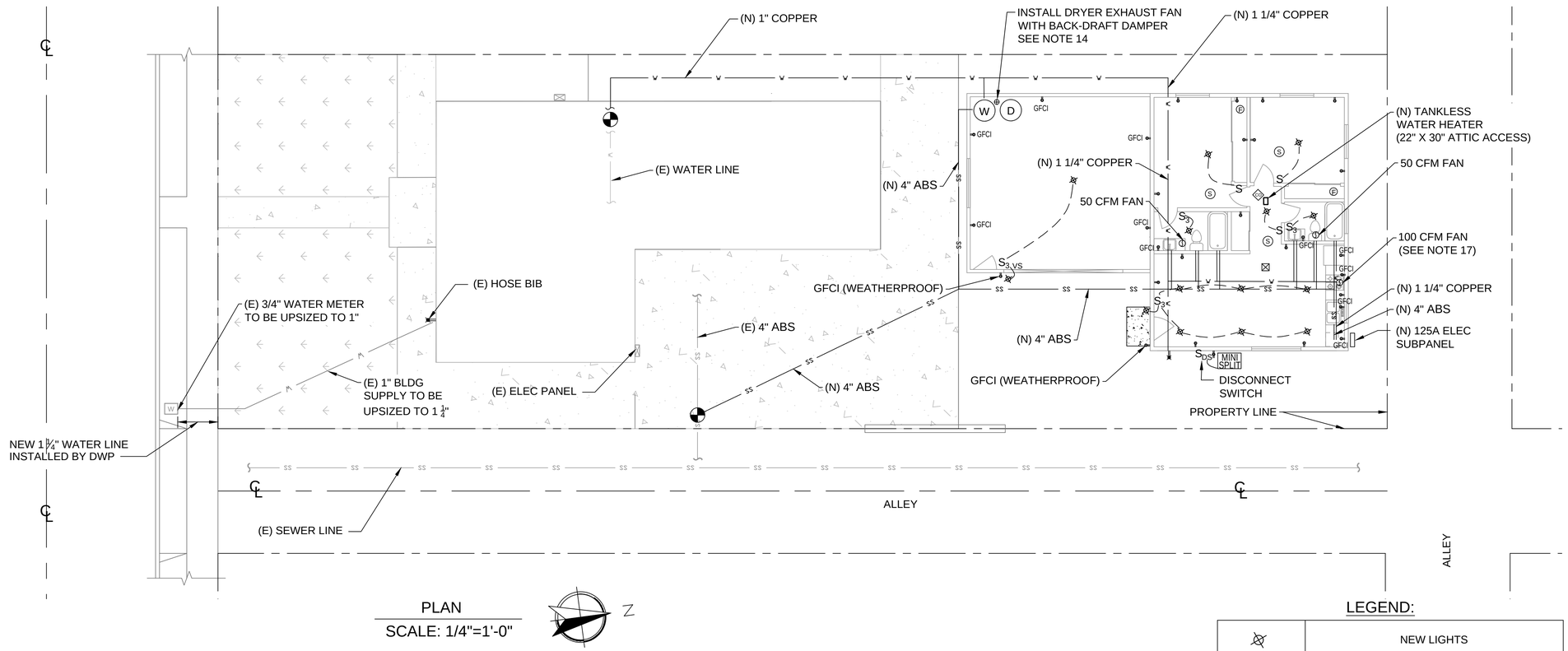

PLAN

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

NOTES:

1. SMOKE ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTIVATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT.
2. AT LEAST ONE LUMINAIRE SHALL BE CONTROLLED BY AN OCCUPANT OR VACANCY SENSOR PROVIDING AUTOMATIC-OFF FUNCTIONALITY.
3. LUMINAIRES THAT ARE OR CONTAIN LIGHT SOURCES THAT MEET REFERENCE JOINT APPENDIX JA8 REQUIREMENTS FOR DIMMING, AND THAT ARE NOT CONTROLLED BY OCCUPANCY OR VACANCY SENSORS, SHALL HAVE DIMMING CONTROLS.
4. WATER CLOSETS NOT TO EXCEED 1.28 GPF.
5. SINGLE SHOWERHEAD: NOT TO EXCEED 1.8 GPM AT 80 PSI, CERTIFIED U.S. EPA WATERSENSER.
6. FAUCETS NOT TO EXCEED 1.2 GPM AT 60 PSI; MINIMUM FLOW RATE OF RESIDENTIAL LAVATORY FAUCET SHALL NOT BE LESS THAN 0.8 GPM AT 20 PSI
7. DRYER EXHAUST DUCT SHALL BE OF RIGID MATERIAL, SMOOTH INTERIOR SURFACE, MINIMUM 4" DIAMETER AND MINIMUM THICKNESS OF 0.016 INCH.
8. BATHROOM EXHAUST DUCT SHALL TERMINATE OUTSIDE THE BUILDING AND SHALL BE EQUIPPED WITH A BACKDRAFT DAMPER.
9. 120 VOLT, 20 AMPERE BRANCH CIRCUITS LOCATED IN BATHROOM AND LAUNDRY SHALL HAVE NO OTHER OUTLETS.
10. ALL 125 V AND 15 AND 20 AMPERE RECEPTACLES SHALL BE TAMPER-RESISTANT RECEPTACLES.
11. ALL OUTDOOR LIGHTING SHALL BE HIGH EFFICACY AND CONTROLLED BY AN "ON/OFF" SWITCH IN ADDITION TO ANOTHER METHOD AS INDICATED IN THE CA ENERGY CODE.
12. LIGHT IN BATHROOM SHALL BE CONTROLLED BY A VACANCY SENSOR.
13. EXISTING SEWER AND WATER LINE ARE SHOWN PER OWNER'S RECORDS. CONTRACTOR TO FIELD VERIFY ON SITE.
14. CONTRACTOR TO INSTALL DRYER EXHAUST FAN VERTICALLY THROUGH ROOF. LAUNDRY EXHAUST DUCT SHALL BE 3 FEET MINIMUM AWAY FROM OPENINGS INTO THE BUILDING.
15. ELECTRICAL PANEL AND SUB-PANEL(S) GROUNDING SHALL COMPLY WITH CEC 250.32. PROVIDE SEPARATE GROUNDING WIRE TO EACH PANEL FROM THE MAIN ELECTRICAL SERVICE ENTRANCE PANEL.
16. METHOD OF HEATING SHALL MAINTAIN A ROOM TEMPERATURE OF NOT LESS THAN 68 DEGREES FAHRENHEIT AT A POINT 3 FT ABOVE FLOOR AND 2 FT FROM EXTERIOR WALLS IN HABITABLE ROOMS.
17. KITCHEN RANGE EXHAUST FAN SHALL HAVE A MINIMUM RATE OF 100 CFM TO THE OUTSIDE OF THE BUILDING. EXHAUST FAN SHALL BE HVI-CERTIFIED, WITH A SOUND RATING OF 3 SANES OR LESS. EXHAUST DUCT SHALL HAVE A SMOOTH INTERIOR SURFACE AND TERMINATE WITH A BACKDRAFT DAMPER.
18. PROVIDE AN ENERGY STAR EXHAUST FAN IN EACH BATHROOM WHICH IS CONTROLLED BY A HUMIDISTAT CAPABLE OF ADJUSTMENT OF LESS THAN OR EQUAL TO 50% TO A MAXIMUM 80% AND VENTED TO THE OUTSIDE OF THE BUILDING.
19. ALARMS SHALL RECEIVE PRIMARY POWER FROM BUILDING WIRING AND HAVE A BATTERY BACK-UP, OUTSIDE OF AND IN THE VICINITY OF THE BEDROOM. SMOKE ALARM SHALL NOT BE INSTALLED WITHIN 36" HORIZONTAL PATH FROM HVAC SUPPLY REGISTER, AND SHALL NOT BE INSTALLED NOT LESS THAN 3 FEET FROM THE DOOR OF BATHROOMS.
20. INDOOR QUALITY AIR (IAQ) BUILDING VENTILATION FAN(S) SHALL HAVE MANUAL SWITCHES THAT CLEARLY LABEL THE FOLLOWING TEXT: "THE SWITCH CONTROLS THE INDOOR AIR QUALITY VENTILATION FOR THE HOME. LEAVE IT ON UNLESS THE OUTDOOR AIR QUALITY IS VERY POOR."
21. AIR CONDITIONER CONDENSER DISCONNECT SWITCH SHALL BE WITHIN VIEW OF EQUIPMENT.
22. PROVIDE NO FEWER THAN (2) DEDICATED KITCHEN 20-AMP GFCI BRANCH CIRCUITS PER CEC 210.11(C)(1), 210.52(B).

NOTE: THE DEPARTMENT OF WATER AND POWER SHALL REMOVE THE EXISTING ¾" WATER METER AND INSTALL A NEW 1" WATER METER PER CITY STANDARD NO. 414. THE DEPARTMENT OF WATER AND POWER SHALL REPLACE THE EXISTING 1" BUILDING SUPPLY WITH A NEW 1¼" BUILDING SUPPLY PIPE FROM THE WATER METER TO THE PROPERTY LINE. CONTACT THE PUBLIC WORKS DEPARTMENT TO SCHEDULE THE UPGRADES AND PROVIDE PERMIT NO. DWSB22-00242.

LEGEND:

	NEW LIGHTS
F	HIGH EFFICIENCY-FLOURESCENT LUMINARES. WALL MOUNTED IN BEDROOM CLOSET
GFCI	GFCI OUTLET,TYP
	AFCI OUTLET,TYP
	BATHROOM EXHAUST FAN
S	SWITCH
S_3	MULTIPLE SWITCHES
VS	VACANCY SENSOR
	125V SINGLE PHASE 20A RECEPTACLE
	UTILITY POINT OF CONNECTION
	HOUSE BIB
S	SMOKE DECTECTOR
CO	CARBON MONOXIDE ALARM
	IAQ VENTILATION FAN

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ELECTRICAL AND PLUMBING PLAN

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STRUCTURAL ABBREVIATIONS

A.B.	ANCHOR BOLT
ABV.	ABOVE
ADD'L	ADDITIONAL
ADJ.	ADJACENT
ALUM.	ALUMINUM
ALT.	ALTERNATE
APPRX.	APPROXIMATE(LY)
ARCH.	ARCHITECT(TURAL)
& OR {	AND
@	AT
BEL.	BELOW
B.F.	BRACED FRAME
BLDG.	BUILDING
BLK.	BLOCK
BLKG.	BLOCKING
BM.	BEAM
B.N.	BOUNDARY NAILING
BNDRY.	BOUNDARY
B.O.F.	BOTTOM OF FOOTING
BRDG.	BRIDGE(ING)
BRG.	BEARING
BTM.	BOTTOM
BTWN.	BETWEEN
CAMB.(C)	CAMBER(ED)
CANT.	CANTILEVERED
C.F.	CUBIC FEET(FOOT)
C.G.	CENTER OF GRAVITY
C.I.P.	CAST IN PLACE
C.J.	CONSTRUCTION JOINT
CL. OR	CENTER LINE (℄)
CLG.	CEILING
CLR.	CLEAR
CMU.	CONC. MASONRY UNIT
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CTSK.	COUNTERSINK
CTR.	CENTER(ED)
C.Y.	CUBIC YARD
d	PENNY(NAILS)
DBL.	DOUBLE
DEPT.	DEPARTMENT
D.F.	DOUGLAS FIR
DIA. (Ø)	DIAMETER
DIAG.	DIAGONAL
DIAPH.	DIAPHRAGM
DIM.	DIMENSION
DN.	DOWN
do	DITTO(REPEAT)
DP (D)	DEEP (DEPTH)
DWG.	DRAWING(S)
DWL.	DOWEL(S)
EA.	EACH
E.F.	EACH FACE
E.J.	EXPANSION JOINT
EL.	ELEVATION
ELEC.	ELECTICAL
ELEV.	ELEVATOR
EMBD.	EMBED(MENT)
E.N.	EDGE NAIL
ENG.	ENGINEER
EQ.	EQUAL
EQPT.	EQUIPMENT
EXP.	EXPANSION
EXST.(E)	EXISTING
EXT.	EXTERIOR

FAB.	FABRICATION
FND.	FOUNDATION
FIN.	FINISH(ED)
FLG.	FLANGE
FLR.	FLOOR
F.N.	FIELD(FACE)NAIL
F.O.C.	FACE OF CONCRETE
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD
F.O.W.	FACE OF WALL
FRM.	FRAME(ING)
F.S.	FAR SIDE
FT.(')	FOOT(FEET)
FTG.	FOOTING
F.V.	FEILD VERIFY
GA.	GAUGE
GALV.	GALVANIZED
GB	GRADE BEAM
G.C.	GENERAL CONTRACTOR
GLB	GLUED LAMINATED BEAM
GRD.	GRADE
GYPDB.	GYPSUM WALLBOARD
HD	HOLD DOWN
HDR.	HEADER
HGR.	HANGER
HORZ.(H)	HORIZONTAL
HSB	HIGH STRENGTHBOLTS
HT.	HEIGHT
I.D.	INSIDE DIAMETER
I.E.	INVERT ELEVATION
I.F.	INSIDE FACE
IN.(")	INCH(S)
INT.	INTERIOR
JST.	JOIST
JT.	JOINT
K	KIPS(1000)
LAT.	LATERAL
LB(#)	POUNDS
L.B.	LAG BOLTS
LDGR	LEDGER
L.F.	LINEAL FEET(FOOT)
LG.	LONG(ITUDINAL)
LGTH	LENGTH
LLH	LONG LEG HORIZ.
LLV	LONG LEG VERT.
LT.WT.	LIGTH WEIGHT
MAS.	MASONRY
MAT'L.	MATERIAL
MAX.	MAXIMUM
M.B.	MACHINE BOLT
MECH.	MECHANICAL
MEZZ.	MEZZANINE
MFR.	MANUFACTURER
MISC.	MISCELLANEOUS
MIN.	MINIMUM
MLB	MINI-LAM-BM.
MTL.	METAL
(N)	NEW
NO.(#)	NUMBER
N.S.	NEAR SIDE
N.S.G.	NON-SHRINK GROUT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
O.H.	OPPOSITE HAND
OPNG.	OPENING
ORNT.	ORIENTATE(ION)
OWJ.	OPEN WEB JOISTS

PAR. (//)	PARALLEL
P/C	PRECAST CONCRETE
PERP. (⊥)	PERPENDICULAR
PL. (⅊)	PLATE
PLAM	PURLAM BEAM
PLY.	PLYWOOD
P.S.F.	POUNDS PER SQUARE FOOT
P.S.I.	POUNDS PER SQUARE INCH
PSL	PARALLAM (2.0E, Fb=2900PSI)
P.T.	PRESSURE TREATED
P/T	POSTTENSIONED (PRESTRESSED)
QTY.	QUANTITY
RAD. (R)	RADIUS
R.C.P.	REINFORCED CONCRETE PIPE
REF.	REFERENCE
REINF.	REINFORCEMENT(ING)
REQ'D.	REQUIRED
R.F.	RIGID FRAME
R.O.	ROUGH OPENING
R.B.	RIDGE BOARD
SCHED.	SCHEDULE
SHT.	SHEET
SHTG.	SHEATHING
SIM.	SIMILAR
SKW.	SKEW(ED)
SPC.	SPACE(S)(ING)
SPEC.	SPECIFICATION(S)
SQ.	SQUARE
SS	SELECT STRUCTURAL
STD.	STANDARD
STGR.	STAGGER(ED)
STIFF.	STIFFENER(S)
STIR.	STIRRUP(S)
STL.	STEEL
STRUC.	STRUCTURAL
SUSP.	SUSPENDED(TION)
SYMM.	SYMMETRICAL
(T)	TOP
T & B	TOP AND BOTTOM
TEMP.	TEMPERATURE
T & G	TONGUE AND GROOVE
THK.	THICK(NESS)
THRD.	THREADED
TMPRY.	TEMPORARY
T.N.	TOE NAIL
T.O.S.	TOP OF SHEATHING
T.O.W.	TOP OF WALL
TRANSV.	TRANSVERSE
T.S.	TOP OF STEEL
TYP.	TYPICAL
UBC	UNIFORM BUILDING CODE
U.O.N.	UNLESS OTHERWISE NOTED
VERT.	VERTICAL
VIF	VERIFY IN FIELD
(W)	WIDE(WIDTH)
w/	WITH
WD.	WOOD
W.P.	WORK POINT
WPJ	WEAKENED PLANE JOINT
W.S.	WELDED STUD(S)
WT	WEIGHT
WWF	WELDED WIRE FABRIC
X-STG	EXTRA STRONG
XX-STG	DOUBLE EXTRA STRONG
YD	YARD

TABLE NO. 2304.10.1 :FASTENING SCHEDULE (CONTINUED)

DESCRIPTION OF BUILDING ELEMENTS	NUMBER & TYPE OF FASTENER[d,e]	SPACING & LOCATION	
WOOD STRUCTURAL PANELS (WSP), SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING[a]			
		EDGES (INCHES)	INTERMEDIATE SUPPORTS (INCHES)
31. 3/8" - 1/2"	6d COMMON OR DEFORMED (2"x 0.113") (SUBFLOOR AND WALL)	6	12
	8d BOX OR DEFORMED (2 1/2"x 0.113") (ROOF)	6	12
	2 3/8"x 0.113" NAIL (SUBFLOOR AND WALL)	6	12
	1 3/4" 16 GAGE STAPLE, 7/16" CROWN (SUBFLOOR AND WALL)	4	8
	2 3/8"x 0.113" NAIL (ROOF)	4	8
	1 3/4" 16 GAGE STAPLE, 7/16" CROWN (ROOF)	3	6
32. 19/32" - 3/4"	8d COMMON (2 1/2"x 0.131"); OR 6d DEFORMED (2"x 0.113")	6	12
	2 3/8"x 0.113" NAIL; OR 2" 16 GAGE STAPLE, 7/16" CROWN	4	8
33. 7/8" - 1 1/4"	10d COMMON (3"x 0.148"); OR 8d DEFORMED (2 1/2"x 0.131")	6	12
OTHER EXTERIOR WALL SHEATHING			
34. 1/2" FIBERBOARD SHEATHING[b]	1 1/2" GALVANIZED ROOF NAIL (7/16" HEAD DIAMETER); OR 1 1/4" 16 GAGE STAPLE WITH 7/16" CROWN	3	6
35. 25/32" FIBERBOARD SHEATHING[b]	1 3/4" GALVANIZED ROOF NAIL (7/16" HEAD DIAMETER); OR 1 1/2" 16 GAGE STAPLE WITH 7/16" OR 1" CROWN	3	6
WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING			
36. 3/4" AND LESS	8d COMMON (2 1/2"x 0.131"); OR 6d DEFORMED (2"x 0.113")	6	12
37. 7/8" - 1"	8d COMMON (2 1/2"x 0.131"); OR 8d DEFORMED (2 1/2"x 0.131")	6	12
38. 1 1/8" - 1 1/4"	10d COMMON (3"x 0.148"); OR 8d DEFORMED (2 1/2"x 0.131")	6	12
PANEL SIDING TO FRAMING			
39. 1/2" OR LESS	6d CORROSION-RESISTANT SIDING (1 7/8"x 0.106"); OR 6d CORROSION-RESISTANT CASING (2"x 0.099")	6	12
40. 5/8"	8d CORROSION-RESISTANT SIDING (2 3/8"x 0.128"); OR 8d CORROSION-RESISTANT CASING (2 1/2"x 0.113")	6	12
INTERIOR PANELING			
41. 1/4"	4d CASING (1 1/2"x 0.080"); OR 4d FINISH (1 1/2"x 0.072")	6	12
42. 3/8"	6d CASING (2"x 0.099"); OR 6d FINISH (PANEL SUPPORTS AT 24")	6	12

FOR SI: 1 INCH = 25.4 mm

a. NAILS SPACED AT 6 INCHES AT INTERMEDIATE SUPPORTS WHERE SPANS ARE 48 INCHES OR MORE. FOR NAILING OF WOOD STRUCTURAL PANEL AND PARTICLEBOARD DIAPHRAGMS AND SHEAR WALLS, REFER TO SECTION 2305. NAILS FOR WALL SHEATHING ARE PERMITTED TO BE COMMON, BOX OR CASING.

b. SPACING SHALL BE 6 INCHES ON CENTER ON THE EDGES AND 12 INCHES ON CENTER AT INTERMEDIATE SUPPORTS FOR NONSTRUCTURAL APPLICATIONS. PANEL SUPPORTS AT 16 INCHES (20 INCHES IF STRENGTH AXIS IN THE LONG DIRECTION OF THE PANEL, UNLESS OTHERWISE MARKED).

c. WHERE A RAFTER IS FASTENED TO AN ADJACENT PARALLEL CEILING JOIST IN ACCORDANCE WITH THIS SCHEDULE AND THE CEILING JOIST IS FASTENED TO THE TOP PLATE IN ACCORDANCE WITH THIS SCHEDULE, THE NUMBER OF TOENAILS IN THE RAFTER SHALL BE PERMITTED TO BE REDUCED BY ONE NAIL.

d. COMMON NAILS SHALL BE USED.

e. STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16 INCH.

TABLE NO. 2304.10.1 :FASTENING SCHEDULE

DESCRIPTION OF BUILDING ELEMENTS	NUMBER & TYPE OF FASTENER[d,e]	SPACING & LOCATION
	WALL	
1. BLOCKING BETWEEN CEILING JOISTS, RAFTERS, OR TRUSSES TO TOP PLATE OR OTHER FRAMING BELOW.	3-8d COMMON (2 1/2"x 0.131"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	EACH END, TOENAIL
BLOCKING BETWEEN RAFTERS OR TRUSS NOT AT THE WALL TOP PLATE, TO RAFTER OR TRUSS.	2-8d COMMON (2 1/2"x 0.131") 2-3"x 0.131" NAILS 2-3" 14 GAGE STAPLES	EACH END, TOENAIL
	2-16d COMMON (3 1/2"x 0.162") 3-3"x 0.131" NAILS 3-3" 14 GAGE STAPLES	END NAIL
FLAT BLOCKING TO TRUSS AND WEB FILLER	16d COMMON (3 1/2"x 0.162") @ 6" O.C. 3"x 0.131" NAILS @ 6" O.C. 3" 14 GAGE STAPLES @ 6" O.C.	FACE NAIL
2. CEILING JOIST TO TOP PLATE	3-8d COMMON (2 1/2"x 0.131"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	EACH JOIST, TOENAIL
3. CEILING JOIST NOT ATTACHED TO PARALLEL RAFTER LAPS OVER PARTITIONS (NO THRUST) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	3-16d COMMON (2 1/2"x 0.162"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
4. CEILING JOIST ATTACHED TO PARALLEL RAFTER (HEEL JOINT) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	PER TABLE 2308.7.3.1	FACE NAIL
5. COLLAR TIE TO RAFTER	3-10d COMMON (3"x 0.148"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL[c]
6. RAFTER OF ROOF TRUSS TO TOP PLATE (SEE SECTION 2308.7.5, TABLE 2308.7.5)	3-10d COMMON (3"x 0.148"); OR 3-16d BOX (3 1/2"x 0.135"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
7. ROOF RAFTERS TO RIDGE VALLEY OR HIP RAFTERS; OR ROOF RAFTER TO 2-INCH RIDGE BEAM	2-16d COMMON (3 1/2"x 0.162"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
	3-10d COMMON (3 1/2"x 0.148"); OR 3-16d BOX (3 1/2"x 0.135"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL
8. STUD TO STUD (NOT AT BRACED WALL PANELS)	16d COMMON (3 1/2"x 0.162");	24" O.C. FACE NAIL
	10d BOX (3"x 0.128"); OR 3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	16" O.C. FACE NAIL
9. STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16d BOX (3 1/2"x 0.162"); OR	16" O.C. FACE NAIL
	16d BOX (3 1/2"x 0.135"); OR	12" O.C. FACE NAIL
	3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	12" O.C. FACE NAIL
10. BUILT-UP HEADER (2" TO 2" HEADER)	16d COMMON (3 1/2"x 0.162"); OR	16" O.C. EACH EDGE, FACE NAIL
	16d BOX (3 1/2"x 0.135")	12" O.C. EACH EDGE, FACE NAIL
11. CONTINUOUS HEADER TO STUD	4-8d COMMON (2 1/2"x 0.131"); OR 4-10d BOX (3"x 0.128")	TOENAIL
12. TOP PLATE TO TOP PLATE	16d COMMON (3 1/2"x 0.162");	16" O.C. FACE NAIL
	10d BOX (3"x 0.128"); OR 3"x 0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	12" O.C. FACE NAIL
13. TOP PLATE TO TOP PLATE, AT END JOINTS	8-16d COMMON (3 1/2"x 0.162"); OR 12-10d BOX (3"x 0.128"); OR 12-3"x 0.131" NAILS; OR 12-3" 14 GAGE STAPLES, 7/16" CROWN	EACH SIDE OF END JOINT, FACE NAIL (MINIMUM 24" LAP SPLICELENGTH EACH SIDE OF END JOINT)
14. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS)	16d COMMON (3 1/2"x 0.162");	16" O.C. FACE NAIL
	16d BOX (3 1/2"x 0.135"); OR 3"x 0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	12" O.C. FACE NAIL
15. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING AT BRACED WALL PANELS	2-16d COMMON (3 1/2"x 0.162"); OR 3-10d BOX (3 1/2"x 0.135"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	16" O.C. FACE NAIL
16. STUD TO TOP OF BOTTOM PLATE	2-8d COMMON (2 1/2"x 0.131"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN; OR	TOENAIL
	2-16d COMMON (3 1/2"x 0.162"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
17. TOP OR BOTTOM PLATE TO STUD	2-16d COMMON (3 1/2"x 0.162"); OR 3-10d BOX (3 1/2"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
18. TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS	2-16d COMMON (3 1/2"x 0.162"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
19. 1" BRACE TO EACH STUD AND PLATE	2-8d COMMON (2 1/2"x 0.131"); OR 2-10d BOX (3"x 0.128"); OR 2-3"x 0.131" NAILS; OR 2-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
20. 1" x 6" SHEATHING TO EACH BEARING	2-8d COMMON (2 1/2"x 0.131"); OR 2-10d BOX (3"x 0.128")	FACE NAIL
21. 1" x 8" AND WIDER SHEATHING TO EACH BEARING	3-8d COMMON (2 1/2"x 0.131"); OR 3-10d BOX (3"x 0.128")	FACE NAIL
	FLOOR	
22. JOIST TO SILL, TOP PLATE, OR GIRDER	3-8d COMMON (2 1/2"x 0.131"); OR FLOOR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL
23. RIM JOIST, BAND JOIST, OR BLOCKING TO TOP PLATE, SILL OR OTHER FRAMING BELOW	8d COMMON (2 1/2"x 0.131"); OR 10d BOX (3"x 0.128"); OR 3"x 0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	6" O.C., TOENAIL
24. 1" x 6" SUBFLOOR OR LESS TO EACH JOIST	2-8d COMMON (2 1/2"x 0.131"); OR 2-10d BOX (3"x 0.128")	FACE NAIL
25. 2" SUBFLOOR TO JOIST OR GIRDER	2-16d COMMON (3 1/2"x 0.162")	FACE NAIL
26. 2" PLANKS (PLANK & BEAM - FLOOR & ROOF)	2-16d COMMON (3 1/2"x 0.162")	EACH BEARING, FACE NAIL
27. BUILT-UP GIRDERS AND BEAMS, 2" LUMBER LAYERS	20d COMMON (4"x 0.192")	32" O.C., FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
	10d BOX (3"x 0.128"); OR 3"x 0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	24" O.C., FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
	AND: 2-20d COMMON (4"x 0.192"); OR 3-10d BOX (3"x 0.128"); OR 3-3"x 0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	ENDS AND AT EACH SPLICE, FACE NAIL
28. LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	3-16d COMMON (3 1/2"x 0.162"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	EACH JOIST OR RAFTER, FACE NAIL
29. JOIST TO BAND JOIST OR RIM JOIST	3-16d COMMON (3 1/2"x 0.162"); OR 4-10d BOX (3"x 0.128"); OR 4-3"x 0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
30. BRIDGING OR BLOCKING TO JOIST, RAFTER TO TRUSS	2-8d COMMON (2 1/2"x 0.131"); OR 2-10d BOX (3"x 0.128"); OR 2-3"x 0.131" NAILS; OR 2-3" 14 GAGE STAPLES, 7/16" CROWN	EACH END, TOENAIL

(CONTINUED)

STRUCTURAL NOTES

DESIGN CRITERIA

1. VERTICAL LOADS:
   a) DEAD LOADS:
      ROOF 15 PSF
      FLOOR 15 PSF
   b) LIVE LOADS:(REDUCIBLE UNLESS NOTED OTHERWISE)
      ROOF 20 PSF
      FLOOR 40 PSF
2. LATERAL LOADS:
   a) EARTHQUAKE DESIGN DATA:

V= 0.24 W (ASD) (INCLUDES ρ		= 1.3)
TOTAL WEIGHT OF BUILDING		= 32.7 KIPS
SEISMIC IMPORTANCE FACTOR		= 1
RISK CATEGORY		= II
MAPPED SPECTRAL RESPONSE ACCEL.	Ss	= 2.132g
	S1	= 0.799g
SITE CLASS		= D
SPECTRAL RESPONSE COEFF.	SDS	= 1.705g
	SD1	= 0.906g
SEISMIC DESIGN CATEGORY		= D
RESPONSE MODIFICATION FACTOR PLYWOOD SHEARWALLS	R	= 6.5
SEISMIC RESPONSE COEFF.	Cs	= 0.26

ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE

   b) WIND:

BASIC WIND SPEED	= 95 MPH
SITE EXPOSURE	= B
WIND IMPORTANCE FACTOR	= 1.00
INTERNAL PRESSURE COEFFICIENT	= +0.18 & -0.18

STRUCTURAL WOOD

1. ALL FRAMING LUMBER SHALL BE DOUGLAS FIR-LARCH GRADE MARKED BY A RECOGNIZED GRADING AGENCY (WCLIB & WWPA)

JOISTS & PLANKS:	NO. 2
BEAMS AND STRINGERS:	NO. 1
POST AND TIMBERS:	NO. 1
GLUED LAMINATED TIMBERS:	COMBINATION 24F-V8
PARALLAM, PSL: 2.0E (2900 Fb)	
VERTICAL STUDS:	
2x4 STUDS, 8'-0" LONG:	STUD GRADE
2x4 STUDS, 8'-1" TO 14'-0":	NO. 1
2x6 STUDS:	NO. 2
ALL OTHER LUMBER:	"NO. 1 STRUCTURAL" LIGHT FRAMING

2. ALL SILL PLATES RESTING ON CONCRETE OR MASONRY, WHICH IS IN CONTACT WITH EARTH OR RESTING ON FOUNDATIONS SHALL BE PRESSURE TREATED DOUGLAS FIR (P.T.D.F.). ALL FASTENERS SUCH AS NAILS, BOLTS, SCREWS, ANCHOR BOLTS, ETC. ATTACHING P.T.D.F. OR FIRE-RETARDANT TREATED WOOD SHALL BE HOT-DIPPED ZINC COATED GALVANIZED OR STAINLESS STEEL(ASTM A153).
3. WHERE STUD PARTITIONS JOIN CONCRETE OR MASONRY WALLS THE END STUD SHALL BE ANCHORED THERETO WITH 1/2"(BOLTS NEAR THE TOP & BOTTOM AND AT EACH ROW OF FIRE BLOCKING. SUCH BOLTS SHALL BE EMBEDDED IN THE WALL NOT LESS THAN 2/3 OF THE WALL THICKNESS OR 8" MAX.)
4. CUTTING, NOTCHING, OR BORING OF STUDS SHALL BE PERMITTED ONLY AS DETAILED OR APPROVED BY ENGINEER AND/OR PER CBC SECTION 2308.5.9 OR 2308.5.10.
   CUTTING, NOTCHING, OR BORING OF JOIST SHALL BE PERMITTED ONLY AS DETAILED OR APPROVED BY ENGINEER AND/OR PER CBC SECTION 2308.4.2.4 OR 2308.7.4
5. ALL NAILING SHALL CONFORM TO CBC TABLE 2304.10.1, AND SHALL BE COMMOM NAILS, UNLESS NOTED OTHERWISE ON PLANS AND DETAILS.
6. ALL BOLT HEADS AND NUTS BEARING ON WOOD SHALL HAVE STANDARD CUT WASHERS. HOLES FOR BOLTS SHALL BE BORED 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER. BOLTS IN WOOD SHALL NOT BE LESS THAN 7 DIAMETERS FROM THE END AND 4 DIAMETERS FROM THE EDGE OF THE MEMBER.
7. TOP PLATES OF ALL WOOD STUD WALLS TO BE 2-2x MINIMUM (SAME WIDTH AS STUDS), LAP 48" MIN. WITH NOT LESS THAN 6-16d NAILS AT EACH LAP AND NOT MORE THAN 12" BETWEEN NAILS.
8. PLYWOOD SHALL BE APA STRUCTURAL I RATED SHEATHING WITH EXTERIOR GLUE.
9. PROVIDE DOUBLED JOISTS UNDER ALL PARALLEL PARTITIONS.
10. ALL LAG SCREWS TO BE PREDRILLED, DRILL DIAMETER TO BE 60 PERCENT OF SHANK DIAMETER.
11. RE-TIGHTEN ALL ANCHOR BOLTS JUST BEFORE CLOSING IN.
12. ALL FRAMING ANCHORS, POST CAPS, BASES, HANGERS, STRAPS, ETC. SHALL BE AS MANUFACTURED BY "SIMPSON COMPANY" OR ENGINEER APPROVED EQUAL.
13. PROVIDE BLOCKING OR BRIDGING PER 2015 NDS SECTION 4.4.1 & 2308.4.6 2019 CBC SECTION 2308.4.2.3.
14. MOISTURE CONTENT OF WOOD AT TIME OF PLACING SHALL NOT EXCEED 19 PERCENT.
15. MACHINE BOLTS AND ANCHOR BOLTS SHALL BE GRADE-A CONFORMING TO ASTM A307. NUTS FOR MACHINE BOLTS AND ANCHOR BOLTS SHALL CONFORM TO ASTM A563, HEX GRADE-A. THREADED RODS SHALL CONFORM TO ASTM A36. ROUND WASHERS SHALL CONFORM TO ASTM F436 AND SQUARE PLATE WASHERS SHALL CONFORM TO ASTM A36.

SPECIAL INSPECTION

1. SPECIAL INSPECTION SHALL MEET THE REQUIREMENTS OF CBC SECTION 1704.
2. SPECIAL INSPECTORS SHALL:
   A) BE UNDER THE SUPERVISION OF A CALIFORNIA REGISTERED CIVIL ENGINEER.
   B) OBSERVE THE WORK ASSIGNED FOR CONFORMANCE WITH THE APPROVED DRAWINGS AND SPECIFICATIONS.
   C) FURNISH INSPECTION REPORTS TO THE ENGINEER AND BUILDING DEPARTMENT. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION; THEN IF NOT CORRECTED, TO THE ENGINEER AND BUILDING DEPARTMENT.
   D) SUBMIT TO THE ENGINEER AND BUILDING DEPARTMENT A FINAL REPORT, SIGNED BY A CALIFORNIA REGISTERED CIVIL ENGINEER, STATING THAT THE WORK WAS IN CONFORMANCE WITH THE APPROVED DRAWINGS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CBC.
3. INSPECTION NOTES:
   A) CONSTRUCTION INSPECTIONS LISTED ARE IN ADDITION TO THE CALLED INSPECTIONS REQUIRED BY CBC SECTION 109,APPENDIX CHAPTER 1. SPECIAL INSPECTION IS NOT A SUBSTITUTE FOR INSPECTION BY A BUILDING OFFICIAL. SPECIALLY INSPECTED WORK WHICH IS INSTALLED OR COVERED WITHOUT APPROVAL OF THE BUILDING OFFICIAL IS SUBJECT TO REMOVAL OR EXPOSURE.
   B) CONTINUOUS INSPECTION IS ALWAYS REQUIRED DURING PERFORMANCE OF THE WORK UNLESS SPECIFICALLY NOTED.
   C) SPECIAL INSPECTORS MUST BE CERTIFIED BY THE BUILDING DEPARTMENT TO PERFORM THE TYPES OF INSPECTIONS SPECIFIED.
   D) IT IS THE RESPONSIBILITY OF THE OWNER TO INFORM THE SPECIAL INSPECTOR OR INSPECTION AGENCY AT LEAST ONE WORKING DAY BEFORE PERFORMING ANY WORK THAT REQUIRES SPECIAL INSPECTION. ALL WORK PERFORMED WITHOUT REQUIRED SPECIAL INSPECTION IS SUBJECT TO REMOVAL.

SPECIAL INSPECTION REQUIRED

I. ANCHORS, ANCHOR BOLTS, & DOWELS
   1. VERIFY MANUFACTURERS INSTALLATION REQUIREMENTS (AND TESTING) OF EPOXIED DOWELS IN CONCRETE AT (HOLDOWNS) (EXISTING FOOTINGS) (CONCRETE REPAIRS).
   2. VERIFY MANUFACTURERS INSTALLATION REQUIREMENTS OF WEDGE AND SLEEVE ANCHORS (WHERE INDICATED).

II. STRUCTURAL WOOD
   1. VERIFY NAILING, BOLTING,ANCHORING AND OTHER FASTENING OF COMPONENTS OF: SHEARWALLS (w/E.N.<6"O.C.), WOOD DIAPHRAGMS, DRAG STRUCTS, SHEAR PANELS, AND HOLD-DOWNS (CONTINUOUS INSPECTION NOT REQUIRED).

GENERAL

1. NOTES AND DETAILS ON THE STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER THESE STANDARD STRUCTURAL NOTES.DETAILS NOTED AS "TYPICAL"SHALL BE USED WHENEVER APPLICABLE. REFER TO SPECIFICATIONS FOR INFORMATION NOT COVERED BY THESE NOTES OR DRAWINGS.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS BEFORE STARTING WORK, AND THE ENGINEER/ARCHITECT SHALL BE IMMEDIATELY NOTIFIED, IN WRITING, OF ANY DISCREPANCIES. IN NO CASE SHALL DIMENSIONS BE SCALED FROM PLANS, SECTIONS, OR DETAILS ON THE STRUCTURAL DRAWINGS.
3. ALL OMISSIONS AND CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE STRUCTURAL DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF, AND RESOLVED WITH, THE ENGINEER BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.
4. WHERE A CONSTRUCTION DETAIL IS NOT SPECIFICALLY SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
5. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF UTILITY SERVICES IN THE AREA TO BE EXCAVATED, BEFORE BEGINNING EXCAVATION.
6. NO PIPES, DUCTS, SLEEVES, CHASES, ETC. SHALL BE PLACED IN OR THRU SLABS, BEAMS, OR WALLS, NOR SHALL ANY STRUCTURAL MEMBER BE CUT FOR PIPES, DUCTS, ETC. EXCEPT AS INDICATED ON THE STRUCTURAL DRAWINGS. THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FOR INSTALLATION OF ANY ADDITIONAL PIPES, DUCTS, ETC.
7. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE 2019 CBC.
8. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
9. RETAIN A CALIFORNIA REGISTERED CIVIL ENGINEER TO DESIGN ALL TEMPORARY BRACING, SHORING, AND SUPPORT REQUIRED DURING CONSTRUCTION.
10. INCLUDE ENGINEERING FEES, ENGINEERING DESIGN TIME AND BUILDING DEPARTMENT APPROVAL TIME IN THE COST OF PROPOSED MATERIAL ALTERNATES. CONTACT ENGINEER FOR FEE AMOUNT. SUBMIT MATERIAL ALTERNATE FOR REVIEW BEFORE CONSTRUCTION.

FOUNDATION

1. SOILS INFORMATION:
   SOIL DESIGN PRESSURES:
   ALLOWABLE BEARING PRESSURE: 1500 PSF (1/3 INCREASE FOR WIND OR SEISMIC)
   LATERAL EQUIVALENT FLUID PRESSURE: 60 PCF (CANT.) & 100 PCF (RESTRAINED)
   LATERAL BEARING PRESSURE: 100 PCF
   FRICTIONAL FACTOR: 0.25
   BOTTOM OF FOOTING SHALL BE AT LEAST 24" AT EXTERIOR CONDITION & 18" AT INTERIOR CONDITION BELOW LOWEST ADJACENT FINISHED GRADE INTO NATURAL GRADE OR ENGINEERED FILL.
2. REFER TO AND CHECK WITH ARCHITECTURAL DRAWINGS FOR VARIOUS FLOOR SLOPES,DROPPED SLABS, DEPRESSIONS, CURBS, STEPS, WALKS, DRAINS, DEPRESSED FLOOR,ETC.& DIMENSIONS NOT SHOWN.
3. NO CONCRETE SHALL BE POURED IN ANY FOUNDATION UNTIL EXCAVATION HAS BEEN INSPECTED, EXCAVATION SHALL BE KEPT FREE OF LOOSE MATERIAL AND STANDING WATER.
4. ALL SLEEVES THROUGH FOUNDATION WALLS AND UNDER FOOTING TO BE INSTALLED PRIOR TO FOUNDATION POUR. SEE DETAIL.
5. NO SLEEVING OF ANY GRADE BEAM WILL BE PERMITTED UNLESS SHOWN ON STRUCTURAL DRAWINGS APPROVED BY THE ENGINEER.
6. THE ENGINEER HAS NO CONTROL OR RESPONSIBILITY FOR THE DESIGN OF TEMPORARY SHORING, SCAFFOLDING, FORMING, UNDERPINNING, ETC., NOT DETAILED ON THESE PLANS.
7. ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING WALLS BEFORE CONCRETE (OR GROUT) HAS ATTAINED FULL DESIGN STRENGTH. CONTRACTOR SHALL BRACE OR PROTECT ALL BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED FULL STRENGTH. CONTRACTOR SHALL PROVIDE FOR DESIGN, PERMITS, AND INSTALLATION OF SUCH BRACING.
8. CONTRACTOR SHALL COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS. NOTIFY STRUCTURAL ENGINEER, PRIOR TO FABRICATION OR ERECTION, WHEN DISCREPANCIES ARE FOUND.

REINFORCED STEEL

1. NO BRICK OR POROUS MATERIAL SHALL BE USED TO SUPPORT FOOTING STEEL OFF THE GROUND. PRECAST CONCRETE DOBIES ARE APPROVED.
2. BAR REINFORCEMENT SHALL BE ASTM A615, GRADE 60.
3. BAR REINFORCEMENT THAT IS TO BE WELDED SHALL BE ASTM A706, GRADE 60. WELDING OF REINFORCING BARS SHALL CONFORM TO AWS D1.4. E90XX ELECTRODES SHALL BE USED. SPECIAL INSPECTION IS REQUIRED FOR ALL FIELD WELDING.
4. SPLICES IN REINFORCING STEEL SHALL LAP AS FOLLOWS, UNLESS NOTED OTHERWISE:
   #3 THROUGH #6 = 45 DIA., #7 THROUGH #11 = 56 DIA.
   HORIZONTAL SPLICES SHALL BE STAGGARD. NONCONTACT SPLICES SHALL NOT BE SPACED TRANSVERSELY FARTHER APART 1/5 THE REQUIRED LAP SPLICE LENGTH, OR 6 INCHES.
5. THE CLEAR DISTANCE BETWEEN PARALLEL BARS SHALL BE FOUR BAR DIAMETERS BUT NO LESS THAN 1 1/2" O.U.N.. IN WALLS AND SLABS OTHER THAN CONCRETE JOIST CONSTRUCTION, REINFORCEMENT SHALL BE SPACED NOT FARTHER APART THAN THREE TIMES THE WALL OR SLAB THICKNESS, NOR 18 INCHES,
6. REINFORCING STEEL SHALL HAVE A PROTECTED CONCRETE COVERING AS FOLLOWS, UNLESS NOTED OTHERWISE.

WALL STEEL BELOW GRADE:	ON DIRT SIDE WHEN POURED AGAINST DIRT	= 3"
	ON DIRT SIDE WHEN FORMED	= 2"
WALL STEEL ABOVE GRADE:	IN ALL OTHER CASES	= 1-1/2"
OTHER ITEMS:	FOOTING PADS	= 3"
	SLABS (ON EARTH)	= 2"
	SLABS (LIGHT WEIGHT CONCRETE)	= 3/4"
	SLABS (HARD ROCK CONCRETE)	= 1"
	JOISTS (SIDES, TOPS & SOFFITS)	= 1"
	COLUMNS (TO MAIN STEEL)	= 2"
	BEAMS, GIRDERS (SIDES, TOPS AND SOFFITS)	= 2"

7. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 AND SHALL BE LAPPED 12 INCHES MINIMUM.
8. ALL WALLS SHALL BE DOWELED TO SUPPORTING FOOTINGS, BEAMS, PADS, ETC., WIT H BARS THE SAME SIZE AND SPACING AS VERTICAL BARS IN THE WALL UNLESS OTHERWISE DETAILED. ANCHORAGE OF DOWELS SHALL BE EQUIVALENT OF A BAR SPLICE.
9. DOWEL REINFORCED SLABS TO WALLS AND OTHER EDGE MEMBERS PER TYPICAL DETAILS.
10. ALL REINFORCING STEEL IS TO BE PLACED IN RELATIVE POSITION SHOWN ON DRAWINGS.NO SPLICES IN ANY REINFORCING WILL BE PERMITTED EXCEPT THOSE SHOWN ON THE STRUCTURAL DRAWINGS.
11. REINFORCING DETAILING, BENDING, AND PLACING SHALL BE IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTES "MANUAL OF STANDARD PRACTICE", LATEST EDITION.
12. ALL REINFORCING STEEL , ANCHOR BOLTS, DOWELS, AND INSERTS SHALL BE WELL SECURED IN POSITION WITH WIRE POSITIONERS BEFORE PLACING CONCRETE OR GROUT. VERTICAL BARS IN MASONRY WALLS SHALL BE TIED IN POSITION AT THE TOP AND BOTTOM AND INTERVALS NOT EXCEEDING 200 BAR DIAMETERS.

REINFORCED CONCRETE

1. CEMENT SHALL CONFORM TO ASTM C150, TYPE II.
2. AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF:

SLAB-ON-GRADE	2500 PSI
CONT. FOOTING	2500 PSI
SPREAD FOOTINGS	2500 PSI
GRADE BEAMS	3000 PSI

   (4" MAX. SLUMP FOR FLATWORK) (WATER/CEMENT RATIO LESS THAN 0.45).
4. ADMIXTURES MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER. ADMIXTURES SHALL COMPLY WITH ASTM C494 & C1017 AND BE OF A TYPE THAT INCREASES THE WORKABILITY OF THE CONCRETE, BUT SHALL NOT BE CONSIDERED TO REDUCE THE SPECIFIED MINIMUM CEMENT CONTENT (CALCIUM CHLORIDE SHALL NOT BE USED).
5. NO CONDUIT PLACED IN A CONCRETE SLAB SHALL HAVE AN OUTSIDE DIAMETER GREATER THAN 1/3 THE THICKNESS OF THE SLAB. NO CONDUIT SHALL BE EMBEDDED IN A SLAB THAT IS LESS THAN 3 1/2" THICK. EXCEPT FOR LOCAL OFFSETS, MINIMUM CLEAR DISTANCE BETWEEN CONDIUTS SHALL BE THREE DIAMETERS ON CENTER. (EXCEPT IF THE CONDUIT IS PASSING THROUGH).
6. PROJECTING CORNERS OF SLABS, BEAMS, WALLS, COLUMNS, ETC. SHALL BE FORMED WITH 3/4" CHAMFERS.
7. REFER TO DRAWINGS OF OTHER DISCIPLINES FOR MOLDS, GROOVES, CLIPS, ORNAMENTS, OR GROUNDS REQUIRED TO BE CAST INTO CONCRETE.
8. ALL SLABS ON GRADE SHALL HAVE "CONTROL JOINTS" (SEE DETAIL) INSTALLED TO PROVIDE APPROXIMATELY 15 FOOT SQUARES UNLESS DETAILED OTHERWISE ON THE PLANS. WHERE CONCRETE POURS ARE STOPPED, THE JOINT SHALL BE FORMED PER TYPICAL CONSTRUCTION JOINT DETAIL.

REVISION

MARK	DATE	REVISIONS
1		
2		
3		

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CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT DISCREPANCIES TO THE ENGINEER. ALL CONSTRUCTION SHALL CONFORM TO THE C.B.C.

TITLE

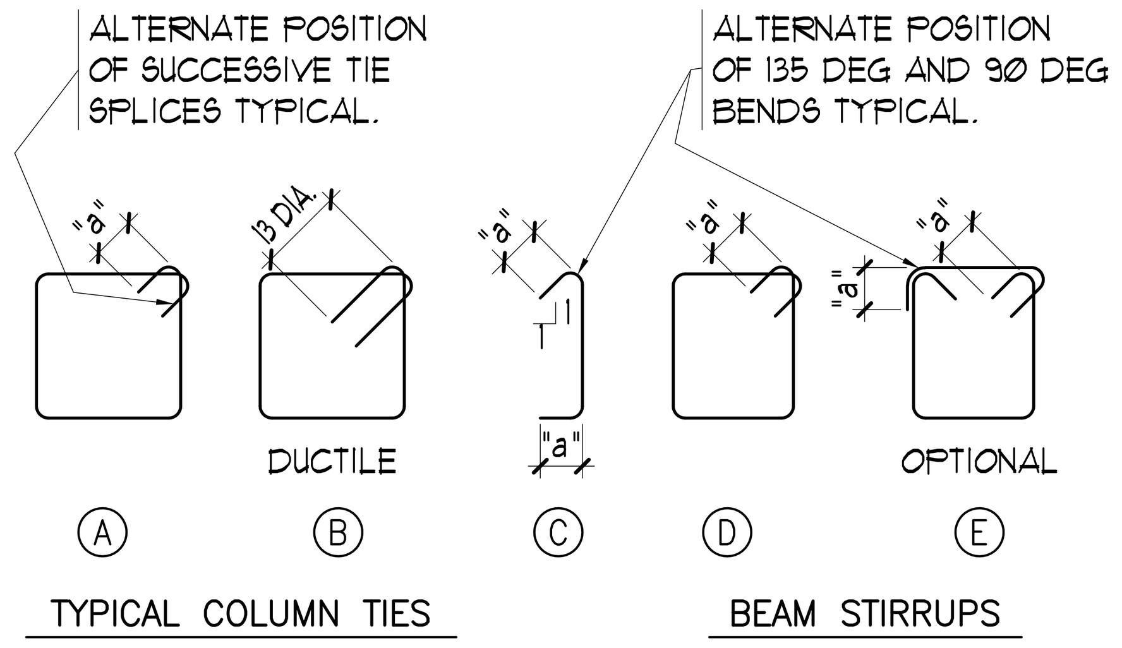
STRUCTURAL NOTES

REGISTERED PROFESSIONAL ENGINEER
EDUARDO J. CARRILLO
C77737
EXP. 6-30-23
CIVIL
STATE OF CALIFORNIA
SIGNED: 9/29/22

JOB #:	DRAWN:
22-251	D.D. / J.K.
DATE:	CHECKED:
Sep. 29, 22	E.C.

S1.0

NOTE: FOR SIZE AND SPACING OF ALL TIES AND STIRRUPS, REFER TO SCHEDULE AND/OR DETAILS TYPICAL.

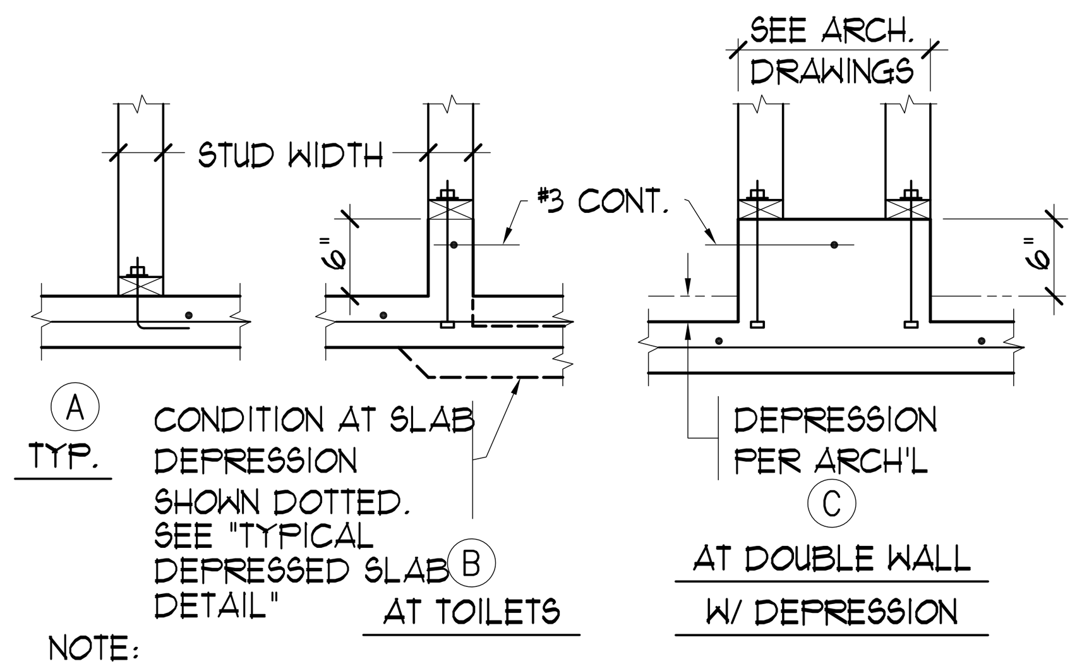


DIMENSION "a" FOR #3 TIES = 5"
FOR #4 TIES = 5½"
FOR #5 TIES = 6"

TYPICAL REINF. TIES AND STIRRUPS

S1-119

4 DETAIL

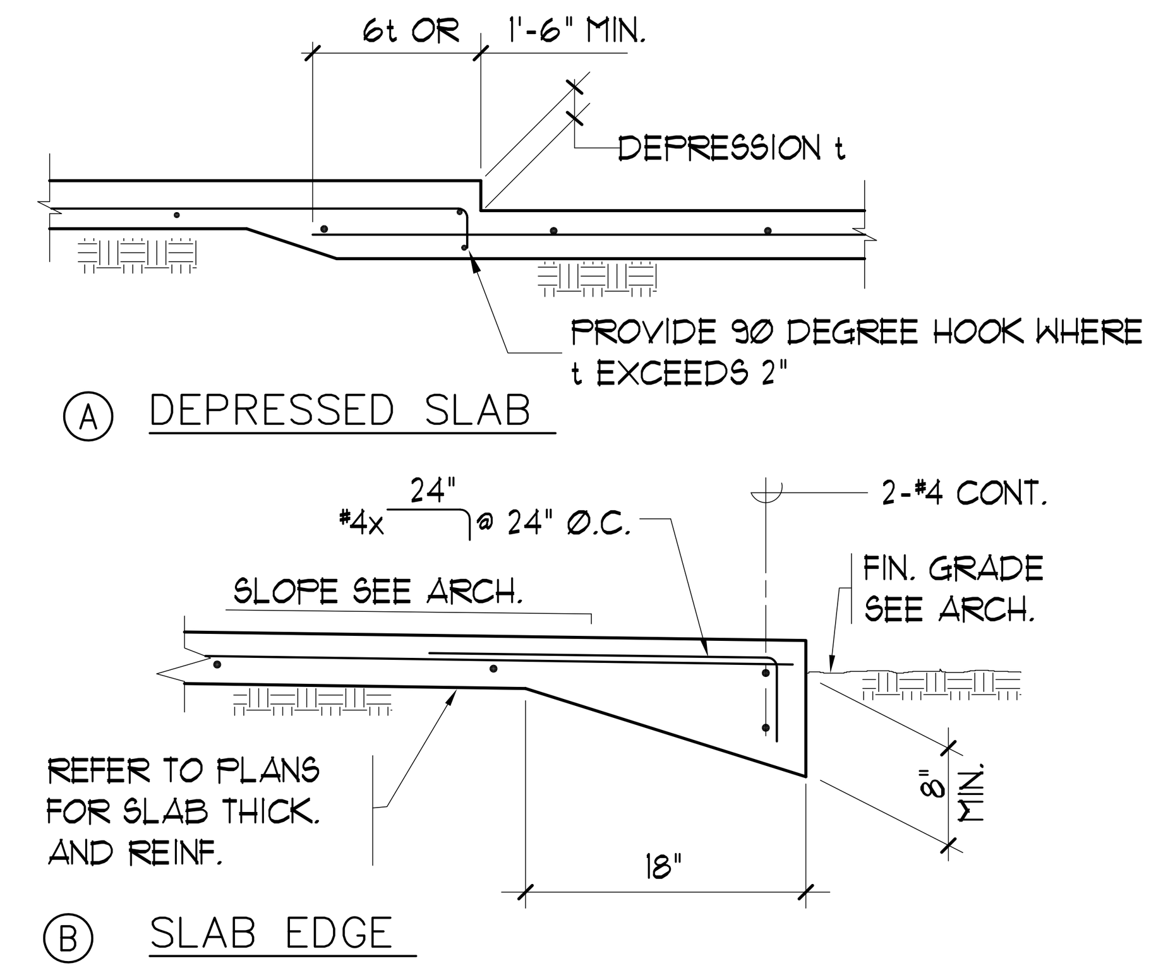


NOTE:
ALL SILLS TO BE 2x DOUGLAS FIR (TREATED). SILL BOLTS SHALL BE NOT LESS THAN ½" DIA.x12" @ 4'-0"o.c.
ALTERNATE:
IN LIEU OF BOLTS SHOWN, 0.145" DIA.x 3" LONG POWDER DRIVEN PINS WITH 1⅜" WASHERS @ 32"o.c. POWDER DRIVEN PINS MUST PENETRATE CONC. 1¼" MIN. USE LOW VELOCITY "HILTI" OR EQUAL. POWDER DRIVEN PINS NOT PERMITTED WHEN PARTITIONS REST ON CURBS.

NON-BEARING PARTITION ANCHORAGE AT SILL

S1-104

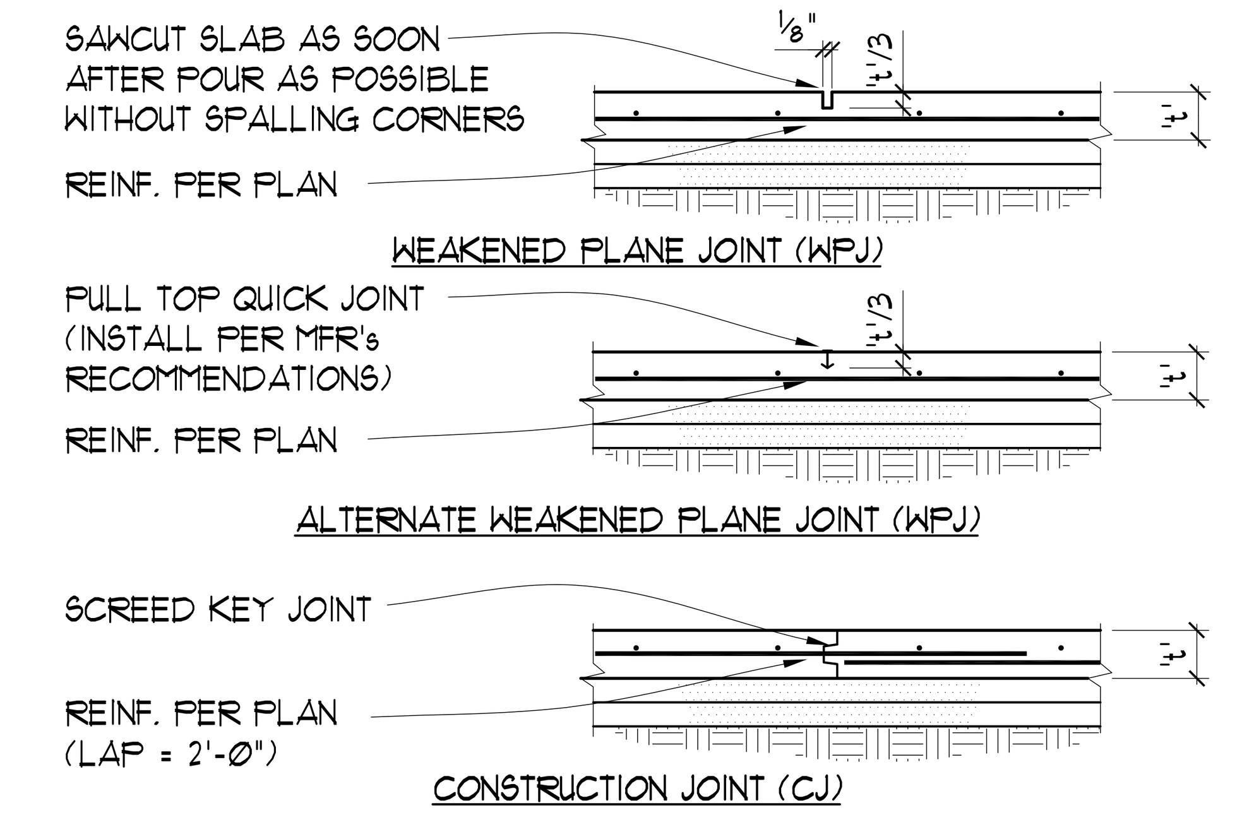
3 DETAIL



TYPICAL DEPRESSED SLAB AND SLAB EDGE

S1-100

2 DETAIL

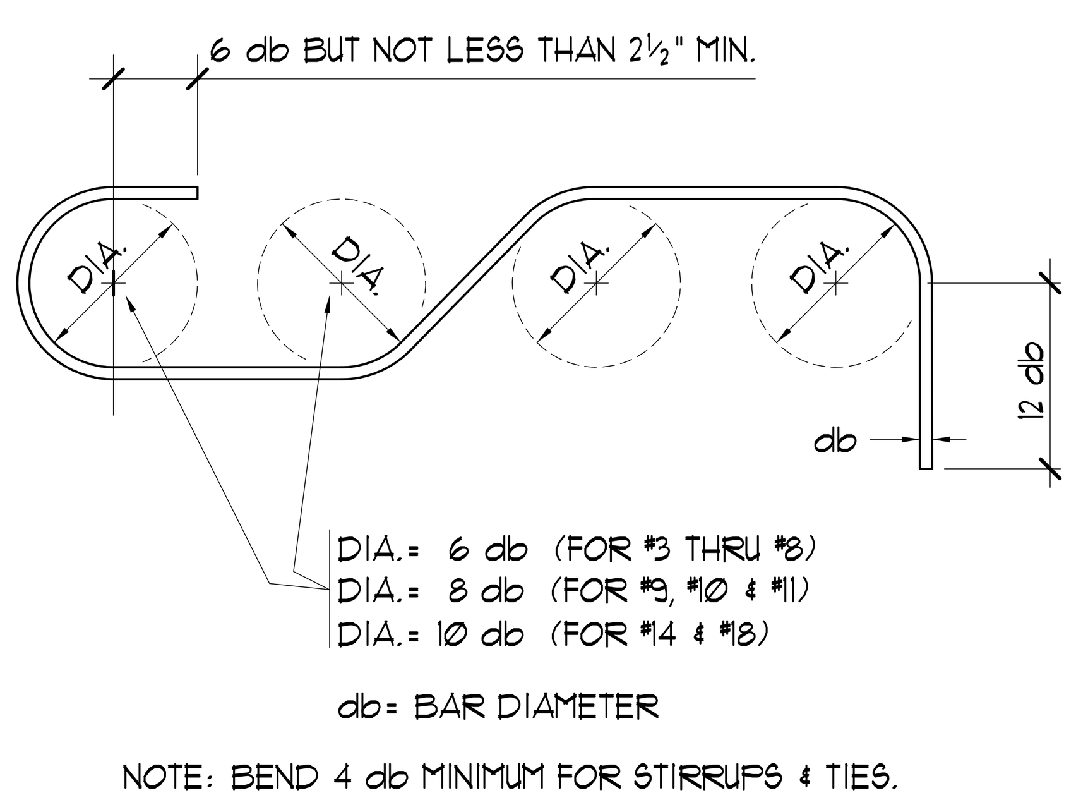


NOTES:
1. JOINT SPACING SHALL NOT EXCEED 24 TIMES THE SLAB THICKNESS IN BOTH DIRECTIONS. PANELS BOUNDED BY SAWCUTS SHALL BE AS CLOSE TO SQUARE AS POSSIBLE, WITH A 1½:1 MAXIMUM ASPECT RATIO.
2. CURING COMPOUND SHALL BE APPLIED IN TWO COATS IN OPPOSITE DIRECTIONS WITH AN EXTRA APPLICATION ON ALL SAW CUT JOINTS. COMPOUND TO BE APPLIED WITHIN TWO HOURS OF FINISHING OPERATIONS.
3. UNDERGROUND UTILITIES, PIPING, CONDUIT, ETC. SHALL BE PLACED BELOW THE SAND. PIPING AND CONDUITS SHALL NOT BE PLACE IN THE PLANE OF THE SLAB.

SLAB-ON-GRADE JOINTS

S1-29

1 DETAIL



db= BAR DIAMETER

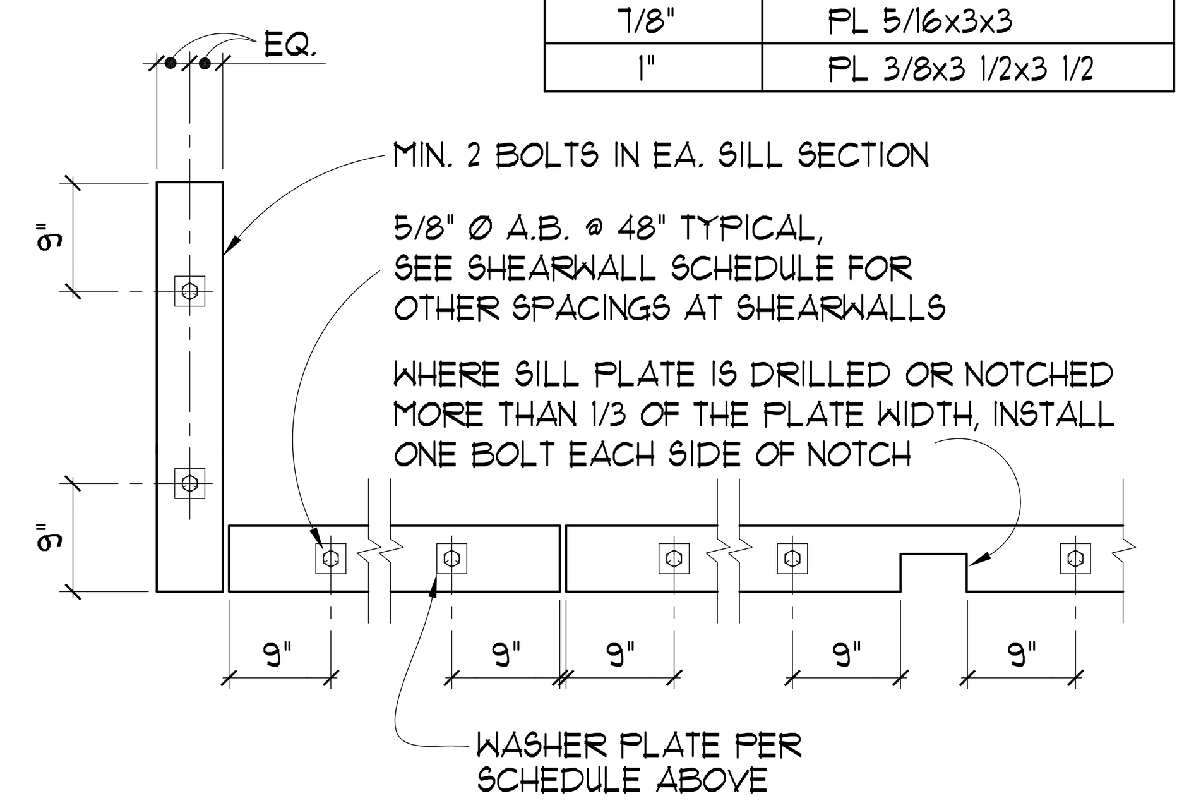
NOTE: BEND 4 db MINIMUM FOR STIRRUPS & TIES.

STANDARD REINF. HOOKS AND BENDS

S1-118

8 DETAIL

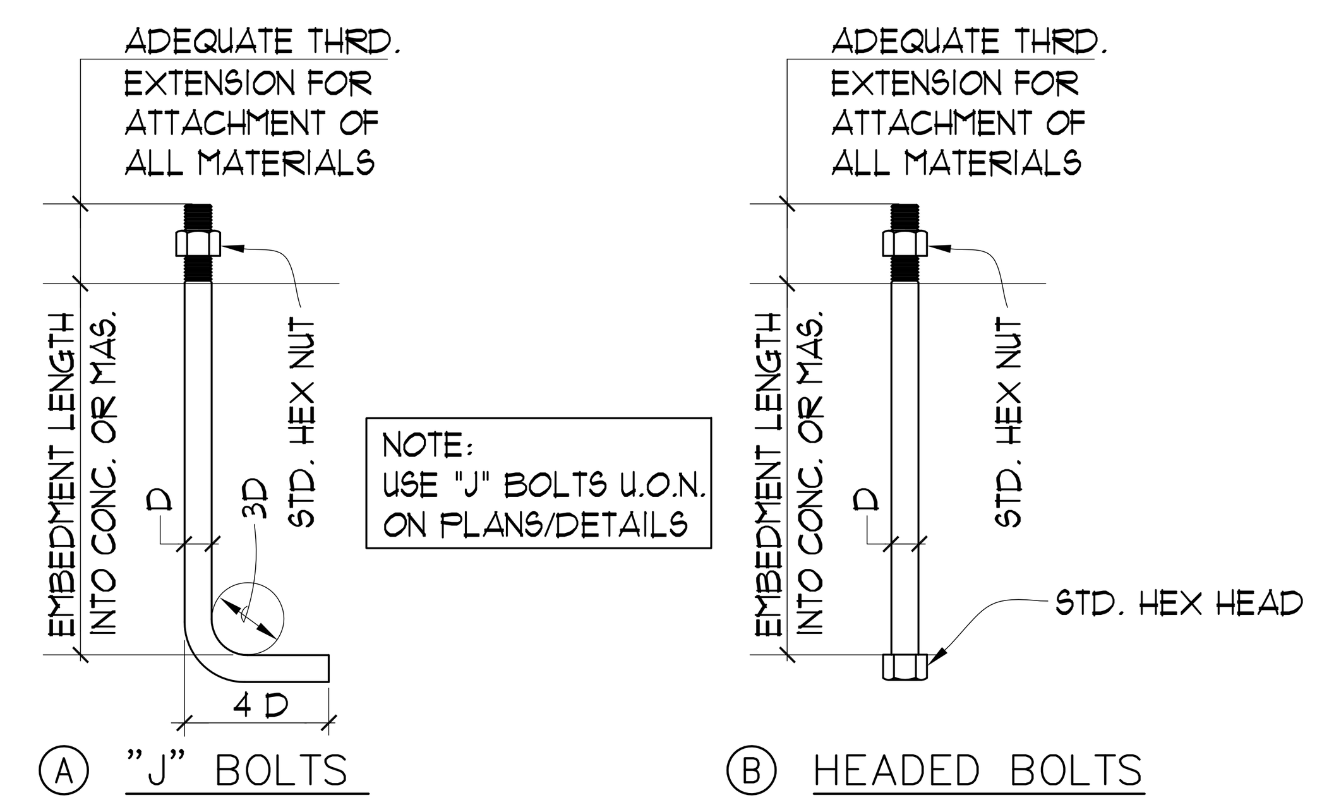
BOLT SIZE	PLATE WASHER SIZE
1/2"	PL .229x3x3
5/8"	PL .229x3x3
3/4"	PL .229x3x3
7/8"	PL 5/16x3x3
1"	PL 3/8x3 1/2x3 1/2



TYP. SILL PLATE BOLTING

S1-70

7 DETAIL

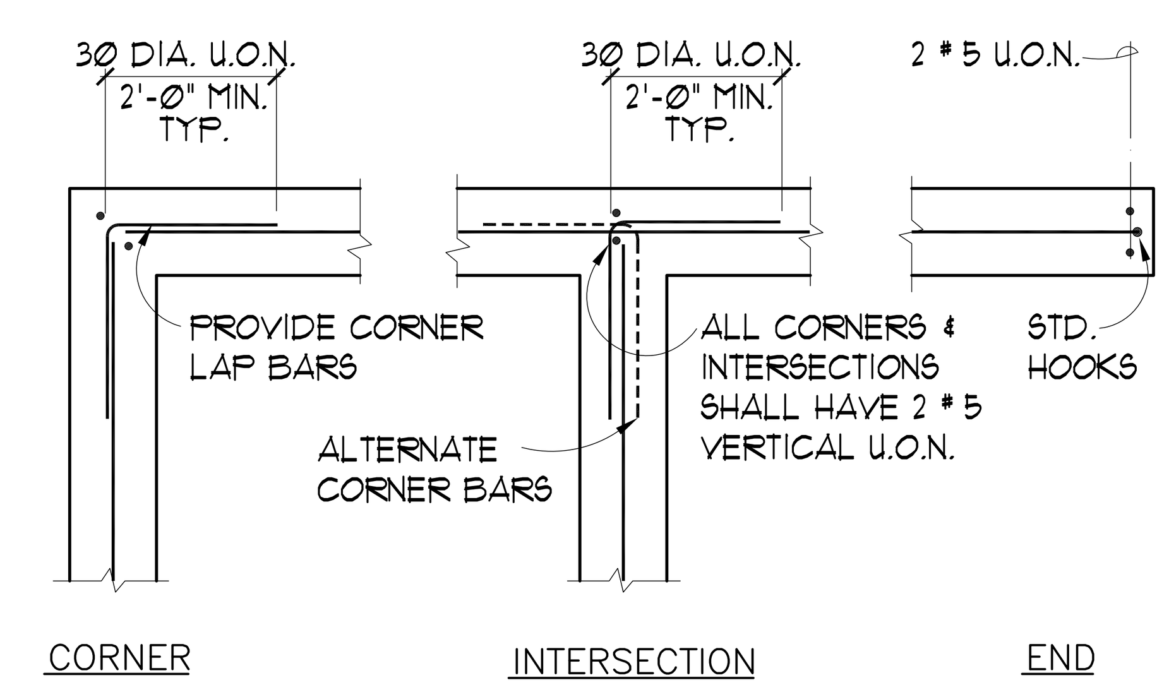


BOLT DIA. "D"	MINIMUM EMBEDMENT	
	VERT. ANCHOR BOLTS	HORIZ. ANCHOR BOLTS
1/2"	7"	5"
5/8"	7"	5"
3/4"	7"	5"
7/8"	8"	6"
1"	9"	7"
1 1/8"	10"	8"

TYPICAL ANCHOR BOLTS

S1-09

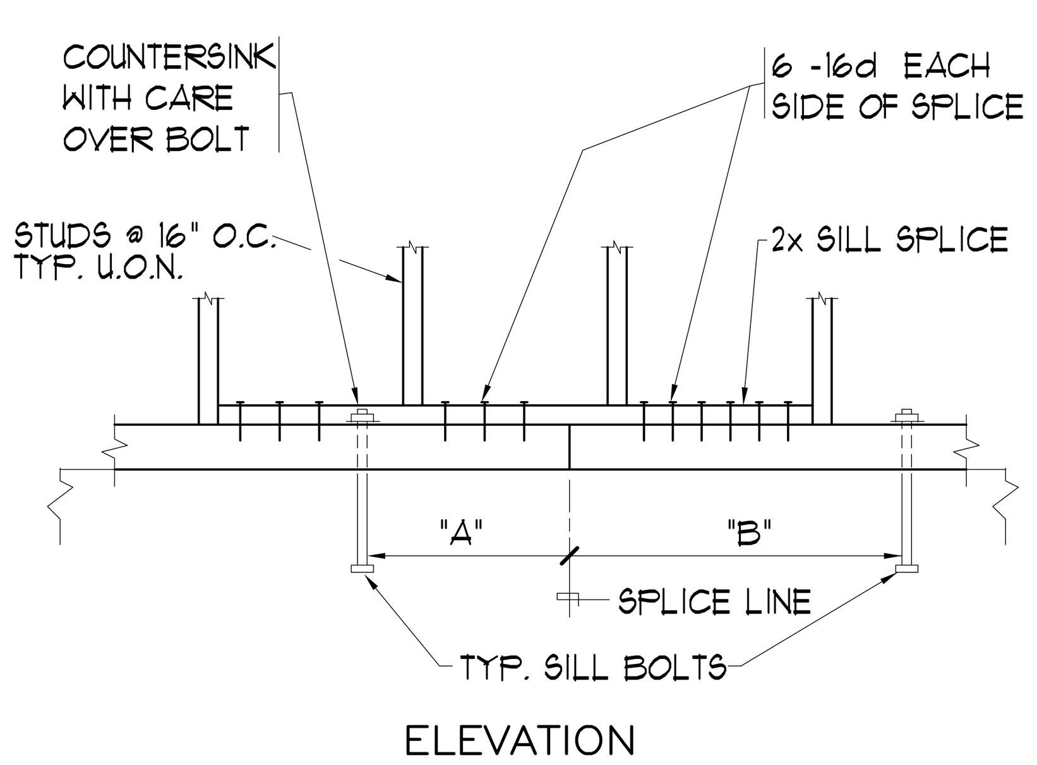
6 DETAIL



TYP CONCRETE INTERSECTIONS
(HORIZONTAL REINF. AT CENTER)

S1-23

5 DETAIL

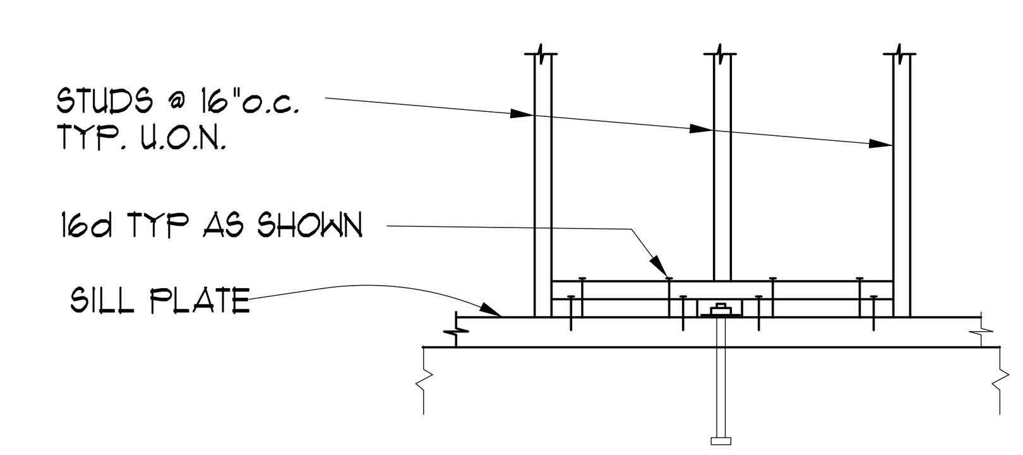


NOTE:
THIS DETAIL REQUIRED WHEN EITHER "A" OR "B" IS GREATER THAN 9".

SPECIAL COND. AT SILL SPLICE

S1-113

12 DETAIL

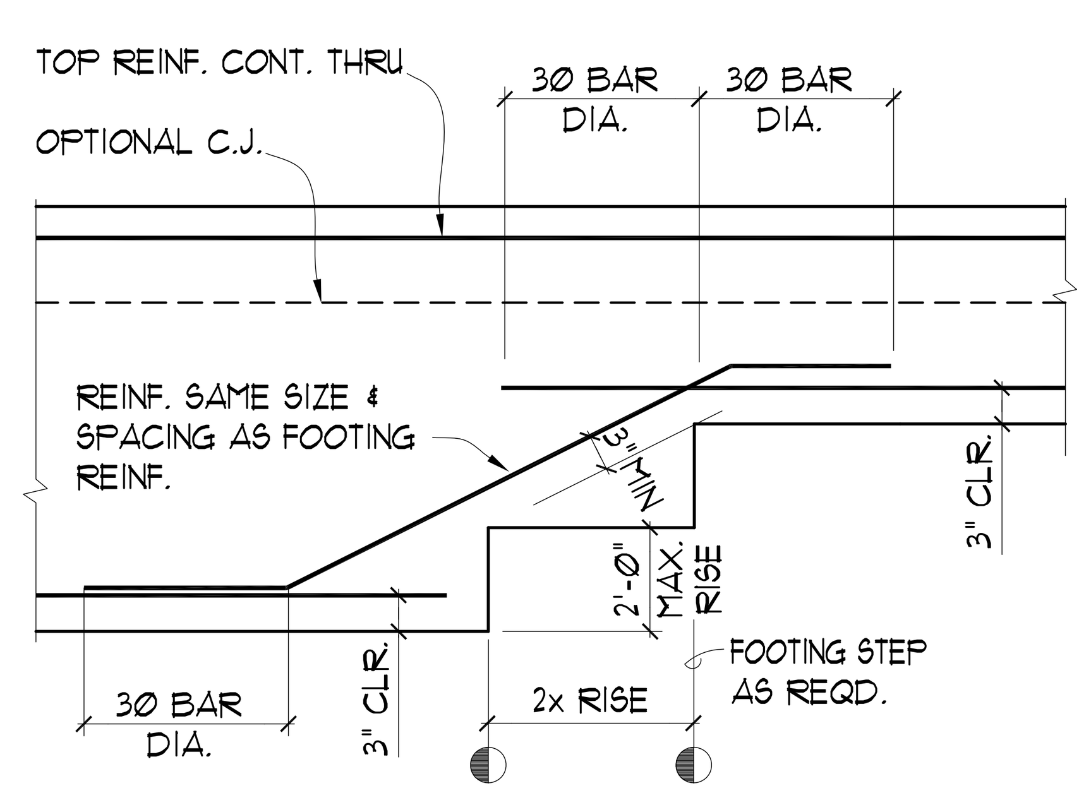


INSTALL 2x FILLER PIECES AS SHOWN TO BRIDGE BOLT HEAD

TYPICAL DETAIL WHEN STUD OCCURS OVER ANY PART OF SILL BOLT

S1-114

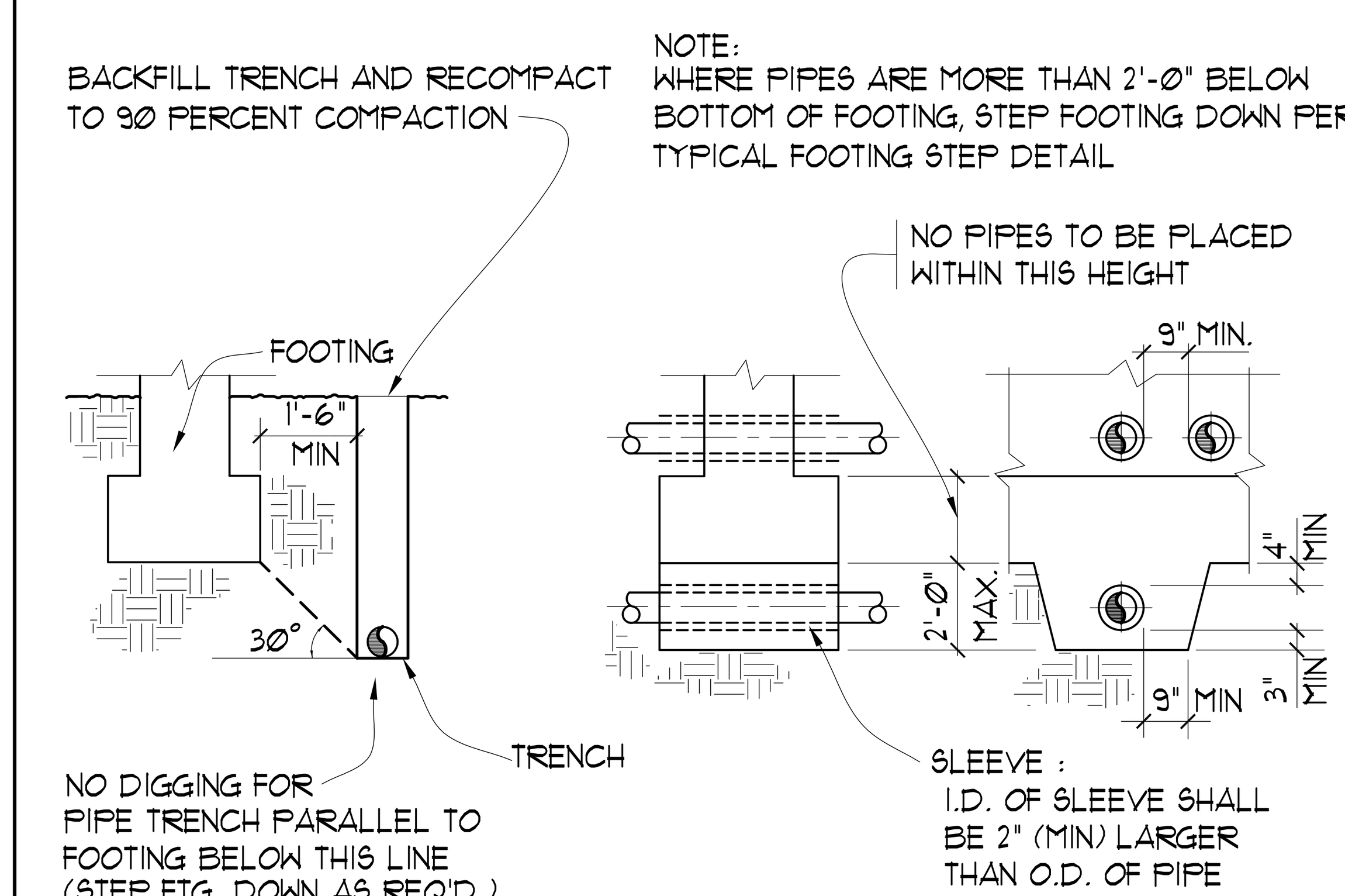
11 DETAIL



TYPICAL FOOTING STEP

S1-03

10 DETAIL



NOTE: PLACE CONCRETE FILL AROUND SLEEVES BEFORE POURING FOOTINGS PADS. FILL SHALL BE SAME WIDTH AS FOOTING AND FULL DEPTH OF PIPE TRENCH.

TYP. FOOTING AT PIPE OR CONDUIT

S1-01

9 DETAIL

REVISION

MARK	DATE	REVISIONS
1		
2		
3		

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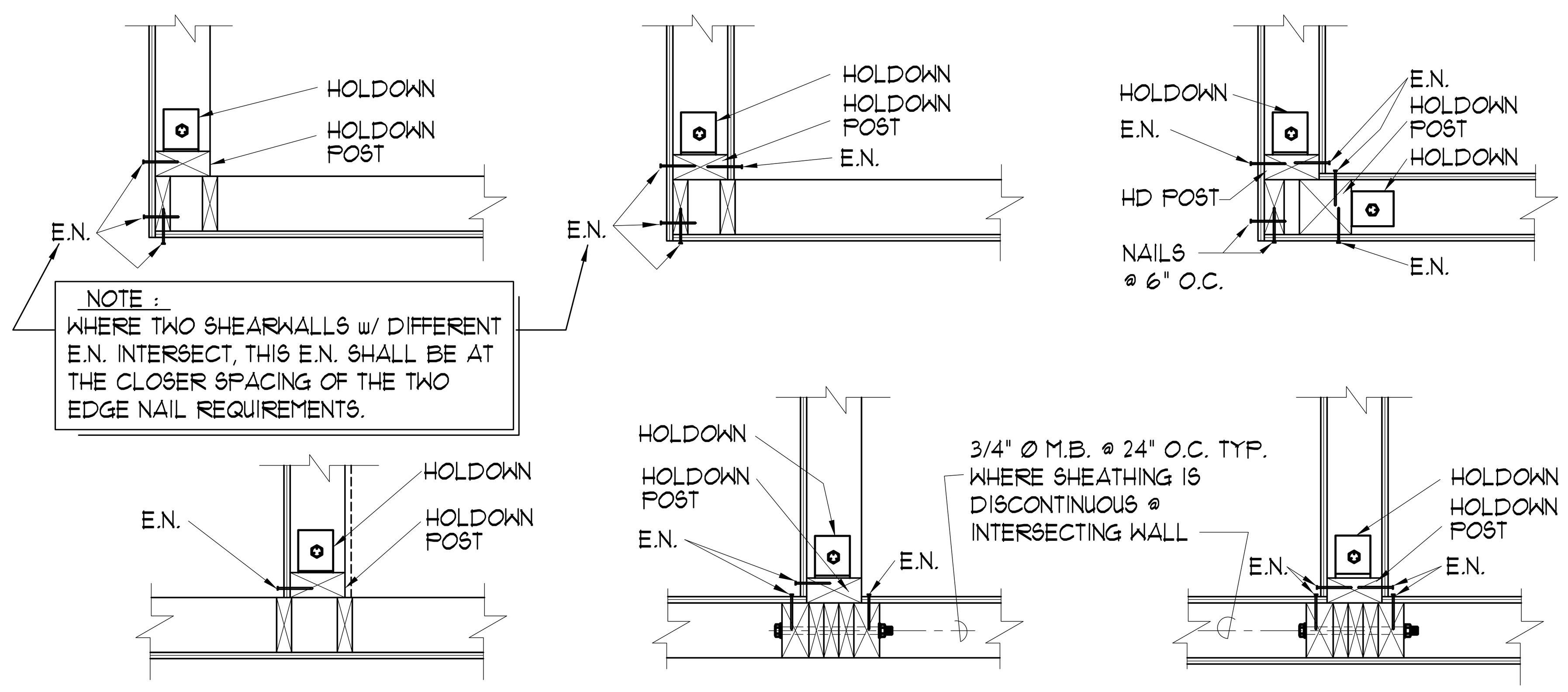
TITLE
TYPICAL DETAILS

JOB #:	DRAWN:
22-251	D.D. / J.K.
DATE:	CHECKED:
Sep. 26, 22	E.C.

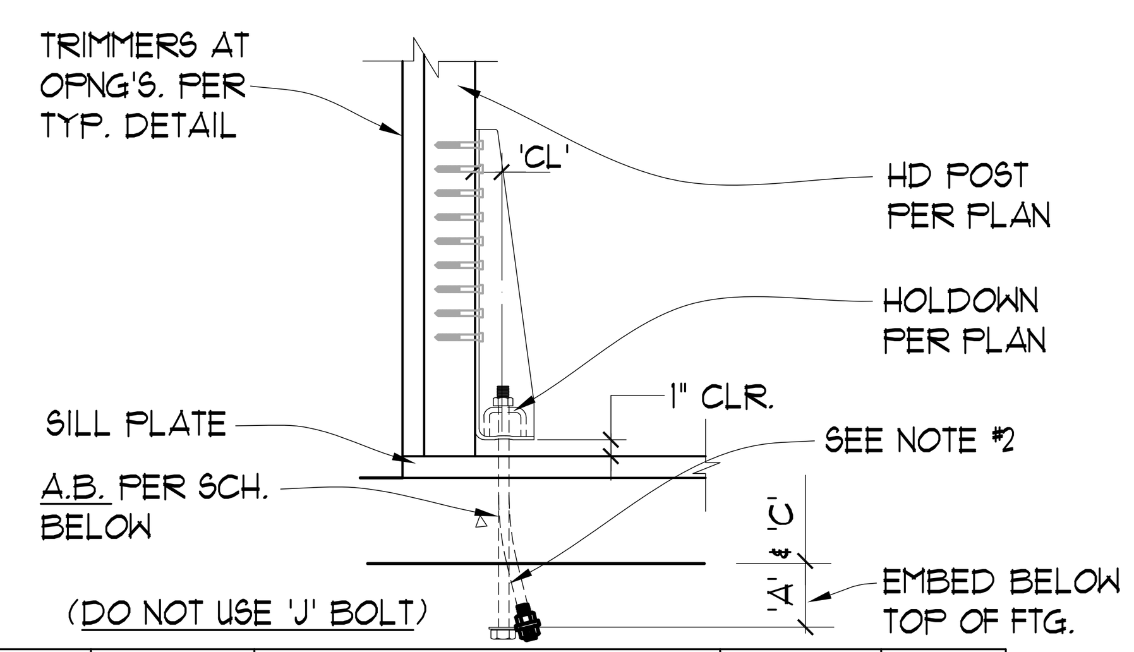
S1.1



TYPICAL SHEARWALL INTERSECTIONS

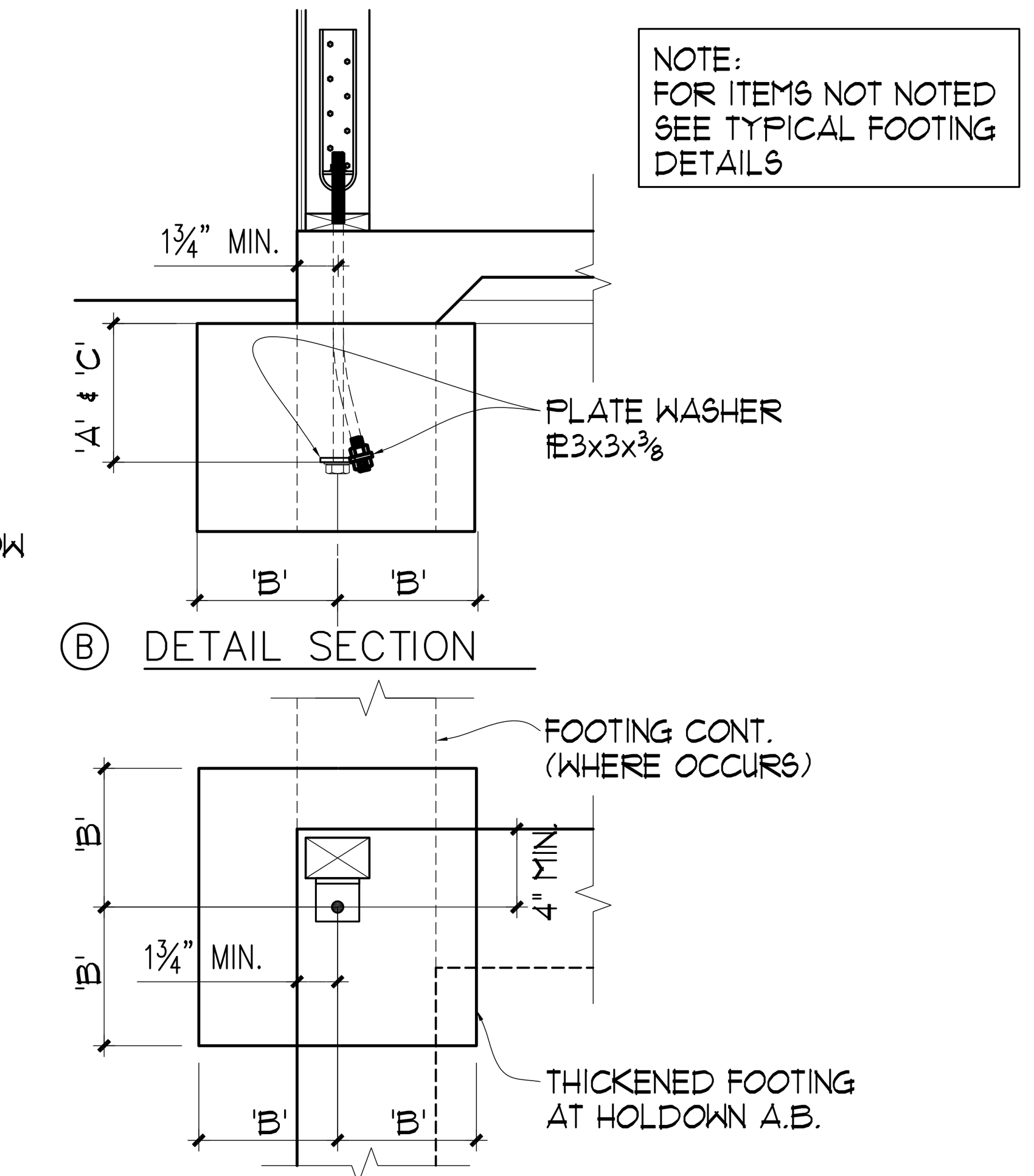
S1-39

4 DETAIL



MARK	MIN. HD POST	NO. OF 'SDS1/4x3' SCREWS	ANCH. BOLT	DIMENSIONS 'A' (MIN)	'B' (MIN)	'C' (MIN)	'CL'	ALLOW. TENSION KIPS(3)
HDU2	4 x 4	6	SB5/8"x24"	-	-	18"	1-5/16"	2.30
HDU4	4 x 4	10	SB5/8"x24"	-	-	18"	1-5/16"	3.42
HDU5	4 x 4	14	SB5/8"x24"	-	-	18"	1-5/16"	4.23
HDU8	4 x 6	20	SB7/8"x24"	-	-	18"	1-3/8"	5.23
HDU11	4 x 6	30	SB1"x30"	-	-	24"	1-3/8"	7.00
HDU14	6 x 6	36	PAB8 (1")	14"	18"	-	1-9/16"	10.83

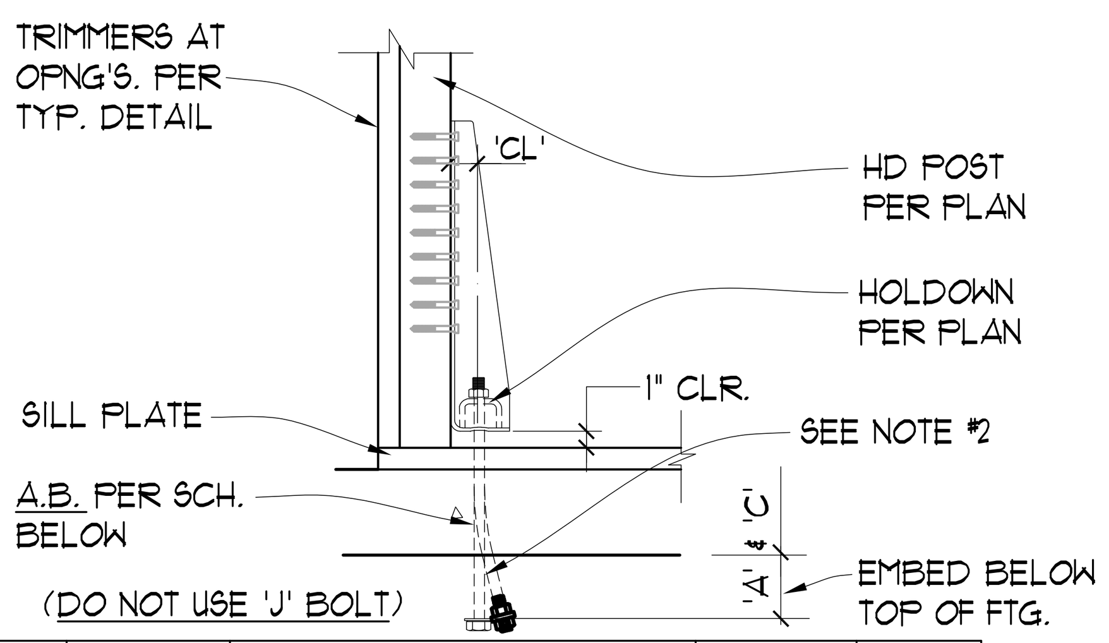
1) ALL HOLDOWN ANCHOR BOLTS SHALL BE SECURELY FASTENED IN PLACE PRIOR TO PLACING CONCRETE.
2) PROVIDE 3" COVER AT EARTH FORMED SURFACES, AT ALL HD. A.B.'S.
3) BASED ON LARR #25720 VALUES REDUCED BY 25 PERCENT.
4) HD ANCHOR BOLT TO BE @ ℄ OF STUD WALL.



TYPICAL HOLDOWN AT FOUNDATION (SLAB-ON-GRADE) Ⓐ PLAN VIEW

S1-38A

2 DETAIL



MARK	MIN. HD POST	NO. OF 'SDS1/4x3' SCREWS	ANCH. BOLT	DIMENSIONS 'A' (MIN)	'B' (MIN)	'C' (MIN)	'CL'	ALLOW. TENSION KIPS(3)
HDU2	4 x 4	6	SB5/8"x24"	-	-	18"	1-5/16"	2.30
HDU4	4 x 4	10	SB5/8"x24"	-	-	18"	1-5/16"	3.42
HDU5	4 x 4	14	SB5/8"x24"	-	-	18"	1-5/16"	4.23
HDU8	4 x 6	20	SB7/8"x24"	-	-	18"	1-3/8"	5.23
HDU11	4 x 6	30	PAB8 (1")	14"	18"	-	1-3/8"	7.00
HDU14	6 x 6	36	PAB8 (1")	14"	18"	-	1-9/16"	10.83

1) ALL HOLDOWN ANCHOR BOLTS SHALL BE SECURELY FASTENED IN PLACE PRIOR TO PLACING CONCRETE.
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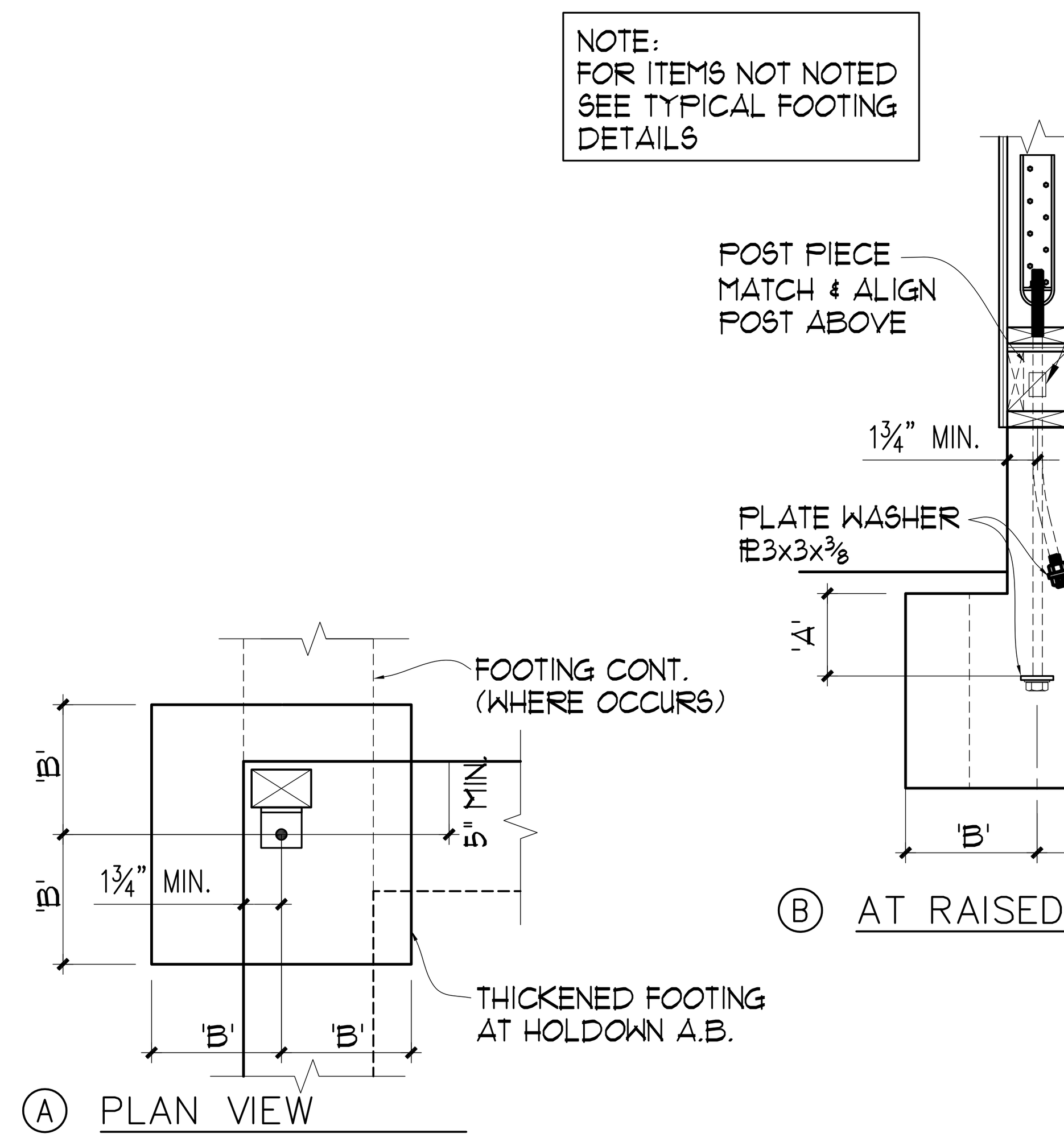
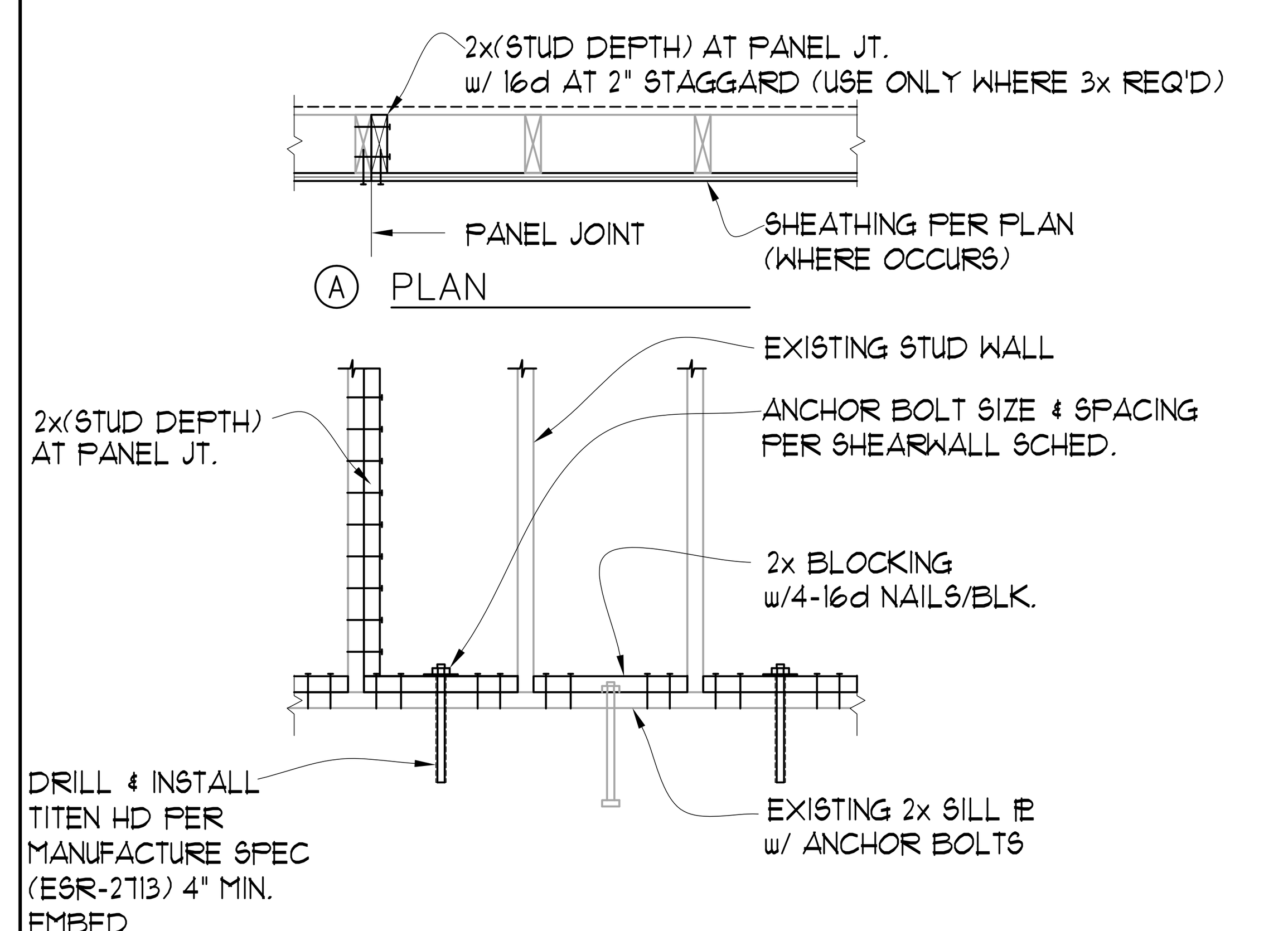
3) BASED ON LARR #25720 VALUES REDUCED BY 25 PERCENT.
4) HD ANCHOR BOLT TO BE @ ℄ OF STUD WALL.



TYPICAL HOLDOWN AT FOUNDATION (RAISED-FLOOR) Ⓐ PLAN VIEW

S1-38A

8 DETAIL

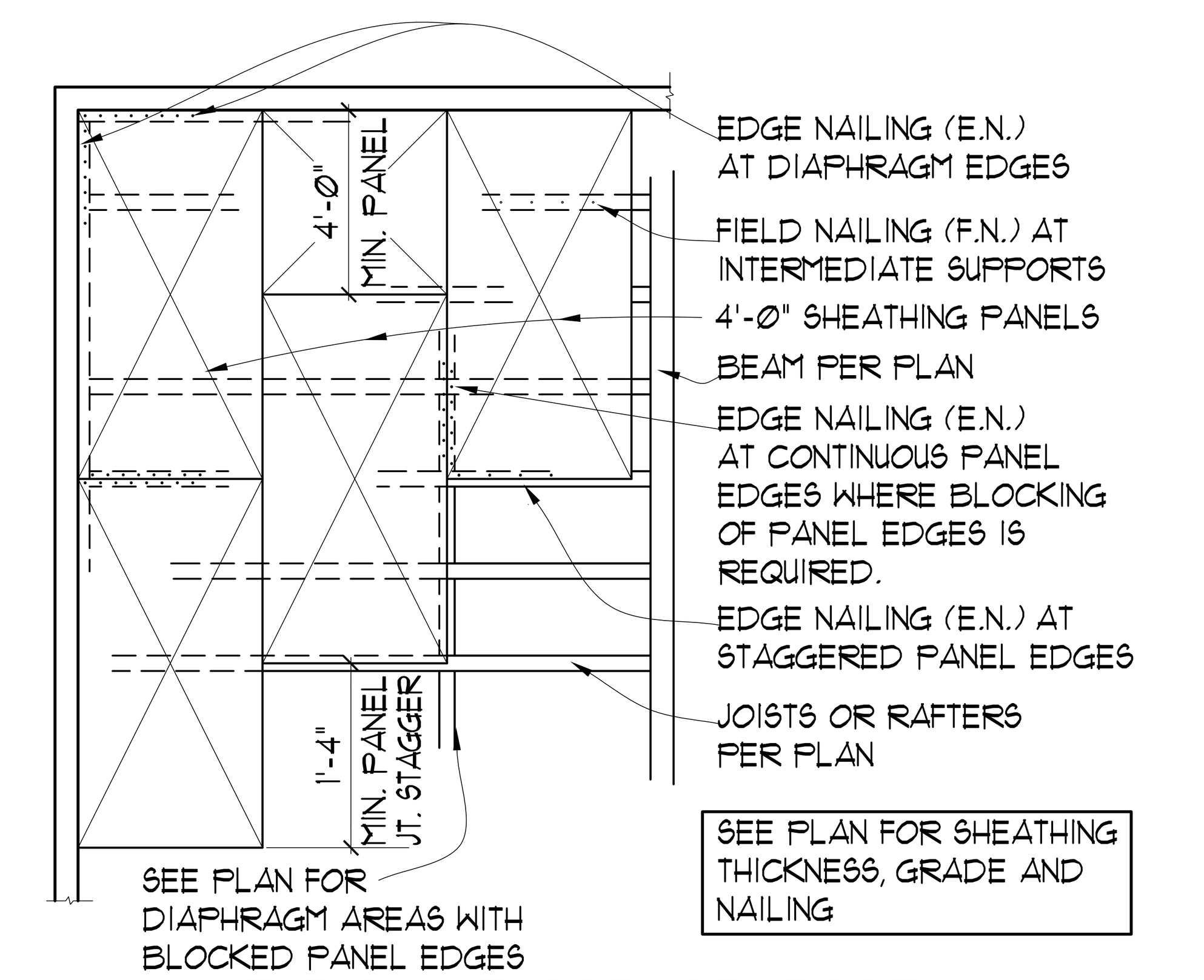


NOTE: THIS DETAIL TO BE USED ONLY WHERE 3x SILL IS REQUIRED AS INDICATED ON SHEARWALL DETAILS AND SCHEDULE.

TYPICAL DETAIL AT EXISTING 2x STUD WALLS WHERE 3x SILLS/STUDS ARE REQUIRED

S1-43

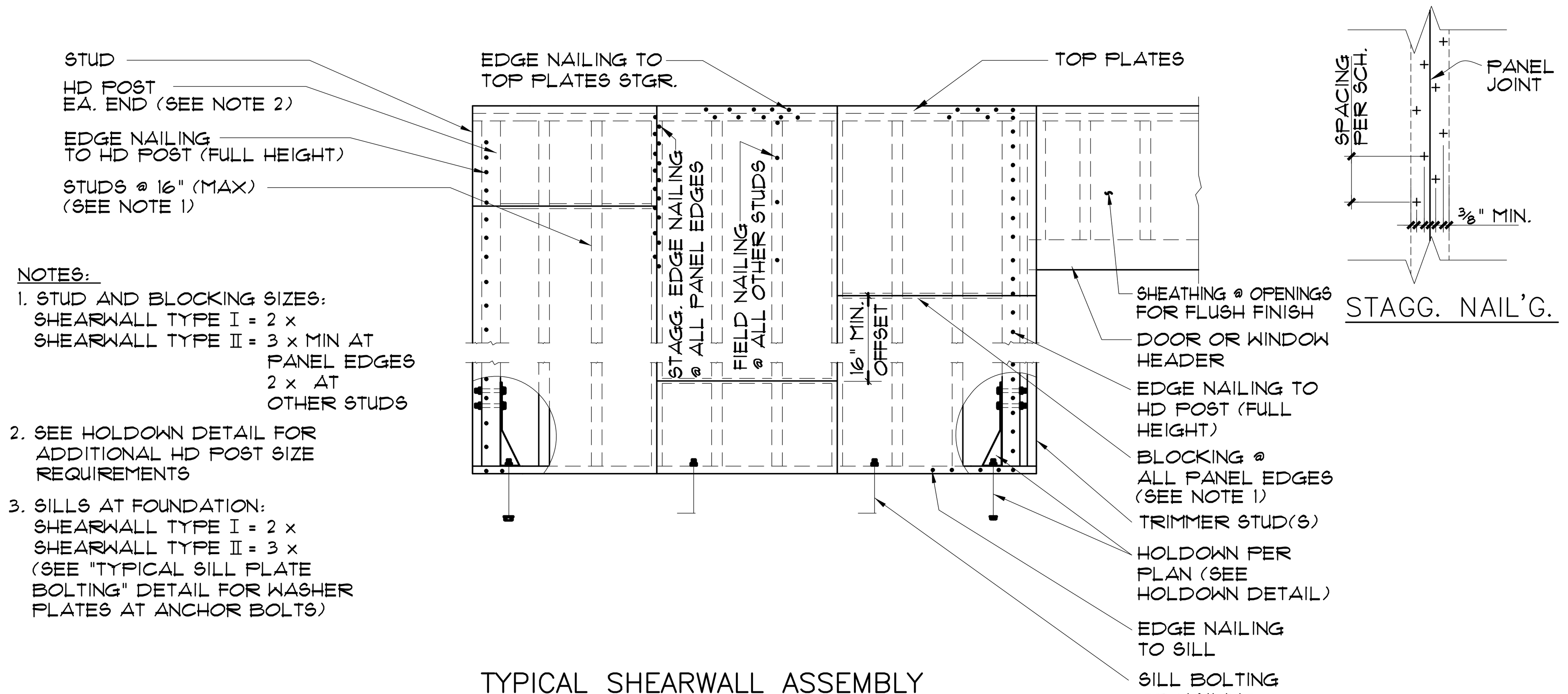
6 DETAIL



TYPICAL FLOOR OR ROOF DIAPHRAGM ASSEMBLY

S1-15

5 DETAIL

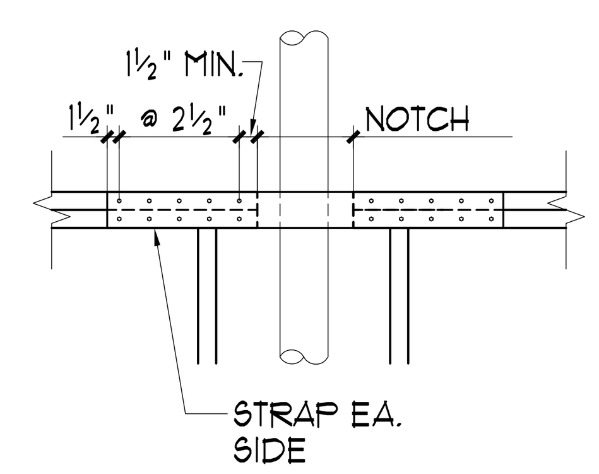


NOTES:
1. STUD AND BLOCKING SIZES:
SHEARWALL TYPE I = 2 x
SHEARWALL TYPE II = 3 x MIN AT PANEL EDGES
2 x AT OTHER STUDS
2. SEE HOLDOWN DETAIL FOR ADDITIONAL HD POST SIZE REQUIREMENTS
3. SILLS AT FOUNDATION:
SHEARWALL TYPE I = 2 x
SHEARWALL TYPE II = 3 x
(SEE "TYPICAL SILL PLATE BOLTING" DETAIL FOR WASHER PLATES AT ANCHOR BOLTS)

TYPICAL SHEARWALL ASSEMBLY
(SHEARWALL TYPES I & II)

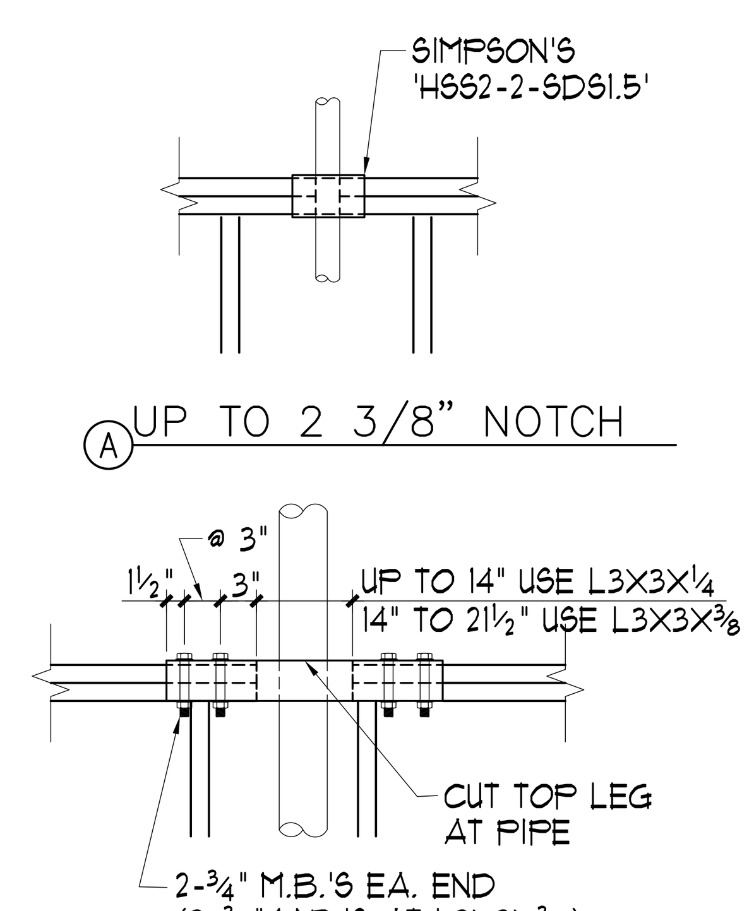
S1-16

12 DETAIL



NOTCH	STRAP PLATE	SCREWS EA. END
2 3/8"-6"	⅊1/8x3	4-SDS1/4x2
6"-10"	⅊3/16x3	4-SDS1/4x2
10"-14"	⅊1/4x3	6-SDS1/4x2
14"-21"	⅊3/8x3	10-SDS1/4x2

Ⓑ 2 3/8" TO 21" NOTCH



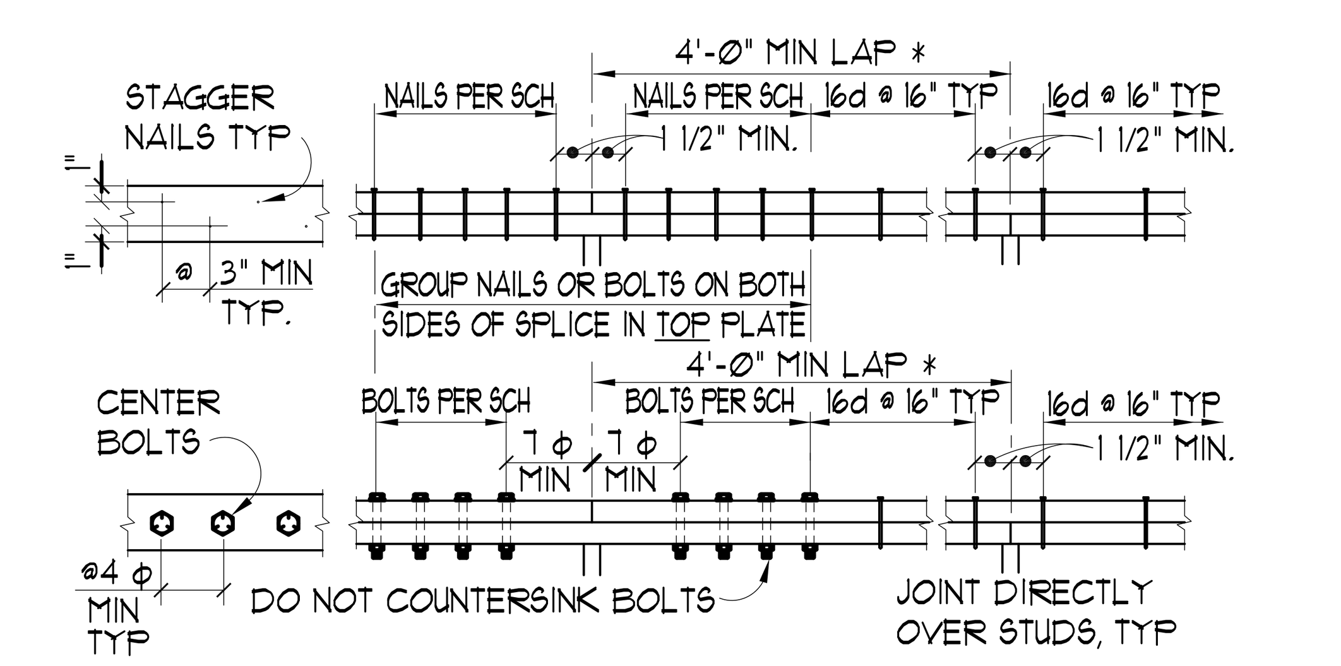
Ⓐ UP TO 2 3/8" NOTCH

Ⓒ OPTIONAL L3X3 ANGLE

TYP. FIX FOR NOTCHED DOUBLE TOP PLATE

S1-56

10 DETAIL



MARK	MIN PL. THK	NAILS	DESIGN LOAD
6	2 x	6 - 16d	1250 #
8	2 x	8 - 16d	1670 #
10	2 x	10 - 16d	2090 #
12	2 x	12 - 16d	2510 #
14	2 x	14 - 16d	2920 #
16	2 x	16 - 16d	3340 #
18	2 x	18 - 16d	3760 #
20 *	2 x	20 - 16d	(1)3780#/ 4180 #

* = 6'-0" MIN LAP LENGTH AT SPLICE 20, 22 & 24

MARK	MIN PL. THK	BOLTS	DESIGN LOAD	
22 *	2 x	22 - 16d	3780# / 4600#	(1)
24 *	2 x	24 - 16d	3780# / 5010#	(1)
B1	2 x	6 - 5/8	3780# / 5800#	(1)
B2	2 x	8 - 5/8	3780# / 7590#	(1)
B3	2 x	8 - 3/4	3780# / 7590#	(1)
B4	3 x 6	6 - 3/4	11,600 #	
B5	3 x 6	8 - 3/4	12,650 #	

(1) x4 VALUE / x6 VALUE

TOP PLATE SPLICE DESIGN TABLE

S1-08

9 DETAIL

REVISION

MARK	DATE	REVISIONS
1		
2		
3		

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JIMENEZ RESIDENCE
ADU & (N) GARAGE

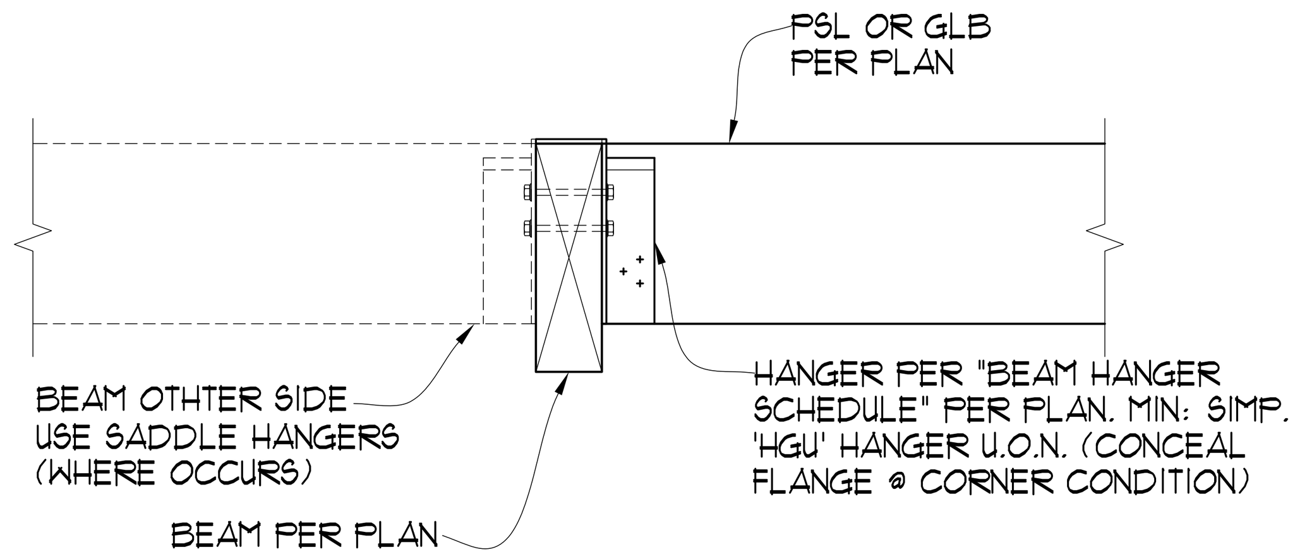
PROJECT ADDRESS:
915 W. 8th ST.
CORONA, CA 92882

CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT DISCREPANCIES TO THE ENGINEER. ALL CONSTRUCTION SHALL CONFORM TO THE C.B.C.

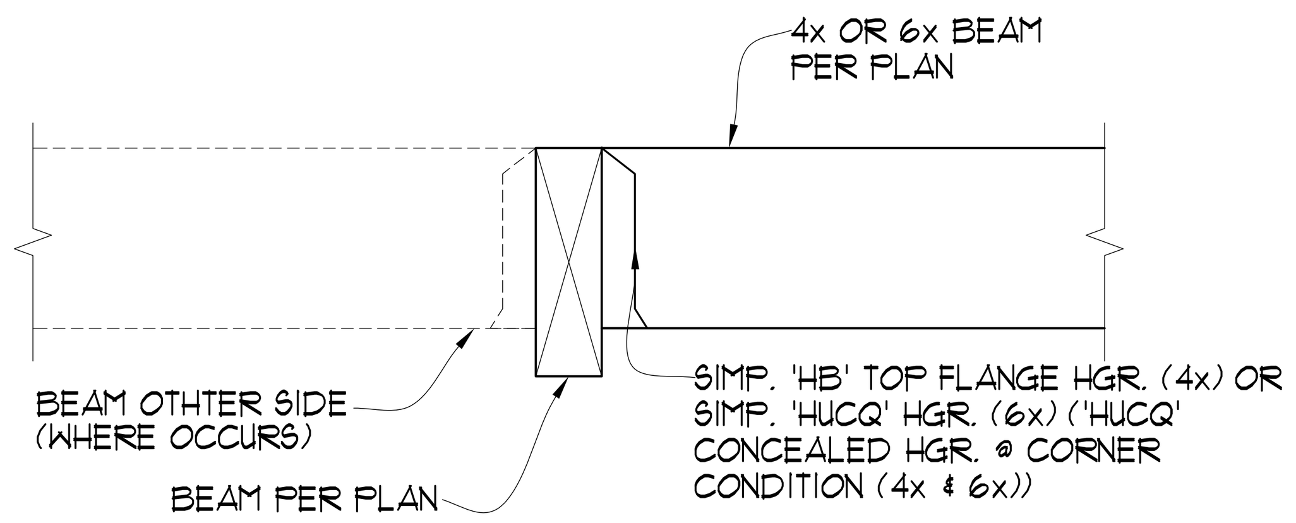
TITLE
TYPICAL DETAILS

JOB #: 22-251	DRAWN: D.D. / J.K.
DATE: Sep. 26, 22	CHECKED: E.C.

S1.2



Ⓐ PSL OR GLB CONNECTION



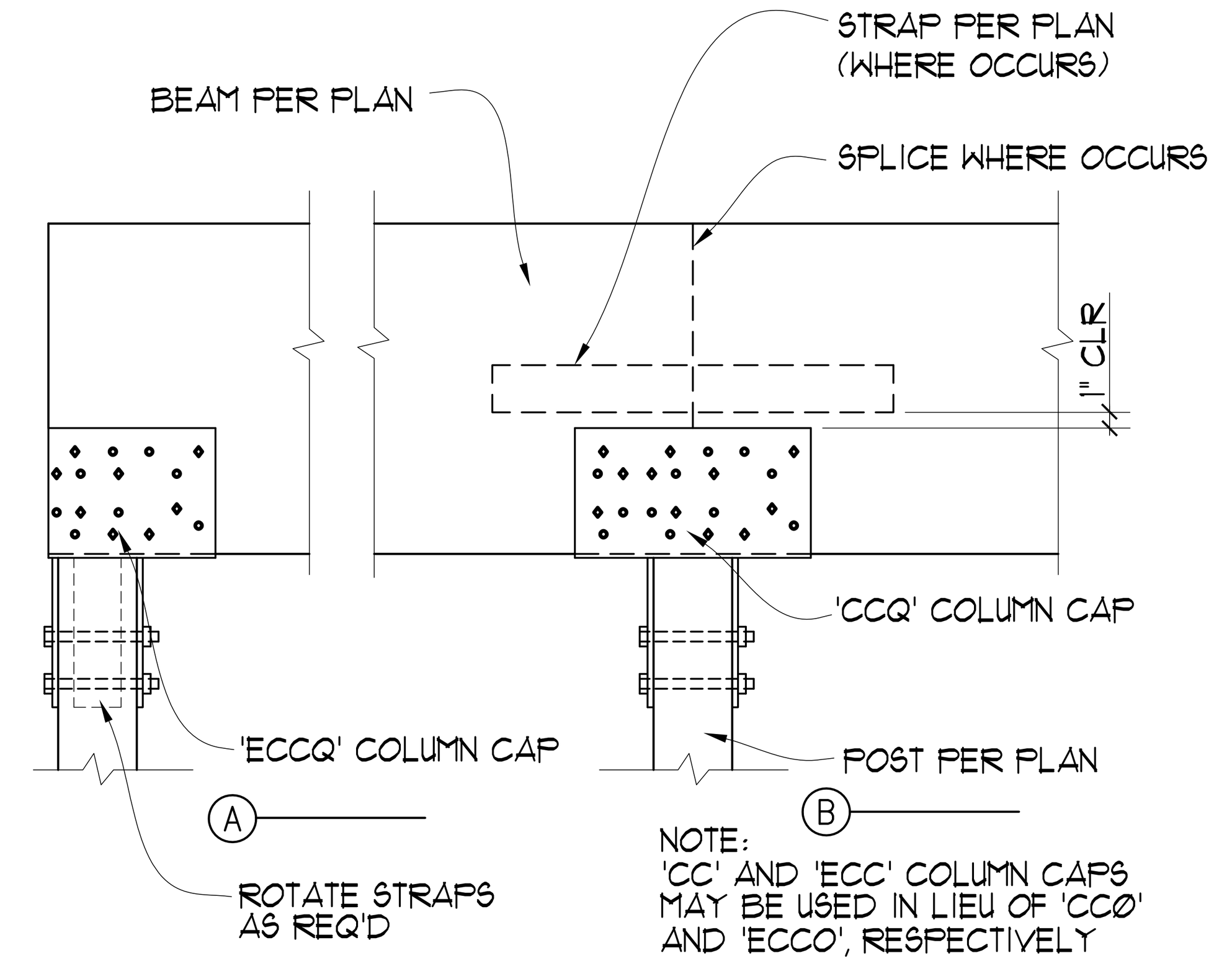
Ⓑ 4x OR 6x CONNECTION

S1-46B

BEAM HANGER SCHEDULE						
WOOD TYPE	BEAM WIDTH	REQUIRED HANGER	CAPACITY (LBS)	REQUIRED HANGER @ CORNER CONDITION	CAPACITY @ CORNER (LBS)	REDUCTION FACTOR APPLIED
SAWN LUMBER	4x	'HB' TOP FLANGE	5,650	'HUCQ' CONCEALED HGR.	4,500	–
	6x	'HUCQ'	4,680			–
ENGINEERED (PSL)(1)	3 ½", 5 ¼"	'MGU'	9,450	'MGU' CONCEALED HGR.	8,316	0.88
	3 ½", 5 ¼", 7"	'HGU'	13,160	'HGU' CONCEALED HGR.	9,870	0.75
	5 ¼", 7"	'HHGU'	17,345	'HHGU' CONCEALED HGR.	13,008	0.75
	3 ½", 5 ¼", 7"	'EGQ'	18,680	–	–	–

NOTES:
1. SEE SIMPSON STRONG-TIE CATALOG FOR HIGHER CAPACITY VALUES WHEN USING LVL ENGINEERED LUMBER.

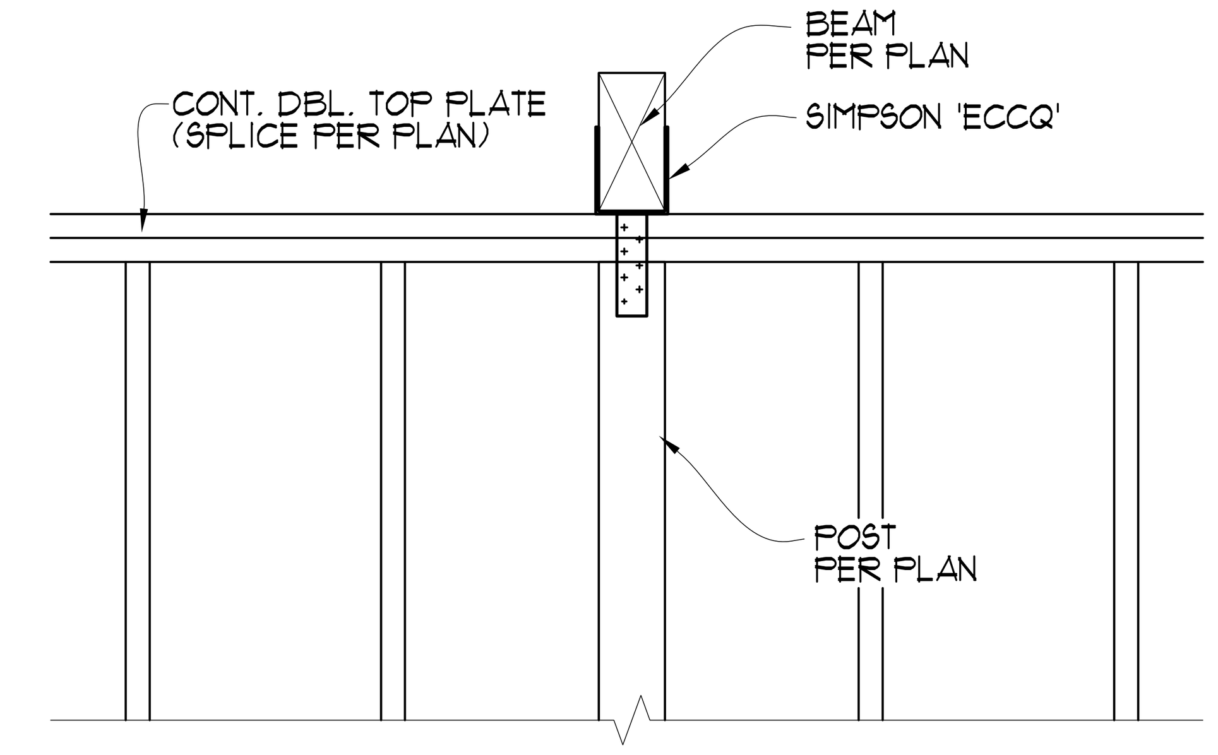
4 DETAIL



TYPICAL GLB OR PSL BEAM TO POST

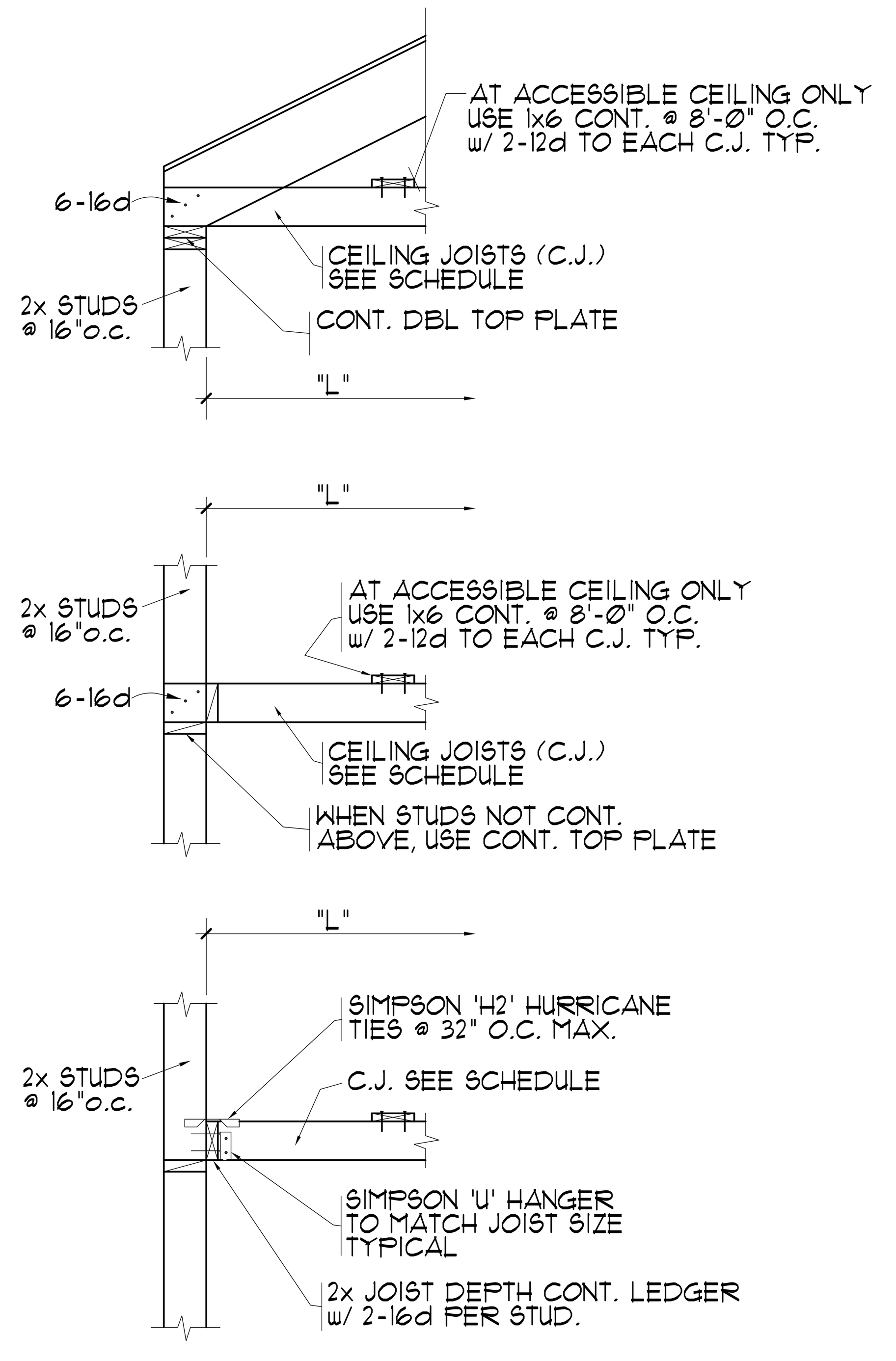
S1-12S

2 DETAIL



TYPICAL GLB OR PSL BEAM TO IN-WALL POST

1 DETAIL



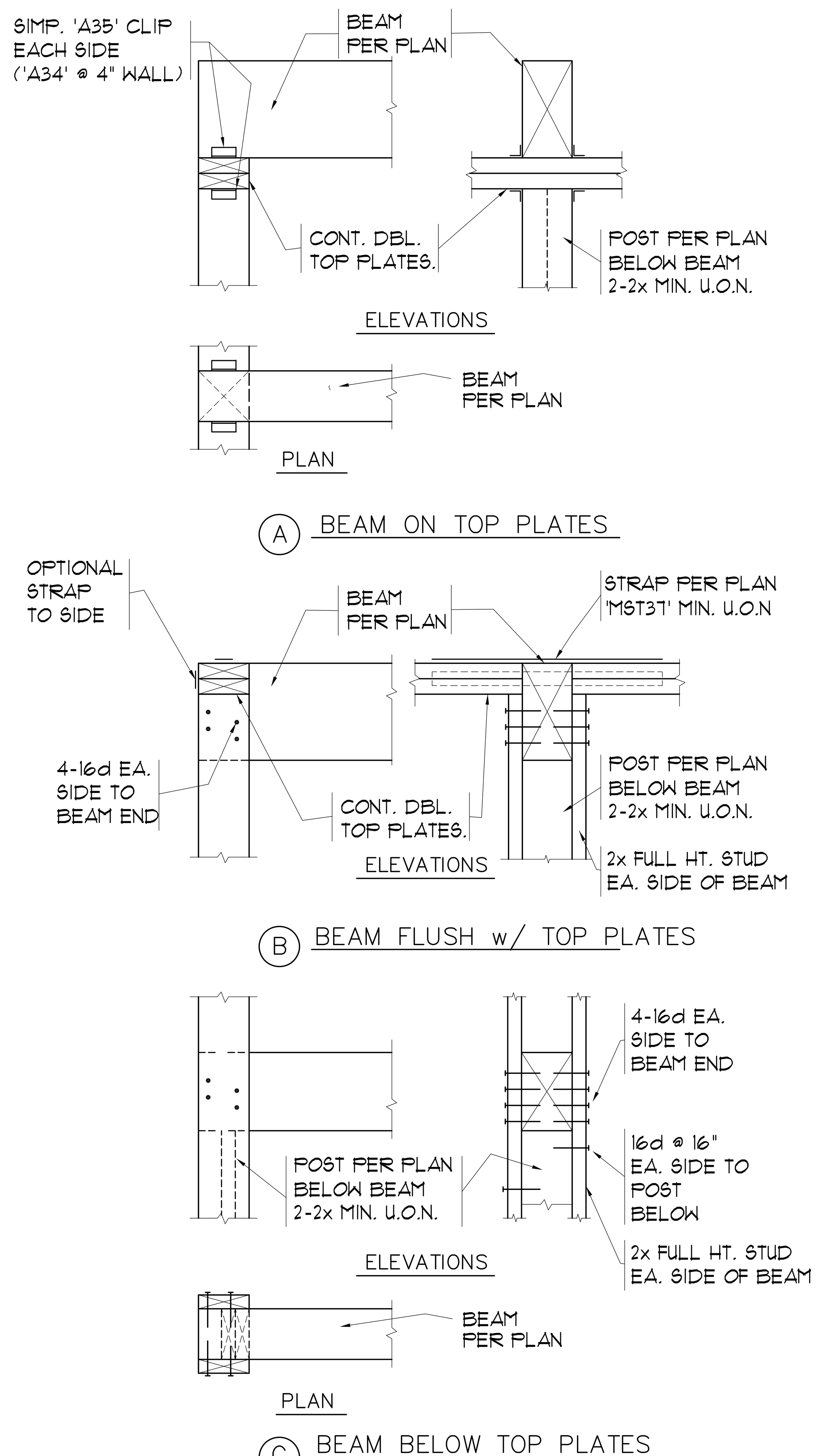
CEILING JOIST SCHEDULE	
CLEAR SPAN "L"	JOIST SIZE & SPACING
11'-0" OR LESS	2x6 @ 16"
11'-0" TO 16'-3"	2x8 @ 16"
16'-3" TO 19'-10"	2x10 @ 16"
19'-10" TO 24'-3"	2x12 @ 16"
24'-3" TO 27'-0"	2x14 @ 16"

(1) SPANS BASED ON 2016 CBC TABLE 2308.7.1(2)

TYPICAL CEILING JOIST DETAILS AND CEILING JOIST SCHEDULE

S1-111

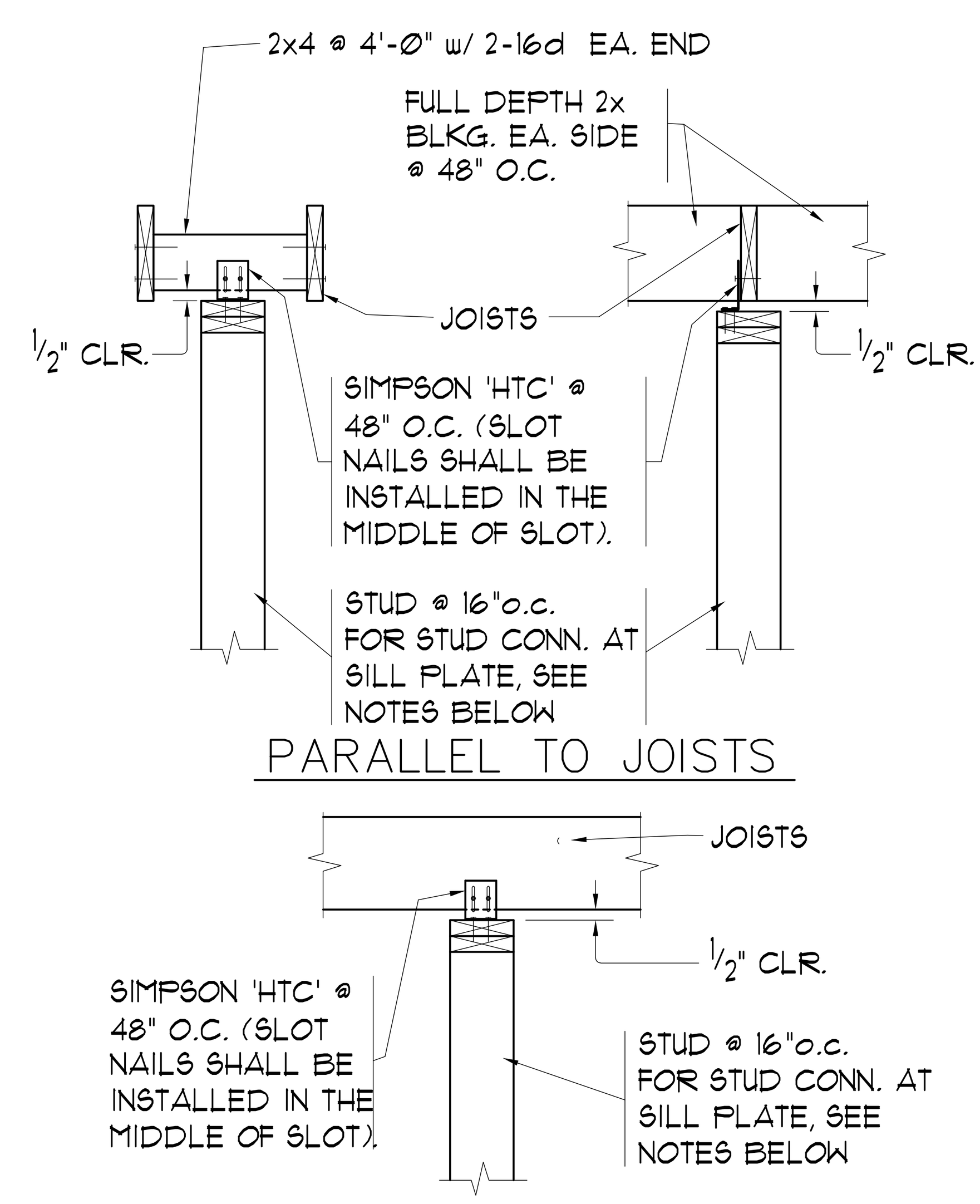
12 DETAIL



TYPICAL BEAM SUPPORT @ STUD WALLS

S1-110

11 DETAIL



*NOTE: DO NOT INSTALL NON-BEARING PARTITIONS UNTIL DEAD LOAD IS IN PLACE. (AT ROOF CONST. AND WHERE A DEFLECTION SPACE HAS BEEN PROVIDED FOR, THIS REQUIREMENT MAY BE WAIVED).

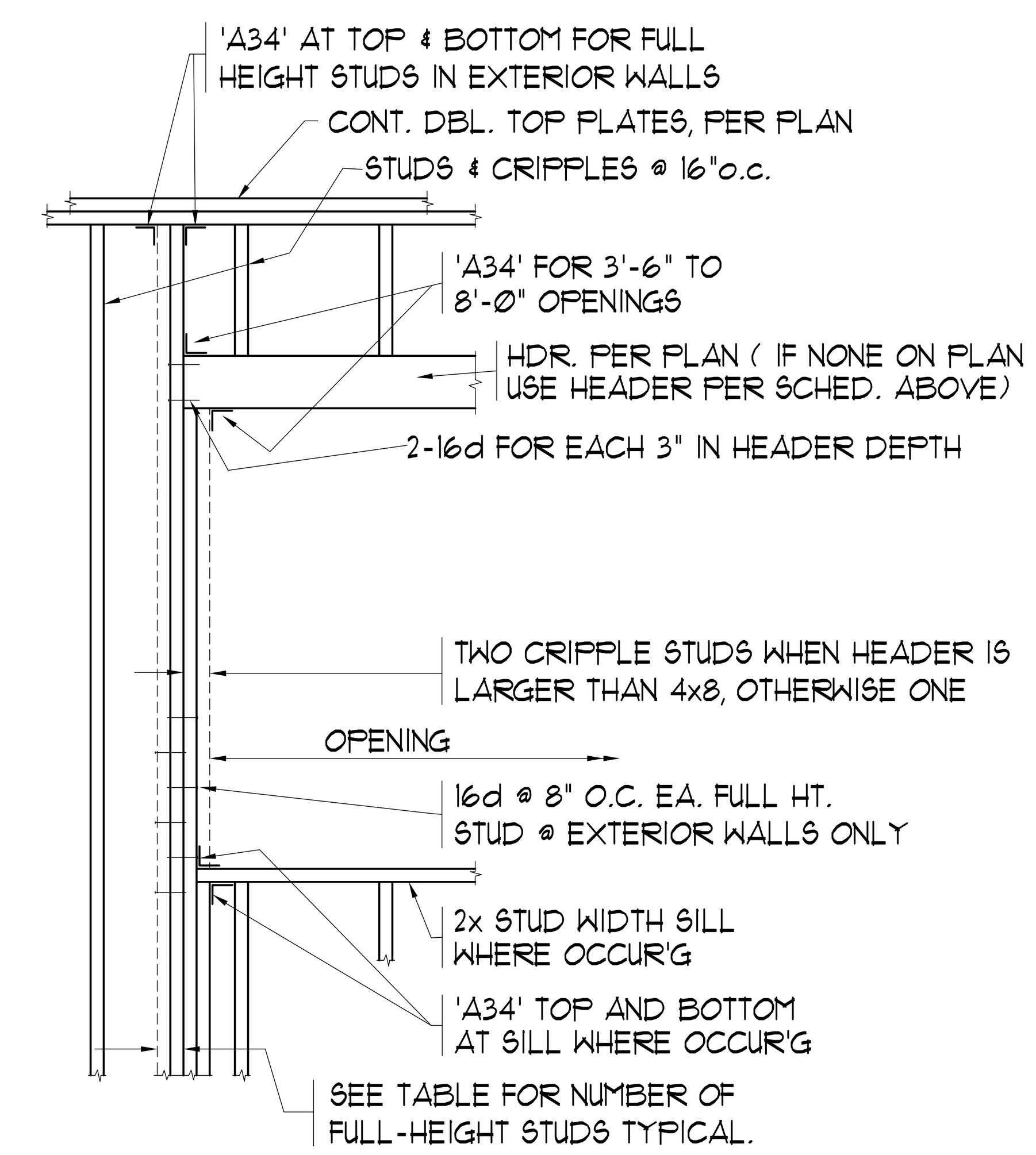
TYP. NON-BEARING PARTITION ANCHORAGE AT SAWN LUMBER

S1-112

10 DETAIL

HEADER SCHEDULE			
BEARING AND EXTERIOR WALLS		NON-BEARING WALLS	
OPENING WIDTH	HEADER SIZE	OPENING WIDTH	HEADER SIZE
6'-0" OR LESS	4x6	8'-0" OR LESS	4x6
6'-1" TO 8'-0"	4x8	8'-1" TO 12'-0"	4x8
8'-1" TO 10'-0"	4x10		

NOTE: USE 6x LINTEL MEMBERS IN 2x6 STUD WALLS.



OPENING WIDTH	NUMBER OF FULL-HEIGHT STUDS		
	ALL EXTERIOR WALLS	INTERIOR BRG. WALLS	INTERIOR NON-BEARING WALLS
7'-0" OR LESS	2	2	1
7'-1" TO 10'-0"	3	2	1
OVER 10'-0"	4	2	1

NOTE: OMIT FULL-HT. STUDS WHERE POST FOR HOLDDOWN ANCHOR OCCURS. SEE PLAN AND TYPICAL HOLDDOWN DETAIL.

TYPICAL HEADER DETAIL

S1-120

9 DETAIL

REVISION

MARK	DATE	REVISIONS
1		
2		
3		

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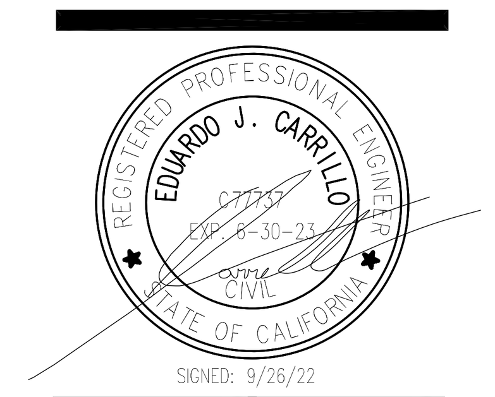
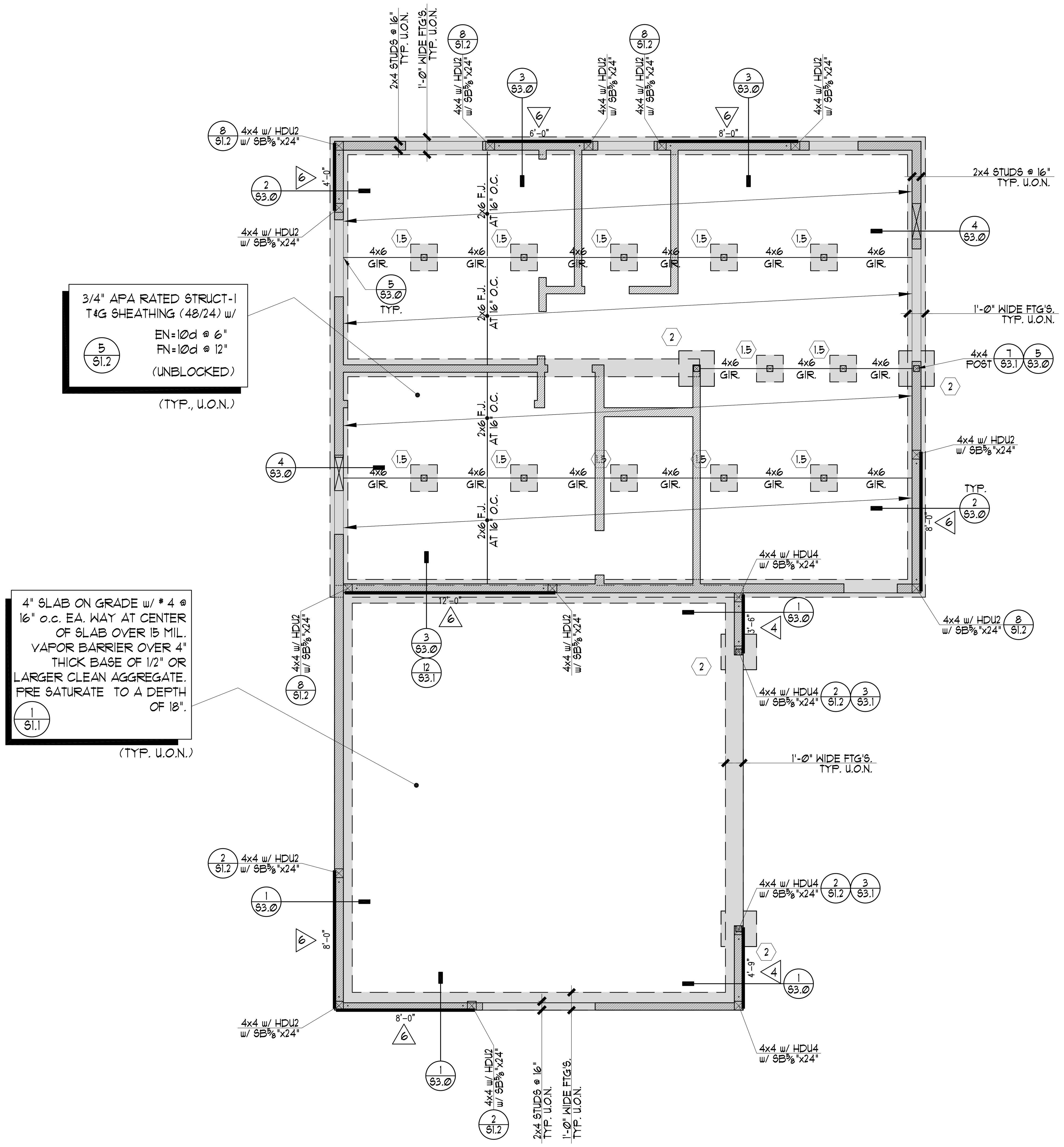
TITLE
TYPICAL DETAILS



JOB #: 22-251	DRAWN: D.D. / J.K.
DATE: Sep. 26, 22	CHECKED: E.C.

S1.3



FOUNDATION PLAN

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

PLAN NOTES

1. SEE GENERAL NOTES AND TYPICAL DETAILS ON SHEETS S1.0A, S1.0B, S1.1, S1.2, S1.3 & S1.4. THESE NOTES AND DETAILS SHALL BE USED WHERE APPLICABLE WHETHER SPECIFICALLY REFERENCED OR NOT.
2. SLAB-ON-GRADE CONSTRUCTION JOINT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO PLACEMENT OF CONCRETE.
3. STRUCTURAL WALLS ARE WALLS THAT RESIST GRAVITY , WIND, AND/OR SEISMIC LOADS. ALL EXTERIOR WOOD FRAME WALLS ARE STRUCTURAL WALLS. WALLS OR PORTIONS OF WALLS NOT INDICATED ON THE STRUCTURAL DRAWINGS ARE PARTITION WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATION AND EXTENT OF PARTITION WALLS.
4. FOR DIMENSIONS, EXTENT , AND NATURE OF ALL WALLS, REFER TO ARCHITECTURAL DWGS.
5. FOR ITEMS EMBEDDED INTO CONCRETE SLABS AND WALLS, REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS.
6. ANCHOR BOLTS, INCLUDING HOLDOWN ANCHORS, SHALL BE TIED IN PLACE PRIOR TO FOUNDATION INSPECTION.
7. HOLD- DOWNS SHALL BE RE-TIGHTENED JUST PRIOR TO COVERING THE WALL FRAMING.
8. ALL WOOD EXPOSED TO WEATHER TO BE TREATED WOOD, REDWOOD OR OTHER SPECIES NATURALLY RESISTANT TO DECAY AND JOIST HANGERS, STRAPS, TIES, ETC. SHALL BE GALVANIZED (G185 COATING). FASTENERS SHALL BE STAINLESS STEEL OR APPROVED EQUAL.
9. ALL EXISTING FRAMING, DIMENSIONS, FOOTINGS TO BE VERIFY BY CONTRACTOR PRIOR TO COMMENCING ANY WORK. NOTIFY THE ENGINEER OF RECORDS IF ANY DISCREPANCIES OCCURS.

LEGEND

- (2.5) SPREAD FOOTING PER SCHEDULE ON THIS SHEET.
- SLAB-ON-GRADE JOINT PER DETAIL 1/S1.1
- 4x6 — WOOD POST SIZE. MARK IS INDICATED AT THE BASE OF THE POST.
- 4x4 HDU2 — HOLDOWN ANCHOR SIZE PER DETAIL 2/S1.2. HOLDOWN ANCHORS SHALL BE TIED IN PLACE PRIOR TO FOUNDATION INSPECTION.
- 4'-0" 6 — SHEARWALL PER SCHEDULE ON S2.0. SEE DETAILS ON SHEET S1.2 FOR TYPICAL SHEARWALL ASSEMBLY. ALL SHEARWALLS CALLED OUT AT THIS LEVEL START AT THIS LEVEL AND CONTINUE UP.
- NEW FOOTING PER PLAN, SEE DETAILS FOR DEPTH AND REBAR.
- EXISTING FOOTING PER PLAN. (E) FOOTING SHALL BE OF PLAIN CONCRETE HAVING A 28 DAY COMPRESSIVE STRENGTH OF 2,500 PSI (G.C. TO F.V.). CONTRACTOR TO NOTIFY/CONTACT E.O.R. IF ANY DISCREPANCIES OCCUR.

SPREADFTG1500REV

SPREAD FOOTING SCHEDULE			
MARK	SIZE (W x LGTH x THK) (2)(3)	REINF. (E.W. BOT.)	CAPACITY (KIPS) (1)
1.5 (2)(3)	1'-6" x 1'-6" x 24"*	3- #4	3
2 (2)(3)	2'-0" x 2'-0" x 24"*	3- #4	5
2.5 (2)(3)	2'-6" x 2'-6" x 24"*	4- #4	8
3 (2)(3)	3'-0" x 3'-0" x 24"*	3- #5	12
3.5 (2)(3)	3'-6" x 3'-6" x 24"*	3- #5	16.5
4 (2)(3)	4'-0" x 4'-0" x 24"*	4- #5	21.5

A. WHEN HOLDOWN A.B. IS LOCATED AT (N) SPREAD FTG: THICKEN/DEEPEN PAD PER A.B. MIN. EMBEDMENT DIMENSION SHOWN ON DETAIL 2/S1.2 + 6".

SPREAD FOOTING SCHEDULE NOTES:

1. ABOVE CAPACITY VALUES ARE BASED ON AN ALLOWABLE SOIL BEARING PRESSURE OF 1500 PSF.
2. * MIN. (N) SPREAD FOOTING THK. MAY BE 12" THK. MIN. WHEN UNDERPINNING.
   ** SEE NOTE (3) FOR ADDITIONAL REQUIREMENTS.
3. MIN. FOOTING BEARING DEPTH OF (N) SPREAD FOOTING TO BE 24" DEEP FROM LOWEST ADJACENT GRADE (FOR EXTERIOR CONDITION) AND 18" DEEP FROM LOWEST ADJACENT GRADE (FOR FOR INTERIOR CONDITION).

REGULAR SHEARWALL SCH. EC NEW1

SHEARWALL SCHEDULE										
MARK	SHEATHING (1)	NAIL SIZE (2)	EDGE NAIL SPACING	FIELD NAIL SPACING	SILL TO WOOD CONN. (1)	SILL TO CONC. CONN. (5) (CAST-IN-PLACE)	SILL TO CONC. CONN. (5) (SIMPSON RETROFIT BOLT) (RFB #5x8)	BLKG. TO TOP PLATE CONNECTION	SHEAR WALL TYPE(3)	ALLOW. SHEAR TYPE(3)
6	15/32 STR I O.S.	10d	6"	12"	SDS1/4"x6" @ 16"	2x: 5/8"ø A.B. @ 32" 3x: 5/8"ø A.B. @ 48"	2x: 5/8"ø SCREW @ 32" 3x: 5/8"ø SCREW @ 32"	A35 @ 16"	I	340
4	15/32 STR I O.S.	10d	4"	12"	SDS1/4"x6" @ 12"	3x: 5/8"ø A.B. @ 32"	3x: 5/8"ø SCREW @ 24"	A35 @ 16"	II	510
3	15/32 STR I O.S.	10d	3" STGR(4)	12"	SDS1/4"x6" @ 9"	3x: 5/8"ø A.B. @ 24"	3x: 5/8"ø SCREW @ 18"	A35 @ 12"	II	665
2	15/32 STR I O.S.	10d	2" STGR(4)	12"	SDS1/4"x6" @ 6"	3x: 5/8"ø A.B. @ 16"	3x: 5/8"ø SCREW @ 12"	A35 @ 8"	II	870
4D	15/32 STR I D.S.	10d	4"	12"	SDS1/4"x6" @ 6"	3x: 5/8"ø A.B. @ 16"	3x: 5/8"ø SCREW @ 12"	A35 @ 8"	III	1020
3D	15/32 STR I D.S.	10d	3" STGR(4)	12"	SDS1/4"x6" @ 4"	3x: 5/8"ø A.B. @ 12"	3x: 5/8"ø SCREW @ 8"	A35 @ 6"	IV	1330
2D	15/32 STR I D.S.	10d	2" STGR(4)	12"	SDS1/4"x6" @ 3"	3x: 5/8"ø A.B. @ 8"	3x: 5/8"ø SCREW @ 6"	A35 @ 4"	IV	1740

USE: 3x STUDS AT ALL PANEL EDGES. 2x STUDS AT OTHER.

SHEARWALL NOTES:

1. O.S. INDICATES SHEATHING ON ONE SIDE OF WALL AS SHOWN ON PLANS.
   D.S. INDICATES DOUBLE SIDED SHEARWALL: SHEATHING ON BOTH SIDES OF WALL.
2. USE COMMON WIRE NAILS FOR ALL STRUCT. I SHEATHING.
3. SEE DETAILS ON SHEET S1.2 FOR SHEARWALL ASSEMBLIES BASED ON SHEARWALL TYPE.
4. FOR STAGGERED EDGE NAILING REQUIREMENTS SEE DETAIL ON SHEET S1.2.
5. SEE DETAILS 6/S1.1 AND 7/S1.1 FOR PLATE WASHER SIZE AND MINIMUM ANCHOR BOLT EMBEDMENT, RESPECTIVELY. TITEN HD SCREWS TO BE USED IN RETROFIT CONDITIONS.
6. WHERE 3x SILL PLATES AND EDGE STUDS ARE REQUIRED AT EXISTING 2x CONDITION, SEE DETAIL 6/S1.2.
7. MIN. EDGE DISTANCE AT ALL PLYWOOD EDGES SHALL BE ½".
8. ALL A.B.'S TO HAVE A 3x3x0.229 MINIMUM PLATE WASHER SIZE.
9. PERIODIC SPECIAL INSPECTION IS REQUIRED FOR WOOD SHEAR WALL,SHEAR PANELS, AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING, AND OTHER FASTENING TO COMPONENTS OF THE SEISMIC FORCE RESISTING SYSTEM. SPECIAL INSPECTION BY A DEPUTY INSPECTOR IS REQUIRED WHERE THE FASTENER SPACING OF THE SHEATHING IS 4 INCHES ON CENTER OR LESS.

GENERAL CONTRACTOR NOTES

(*) SHEARWALLS TYPE 3, 2, 3D, AND 2D DESCRIBED ON SHEARWALL SCHEDULE ON SHEET S2.0 MUST USE A SINGLE 3x STUD (VERTICALLY) & 3x BLOCKING (HORIZONTALLY) MINIMUM AT ALL PANEL EDGES (ABUTTING PANELS RECEIVING EDGE NAILING). USE 2x STUDS AT OTHER TYPES. (NDS 2015, SEC. 15.3)

(▲) ALL WOOD STRUCTURAL SHEARWALL PANEL JOINTS OF SHEARWALLS TYPE 3, 2, 3D, AND 2D MUST USE STAGGERED NAILING AS SHOWN ON DETAIL 12 ON SHEET S1.2. ALL SILL PLATE NAILING OF SHEARWALLS TYPE 3, 2, 3D, AND 2D MUST USE A STAGGERED NAILING PATTERN.

NAILS SHALL BE PLACED NOT LESS THAN ½" EDGE DISTANCE FROM THE PANEL EDGES AND ⅜" FROM THE EDGE OF THE CONNECTING MEMBERS.

REVISION		
MARK	DATE	REVISIONS
1		
2		
3		

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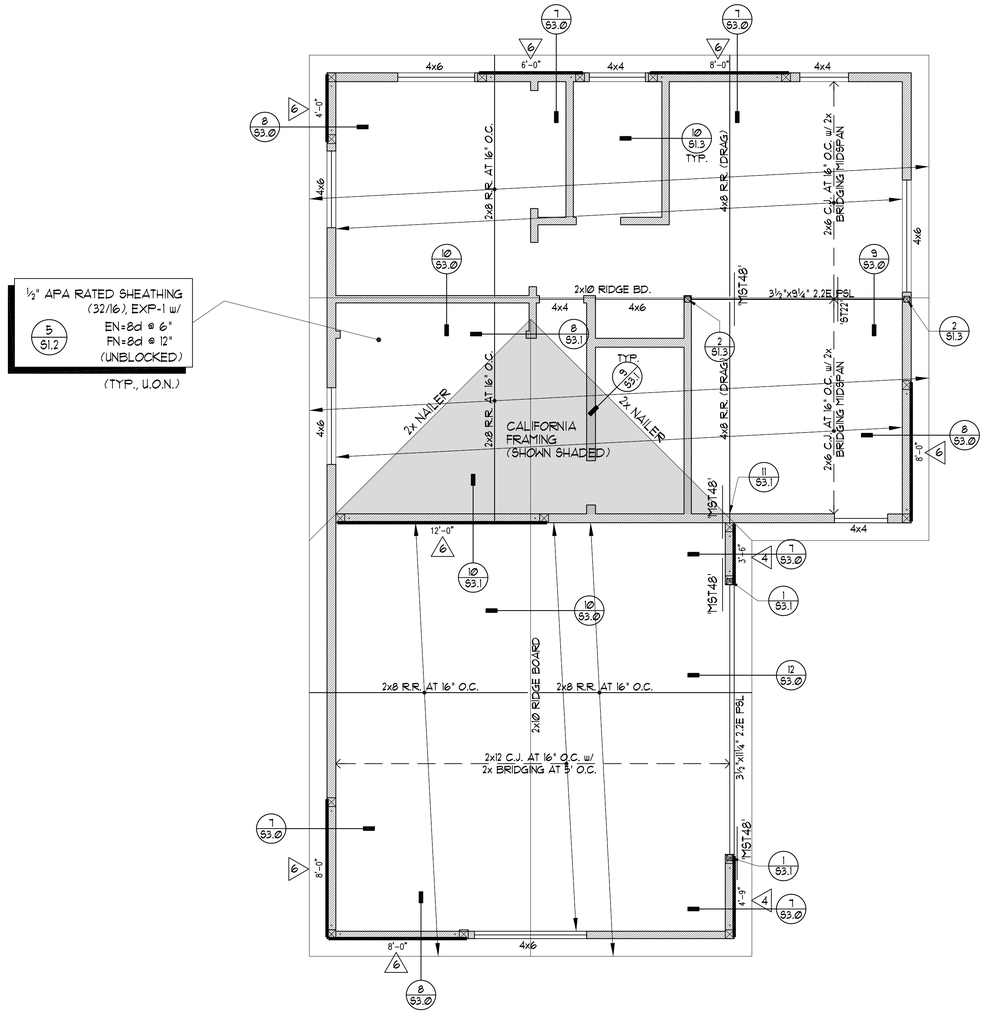
TITLE

FOUNDATION PLAN

REGISTERED PROFESSIONAL ENGINEER EDUARDO J. CARRILLO STATE OF CALIFORNIA
SIGNED: 12/28/22

JOB #: 22-251	DRAWN: D.D. / J.K.
DATE: Dec. 28, 22	CHECKED: E.C.

S2.0



ROOF FRAMING PLAN

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

PLAN NOTES

1. SEE GENERAL NOTES AND TYPICAL DETAILS ON SHEETS S1.ØA, S1.ØB, S1.1, S1.2, S1.3 & S1.4. THESE NOTES AND DETAILS SHALL BE USED WHERE APPLICABLE WHETHER SPECIFICALLY REFERENCED OR NOT.
2. FOR TOP OF SHEATHING, TOP PLATE, AND TOP OF PARAPET ELEVATIONS NOT NOTED, REFER TO ARCHITECTURAL DRAWINGS.
3. STRUCTURAL WALLS ARE WALLS THAT RESIST GRAVITY , WIND, AND/OR SEISMIC LOADS. ALL EXTERIOR WOOD FRAME WALLS ARE STRUCTURAL WALLS. WALLS OR PORTIONS OF WALLS NOT INDICATED ON THE STRUCTURAL DRAWINGS ARE PARTITION WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATION AND EXTENT OF PARTITION WALLS.
4. FOR DIMENSIONS, EXTENT , AND NATURE OF ALL WALLS, REFER TO ARCHITECTURAL DWGS.
5. NOMINAL ROOF LINE VARIES. SEE PLAN FOR SPOT ELEVATIONS. STRUCTURAL WALLS BELOW ARE INDICATED BY DASHED LINES. FRAMING AT THIS LEVEL ARE SHOWN BY SOLID LINES.
6. SIZE AND LOCATION OR ALL MECHANICAL EQUIPMENT TO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO PLACEMENT.
7. ALL WOOD EXPOSED TO WEATHER TO BE TREATED WOOD, REDWOOD OR OTHER SPECIES NATURALLY RESISTANT TO DECAY AND JOIST HANGERS, STRAPS, TIES, ETC. SHALL BE GALVANIZED (G185 COATING). FASTENERS SHALL BE STAINLESS STEEL OR APPROVED EQUAL.
8. ALL EXISTING FRAMING, DIMENSIONS, FOOTINGS TO BE VERIFY BY CONTRACTOR PRIOR TO COMMENCING ANY WORK. NOTIFY THE ENGINEER OF RECORDS IF ANY DISCREPANCIES OCCURS.

LEGEND

- 18 — REQUIRED TOP PLATE SPLICE. SEE SCHEDULE ON 9/S1.2 FOR ALL REQUIREMENTS. THE MARKED SPLICE SHALL APPLY FOR THE FULL LENGTH OF THE WALL WHERE INDICATED. USE TYPE 18 SPLICE MIN., U.N.O. ON PLAN.
- FRAMING MEMBER BEARING ON TOP OF SUPPORT.
- FRAMING MEMBER INSTALLED FLUSH (IN HANGER) AT ITS SUPPORT. SEE DETAIL 4/S1.3 FOR REQUIRED BEAM HANGER TYPE.
- HEADER MEMBER. INSTALL MEMBER AT HEAD OF OPENING IN WALL BELOW. SEE DETAIL 9/S1.3.
- BEAM MEMBER INSTALLED DIRECTLY BELOW SHEATHING, U.O.N.
- C.J. — CEILING JOIST CLEAR SPAN, SEE DETAIL 12/S1.3 FOR CEILING JOIST SIZE AND SPACING.
- 'CMST12' COIL STRAP (L=15FT MIN. U.N.O.) w/ CONT. 4x JOIST DEPTH CONT. BLK'G, PER DETAIL.
- 4'-0" / 6 — SHEARWALL PER SCHEDULE ON S2.Ø. SEE DETAILS ON SHEET S1.2 FOR TYPICAL SHEARWALL ASSEMBLY. ALL SHEARWALLS CALLED OUT AT THIS LEVEL START AT THIS LEVEL AND CONTINUE DOWN.

GENERAL CONTRACTOR NOTES

Ⓧ SHEARWALLS TYPE 3, 2, 3D, AND 2D DESCRIBED ON SHEARWALL SCHEDULE ON SHEET S2.Ø MUST USE A SINGLE 3x STUD (VERTICALLY) & 3x BLOCKING (HORIZONTALLY) MINIMUM AT ALL PANEL EDGES (ABUTTING PANELS RECEIVING EDGE NAILING). USE 2x STUDS AT OTHER TYPES. (NDS 2Ø15, SEC. 15.3)

Ⓐ ALL WOOD STRUCTURAL SHEARWALL PANEL JOINTS OF SHEARWALLS TYPE 3, 2, 3D, AND 2D MUST USE STAGGERED NAILING AS SHOWN ON DETAIL 12 ON SHEET S1.2. ALL SILL PLATE NAILING OF SHEARWALLS TYPE 3, 2, 3D, AND 2D MUST USE A STAGGERED NAILING PATTERN.

NAILS SHALL BE PLACED NOT LESS THAN ½" EDGE DISTANCE FROM THE PANEL EDGES AND ⅜" FROM THE EDGE OF THE CONNECTING MEMBERS.

ADDITIONAL NOTES

1. ALL WOOD & STEEL w/ WOOD NAILER ROOF BEAMS AND ROOF DRAG BEAMS TO HAVE 2-ROWS E.N.

REVISION

MARK	DATE	REVISIONS
1		
2		
3		

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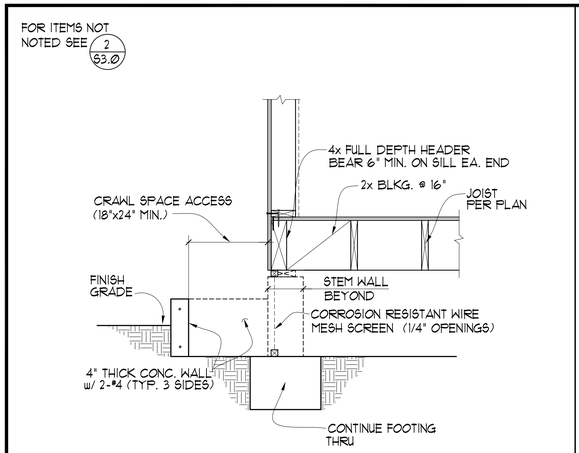
TITLE

ROOF FRMG. PLAN

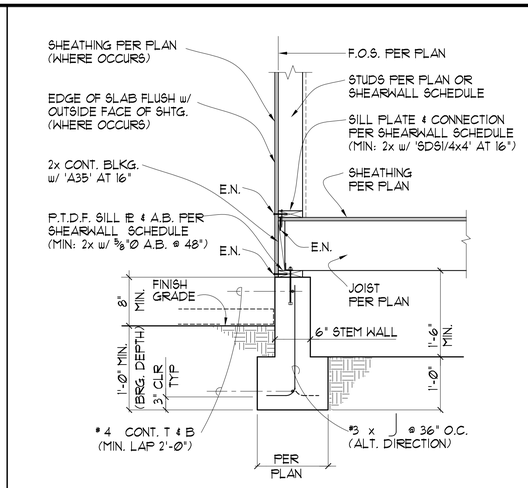
REGISTERED PROFESSIONAL ENGINEER
EDUARDO J. CARRILLO
EXP. 06-30-23
CIVIL
STATE OF CALIFORNIA
SIGNED: 12/28/22

JOB #:	DRAWN:
22-251	D.D. / J.K.
DATE:	CHECKED:
Dec. 28, 22	E.C.

S2.1



4 DETAIL



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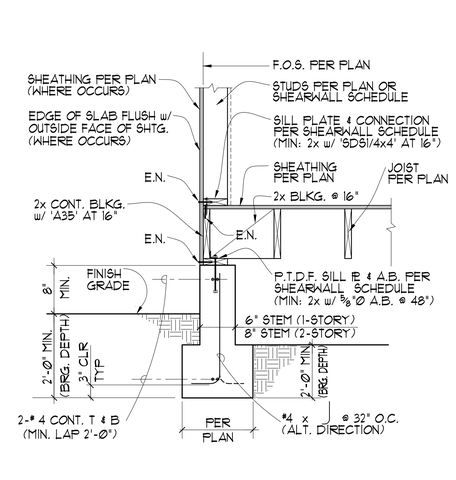

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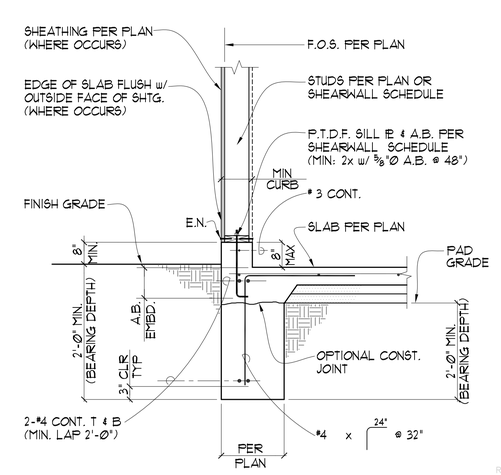
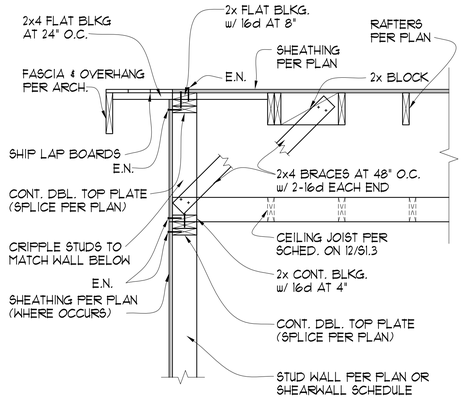


1 DETAIL



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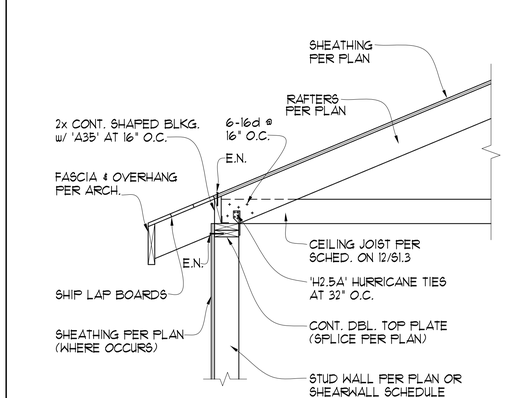
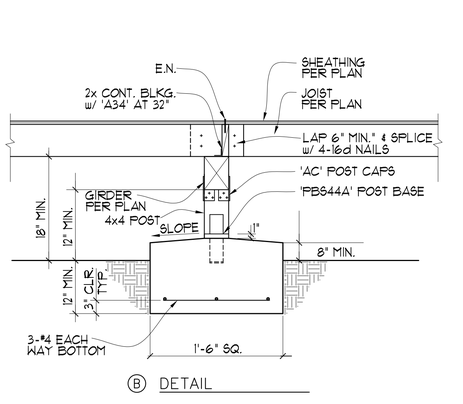


7 DETAIL



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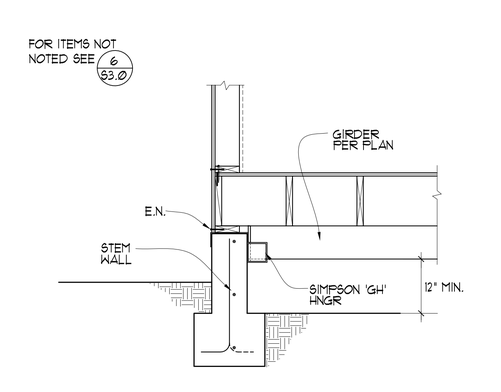

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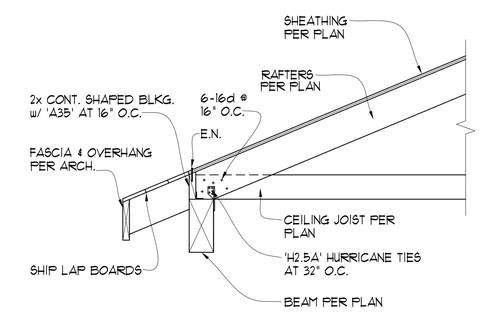

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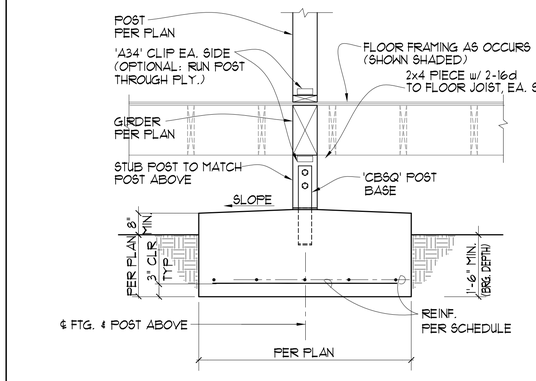

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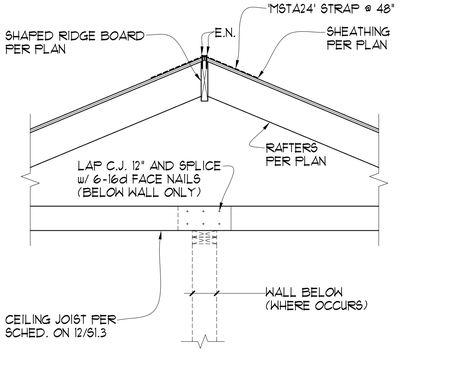

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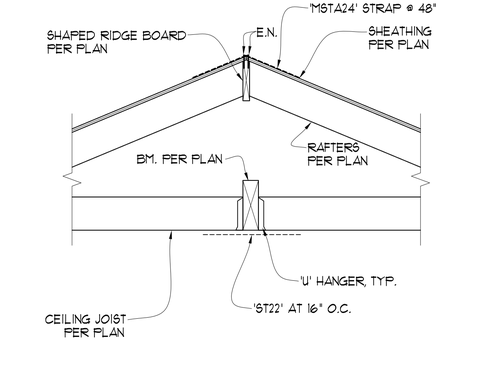

9 DETAIL

REVISION

MARK	DATE	REVISIONS
1		
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3		

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PROJECT ADDRESS:
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CORONA, CA 92882

CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT DISCREPANCIES TO THE ENGINEER. ALL CONSTRUCTION SHALL CONFORM TO THE C.B.C.

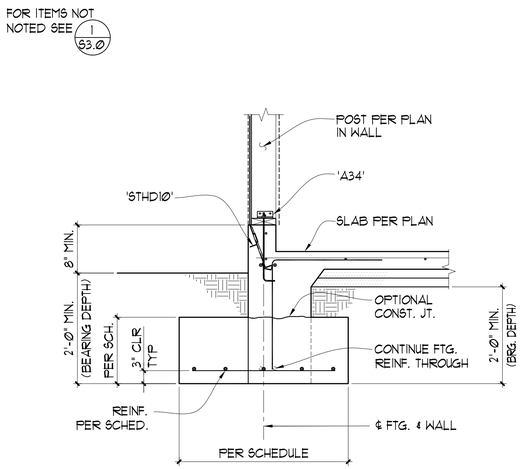
TITLE

STRUCTURAL DETAILS

REGISTERED PROFESSIONAL ENGINEER EDUARDO J. CARRILLO EXP. 6-30-23 STATE OF CALIFORNIA
SIGNED: 12/28/22

JOB #:	DRAWN:
22-251	D.D. / J.K.
DATE:	CHECKED:
Dec. 28, 22	E.C.

S3.0



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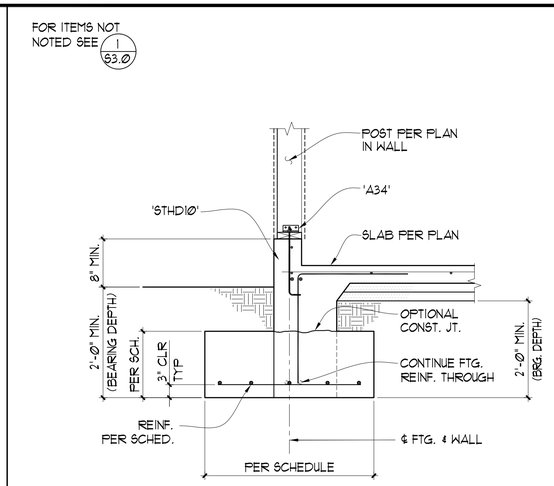

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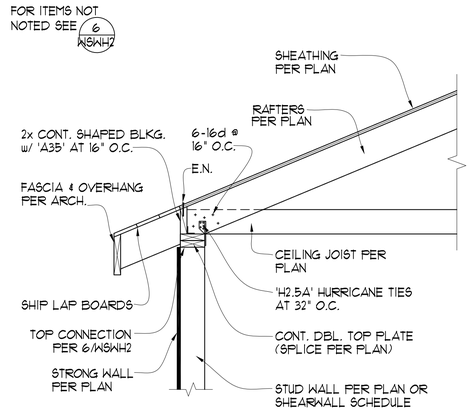

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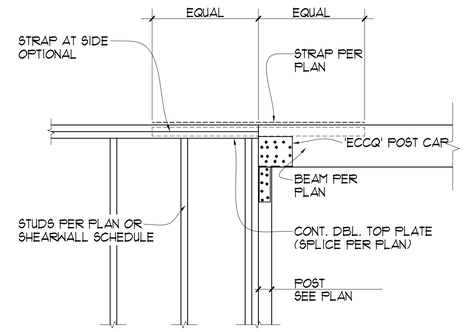
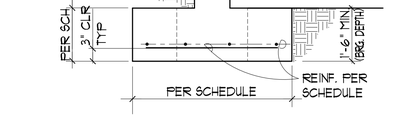


1 DETAIL

TYP. CALIFORNIA FRAMING

R773

8 DETAIL



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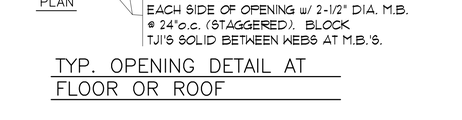
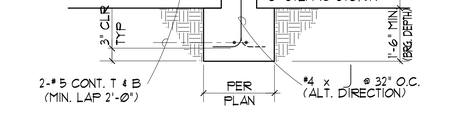


TYP. OPENING DETAIL AT FLOOR OR ROOF

S1-116

6 DETAIL



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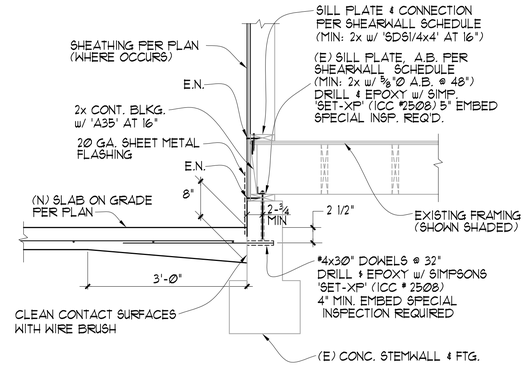

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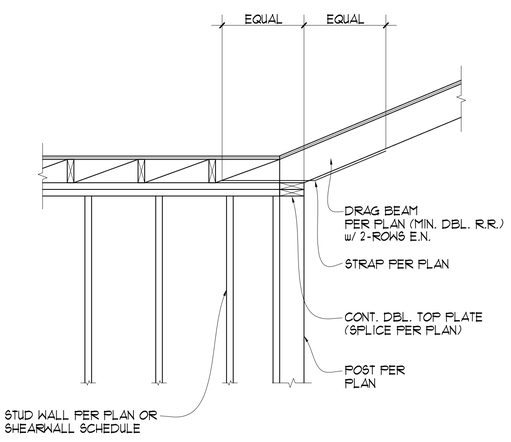

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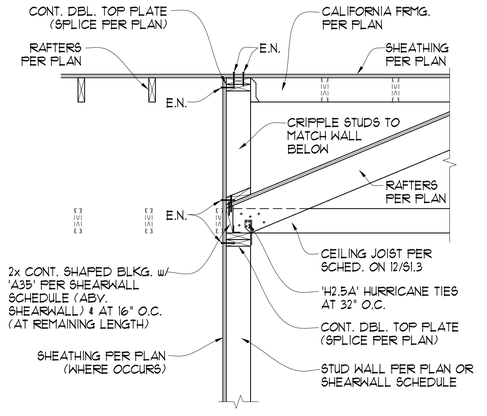

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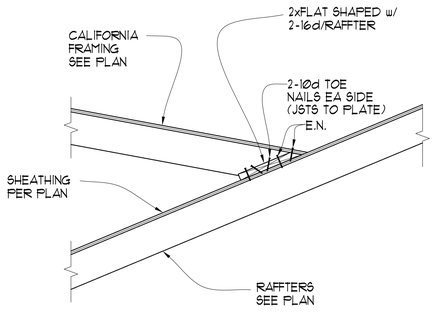

R795

9 DETAIL

REVISION

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JIMENEZ RESIDENCE

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CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT DISCREPANCIES TO THE ENGINEER. ALL CONSTRUCTION SHALL CONFORM TO THE C.B.C.

TITLE

STRUCTURAL DETAILS

EDUARDO J. CARRILLO
REGISTERED PROFESSIONAL ENGINEER
EXP: 06-30-23
STATE OF CALIFORNIA
SIGNED: 12/28/22

JOB #: 22-251	DRAWN: D.D. / J.K.
DATE: Dec. 28, 22	CHECKED: E.C.

S3.1

Water Fixture Unit (WFU) Count Table

Address: 915 W 8th, Corona CA Building Plan Check No.

Plumbing Fixture	WFU/Fixture	Existing Fixture	Proposed Fixture	Total Fixture	WFU
Bathtub or Combination Bath/Shower (fill)	4	1	2	3	12
3/4" Bathtub Fill Valve	10				
Bidet	1				
Clothes washer	4	1	1	2	8
Dental Unit, Cuspidor					
Dishwasher, domestic	1.5	1	1	2	3
Drinking Fountain or Water Cooler	0.5				
Hose Bibb	2.5	1	1	2	5
Lavatory	1	1	2	3	3
Lawn Sprinkler, each head	1				
Mobile Home, each (minimum)	12				
Sinks					
Bar	1				
Clinic Faucet					
Clinic Flushometer Valve with or without Faucet					
Kitchen, domestic without without dishwasher	1.5	1	1	2	3
Laundry	1.5				
Service or Mop Basin	1.5				
Washup, each set of faucets					
Shower, per head	2				
Urinal, flush tank	2				
Wash Fountain, circular spray					
Water Closet, 1.6 GPF Gravity Tank	2.5	1	2	3	7.5
Water Closet, 1.6 Flushometer Tank	2.5				
Water Closet, 1.6 GPF Gravity Valve					
Water Closet, greater than 1.6 GPF Gravity Tank	3				
Water Closet, 1.6 GPF greater than Flushometer Valve					
				Total WFU	41.5

Existing Meter: 3/4"
Existing Static Pressure at Meter: 80 psi to be verified on site.
Length from water Meter to Furthest Water Fixture: 170'
Building Supply Pipe Diameter: 1 1/4"
Required Meter size per CPC Table 610.4: 1"
Max WFU per CPC Table 610.4: 62

TABLE 610.4
FIXTURE UNIT TABLE FOR DETERMINING WATER PIPE AND METER SIZES

METER AND STREET SERVICE (inches)	BUILDING SUPPLY AND BRANCHES (inches)	MAXIMUM ALLOWABLE LENGTH (feet) 170'														
		40	60	80	100	150	200	250	300	400	500	600	700	800	900	1000
PRESSURE RANGE – 30 to 45 psi[1]																
¾	½[2]	6	5	4	3	2	1	1	1	0	0	0	0	0	0	0
¾	¾	16	16	14	12	9	6	5	5	4	4	3	2	2	2	1
¾	1	29	25	23	21	17	15	13	12	10	8	6	6	6	6	6
1	1	36	31	27	25	20	17	15	13	12	10	8	6	6	6	6
¾	1¼	36	33	31	28	24	23	21	19	17	16	13	12	12	11	11
1	1¼	54	47	42	38	32	28	25	23	19	17	14	12	12	11	11
1½	1¼	78	68	57	48	38	32	28	25	21	18	15	12	12	11	11
1	1½	85	84	79	65	56	48	43	38	32	28	26	22	21	20	20
1½	1½	150	124	105	91	70	57	49	45	36	31	26	23	21	20	20
2	1½	151	129	129	110	80	64	53	46	38	32	27	23	21	20	20
1	2	85	85	85	85	85	85	82	80	66	61	57	52	49	46	43
1½	2	220	205	190	176	155	138	127	120	104	85	70	61	57	54	51
2	2	370	327	292	265	217	185	164	147	124	96	70	61	57	54	51
2	2½	445	418	390	370	330	300	280	265	240	220	198	175	158	143	133
PRESSURE RANGE – 46 to 60 psi[1]																
¾	½[2]	7	7	6	5	4	3	2	2	1	1	1	0	0	0	0
¾	¾	20	20	19	17	14	11	9	8	6	5	4	4	3	3	3
¾	1	39	39	36	33	28	23	21	19	17	14	12	10	9	8	8
1	1	39	39	39	36	30	25	23	20	18	15	12	10	9	8	8
¾	1¼	39	39	39	39	39	39	34	32	27	25	22	19	19	17	16
1	1¼	78	78	76	67	52	44	39	36	30	27	24	20	19	17	16
1½	1¼	78	78	78	78	66	52	44	39	33	29	24	20	19	17	16
1	1½	85	85	85	85	85	85	80	67	55	49	41	37	34	32	30
1½	1½	151	151	151	151	128	105	90	78	62	52	42	38	35	32	30
2	1½	151	151	151	151	150	117	98	84	67	55	42	38	35	32	30
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	83	80
1½	2	370	370	340	318	272	240	220	198	170	150	135	123	110	102	94
2	2	370	370	370	370	368	318	280	250	205	165	142	123	110	102	94
2	2½	654	640	610	580	535	500	470	440	400	365	335	315	285	267	250
PRESSURE RANGE – Over 60 psi[1]																
¾	½[2]	7	7	7	6	5	4	3	3	2	1	1	1	1	1	0
¾	¾	20	20	20	20	17	13	11	10	8	7	6	6	5	4	4
¾	1	39	39	39	39	35	30	27	24	21	17	14	13	12	12	11
1	1	39	39	39	39	38	32	29	26	22	18	14	13	12	12	11
¾	1¼	39	39	39	39	39	39	39	39	34	28	26	25	23	22	21
1	1¼	78	78	78	78	74	62	53	47	39	31	26	25	23	22	21
1½	1¼	78	78	78	78	78	74	65	54	43	34	26	25	23	22	21
1	1½	85	85	85	85	85	85	85	85	81	64	51	48	46	43	40
1½	1½	151	151	151	151	151	151	130	113	88	73	51	51	46	43	40
2	1½	151	151	151	151	151	151	142	122	98	82	64	51	46	43	40
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
1½	2	370	370	370	370	360	335	305	282	244	212	187	172	153	141	129
2	2	370	370	370	370	370	370	370	340	288	245	204	172	153	141	129
2	2½	654	654	654	654	654	650	610	570	510	460	430	404	380	356	329

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 pound-force per square inch = 6.8947 kPa

Notes:
[1] Available static pressure after head loss.
[2] Building supply, not less than ¾ of an inch (20 mm) nominal size.

REVISIONS BY	

WATER SUPPLY TABLES

MR. S. JIMENEZ
915 W 8TH STREET
CORONA, CA

DRAWN
N. MEAS

TEL. NUMBER
(714) 492-2826

DATE
11/14/2022

SCALE
AS SHOWN

JOB NO.
1002

SHEET
T1.0

GENERAL INFORMATION					
01	Project Name	(N) DWELLING UNIT			
02	Run Title	Title 24 Analysis			
03	Project Location	915 W. 8TH ST.			
04	City	CORONA	05	Standards Version	2019
06	Zip code	92882	07	Software Version	EnergyPro 8.3
08	Climate Zone	10	09	Front Orientation (deg/ Cardinal)	180
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	NewConstruction	13	Number of Bedrooms	2
14	Addition Cond. Floor Area (ft^2)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft^2)	n/a	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft^2)	839	19	Glazing Percentage (%)	10.01%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Is Natural Gas Available?	Yes			

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	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	This building incorporates one or more Special Features shown below

ENERGY DESIGN RATING				
	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	Total[2] (EDR)	Efficiency[1] (EDR)	Total[2] (EDR)
Standard Design	54.4	26.6		
Proposed Design	54	24.1	0.4	2.5
RESULT: [3] COMPLIES				

1: Efficiency EDR includes improvements to the building envelope and more efficient equipment
2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries
3: Building complies when efficiency and total compliance margins are greater than or equal to zero

- Standard Design PV Capacity: 2.21 kWdc
- PV System resized to 2.37 kWdc (a factor of 2.371) to achieve 'Maximum PV for Compliance Credit' PV scaling

ENERGY USE SUMMARY				
Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	3.65	5.68	-2.03	-55.6
Space Cooling	44.86	43.32	1.54	3.4
IAQ Ventilation	4.59	4.59	0	0
Water Heating	23.49	21.59	1.9	8.1
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	**76.59**	**75.18**	**1.41**	**1.8**

REQUIRED PV SYSTEMS - SIMPLIFIED

01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
2.37	NA	Standard	Fixed	none	true	150-270	n/a	n/a	<=7:12	96	98

REQUIRED SPECIAL FEATURES

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

- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)

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 buildng tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- Verified EER
- Verified SEER
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)

Heating System Verifications:
- Verified HSPF
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)

HVAC Distribution System Verifications:
- -- None --

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

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft^2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
(N) DWELLING UNIT	839	1	2	1	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	Water Heating System 2
(N) 839 SQ. FT. ADU	Conditioned	Undefined System1	839	8	DHW Sys 1	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)
NORTH WALL	(N) 839 SQ. FT. ADU	R-15 Wall	0	Back	264	28	90
EAST WALL	(N) 839 SQ. FT. ADU	R-15 Wall	90	Right	204	24	90
SOUTH WALL	(N) 839 SQ. FT. ADU	R-15 Wall	180	Front	264	20	90
WEST WALL	(N) 839 SQ. FT. ADU	R-15 Wall	270	Left	204	32	90
Roof	(N) 839 SQ. FT. ADU	R-38 Roof Attic	n/a	n/a	839	n/a	n/a
Raised Floor	(N) 839 SQ. FT. ADU	R-19 Floor Crawlspace	n/a	n/a	839	n/a	n/a

ATTIC

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic (N) 839 SQ. FT. ADU	Attic Roof(N) 839 SQ. FT. ADU	Ventilated	4	0.1	0.85	Yes	No

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Window	Window	NORTH WALL	Back	0			1	16	0.3	NFRC	0.23	NFRC	Bug Screen
Window 2	Window	NORTH WALL	Back	0			1	6	0.3	NFRC	0.23	NFRC	Bug Screen
Window 3	Window	NORTH WALL	Back	0			1	6	0.3	NFRC	0.23	NFRC	Bug Screen

REVISIONS BY	

TITLE 24

MR. S. JIMENEZ
915 W 8TH STREET
CORONA, CA

DRAWN	N. MEAS
TEL. NUMBER	(714) 492-2826
DATE	11/14/2022
SCALE	AS SHOWN
JOB NO.	1002
SHEET	T2.0

FENESTRATION / GLAZING

01 Name	02 Type	03 Surface	04 Orientation	05 Azimuth	06 Width (ft)	07 Height (ft)	08 Mult.	09 Area (ft^2)	10 U-factor	11 U-factor Source	12 SHGC	13 SHGC Source	14 Exterior Shading
Window 4	Window	EAST WALL	Right	90			1	24	0.3	NFRC	0.23	NFRC	Bug Screen
Window 5	Window	WEST WALL	Left	270			1	16	0.3	NFRC	0.23	NFRC	Bug Screen
Window 6	Window	WEST WALL	Left	270			1	16	0.3	NFRC	0.23	NFRC	Bug Screen

OPAQUE DOORS

01 Name	02 Side of Building	03 Area (ft^2)	04 U-factor
Door	SOUTH WALL	20	0.2

OPAQUE SURFACE CONSTRUCTIONS

01 Construction Name	02 Surface Type	03 Construction Type	04 Framing	05 Total Cavity R-value	06 Interior / Exterior Continuous R-value	07 U-factor	08 Assembly Layers
R-15 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Exterior Finish: 3 Coat Stucco
Attic Roof(N) 839 SQ. FT. ADU	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x10 @ 16 in. O. C.	R-19	None / None	0.046	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 / 2x10

OPAQUE SURFACE CONSTRUCTIONS

01 Construction Name	02 Surface Type	03 Construction Type	04 Framing	05 Total Cavity R-value	06 Interior / Exterior Continuous R-value	07 U-factor	08 Assembly Layers
R-38 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

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

WATER HEATING SYSTEMS

01 Name	02 System Type	03 Distribution Type	04 Water Heater Name (#)	05 Solar Heating System	06 Compact Distribution	07 HERS Verification
DHW Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heater 1 (1)	n/a	None	n/a

WATER HEATERS

01 Name	02 Heating Element Type	03 Tank Type	04 # of Units	05 Tank Vol. (gal)	06 Energy Factor or Efficiency	07 Input Rating or Pilot	08 Tank Insulation R-value (Int/Ext)	09 Standby Loss or Recovery Eff	10 1st Hr. Rating or Flow Rate	11 NEEA Heat Pump Brand or Model	12 Tank Location or Ambient Condition
DHW Heater 1	Gas	Consumer Instantaneous	1	0	0.91-UEF	<= 200 kBtu/hr	0	n/a	n/a	n/a	n/a

WATER HEATING - HERS VERIFICATION

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

SPACE CONDITIONING SYSTEMS

01 Name	02 System Type	03 Heating Unit Name	04 Cooling Unit Name	05 Fan Name	06 Distribution Name	07 Required Thermostat Type	08 Status	09 Verified Existing Condition	10 Heating Equipment Count	11 Cooling Equipment Count
Undefined System1	Heat pump heating cooling	Heat Pump System 1	Heat Pump System 1	n/a	n/a	Setback	New	NA	1	1

HVAC - HEAT PUMPS

01 Name	02 System Type	03 Number of Units	04 Heating HSPF/COP	05 Heating Cap 47	06 Heating Cap 17	07 Cooling SEER	08 Cooling EER/CEER	09 Zonally Controlled	10 Compressor Type	11 HERS Verification
Heat Pump System 1	VCHP-ductless	1	9.5	80000	75000	16	12.5	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump

HVAC HEAT PUMPS - HERS VERIFICATION

01 Name	02 Verified Airflow	03 Airflow Target	04 Verified EER	05 Verified SEER	06 Verified Refrigerant Charge	07 Verified HSPF	08 Verified Heating Cap 47	09 Verified Heating Cap 17
Heat Pump System 1-hers-htpump	Not Required	0	Required	Required	Yes	Yes	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

01 Name	02 Certified Low-Static VCHP System	03 Airflow to Habitable Rooms	04 Ductless Units in Conditioned Space	05 Wall Mount Thermostat	06 Air Filter Sizing & Pressure Drop Rating	07 Low Leakage Ducts in Conditioned Space	08 Minimum Airflow per RA3.3 and SC3.3.3.4.1	09 Certified non-continuous Fan	10 Indoor Fan not Running Continuously
Heat Pump System 1	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

IAQ (INDOOR AIR QUALITY) FANS

01 Dwelling Unit	02 IAQ CFM	03 IAQ Watts/CFM	04 IAQ Fan Type	05 IAQ Recovery Effectiveness - SRE	06 IAQ Recovery Effectiveness - ASRE	07 HERS Verification
SFam IAQVentRpt	47	0.35	Exhaust	n/a	n/a	Yes

REVISIONS BY	

TITLE 24

MR. S. JIMENEZ
915 W 8TH STREET
CORONA, CA

DRAWN	N. MEAS
TEL. NUMBER	(714) 492-2826
DATE	11/14/2022
SCALE	AS SHOWN
JOB NO.	1002
SHEET	T3.0

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

Project Name: (N) DWELLING UNIT **Calculation Date/Time:** 2022-11-13T18:12:12-08:00 **(Page 9 of 9)**

Calculation Description: Title 24 Analysis **Input File Name:** Building1.ribd19x

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
I, I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name: Juan Castro	Documentation Author Signature: Juan Castro
Company: Juan R Castro	Signature Date: 11/13/2022
Address: 11201 Hulme Ave	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Lynwood, CA 90262	Phone: 3236051743

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: Juan Castro	Responsible Designer Signature: Juan Castro
Company: Juan R Castro	Date Signed: 11/13/2022
Address: 11201 Hulme Ave	License:
City/State/Zip: Lynwood, CA 90262	Phone: 3236051743

Digitally signed by CorGol Home Energy Efficiency Rating System Services, Inc. (CHEERS). This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

Registration Number: 422-P01079578A-000-000-0000000-0000 Registration Date/Time: 11/13/2022 18:04 HERS Provider: CHEERS

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CA Building Energy Efficiency Standards - 2019 Residential Compliance Report Version: 2019.2.000 Schema Version: rev 20200901 Report Generated: 2022-11-13 18:12:45

2019 Low-Rise Residential Mandatory Measures Summary

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

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

2019 Low-Rise Residential Mandatory Measures Summary

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

2019 Low-Rise Residential Mandatory Measures Summary

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

2019 Low-Rise Residential Mandatory Measures Summary

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

REVISIONS BY	

TITLE 24

MR. S. JIMENEZ
915 W 8TH STREET
CORONA, CA

DRAWN	N. MEAS
TEL. NUMBER	(714) 492-2826
DATE	11/14/2022
SCALE	AS SHOWN
JOB NO.	1002
SHEET	T4.0

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE
RESIDENTIAL MANDATORY MEASURES, SHEET 1 (July 2021, Includes July 2021 Supplement)

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

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.

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, 4.106.4.2, or 4.106.4.3 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 commercial power supply.
   1.2 Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost to the homeowner or the developer by more than $400.00 per dwelling unit.
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. If residential parking is available, 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 EVSE. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.

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.
3. A parking space served by electric vehicle supply equipment or designated as a future EV charging space shall count as at least one standard automobile parking space 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.

4.106.4.2.1 Electric vehicle charging space (EV space) locations. Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided at least one EV space shall be located in the common use parking area and shall be available for use by all residents.

4.106.4.2.1.1 Electric Vehicle Charging Stations (EVCS) When EV chargers are installed, EV spaces required by Section 4.106.2.2, Item 3, shall comply with at least one of the following options:

1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code*, Chapter 11A, to allow use of the EV charger from the accessible parking space.
2. The EV space shall be located on an accessible route, 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 4.106.4.2.1.1 and Section 4.106.4.2.2, Item 3.

Note: Electric Vehicle charging stations serving public housing are required to comply with the *California Building Code*, Chapter 11B.

4.106.4.2.2 Electric vehicle charging space (EV space) dimensions. The EV space 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 EV spaces, but not less than one EV space, shall 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.

4.106.4.2.3 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 proposed location of the EV space. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

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*.

4.106.4.2.4 Multiple EV spaces required. Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify 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 the full rated amperage of the EVSE. 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.

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*.

4.106.4.2.5 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*.

4.106.4.3 New hotels and motels. All newly constructed hotels and motels shall provide EV spaces capable of supporting future installation of EVSE. The construction documents shall identify the location of the EV spaces.

Notes:
1. Construction documents are intended to demonstrate the project's capability and capacity or facilitating future EV charging.
2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.
3. A parking space served by electrical vehicle supple equipment or designed as a future EV charging space shall count as at least one standard automobile parking space 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.

4.106.4.3.1 Number of required EV spaces. The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Table 4.106.4.3.1. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.

TABLE 4.106.4.3.1

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED EV SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 and over	6 percent of total

4.106.4.3.2 Electric vehicle charging space (EV space) dimensions. The EV spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486mm).
2. The minimum width of each EV space shall be 9 feet (2743mm)

4.106.4.3.3 Single EV space required. When a single EV space is required, the EV space shall be designed in accordance with Section 4.106.4.2.3.

4.106.4.3.4 Multiple EV spaces required. When multiple EV spaces are required, the EV spaces shall be designed in accordance with Section 4.106.4.2.4.

4.106.4.3.5 Identification. The service panels or sub-panels shall be identified in accordance with Section 4.106.4.2.5.

4.106.4.3.6 Accessible EV spaces. In addition to the requirements in Section 4.106.4.3, EV spaces for hotels/motels and all EVSE, when installed, shall comply with the accessibility provisions for the EV charging stations in the *California Building Code*, Chapter 11B.

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 Commnon 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 CAL Fire on maintenance of defensible space around residential structures.

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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DATE
11/14/2022

SCALE
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AIA California

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE

RESIDENTIAL MANDATORY MEASURES, SHEET 1 (July 2021, Includes July 2021 Supplement)

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 O³/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 trichloroethylene), 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.

hhttps://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.

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