

2. CONCRETE FOUNDATION CONSTRUCTION

200. THE FIELD INSPECTOR SHALL VERIFY FOUNDATION REQUIREMENTS DURING FOUNDATION INSPECTION.
201. CONCRETE STRENGTH SHALL BE NO LESS THAN 2,500 PSI @ 28 DAYS, OR HIGHER STRENGTH IF NOTED ON THE PLANS.
202. SLAB REINFORCEMENT & FOOTINGS SHALL BE PER STRUCTURAL DETAILS ON SHEET S4, CENTERED IN SLAB.
203. REINFORCING BARS TO BE GRADE 40 FOR #3 BARS, GRADE 60 FOR #4 BARS & LARGER
204. PROVIDE WEAKENED PLANE JOINTS FOR CRACK CONTROL (SAWCUT OR TOOLED JOINT) AT 14'-0" O/C MAX.
205. SILL ANCHORAGE AT ALL SHEARWALL LOCATIONS SHALL BE PER THE SHEARWALL SCHEDULE. ALL SHEARWALL ANCHOR BOLTS SHALL RECEIVE A 3" SQUARE X 0.229" THICK WASHER. THE WASHER MAY BE DIAGONALLY SLOTTED (WIDTH >= BOLT DIAMETER + 3/16", LENGTH <= 1 1/2") PROVIDED THAT A STANDARD CUT WASHER IS USED ON TOP OF THE SQUARE WASHER. SHEARWALL ANCHORS SHALL BE PLACED A MIN. OF 1 3/4" FROM THE EDGE OF CONCRETE.
206. EMBEDDED SILL ANCHOR BOLTS AT TYPICAL NON-SHEARWALL CONDITIONS SHALL BE 3/8" DIA. MIN. ANCHOR BOLTS WITH A STANDARD CUT WASHER. SPACING SHALL NOT EXCEED 48 INCHES O/C. LOCATE AN ANCHOR BOLT NOT MORE THAN 9 INCHES, OR LESS THAN 4" FROM ENDS AND SPLICES. EACH SILL SHALL HAVE (2) SILL BOLTS MIN.
207. ANCHOR BOLTS SHALL BE EMBEDDED A MIN. OF 7 INCHES INTO CONCRETE. IN A TWO-POUR SYSTEM, ANCHOR BOLTS TO BE EMBEDDED 5 INCHES MIN. INTO FIRST POUR.
208. SEE WOOD FRAMING CONSTRUCTION NOTES FOR ALTERNATE SILL ANCHORAGE.
209. ALL HOLDOWNS SHALL BE PLACED A MINIMUM DIM AS SHOWN IN DETAIL 384/54 FROM EXTERIOR CORNER OF SLAB.
210. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. SUBCONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. IMMEDIATELY NOTIFY HOMEOWNER AND CITY OF SANTA ANA OF ANY DISCREPANCY, TYPICAL.
211. PROVIDE A UFER GROUND FOR ELECTRICAL SYSTEM PER ARTICLE 250.52 N.E.C.
212. ALL SURROUNDING FLAT WORK SHALL BE VERIFIED WITH HOMEOWNER FOR LOCATION AND AMOUNT TO BE POURED.
213. RETROFIT MISPLACED HOLDOWNS AS NOTED BELOW. AT EPOXY ANCHORS USE SIMPSON SET-XP EPOXY PER MANUFACTURERS INSTALLATION REQUIREMENTS AS FOLLOWS:

RETROFIT BOLT	REPLACEMENT HARDWARE
MISPLACED HOLDOWN LSTD8, HTT4 STHD10, STHD14, HTT5 LTT20B LTT20B HDU8	HTT4 HTT5 LTT20B LTT20B HDU8
ALL-THREAD, EMBED 9"	HTT5
ALL-THREAD, EMBED 9"	LTT20B
ALL-THREAD, EMBED 7"	LTT20B
ATTACH TO EXISTING A.B.	HDU8
ALL-THREAD, EMBED 15"	

214. RETROFIT 3/8" & 1/2" EMBEDDED ANCHOR BOLTS AS NOTED BELOW. AT EPOXY ANCHORS USE SIMPSON SET-XP EPOXY PER SIMPSON'S INSTALLATION REQUIREMENTS.
- | LOCATION | TYPE | REPLACEMENT |
|--------------------------|------------------------|---|
| SLAB EDGE, 1/3-4" DIST. | SHEARWALL | 3/8" ALL-THREAD, EPOXY, EMBED 3" |
| INTERIOR > 6" EDGE DIST. | SHEARWALL OR NON-SHEAR | 3/8" TITEN HD, EMBED 3" MIN. |
| ANY OTHER | NON-SHEAR | 0.145 DIA. SHOT PINS SPACED 4 INCHES APART ON SILL. (2) FOR EACH MISSING ANCHOR BOLT. MAX. OF (6) SHOT PINS EVERY 6 FT. |
215. WHEN REQUESTING A BUILDING DEPARTMENT FOUNDATION INSPECTION, HAVE CONTRACTOR DOCUMENTATION IN WRITING FOR THE FOLLOWING:
- THE PAD WAS PREPARED IN ACCORDANCE WITH THE SITE REQUIREMENTS AND CITY OF SANTA ANA APPROVAL.
 - THE UTILITY TRENCHES HAVE BEEN PROPERLY BACKFILLED & COMPACTED.
 - THE FOUNDATION EXCAVATIONS, EXPANSIVE CHARACTERISTICS AND BEARING CAPACITY COMPLIES WITH THE CITY OF SANTA ANA RECOMMENDATIONS.
216. ALL HOLDOWN ANCHORS & HARDWARE MUST BE TIED IN PLACE PRIOR TO CALLING FOR A FOUNDATION INSPECTION.

3. WOOD FRAMING CONSTRUCTION

300. ROOFING MATERIALS SHALL BE PER ARCHITECTURAL DRAWINGS.
301. ROOF SHEATHING SHALL BE 3/8" OR 1/2" C-D GRADE. INTERIOR TYPE PLYWOOD WITH EXTERIOR GLUE OR OSB PANELS. IDENTIFICATION INDEX (240) W/ 8D COMMON NAILS @ 6" O/C @ ALL PERIMETER EDGES AND ALL INTERIOR SUPPORTED EDGES AND @ 12" O/C @ ALL INTERMEDIATE SUPPORTS. SEE DETAILS FOR SHEAR AND DRAG NAILING.
302. TYPICAL WALL SHEATHING:
INTERIOR SURFACES: WHERE DRYWALL IS SPECIFIED, PROVIDE MIN. 5/8" GYPSUM WALLBOARD W/ SD COOLER NAILS OR EQUAL @ 7" O/C TO ALL STUDS AND TO TOP & BOTTOM PLATES (UNBLOCKED) AT INTERIOR SIDE OF EXTERIOR WALLS AND AT BOTH SIDES OF ALL INTERIOR WALLS.

EXTERIOR SURFACES: SEE PLANS. WHERE "STUCCO" IS SPECIFIED PROVIDE 1/2" EXTERIOR CEMENT PLASTER OVER WIRE LATH OVER TYPE 15 BUILDING PAPER. LATH ATTACHED TO ALL STUDS AND TOP AND BOTTOM PLATES (OR BLOCKING AS OCCURS) W/ 16 GAGE X 7/16" STAPLES @ 6" O/C OR NO. 11 GAGE X 1-1/2" FURRING NAILS WHERE INDICATED ON ELEVATIONS.
303. STRUCTURAL SHEATHING MAY BE EITHER OSB OR PLYWOOD. ANY NOTES REFERRING TO PLYWOOD ALSO APPLIES TO OSB.
304. TOP PLATES SHALL BE DOUBLE 2X W/ WIDTH EQUAL TO STUDS BELOW, W/ (21) 16D NAILS MIN. @ MINIMUM 4'-0" LAP SPLICES. USE SIMPSON RPS OR CS16 STRAP EACH SIDE OR ONE SIDE AND TOP WHERE LAP SPLICE IS NOT POSSIBLE. SEE DETAILS FOR NOTCHES, CUT-OUTS AND COMPLETE PLATE BREAKS AT HEATING, VENTING, AND PLUMBING.

3. WOOD FRAMING CONSTRUCTION (CONT.)

305. TYPICAL SHEAR TRANSFER:
ROOF TO WALL: CONNECT ROOF FRAMING TO TOP PLATE W/ SIMPSON H1 @ 24" O/C OR A35 OR RBC @ 24" O/C OR PER SHEAR TRANSFER DETAILS.

SILL PLATE ANCHORS:

306. GROUND FLOOR / SLAB ON GRADE WALLS: PROVIDE 2X (MIN.) PTDF SILL PLATES. SEE CONCRETE FOUNDATION CONSTRUCTION NOTES 206, 207 & 208 FOR ANCHOR BOLTS. AT INTERIOR NON-SHEAR CONDITIONS, 0.145 SHOT PIN ANCHORS @ 32" O/C MAY BE USED TO CONNECT PARTITIONS AND BEARING WALLS TO SLAB.
307. ALL WOOD SILL PLATES AND ALL WOOD MEMBERS DIRECTLY AGAINST CONCRETE OR MASONRY SHALL BE FOUNDATION GRADE REDWOOD SILLS OR PTDF SILLS, TREATED WITH SODIUM BORATE (SBX/DOT) WHEN INSTALLED IN A DRY OR ENCLOSED ENVIRONMENT. (SODIUM BORATE TREATMENT DOES NOT REQUIRE CORROSION RESISTANT CONNECTORS.) IF OTHER TREATMENTS ARE USED, SEE NOTE 309.
308. FASTENERS IN CONTACT WITH PRESSURE TREATED WOOD:
ALL NAILS AND FASTENERS IN CONTACT WITH PRESSURE TREATED LUMBER TREATED WITH ACQ-C, ACQ-D, CA-B, AND CBA-A WITHOUT AMMONIA SHALL BE GALVANIZED PER ASTM A153.

ALL NAILS AND FASTENERS IN CONTACT WITH PRESSURE TREATED LUMBER TREATED WITH ACQ-C, ACQ-D, CA-B, AND CBA-A WITH AMMONIA SHALL BE TYPE 303, 304, 305, OR 316 STAINLESS STEEL.

WHERE PRESSURE TREATED LUMBER IS INSTALLED IN AN EXTERIOR WET ENVIRONMENT, ALL NAILS AND FASTENERS IN CONTACT WITH THE PRESSURE TREATED LUMBER SHALL BE TYPE 303, 304, 305, OR 316 STAINLESS STEEL.
309. RE-TIGHTEN ALL HOLDOWN ANCHORS JUST PRIOR TO COVERING THE WALL FRAMING.
310. ENGINEERED BEAMS ARE AS FOLLOWS:
"PSL" REFERS TO PARALLEL STRAND LUMBER (E=2.0, FB=2900).
"LSL" REFERS TO LAMINATED STRAND LUMBER (E=1.55, FB=2325).
(E=1.3 & FB=1700 AT LSL CONDITIONS WITH D (DEPTH) < 9")
"LVL" REFERS TO LAMINATED VENEER LUMBER (E=2.0, FB=2800).
"GLB" REFERS TO 24F-1.8E GLU-LAM WITH STANDARD CAMBER, U.N.O.
"IJC" ENGINEERED GLU-LAM BEAM MAY BE USED UPON ENGINEER APPROVALS.
AN A.I.T.C CERTIFICATE OF COMPLIANCE ISSUED BY A CURRENT ICC APPROVED QUALITY CONTROL AGENCY FOR GLUED LAMINATED WOOD MEMBERS SHALL BE GIVEN TO THE BUILDING INSPECTOR PRIOR TO INSTALLATION.
311. LUMBER SPECIFICATIONS:
ALL FRAMING LUMBER SHALL BE DOUGLAS FIR-LARCH. STUDS, PLATES & BLOCKING:
2X4 FRAMING LUMBER NOT LISTED BELOW STANDARD GRADE OR BETTER
92-1/4", 104-1/4", & 116-1/4" 2X4 STUDS STUD GRADE OR BETTER
2X4 STUDS OVER 10' #2 OR BETTER
2X4 SILLS & PLATES STANDARD OR BETTER
2X6 STUDS, SILLS, & PLATES #2 OR BETTER
4X4 STUDS & POSTS STANDARD OR BETTER OR #1
4X6, 6X6, & LARGER STUDS & POSTS #1 OR BETTER
4X4, 4X6 BEAMS & HEADERS #2 OR BETTER
4X8, 4X10, 4X12, 4X14 BEAMS & HEADERS #1 OR BETTER
6X4 BEAMS & HEADERS #2 OR BETTER
6X6 & LARGER BEAM & HEADERS #1 OR BETTER
2X6 AND LARGER RAFTERS AND JOISTS #2 OR BETTER
312. HOLES, CUTOUTS, AND NOTCHES IN FRAMING MEMBERS:
BY VIRTUE OF CODE COMPLIANCE WITH ELECTRICAL AND PLUMBING CODES, HOLES AND NOTCHES WILL INEVITABLY BE MADE IN FRAMING MEMBERS. THE CODE RECOGNIZES AND APPROVES VARIOUS HOLES AND NOTCHES WITHOUT ENGINEERING JUSTIFICATION IN CBC SECTION 2308.8.2. ENGINEERED (PSL,LSL) RECTANGULAR LUMBER BEAMS BEHAVE LIKE ANY OTHER RECTANGULAR SHAPE WHEN NOTCHED OR BORED, SO THE ENGINEER OR ARCHITECT MAY SPECIFY LIMITS WITHOUT MANUFACTURER APPROVAL OTHER HOLES AND NOTCHES ARE ALLOWED AS NOTED BELOW:

PSL AND LVL BEAMS: A HOLE 1 INCH IN DIAMETER CAN BE DRILLED ANYWHERE, AND A 2 INCH DIA. HOLE CAN BE DRILLED IN THE MIDDLE THIRD OF THE SPAN IN THE MIDDLE THIRD OF THE DEPTH OF THE BEAM FOR ANY PSL OR LVL BEAM, EXCEPT CANTILEVERED BEAMS AND BEAMS SUPPORTING CONCENTRATED LOADS. HOLES IN THOSE CONDITIONS REQUIRE APPROVAL IN WRITING FROM THE ENGINEER.
- PSL AND LVL BEAMS: A RAKE CUT (TAPER) AT THE TOP OF THE BEAM AT THE END OF THE SUPPORT IS ALLOWED IF NOTED ON PLANS, TO A MINIMUM OF 4-3/8" AT INSIDE FACE OF SUPPORT. RAKE CUT (TAPER) THAT RESULTS IN A DEPTH AT THE INSIDE FACE OF THE SUPPORT OF 2/3RDS THE BEAM DEPTH IS ALLOWED AT CONDITIONS NOT SPECIFIED. OTHER TAPERED ENDS AND SQUARE NOTCHES IN TOP OR BOTTOM FACE REQUIRE APPROVAL IN WRITING FROM THE ENGINEER OR ARCHITECT.
- STUDS AND PLATES: SEE STRUCTURAL DETAILS 13 & 14 ON SHEET S4 FOR NOTCHING AND BORING.
313. PROVIDE 2X4 TRIMMER & 2X4 KING STUD EACH END OF EACH 4X DROPPED BEAM OR HEADER. PROVIDE DOUBLE TRIMMERS AT EACH 4X10 OR LARGER. PROVIDE DOUBLE TRIMMERS AT EACH 3-1/2 X 7-1/2 PSL OR LSL OR LARGER.
314. PROVIDE 2X6 TRIMMER & 2X6 KING STUD EACH END OF EACH 6X DROPPED BEAM OR HEADER. PROVIDE DOUBLE TRIMMERS AT EACH 6X8 OR LARGER. PROVIDE DOUBLE TRIMMERS AT EACH 5-1/4 X 7-1/2 PSL OR LSL OR LARGER.
315. PROVIDE DOUBLE KING STUDS AT ALL OPENINGS 8'-1" WIDE AND WIDER OR PER PLAN.
316. PROVIDE MINIMUM 2-1/4" BEARING @ EACH END OF EACH FLUSH BEAM OR HEADER WHERE BEARING IS ON TOP PLATE. PROVIDE 2X4 STUD WITHIN 3" OF BEARING POINT. PROVIDE (2) 2X STUDS @ 6X OR LSL OR PSL BEAMS.
317. ROOF RAFTERS SHALL BE 2X RAFTERS AS NOTED ON STRUCTURAL DRAWINGS
318. EAVES SHALL BE PER ARCHITECTURAL PLANS W/ APPLIED TAILS PER ARCHITECTURAL PLANS. OVERHANG DETAILS ARE NOT SHOWN ON STRUCTURAL PLANS.
319. SEE THE ARCHITECTURAL ROOF PLANS FOR ROOF PITCH AND ADDITIONAL INFORMATION.
320. COMBINE AND GROUP PLUMBING VENTS WHENEVER POSSIBLE TO MINIMIZE ROOF PENETRATIONS.

3. WOOD FRAMING CONSTRUCTION (CONT.)

321. WOOD TO WOOD CONNECTORS SHALL BE SIMPSON STRONG TIE OR USP STRUCTURAL CONNECTORS. ALL SPECIFIED CONNECTOR CALL-OUTS ARE SIMPSON CATALOG CALL-OUTS. USP SUBSTITUTIONS SHALL HAVE A CAPACITY EQUAL TO OR GREATER THAN THE SIMPSON CATALOG VALUES. ANY OTHER ICC APPROVED METAL CONNECTOR MAY BE USED UPON APPROVAL BY THE ENGINEER OR ARCHITECT.
322. ICC APPROVED CONNECTORS SHALL BE USED WHERE CONNECTORS ARE SPECIFIED. UNLESS OTHERWISE NOTED, THE FOLLOWING BEAM AND JOIST HANGERS SHALL BE USED:
- | BEAM OR JOIST | SIMPSON/USP HANGER |
|----------------------|--------------------------|
| I-JOIST FLOOR JOISTS | IUS, IUT, OR ITT HANGERS |
| 1.75 X LSL AND LVL | HU, HUS, OR WPU |
| 2.69 X PSL AND LVL | HU OR HWU |
| 3.5 X PSL AND LVL | HHUS OR HWU |
| 5.25 X LSL AND LVL | HHUS OR HWU |
| 7 X PSL AND LVL | HHUS OR HWU |
- AT BEAM HANGER CALLOUTS, IE HGUS OR HU BEAMS, THE CALLOUT IS ABBREVIATED. THE HANGER WIDTH MAY BE OMITTED TO ALLOW FLEXIBILITY IN ORDERING. EXAMPLE: 2.69 PSL THE CALLOUT MAY READ HGUS12. AN HGUS2.75/12 OR HGUS412 (WITH FILLERS) ARE APPLICABLE. WHERE HANGERS OFFER (MIN) OR (MAX), NAIL TO APPLY (MAX) LOADS.
323. WHERE SHEARWALL LENGTHS ARE SPECIFIED ON THE PLANS, THE LENGTH SHOWN IS A MINIMUM DIMENSION. THE SHEARWALL MAY BE LENGTHENED FOR CONSTRUCTION PURPOSES, BUT SHALL NOT BE REDUCED UNLESS OTHERWISE NOTED. ALL ENGINEERED WOOD PANEL SHEAR (PLYWOOD OR OSB) SHALL BE BLOCKED.
324. THE FOLLOWING HOLES IN SHEARWALLS ARE ALLOWED:
A) APPROXIMATELY SQUARE HOLES NOTCHED, PUNCHED, OR CUT THAT ARE LESS THAN 25 SQ. INCHES
B) APPROXIMATELY SQUARE HOLES CLEAN CUT OR BORED IN SHEARWALLS THAT ARE LESS THAN 64 SQ. INCHES (ONE HOLE PER 4' OF SHEARWALL)
C) APPROXIMATELY SQUARE HOLES, LESS THAN 64 SQ. INCHES (ONE HOLE PER 8' OF SHEARWALL) WITH ALL EDGES BLOCKED & EDGE NAILED.
D) HOLES INDIVIDUALLY APPROVED BY THE ENGINEER OR ARCHITECT OF RECORD.
325. STUDS SHALL BE SPACED @ 16" O/C MAX. UNLESS OTHERWISE SPECIFIED. USE STUD GRADE EXCEPT AT PLATE HEIGHTS HIGHER THAN 10'-0", THEN USE DF#2 OR BETTER
326. ALL FINISHES, WATERPROOFING, DRAINAGE, AND FIRE-RELATED ELEMENTS ARE BY THE ARCHITECT OF RECORD AND ARE REQUIRED EVEN THOUGH THEY MAY NOT BE SHOWN ON THE STRUCTURAL PLANS AND DETAILS.

4. ICC-ES AND NER APPROVALS

400. PLYWOOD AND OSB PANELS: FULL REPORTS FOUND AT: [HTTP://WWW.ICC-ES.ORG](http://www.icc-es.org)
APA PLYWOOD & OSB-ESR-2586
401. JOISTS AND RAFTERS AND BEAMS:
TRUS-JOIST T.U.I JOISTS AND PSL, LSL, & LVL-ICC-ES ESR-1387, 1153,
BOISE CASCADE PCI JOISTS, VERSA-LAM, & VERSA-STRAND-ICC-ESR-1040, 1336
LOUISIANA PACIFIC JOISTS & BEAMS-ESR-1305, 2403
ROSEBURG JOISTS & BEAMS-ESR-1210, 1251
GLU-LAM BEAMS-ESR-1940
PACIFIC WOOD TECH - ESR 2909
402. WOOD CONNECTORS:
SIMPSON CONNECTORS-ICC-ES ESR #S 1161, 1622, 1866, 2105, 2203, 2236, 2320, 2549, 2551, 2552, 2563, 2330, 2554, 2555, 2604, 2605, 2606, 2607, 2608, 2611, 2613, 2614, 2615, 2616, 2617, 2920, 3046
IAPMO ER-112, 130, 143, 192, 262
USP LUMBER CONNECTORS-ICC-ES ESR #S 1178, 1280, 1575, 1702, 1781, 1881, 1970, 2104, 2685, 1831, 1465, 2761, 2787, IAPMO ER-200
QUICK DRIVE WOOD SCREWS-ICC-ES ESR-1472
403. ADHESIVES & ANCHORS:
SIMPSON EPOXY-TIE HIGH STRENGTH EPOXY (SET-XP)-ICC-ES ESR-1772, 2508.
SIMPSON WEDGE-ALL (WA) WEDGE ANCHORS-ICC-ES ESR-1771
SIMPSON TITEN HD-ICC-ESR-1056, 2713
SIMPSON SHOT PINS ICC-ES ESR-2138
HILTI X-DN, X-ZF, X-CF SHOT PINS-ICC-ES ESR-1663, 1752, 2269

5. NAILING & FASTENING

500. 16D NAILS AS SHOWN ON THE DETAILS MAY BE COMMON, BOX, OR SINKER NAILS (0.135" MIN. DIA)
501. AS AN ALTERNATE TO THE COMMON AND BOX NAILS SPECIFIED IN THE STRUCTURAL PLANS, THE FOLLOWING "CUTLER" GUN NAILS (OR EQUAL) ARE ACCEPTABLE ALTERNATIVES.
502. ALTERNATE NAILING FOR ROOF SHEATHING:
8D 2 1/2" X 0.135 WIRE BARBED NAILS BY CUTLER OR EQUAL.
503. ALTERNATE NAILING FOR FLOOR SHEATHING: #8 X 2" SELF SETTING WOOD SCREWS, OR 8D 2 1/2" X 0.135 OR 0.146 SCREW SHANK FLOOR NAILS BY CUTLER OR EQUAL
504. SHEAR PANELS WHERE 8D COMMON NAILS ARE SPECIFIED:
10D 2 1/2" X 0.148" WIRE BARBED NAILS BY CUTLER OR EQUAL
- | NAIL SIZES | | | | |
|--------------|-----------------|------------|---------------|----------------------|
| SIZE OF NAIL | STANDARD LENGTH | WIRE GAUGE | SIZE (INCHES) | PENETRATION REQUIRED |
| 6D | 2" | 12 | 0.099 | 1" |
| 8D | 2" | 11 | 0.113 | 1" |
| 10D | 3" | 10 | 0.128 | 1 1/2" |
| 12D | 3" | 10 | 0.128 | 1 1/2" |
| 16D | 3" | 10 | 0.135 | 1 1/2" |
| 16D SINKER | 3" | 9 | 0.148 | 1 1/2" |
- | BOX NAILS | | | | |
|--------------|-----------------|------------|---------------|----------------------|
| SIZE OF NAIL | STANDARD LENGTH | WIRE GAUGE | SIZE (INCHES) | PENETRATION REQUIRED |
| 6D | 2" | 12 | 0.099 | 1" |
| 8D | 2" | 11 | 0.113 | 1" |
| 10D | 3" | 10 | 0.128 | 1 1/2" |
| 12D | 3" | 10 | 0.128 | 1 1/2" |
| 16D | 3" | 10 | 0.135 | 1 1/2" |
| 16D SINKER | 3" | 9 | 0.148 | 1 1/2" |
- | COMMON NAILS | | | | |
|--------------|-----------------|------------|---------------|----------------------|
| SIZE OF NAIL | STANDARD LENGTH | WIRE GAUGE | SIZE (INCHES) | PENETRATION REQUIRED |
| 6D | 2" | 11 | 0.113 | 1" |
| 8D | 2 1/2" | 10 | 0.131 | 1 1/2" |
| 10D | 3" | 9 | 0.148 | 1 1/2" |
| 12D | 3" | 9 | 0.148 | 1 1/2" |
| 16D | 3" | 8 | 0.162 | 1 1/2" |

6. NAILING SCHEDULE, MINIMUMS (CBC CHAPTER 23, TABLE 2304.10.2)

- | WOOD STRUCT. PANELS, SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRMG AND PARTICLEBOARD WALL SHEATHING TO FRAMING | EDGES (IN) | INTERMEDIATE SUPPORTS (IN) |
|---|------------|----------------------------|
| 16d Com or deformed; or 2 1/2" x 113" nail (subfloor & hd wall) | 6 | 12 |
| 8d Com or deformed (roof) or 2 1/2" x 113" nail (roof) | 6 | 6 |
| 1 1/2" 16 Ga Staple, 3/16" crown (subfloor and wall) | 4 | 8 |
| 2 1/2" x 113" x 266" head nail, (roof) | 3 | 3 |
| 1 1/2" 16 Ga Staple, 3/16" crown (roof) | 3 | 3 |
| 8d Com or deformed (subfloor and wall) | 6 | 12 |
| 8d Com or deformed (roof) or 2 1/2" x 113" nail (roof) | 6 | 6 |
| 2 1/2" x 113" x 266" head nail, 2" 16 Gage staple, 3/16" crown | 4 | 8 |
| 10d Com or (3"x0.148"); or deformed (2 1/2" x 131" x 281 head) | 6 | 12 |
| OTHER EXTERIOR WALL SHEATHING (FIBERBOARD) | | |
| 1 1/2" x 0.120", galvanized roofing nail (1 1/2" head dia) or 1 1/2" 16 Ga Staple w/ 3/16" or 1" crown | 3 | 6 |
| 1 1/2" x 0.120", galvanized roofing nail (1 1/2" head dia) or 1 1/2" 16 Ga Staple w/ 3/16" or 1" crown | 3 | 6 |
| WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING | | |
| 3/8" & LESS 8d COMMON (2 1/2" x 0.131"); or deformed (2" x 0.113"); or deformed (2" x 0.120") | 6 | 12 |
| 1/2"-1" 8d COMMON (2 1/2" x 0.131"); or deformed (2" x 0.113"); or deformed (2" x 0.120") | 6 | 12 |
| 1 1/2"-1 1/2" 10d COMMON (3" x 0.148"); or deformed (2 1/2" x 0.131"); or deformed (2 1/2" x 0.120") | 6 | 12 |
| PANEL SIDING TO FRAMING | | |
| 3/8" & LESS 6d corrosion-resistant siding (1 1/2" x 106"); or 6d corrosion-resistant (2" x 0.099") | 6 | 12 |
| 1/2" 8d corrosion-resistant siding (2 1/2" x 128"); or 8d corrosion-resistant casing (2 1/2" x 113") | 6 | 12 |
| INTERIOR PANELING | | |
| 1/2" 4d casing (1 1/2" x 0.080"); or 4d finish (1 1/2" x 0.072") | 6 | 12 |
| 3/8" 6d casing (2" x 0.099"); or 6d finish (2" x 0.092") - (Panel supports at 24 inches) | 6 | 12 |
- BLKG AT CEILING JOISTS, RAFTERS, OR TRUSSES TO TOP PLATE OR OTHER FRAMING, T.N.
BLKG AT CEILING RAFTERS OR TRUSSES NOT AT WALL TOP PLATE TO RAFTER OR TRUSS, T.N.
BLKG AT CEILING RAFTERS OR TRUSSES NOT AT WALL TOP PLATE TO RAFTER OR TRUSS, E.N.
FLAT BLKG TO TRUSS AND WEB, F.N.
CEILING JOISTS TO TOP PLATE, T.N.
CEILING JOISTS NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS, F.N. PER 2308.7.3.1
CEILING JOISTS ATTACHED TO PARALLEL RAFTER (HEEL JOINT), F.N. PER 2308.7.3.1
COLLAR TIE TO RAFTER, F.N.
RAFTER/TRUSS TO TOP PLATE, T.N. PER TABLE 2308.7.3.5
RAFTERS TO RIDGE VALLEY OR HIP, OR FATER TO 2" RIDGE BEAM

TOENAIL
ENDNAIL
STUD TO STUD (NOT AT BRACED WALL PANELS)
STUD TO STUD AT INTERSECTING WALL CORNERS (BRACED WALL)
BUILT-UP HEADER (2" TO 2"), FN EA. EDGE
CONT. HEADER TO STUD, T.N.
TOP PLATE TO TOP PLATE
TOP PLATE TO TOP PLATE, AT END JOINTS (EACH SIDE OF END JOINT), FACENAIL
24" MIN LAP SPLICE EA. SIDE
BOTTOM PLATE TO JOIST, RIM, OR BLKG, FACENAIL

UNBRACED WALL: 16" o.c. FN
UNBRACED WALL: 12" o.c. FN
BRACED WALL: 16" o.c. FN
STUD TO TOP OR BOTTOM PLATE

TOENAIL
ENDNAIL
TOP PLATES, LAPS AT CORNERS AND INTERSECTION, F.N.
1" BRACE TO EACH STUD AND PLATE, F.N.
1"x6" SHEATHING TO EACH BEARING, F.N.
1"x8" SHEATHING AND WIDER TO EACH BEARING, F.N.
JOIST TO JOIST, TOP PLATE, OR GIRDER, T.N.
RIM JOIST, BAND JOIST, OR BLOCKING TO TOP PLATE, SILL OR OTHER
1"x6" SUBFLOOR OR LESS TO EACH JOIST, F.N.
2" SUBFLOOR TO JOIST OR GIRDER, F.N. OR BLIND
2" PLANKS (PLANK & BEAM - FLOOR & ROOF), FACENAIL & EACH BEARING
BUILT-UP GIRDERS AND BEAMS, 2" LUMBER LAYERS
32" o.c. FN Top & BTM STAGGERED ON OPPOSITE SIDES
24" o.c. FN Top & BTM
ENDS & SPLICES, FN
LEADER SUPPORTING JOISTS/RAFTERS
JOIST TO BAND OR RIM JOIST, END NAIL
BRIDGING OR BLOCKING TO JOIST, RAFTER OR TRUSS EACH END, T.N.
- 4-8d Box, 3-8d Com, 3-10d box, 3-3" x 0.131" nails, 3-3" 14 gage staples
2-8d Com, 2-3" x 0.131" nails, 2-3" 14 gage staples
2-16d Com, 3-3" x 0.131" nails, 3-3" 14 gage staples
16d Com, 3"x.131" nails, 3"x14 gage staples @ 6" o.c
4-8d box, 3-8d Com, 3-10d box, 3-3" x 0.131" nails, 3-3" 14 gage staples
3-16d Com, 4-10d box, 4-3" x 0.131" nails, 4-3" 14 gage staples
3-16d Com, 4-10d box, 4-3" x 0.131" nails, 4-3" 14 gage staples
3-10d Com, 3-16d or 4-10d box, 4-3" x 0.131" nails, 4-3" 14 gage staples
4-16d box, 3-10d Com, 3-16d or 4-10d box, 4-3" x 0.131" nails, 4-3" 14 gage staples
2-16d Com, 3-16d box, 3-10d box, 3-3" x 0.131" nails, 3-3" 14 gage staples
16d Com @ 24" o.c. FN OR 2-10d box, 3" x 0.131" nails, 3-3" 14 gage staples @ 16" o.c. FN
16d Com @ 16" o.c. FN OR 16d Box, 3" x 0.131" nails, 3-3" 14 gage staples @ 12" o.c. FN
16d Com @ 16" o.c. OR 16d Box @ 12" o.c.
4-8d Com, 4-10d Box, 5-8d box
16d Com @ 16" o.c. FN OR 10d Box, 3" x 0.131" nails, 3" 14 gage staples @ 12 o.c. FN
8-16d Com, 12-16d Box, 12-10d Box, 12-3" x 0.131" nails, 12-3" 14 gage staples
16d Com
16d Box, 3" x 0.131" nails, 3" 14 gage staples
2-16d Com, 3-16d Box, 4-3"x.131" nails, 4-3" 14 gage staples
4-8d Box, 4x10d Box, 4-8d Com, 3-16d Box, 4-3"x0.131" nails, 4-3" 14 gage staples
3-16d Com, 3-10d Box, 3-3"x0.131" nails, 3-3" 14 gage staples
2-16d Com, 3-10d Box, 3-3" x 0.131" nails, 3-3" 14 gage staples
4-8d box, 4-1.75" 16 Gage staples, 2-8d Com, 2-10d Box
4-8d box, 3-8d Com, 3-10d Box, 3-3" x 0.131" nails, 3-3" 14 gage staples
8d Box @ 4" o.c. TN OR 8d Com, 10d Box, 3" x 0.131" nails, 3" 14 gage staples @ 6" o.c. TN
2-1.75" Gage Staples, 2-8d Com, 3-10d Box
3-16d Com, 3-16d Box, 3-10d Box, 3-3" x 0.131" nails, 3-3" 14 gage staples
2-8d Com, 2-10d Box, 2-3" x 0.131" nails, 2-3" 14 gage staples
20d Com
10d Box, 3"x0.131" nails, 3" 14 gage staples
2-20d Com, 3-10d Box, 3-3"x0.131" nails, 3-3" 14 gage staples
4-16d Box, 3-16d Com, 4-10d Box, 4-3"x0.131, 4-3" 14ga. STAPLES
3-16d Com, 4-10d Box, 4-3"x0.131, 4-3" 14ga. STAPLES
2-8d Com, 2-10d box, 2-3" x 0.131" nails, 2-3" 14 gage staples
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- FOOTNOTES:
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. ESR-21 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667.<