

1. **General:** This information reduces an entire chapter of the 'CA Building Code' (C.B.C.) to two pages. It focuses on those practices and methods which are most commonly used. It tends to ignore traditional practices which remain legal but which have fallen into disuse. This handout is not a replacement for the C.B.C. It is simply an attempt to make certain parts of it more accessible. Where unusual conditions are encountered or where other choices are desired, the C.B.C. should be consulted. It is available at many libraries and may be reviewed at your Building and Safety Department. This handout assumes walls of 2x4 at 16 in. o. c. It assumes seismic zone 3 or 4. And it assumes siding, stucco or other exterior wall covering other than plywood.

2. **Lumber:** Use only graded and labeled lumber from a lumber yard. The span tables assume that #2 or better douglas fir or southern pine is used for joists and rafters. If you wish to use ungraded lumber for any purpose, check with your building inspector before installing it.

3. **Roof sheathing and subfloor:** Use only panels labeled with a panel identification index. This is a pair of numbers arranged like a fraction indicating the maximum span allowed for the panel when used as roof sheathing and as subfloor.

For instance, an index of 24/16 indicates that the panel may be used as roof sheathing over rafters spaced at 24 in. or less and as subflooring over joists spaced at 16 in. or less.

4. **Notching of framing members:** Care should be exercised in notching framing members for pipes, ducts etc. so that the member is not weakened excessively. See the illustration.

5. **Lateral support:** Joists and rafters must be blocked, cross braced or otherwise kept from rolling over. 2 x 4 horizontal

members require no support. 2 x 6's and 2 x 8's must be blocked at the ends. 2 x 10's require blocking at ends and must be held in line through their length as by floor sheathing. 2 x 12's must be blocked at ends and over all supports and must be held in line as by floor sheathing. If this is not possible then blocking or cross bracing must be provided every 8 feet or less. 2 x 14's must be blocked at ends and over supports and must be held in line through their entire length as by subfloor, drywall or sheathing.

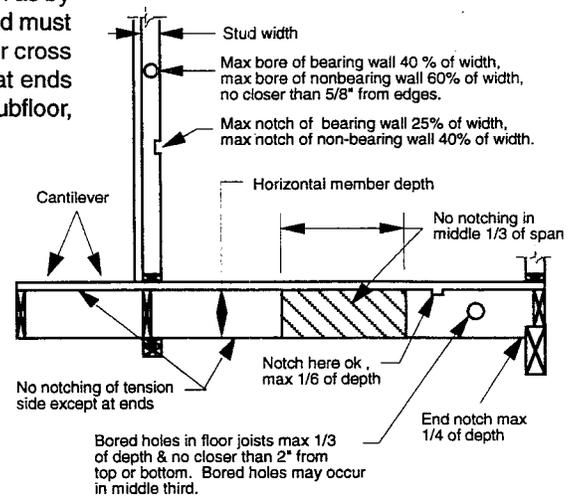
6. **Protection from decay:** In general, use treated lumber where the lumber is touching earth or within 6" of earth. Use treated lumber where it is in contact with concrete. Provide a 1/2 in. air space around the ends of untreated girders where they enter concrete or block walls. Provide 2 in. flashed and ventilated air space between planters and wall. Extend exterior wall coverings behind planter. See the U.B.C. for detail and exceptions.

7. **Fire blocking:** Fire blocking provides a barrier between floors, basements, attics etc., so that fire will not spread rapidly through the chimney-like concealed spaces that are common in wood frame construction. Fire blocking is required: (a) in the concealed spaces of stud walls at all floor or ceiling lines, (b) in any vertical or horizontal concealed space at max 10' intervals, (c) at concealed interconnections between vertical and horizontal spaces such as soffits, drop ceilings and between stair stringers, (d) between the studs at the sides of stair stringers if the space under the stair is unfinished, (e) in openings around pipes, ducts, vents, chimneys etc. at floor and ceiling lines, (f) at openings between attic spaces and chimney chases for factory-built chimneys. Most fire blocking may be made from ordinary 2 in. framing lumber but in the case of vents and chimneys the spacers and sheet metal components provided by the manufacturer must be used.

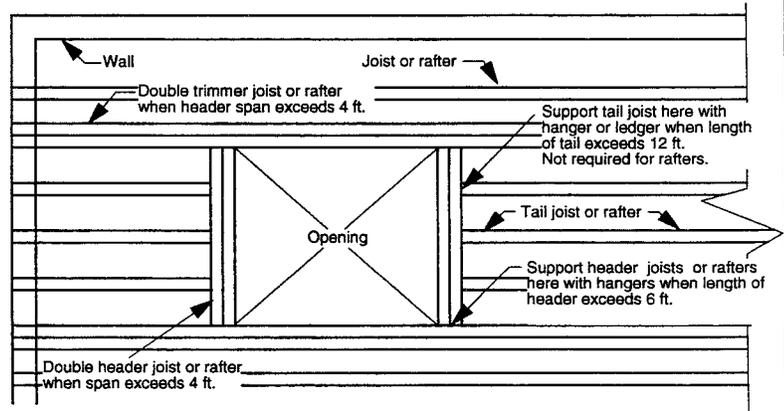
8. **Wall bracing:** The U.B.C. describes eight ways to brace walls. In addition, various metal straps and angles are manufactured for this purpose. Such metal straps are very commonly used in recent years. The two most common methods include: (1) the 1 x 4 or 1 x 6 diagonal let into top plate, bottom plate and intervening studs and placed at an angle between 45 and 60 degrees from the horizontal and (2) 4 ft. wide 5/16 in. plywood or particleboard sheathing panels. Diagonal let-in braces may not be used where the wall supports another story in this seismic zone. Read the manufacturer's literature to determine where metal straps may be used. Braces must be installed at the ends and every 25 ft. of all exterior walls and all main cross-stud partitions.

9. **Rafter ties:** Ceiling joists hold up the ceiling but they also hold the outside walls together. This is needed because the sloping rafters are tending to push those walls outward. Rafter ties of minimum 1 x 4 material at minimum 4 ft. o.c. must be installed to hold the walls in line where the ceiling joists are not parallel to the rafters. Note that the collar ties that have traditionally been installed up near the ridge do not serve the purpose. Rafter ties are installed just above the ceiling joists.

Boring and Notching



Horizontal Framing Around Openings



Simplified Nailing Schedule

1. Joists to sill or girder, toenail	3-8d	11. Continuous header to stud, toenail	4-8d
2. Bridging to joist, toenail each end	2-8d	12. Ceiling joists, laps over partitions, facenail	3-16d
3. Sole plate to joist or blocking, face nail	16d @ 16" o.c.	13. Ceiling joists to parallel rafters	3-16d
4. Top plate to stud, end nail	2-16d	14. Rafter to plate, toenail	3-8d
5. Stud to sole plate	4-8d toenail or 2-16d end nail	15. 1" brace to plates and studs, facenail	2-8d
6. Double studs, facenail	16d @ 24" o.c.	16. Built-up corner studs	16d @ 24" o.c.
7. Doubled top plates, face nail	16d @ 16" o.c.	17. Built up girders and beams	20d @ 32" o.c. at edges & staggered, 2-20d at ends and splices.
8. Top plates laps and intersections, facenail	2-16d	18. Plywood 1/2" or less	6d @ 6" edges & 12" field
9. Continuous header, two pieces	16d @ 16" o.c. at edges	19. Plywood over 1/2" to 1"	8d @ 6" edges & 12" field
10. Ceiling joists to plate, toenail	3-8d		