1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.16.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

R602.1.2.1. Materials. Except as provided in Section R602.8, Item 4, fireblocking shall consist of 2-inch (51mm)nominal lumber, or two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm)wood structural panels or one thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, 1/2-inch (12.7 mm) gypsum board, or 1/4-inch (6.4 mm) cement-based millboard.

Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batts or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

R602.1.2.1 .1 Unfaced fiberglass. Unlaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

R602.1.2.1.2 Fireblocking integrity. The integrity of all fireblocks shall be maintained.

R602.1.3 Nonbearing walls. Load-bearing headers are not required in interior or exterior nonbearing walls. A single flat 2-inch-by-4-inch (51 mm by 102 mm) member may be used as a header in interior or exterior nonbearing walls for openings up to 8 feet (2438 mm) in width if the vertical distance to the parallel nailing surface above is not more than 24 inches (610 mm). For such nonbearing headers, no cripples or blocking are required above the header.

R602.1.3.1. Interior nonbearing walls. Interior nonbearing walls shall be permitted to be constructed with 2-inch-by-3-inch (51 mm by 76 mm) studs spaced 24 inches (610 mm) on center or, when not part of a braced wall line, 2-inch-by-4-inch (51mmby 102 mm) flat studs spaced at 16 inches (406 mm) on center. Interior nonbearing walls shall be capped with at least a single top plate. Interior nonbearing walls shall be fireblocked in accordance with Section R602.8.

R602.2 Design and construction where basic wind speed is less than 100 mph (160.9 km/h) in hurricane-prone regions or 110 miles per hour (177.1 km/h) elsewhere. Exterior walls of wood-frame wood construction shall be designed and constructed in accordance with the provisions of this ~~chapter~~ Section and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Table R602.3(1) through R602.3(4). Exterior walls covered with foam plastic sheathing shall be braced in accordance with Section R602.10. Structural sheathing of shall be fastened directly to structural framing members.

R602.2.1 Stud grade. Studs shall be a minimum No. 3, standard or stud grade lumber.

Exception: Bearing studs not supporting floors and nonbearing studs may be utility grade lumber, provided the studs are spaced in accordance with Table R602.3(5).

R602.2.2 Stud size, height and spacing. The size, height and spacing of studs shall be in accordance with Table R602.3.(5).

Exceptions:

1. Utility grade studs shall not be spaced more than 16 inches (406 mm) on center, shall not support more than roof and ceiling, and shall not exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls.
2. Studs more than 10 feet (3048 mm) in height which are in accordance with Table R602.3.1.

R602.2.3 Top plate. Wood studwalls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least 24 inches (610 mm). Joints in plates need not occur over studs. Plates shall be not less than 2-inches (51 mm) nominal thickness and have a width at least equal to the width of the studs.

Exception: A single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and intersecting walls by a minimum 3-inch-by-6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25.4 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

R602.2.4 Bearing studs. Where joists, trusses or rafters are spaced more than 16 inches (406 mm) on center and the bearing studs below are spaced 24 inches (610 mm) on center, such members shall bear within 5 inches (127 mm) of the studs beneath.

Exceptions:

1. The top plates are two 2-inch by 6-inch (38mmby 140 mm) or two 3-inch by 4-inch (64 mm by 89 mm) members.
2. A third top plate is installed.
3. Solid blocking equal in size to the studs is installed to reinforce the double top plate.

R602.2.5 Bottom (sole) plate. Studs shall have full bearing on a nominal 2 by (38 mm) or larger plate or sill having a width at least equal to the width of the studs.

R602.2.6 Interior load-bearing walls. Interior load-bearing walls shall be constructed, framed and fireblocked as specified for exterior walls.

R602.2.7 Drilling and notching—studs. Drilling and notching of studs shall be in accordance with the following:

1. Notching. Any stud in an exterior wall or bearing partition may be cut or notched to a depth not exceeding 25 percent of its width. Studs in nonbearing partitions may be notched to a depth not to exceed 40 percent of a single stud width.
2. Drilling. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no more than 60 percent of the stud width, the edge of the hole is no more than 5/8 inch (16 mm) to the edge of the stud, and the hole is not located in the same section as a cut or notch. Studs located in exterior walls or bearing partitions drilled over 40 percent and up to 60 percent shall also be doubled with no more than two successive doubled studs bored. See Figures R602.6(1) and R602.6(2).

   Exception: Use of approved stud shoes is permitted when they are installed in accordance with the manufacturer's recommendations.

R602.2.7.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 1/2 inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 16d nails at each side or equivalent.

See Figure R602.6.1.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

R602.2.8 Headers. For header spans see Tables R502.5(1) and R502.5(2).

R602.2.8.1 Wood structural panel box headers. Wood structural panel box headers shall be constructed in accordance with Figure R602.7.2 and Table R602.7.2.

R602.2.9 Cripple walls. Foundation cripple walls shall be framed of studs not less in size than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

Cripple walls with a stud height less than 14 inches (356 mm) shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous foundations.

R602.2.10 Wall bracing. All exterior walls shall be braced in accordance with this section. In addition, interior braced wall lines shall be provided in accordance with Section R602.10.1.1. For buildings in Seismic Design Categories D_0 D_1 and D_2, walls shall be constructed in accordance with the additional requirements of R602.10.9, R602.10.11 and R602.11.

R602.2.10.1 Braced wall lines. Braced wall lines shall consist of braced wall panel construction methods in accordance with Section R602.10.3. The amount and location of bracing shall be in accordance with Table R602.10.1 and the amount of bracing shall be the greater of that required by the Seismic Design Category or the design wind speed. Braced wall panels shall begin no more than 12.5 feet (3810 mm) from each end of a braced wall line. Braced wall panels that are counted as part of a braced wall line shall be in line, except that offsets out-of-plane of up to 4 feet (1219 mm) shall be permitted provided that the total out-to-out offset dimension in any braced wall line is not more than 8 feet (2438 mm).

R602.2.10.1.1 Spacing. Spacing of braced wall lines shall not exceed 35 feet (10,668 mm) on center in both the longitudinal and transverse directions in each story.

Exception: Spacing of braced wall lines not exceeding 50 feet shall be permitted where:

1. The wall bracing provided equals or exceeds the amount of bracing required by Table R602.10.1 multiplied by a factor equal to the braced wall line spacing divided by 35 feet, and
2. The length-to-width ratio for the floor/wall diaphragm does not exceed 3:1.

R602.2.10.2 Cripple wall bracing.

R602.2.10.2.1 Seismic Design Categories Other than D2. In Seismic Design Categories other than D2, cripple walls shall be braced with an amount and type of bracing as required for the wall above in accordance with Table R602.10.1 with the following modifications for cripple wall bracing:

1. The percent bracing amount as determined from Table R602.10.1 shall be increased by 15 percent, and
2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

R602.2.10.2.2 Seismic provisions. Reserved Design Category D2. In Seismic Design Category D2, cripple walls shall be braced in accordance with Table R602.10.1.

R602.2.10.2.3 Redesignation of cripple walls. In any Seismic Design Category, cripple walls are permitted to be redesignated as the first storywalls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

R602.2.10.3 Braced wall panel construction methods. The construction of braced wall panels shall be in accordance with one of the following methods:

1. Nominal 1-inch-by-4-inch (25.4 mm by 102 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.
2. Wood boards of 5/8 inch (15.9 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with Table R602.3(1).
3. Wood structural panel sheathing with a thickness not less than 5/16 inch (7.9 mm) for 16-inch (406 mm) stud spacing and not less than 3/8 inch (9.5 mm) for 24-inch (610 mm) stud spacing. Wood structural panels shall be installed in accordance with Table R602.3(3).
4. One-half-inch (12.7mm)or 25/32-inch (19.8mm)thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with Table R602.3(1).
5. Gypsum board with minimum 1/2-inch (12.7 mm) thickness placed on studs spaced a maximum of 24 inches (610 mm) on center and fastened at 7 inches (178 mm) on center with the size nails specified in Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.
6. Particleboard wall sheathing panels installed in accordance with Table R602.3(4).
7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with Section R703.6.
8. Hardboard panel siding when installed in accordance with Table R703.4.

Exception: Alternate braced wall panels constructed in accordance with Section R602.10.6.1 or 602.10.6.2 shall be permitted to replace any of the above methods of braced wall panels.

R602.2.10.4 Length of braced panels. For Methods 2, 3, 4, 6, 7 and 8 above, each braced wall panel shall be at least 48 inches (1219 mm) in length, covering a minimum of three stud spaces where studs are spaced 16 inches (406 mm) on center and covering a minimum of two stud spaces where studs are spaced 24 inches (610 mm) on center. For Method 5 above, each braced wall panel shall be at least 96 inches (2438 mm) in length where applied to one face of a braced wall panel and at least 48 inches (1219 mm) where applied to both faces.

Exceptions:

1. Lengths of braced wall panels for continuous wood structural panel sheathing shall be in accordance with Section R602.10.5.
2. Lengths of alternate braced wall panels shall be in accordance with Section R602.10.6..1 or R602.10.6.2.

TABLE R602.2.10.1
WALL BRACING

(No changes to existing tables or figures except for renumbering).

TABLE R602.2.3.1
MAXIMUM ALLOWABLE LENGTH OF WOOD WALL STUDS EXPOSED TO WIND SPEEDS OF 100 MPH OR LESS IN SEISMIC DESIGN CATEGORIES A, B, C and D1[b,c]

(No changes to existing tables or figures except for renumbering).

R602.2.10.5 Continuous structural panel sheathing. When continuous wood structural panel sheathing is provided in accordance with Method 3 of R602.10.3 on all sheathable areas of all exterior walls, and interior braced wall lines, where required, including areas above and below openings, braced wall panel lengths shall be in accordance with Table R602.10.5. Wood structural panel sheathing shall be installed at corners in accordance with Figure R602.10.5. The bracing amounts in Table R602.10.1 for Method 3 shall be permitted to be multiplied by a factor of 0.9 for walls with a maximum opening height that does not exceed 85 percent of the wall height or a factor of 0.8 for walls with a maximum opening height that does not exceed 67 percent of the wall height.

R602.2.10.6 Alternate braced wall panel construction methods. Alternate braced wall panels shall be constructed in accordance with Sections R602.2.10.6.1 and R602.2.10.6.2.

R602.2.10.6.1 Alternate braced wall panels. Alternate braced wall lines constructed in accordance with one of the following provisions shall be permitted to replace each 4 feet (1219 mm) of bracedwall panel as required by Section R602.10.4. The maximum height and minimum width of each panel shall be in accordance with Table R602.10.6:

1. In one-story buildings, each panel shall be sheathed on one face with 3/8-inch-minimum- thickness (10 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Table R602.3(1) and blocked at all wood structural panel sheathing edges. Two anchor bolts installed in accordance with Figure R403.1(1) shall be provided in each panel. Anchor bolts shall be placed at panel quarter points. Each panel end stud shall have a tie-down device fastened to the foundation, capable of providing an uplift capacity in accordance with Table R602.10.6. The tie down device shall be installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation or on floor framing supported directly on a foundation which is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. When the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305mmby 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.
2. In the first story of two-story buildings, each braced wall panel shall be in accordance with Item 1 above, except that the wood structural panel sheathing shall be installed on both faces, sheathing edge nailing spacing shall not exceed 4 inches (102 mm) on center, at least three anchor bolts shall be placed at one-fifth points.

R602.2.10.6.2 Alternate braced wall panel adjacent to a door or window opening. Alternate braced wall panels constructed in accordance with one of the following provisions are also permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.4 for use adjacent to a window or door opening with a full-length header:

1. In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not moret than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of 3/8-inch-minimum-thickness (10 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in

accordance with Figure R602.10.6.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.6.2. Use of a built-up header consisting of at least two 2 x 12s and fastened in accordance with Table R602.3(1) shall be permitted. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the side of the inner studs opposite the sheathing. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be installed in the center of each sill plate. The studs at each end of the panel shall have a tie-down device fastened to the foundation with an uplift capacity of not less than 4,200 pounds (18 683 N). Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the bearing studs. The bearing studs shall also have a tie-down device fastened to the foundation with an uplift capacity of not less than 1000 pounds (4448 N). The tie-down devices shall be an embedded strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation which is continuous across the entire length of the braced wall line. The foundation shall be reinforced with not less than one No. 4 bar top and bottom. Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

2. In the first story of two-story buildings, each wall panel shall be braced in accordance with Item 1 above, except that each panel shall have a length of not less than 24 inches (610 mm).

R602.2.10.7 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to, common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to, common blocking of a minimum 11/2 inch (38 mm) thickness.

Exception: Blocking is not required behind horizontal joints in Seismic Design Categories A and B and detached dwellings in Seismic Design Category C when constructed in accordance with Section R602.10.3, braced-wall-panel construction method 3 and Table R602.10.1, method 3, or where permitted by the manufacturer's installation requirements for the specific sheathing material.

R602.2.10.8 Connections. Braced wall line sole plates shall be fastened to the floor framing and top plates shall be connected to the framing above in accordance with Table R602.3(1). Sills shall be fastened to the foundation or slab in accordance with Sections R403.1.6 and R602.11. Where joists are perpendicular to the braced wall lines above, blocking shall be provided under and in line with the braced wall panels. Where joists are perpendicular to braced wall lines below, blocking shall be provided over and in line with the braced wall panels. Where joists are parallel to braced wall lines above or below, a rim joist or other parallel framing member shall be provided at the wall to permit fastening per Table R602.3(1).

R602.2.10.9 Interior braced wall support. In one-story buildings located in Seismic Design Category D2, interior braced wall lines shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two story buildings located in Seismic Design Category D2, all interior braced wall panels shall be supported on continuous foundations.

Exception: Two-story buildings shall be permitted to have interior braced wall lines supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:

1. The height of cripple walls does not exceed 4 feet (1219 mm).
2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

R602.2.10.10 Design of structural elements. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

R602.2.10.11 Bracing in Seismic Design CategoriesD1 and D2. Structures located in Seismic Design Categories D0, D1 and D2 shall have exterior and interior braced wall lines.

R602.2.10.11.1 Braced wall line spacing. Spacing between braced wall lines in each story shall not exceed 25 feet (7620 mm) on center in both the longitudinal and transverse directions.

Exception: In one- and two-story buildings, spacing between two adjacent braced wall lines shall not exceed 35 feet (10 363 mm) on center in order to accommodate one single room not exceeding 900 square feet (84 m2) in each dwelling unit. Spacing between all other braced wall lines shall not exceed 25 feet (7620 mm).

R602.2.10.11.2 Braced wall panel location. Exterior braced wall lines shall have a braced wall panel at each end of the braced wall line.

Exception: For braced wall panel construction Method 3 of Section R602.10.3, the braced wall panel shall be permitted to begin no more than 8 feet (2438 mm) from each end of the braced wall line provided the following is satisfied:

1. A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch (610 mm) panels at the corner shall be attached to framing in accordance with Figure R602.10.5; or
2. The end of each braced wall panel closest to the corner shall have a tie-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The tie-down device shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8 kN). The tie-down device shall be installed in accordance with the manufacturer's recommendations.

R602.2.10.11.3 Collectors. A designed collector shall be provided if a braced wall panel is not located at each end of a braced wall line as indicated in Section R602.10.11.2, or, when using the Section R602.10.11.2 exception, if a braced wall panel is more than 8 feet (2438 mm) from each end of a braced wall line.

R602.2.10.11.4 Cripple wall bracing. In addition to the requirements of Section R602.10.2, where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.1. Where cripple walls braced using Method 3 of Section R602.10.3 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102mm)on center.

R602.2.10.11.5 Sheathing attachment. Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories C, D1 and D2.

R602.2.11 Framing and connections for Seismic Design Categories D_0, D_1 andD_2. The framing and connection details of buildings located in Seismic Design Categories D_0,D_1 andD_2 shall be in accordance with Sections R602.11.1 through R602.11.3

R602.2.11.1 Wall anchorage. Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11. For all buildings in Seismic Design CategoriesD0,D1 andD2 and townhouses in Seismic Design Category C, plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.8mmby 76mmby 76 mm) in size, shall be installed between the foundation sill plate and the nut. The hole in the platewasher is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 13/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

R602.2.11.2 Interior braced wall panel connections. Interior braced wall lines shall be fastened to floor and roof framing in accordance with Table R602.3(1), to required foundations in accordance with Section R602.11.1, and in accordance with the following requirements:

1. Floor joists parallel to the top plate shall be toe-nailed to the top plate with at least 8d nails spaced a maximum of 6 inches (150 mm) on center.
2. Top plate laps shall be face-nailed with at least eight 16d nails on each side of the splice.

R602.2.11.3 Stepped foundations. Where stepped foundations occur, the following requirements apply:

1. Where the height of a required braced wall panel that extends from foundation to floor above varies more than 4 feet (1220 mm), the braced wall panel shall be constructed in accordance with Figure R602.11.3.
2. Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8 feet (2440 mm) in length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4 feet (1219 mm) along the foundation. Anchor bolts shall be located a maximum of 1 foot and 3 feet (305 and 914 mm) from the step in the foundation.
3. Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements for a story shall apply.

4. Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of Section R602.11.1 shall apply.

R602.3 Design and construction where basic wind speed equal of exceed 100 mph (160.9 km/h) in hurricane-prone regions or 110 miles per hour (177.1 km/h) elsewhere. Exterior walls of light-frame wood construction shall be designed and constructed in accordance with the provisions of Section R301.2.1.1 and Section R602.1.

(Tables and Figures from existing Section R602 are to remain unchanged except renumber as required.)

Reason: This modification reorganizes the provisions for wood-frame construction of walls by separating general provisions applicable to all wood construction from that of prescriptive wood-frame construction from that of engineered wood construction. This change adds new Section R602.1 General requirements, revising Section R602.2 to clarify where the prescriptive construction applies and adding new Section R602.3 to clarify where an engineered construction is required.

Cost Impact: The code change proposal will not increase costs. This change merely reorganizes the provisions for wood-frame construction of walls by separating general provisions applicable to all wood construction from that of prescriptive wood-frame construction from that of engineered wood construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB165–06/07
Table R602.3(1)

Proponent: James Bela, Oregon Earthquake Awareness

Revise table as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
Sole plate to joist, solid deck or blocking, face nail	16d (3½" x 0.135")	16" o.c.

(Portions of table and footnotes not shown do not change)

Reason: To add new requirements to the Code.

This code change proposal adds new text "solid deck" to Row 4, Column 1 of TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS. Solid 2-inch Deck is the common means of construction for "post-and-beam" floors.

See also code change proposals to: Section R403 FOOTINGS: R403.1 General. – adding a new Section R403.1.2 Isolated footings. – which is specific to "isolated footings"; and also adding new TABLE R502.5(3) ALLOWABLE SPAN FOR GIRDERS SUPPORTING ONE FLOOR ONLY[a].

State of Oregon Amendment to 2000 IRC; when adopted as the "base code" for 2003 EDITION STATE OF OREGON ONE- AND TWO-FAMILY DWELLING SPECIALTY CODE - Effective Date April 1, 2003
Code Change Proponent – Patrick Bridges: on behalf of Oregon Building Industry Association (OBIA) and Oregon Building Officials Association (OBOA)

State of Oregon Amendment to 2003 IRC: when adopted as the "base code" for 2005 OREGON RESIDENTIAL SPECIALTY CODE (effective date of April 1, 2005)
Code Change Proponent – Richard Rogers, Structural Program Chief, Oregon Building Codes Division: on behalf of Oregon Building Codes Division

Bibliography:
ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, including Supplement No. 1; American Society of Civil Engineers Structural Engineering Institute, Reston, VA.
2005 OREGON RESIDENTIAL SPECIALTY CODE, 2005 Edition (Effective date April 1, 2005), copyright 2005 by International Code Council, Inc., Falls Church, VA., 516 p. + 6 p. errata.
State of Oregon One- and Two-Family Dwelling Specialty Code, 2003 Edition, (Effective date April 1, 2003, copyright 2002 by International Code Council, Inc., Falls Church, VA., 350 p. (Remove 2000 IRC Page / Insert 2003 Oregon Page)
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon's Building Codes Adoption Process Rules, Oral Testimony, 10 p.
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon's Building Codes Adoption Process Rules, Additional Written Testimony, 23 p.
Bela, J. (2002). Building Codes Division Public Hearing September 17, 2002: Adopting 2000 Edition of International Residential Code "Approved as amended/use IRC as base document/allow for Oregon amendments", Written Testimony (FAX) withdrawing Code Change Proposal IRC-02-01 to adopt 2000 Edition of the IRC, 4 p.

Cost Impact:

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB166–06/07
Table R602.3(1)

Proponent: James Bela, Oregon Earthquake Awareness
Revise as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
Sole plate to joist , solid deck or blocking at braced wall panels	3-16d (31/2″ × 0.135″) per 16”	~~16″ o.c.~~

(Portions of table and footnotes not shown do not change)

Reason: To add new requirements to the Code, and deleting a current requirement.

This code change proposal adds new text “solid deck” to Row 9, Column 1 of TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS; adds new text “per 16” to Row 9, Column 2; and -deletes “~~16” o.c.~~“ from Row 9, Column 3. This leaves open-to-interpretation whether the 3-16d fasteners are to be uniformly spaced over 16 inches when fastened to “solid deck or blocking” . or whether they may also be fastened with 3-16d nails clustered at 16” o.c. This is the only “per” designation in this TABLE. Solid 2-inch Deck is the common means of construction for “post-and-beam” floors.

See also code change proposals to: section R403 FOOTINGS: R403.1 General. – adding a new Section R403.1.2 Isolated footings. – which is specific to “isolated footings”; and also adding new TABLE R502.5(3) ALLOWABLE SPAN FOR GIRDERS SUPPORTING ONE FLOOR ONLY[a].

State of Oregon Amendment to 2000 IRC; when adopted as the “base code” for 2003 EDITION STATE OF OREGON ONE- AND TWO-FAMILY DWELLING SPECIALTY CODE - Effective Date April 1, 2003

Code Change Proponent – Patrick Bridges: on behalf of Oregon Building Industry Association (OBIA) and Oregon Building Officials Association (OBOA)

State of Oregon Amendment to 2003 IRC: when adopted as the “base code” for 2005 OREGON RESIDENTIAL SPECIALTY CODE (effective date of April 1, 2005)

Code Change Proponent – Richard Rogers, Structural Program Chief, Oregon Building Codes Division: on behalf of Oregon Building Codes Division

Bibliography:

ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, including Supplement No. 1; American Society of Civil Engineers Structural Engineering Institute, Reston, VA.
2005 OREGON RESIDENTIAL SPECIALTY CODE, 2005 Edition (Effective date April 1, 2005), copyright 2005 by International Code Council, Inc., Falls Church, VA., 516 p. + 6 p. errata.
State of Oregon One- and Two-Family Dwelling Specialty Code, 2003 Edition, (Effective date April 1, 2003, copyright 2002 by International Code Council, Inc., Falls Church, VA., 350 p. (Remove 2000 IRC Page / Insert 2003 Oregon Page)
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon’s Building Codes Adoption Process Rules, Oral Testimony, 10 p.
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon’s Building Codes Adoption Process Rules, Additional Written Testimony, 23 p.
Bela, J. (2002). Building Codes Division Public Hearing September 17, 2002: Adopting 2000 Edition of International Residential Code “Approved as amended/use IRC as base document/allow for Oregon amendments”, Written Testimony (FAX) withdrawing Code Change Proposal IRC-02-01 to adopt 2000 Edition of the IRC, 4 p.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB167–06/07
Table R602.3(1)

Proponent: James Bela, Oregon Earthquake Awareness
Revise table as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (31/2″ × 0.135″)[i]	---

(Portions of table not shown do not change)

‘For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.
a through i (No change to current text))
j. Interior nonbraced wall lines may be nailed with a minimum 4-10d nails.

Reason: To add new requirements to the Code, and deleting a current requirement.
This code change proposal adds new footnote “ j ” to Row 10, Column 2 of TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS; and adds new text “Interior nonbraced wall lines may be nailed with a minimum 4-10d nails” to define footnote j .
This relaxation for the case of “interior nonbraced wall lines” reverts back to the requirements of the 1998 *International One- and Two-Family Dwelling Code*, which also specified a “minimum 48-inch offset of end joints.” 10-d nail fasteners have been, and remain, the specified fastener for “face nailing” “double top plates” at “24” o.c.”. The “minimum 48-inch offset of end joints” language was carried forward into the 2000 IRC, until it was identified as an erratum in the Fourth Printing (November 2001).
See also Code Change Proposals (-4), (-9a), (-g), OEA (-9b), OEA (-e) and OEA (-g1) to TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS.
State of Oregon Amendment to 2000 IRC; when adopted as the “base code” for 2003 EDITION STATE OF OREGON ONE- AND TWO-FAMILY DWELLING SPECIALTY CODE - Effective Date April 1, 2003
Code Change Proponent – Patrick Bridges: on behalf of Oregon Building Industry Association (OBIA) and Oregon Building Officials Association (OBOA)
State of Oregon Amendment to 2003 IRC: when adopted as the “base code” for 2005 OREGON RESIDENTIAL SPECIALTY CODE (effective date of April 1, 2005) Code Change Proponent – Richard Rogers, Structural Program Chief, Oregon Building Codes Division: on behalf of Oregon Building Codes Division

Bibliography:
ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, including Supplement No. 1; American Society of Civil Engineers Structural Engineering Institute, Reston, VA.
2005 OREGON RESIDENTIAL SPECIALTY CODE, 2005 Edition (Effective date April 1, 2005), copyright 2005 by International Code Council, Inc., Falls Church, VA., 516 p. + 6 p. errata.
State of Oregon One- and Two-Family Dwelling Specialty Code, 2003 Edition, (Effective date April 1, 2003, copyright 2002 by International Code Council, Inc., Falls Church, VA., 350 p. (Remove 2000 IRC Page / Insert 2003 Oregon Page)
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon’s Building Codes Adoption Process Rules, Oral Testimony, 10 p.
Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon’s Building Codes Adoption Process Rules, Additional Written Testimony, 23 p.
Bela, J. (2002). Building Codes Division Public Hearing September 17, 2002: Adopting 2000 Edition of International Residential Code “Approved as amended/use IRC as base document/allow for Oregon amendments”, Written Testimony (FAX) withdrawing Code Change Proposal IRC-02-01 to adopt 2000 Edition of the IRC, 4 p.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB168–06/07
Table R602.3(1), Table R802.5.1(9)

Proponent: Dennis Pitts, American Forest & Paper Association, representing same

Revise tables as follows:

TABLE R602.3(1)
FASTENER SCHEDULE STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c, d]	SPACING OF FASTENERS
~~Ceiling joist, laps over partitions, face nail~~	~~3 – 10d~~	~~---~~
~~Ceiling joists to parallel rafters, face nail~~	~~3 – 10d~~	~~---~~

(Portions of table and footnotes not shown do not change)

TABLE R802.5.1(9)
RAFTER/CEILING JOIST HEEL JOINT CONNECTIONS [a, b, c, d, e, f, ~~g,~~ h]

RAFTER SLOPE	RAFTER SPACING (inches)	GROUND SNOW LOAD (psf)											
		30 psf [g]				50 psf				70 psf			
		Roof span (feet)											
		12	20	28	36	12	20	28	36	12	20	28	36
		Required number of 16 d common nails [a, b] per heel joint splices [c, d, e, f]											

(Portions of table not shown do not change)
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kN/m^2
a. through f. (No change to current text)
g. Applies to roof live load of 20 psf or less.
~~g.~~ h. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. When ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors:

Reason: RB168-03/04, which was approved as modified, made substantial changes to the wording of R802.3.1 in an attempt to make the subjects of rafter-to-joist connections, rafter ties, and collar ties clearer. One of the requirements of that change was that rafter/ceiling joist heel connections and connections of ceiling joists where they lap over partitions should be in accordance with Table R802.5.1.9. In doing so, reference to the generic fastener table, Table R602.3(1), was deleted. However, the listings in Table R602.3(1), which are being proposed for deletion in this proposal, were inadvertently left in the table. Their presence there causes confusion over the proper fastener schedule. This proposal corrects that problem.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB169–06/07
Table R602.3(1)

Proponent: Scott Beard, SE, City of Tacoma, WA, representing same

Revise table as follows:

TABLE R602.3(1)
FASTENER SCHEDULE STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c,e]	SPACING OF FASTENERS	
		Edges (Inches)[i]	Intermediate supports[c,e] (inches)
Wood structural panels, subfloor, roof and wall sheathing to framing, and particleboard wall sheathing to framing			
5/16″-1/2″	6d common (2″ × 0.113″) nail (subfloor, ~~wall~~) 8d common (21/2″ × 0.131″) nail (roof) wall	6	12[g]

(Portions of table not shown do not change)

Reason: This one came from around-the-table discussions at the Ad Hoc IRC Bracing.
When the bracing amounts for type 3 bracing were determined, 7/16 structural panel with 8d nails were used for the capacity. This proposal is to bring the specified construction in line with the assumed construction.
This is one of two proposals. One of which brings the nailing up to 8d, the other adjusting the panel thickness.
This situation has become more critical recently, due to changes in how gypsum board is being installed, greatly reducing its bracing capacity. This will not fully mitigate the gypsum problem, but will definitely help.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB170–06/07
Table R602.3(1)

Proponent: Michael Gardner, Gypsum Association, representing same

Revise as follows:

TABLE R602.3(1)
FASTENER SCHEDULE STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c,e]	SPACING OF FASTENERS	
		Edges (Inches)[i]	Intermediate supports[c,e] (inches)
Wood structural panels, subfloor, roof and wall sheathing to framing, and particleboard wall sheathing to framing			
½" gypsum sheathing[d]	1½" galvanized roofing nail; ~~6d common (2" x 0.131") nail~~; staple galvanized, 1 ½" long; 1 ¼" screws, Type W or S	(No change)	(No change)
5/8" gypsum sheathing[d]	1 3/4" galvanized roofing nail; ~~8d common (2 1/2" x 0.131") nail~~; staple galvanized, 1 5/8" long; 1 5/8" screws, Type W or S	(No change)	(No change)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.

a through g (No change to current text)

h. Gypsum sheathing shall conform to ASTM ~~C 79~~ C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

i. (No change to current text)

Reason: Common nails should not be used to attach gypsum sheathing to a substrate or a framing member. To adequately support nail-attached sheathing, a fastener with a larger head, such as a roofing nail, should be used.
In addition, the thick head of a common nail, when compared to a roofing nail, has a tendency to tear the face paper of the gypsum sheathing during application. This can compromise the performance of the sheathing.

Reference in note h to ASTM C 79 is out of date and needs to be corrected to reflect reference to current ASTM product standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB171–06/07

Table R602.3(1), Note g

Proponent: James Bela, Oregon Earthquake Awareness

Revise table as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

(No change to table entries)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.

a through f (No change to current text)

g. For regions having basic wind speed of ~~100 mph or~~ less than 110 mph, nails for attaching wood structural panel roof sheathing to gable endwall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

h through l (No change to current text)

Reason: To add new requirements to the Code, and deleting a current requirement.

This code change proposal fills in the wind "gap" between 100 mph and "equal or exceed 110 mph", where the design requirements of Section R301.2.1.1 Design criteria. – take over and apply for "construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) in hurricane-prone regions, or 110 miles per hour (49 m/s) elsewhere . . . ." In these extreme wind situations, different design criteria than the IRC must be used; such as American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM), etc.

Nothing different occurs in construction practice by making this change above in footnote g. In terms of the model code language of the 2000, 2003 & 2006 IRC: Case (1): For regions 100 mph or less, specified nailing 6" o.c. is required for "attaching wood structural panel roof sheathing to gable end wall framing." Case (2): For regions greater than 100 mph, the 6" o.c. requirement reduces to 4" o.c. (for roof sheathing attachment to gable end wall framing); and additionally, nail spacing for attaching panel roof sheathing to intermediate supports reduces from standard 12" to 6" o.c. "for minimum 48-inch distance from ridges, eaves and gable end walls."

State of Oregon Amendment to 2000 IRC; when adopted as the "base code" for 2003 EDITION STATE OF OREGON ONE- AND TWO-FAMILY DWELLING SPECIALTY CODE - Effective Date April 1, 2003

Code Change Proponent – Patrick Bridges: on behalf of Oregon Building Industry Association (OBIA) and Oregon Building Officials Association (OBOA)

State of Oregon Amendment to 2003 IRC: when adopted as the "base code" for 2005 OREGON RESIDENTIAL SPECIALTY CODE (effective date of April 1, 2005)

Code Change Proponent – Richard Rogers, Structural Program Chief, Oregon Building Codes Division: on behalf of Oregon Building Codes Division

Bibliography:

ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, including Supplement No. 1; American Society of Civil Engineers Structural Engineering Institute, Reston, VA.

2005 OREGON RESIDENTIAL SPECIALTY CODE, 2005 Edition (Effective date April 1, 2005), copyright 2005 by International Code Council, Inc., Falls Church, VA., 516 p. + 6 p. errata.

State of Oregon One- and Two-Family Dwelling Specialty Code, 2003 Edition, (Effective date April 1, 2003, copyright 2002 by International Code Council, Inc., Falls Church, VA., 350 p. (Remove 2000 IRC Page / Insert 2003 Oregon Page)

Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon's Building Codes Adoption Process Rules, Oral Testimony, 10 p.

Bela, J. (2006). Building Codes Division Public Hearing February 21, 2006: Oregon's Building Codes Adoption Process Rules, Additional Written Testimony, 23 p.

Bela, J. (2002). Building Codes Division Public Hearing September 17, 2002: Adopting 2000 Edition of International Residential Code "Approved as amended/use IRC as base document/allow for Oregon amendments", Written Testimony (FAX) withdrawing Code Change Proposal IRC-02-01 to adopt 2000 Edition of the IRC, 4 p.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB172–06/07
R602.6.1

Proponent: Randall Shackelford, Simpson Strong-Tie Co

Revise as follows:

R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 1/2 inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight ~~16d~~ 10d (0.148" diameter) nails having a minimum length of 1 1/2 inches (38 mm) at each side or equivalent. See Figure R602.6.1.

~~**Exception:** When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.~~

Reason: To revise code requirements.

0.148" by 1½" nails are common nails used to install metal ties (connectors). 16d nails tend to split the top plates, while 10d nails do not. A recent interpretation from ICC Staff indicates that the 16d nails currently specified could be 16d box nails. 10d nails have an equivalent or greater calculated capacity as 16d nails.

Table 11P of the 2005 NDS, standard reference number NDS–05 in the codes, provides allowable shear loads of a 16d box nail through a 16 gauge steel plate. They are:

- 88 pounds into Spruce-Pine-Fir
- 102 pounds into Douglas Fir-Larch
- 111 pounds into Southern Pine

Table 11P combined with footnote 3 provides allowable shear loads of a 10d common nail 1½ inches long (0.148" x 1.50") through a 16 gauge steel plate. They are:

- 97 pounds into Spruce-Pine-Fir
- 112 pounds into Douglas Fir-Larch
- 122 pounds into Southern Pine

Based on the allowable loads in the NDS, a 10d nail 1½ inches long exceeds the shear capacity of a 16d box nail in this application. The Exception is stricken because the wood structural panel sheathing does not provide equivalent capacity as the strap. There is no way to tell where the joint in the sheathing will be located. If it is located near the cut top plate, it will transfer very little load across the plate. Even if the panel were located exactly centered over the cut in the plates, there will only be four 6d common nails on each side of the cut.

Cost Impact: The code change proposal will only increase the cost of construction if sheathing is being used to splice cuts in plates

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB173–06/07
R602.6.1

Proponent: Scott Dornfeld, City of Delano, MN, representing himself

Revise as follows:

R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 1/2 inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 16d nails ~~at each side~~ or equivalent. See Figure R602.6.1.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

Reason: The purpose for this code change is to maintain that the top plates stay in tact. By using eight 16d nails on each side of the opening we are spitting the plates apart. Therefore, weakening the strength of those plates. Today's light framed construction is not built today as we did many years ago when the framing fit together as a puzzle.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing: Committee AS AM D
Assembly: ASF AMF DF

RB174–06/07
R602.8

Proponent: Donald LeBrun, CBO, State of Indiana, representing the Indiana Association of Building Officials

Revise as follows:

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved <u>non-combustible</u> material to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

Reason: This proposal and a similar but opposite proposal are presented so that we may better understand the committee's intent and bring resolution to this issue. In past codes we were directed to use a non-combustible material in this location. Our present commentary also supports the use of a non-combustible material. Unfortunately, our current code language is lacking at best. It leaves the matter to each building official to determine what he will approve without clear guidance.

Building officials are being bombarded with product information, evaluation reports, sales hype and rumors on what products should be approved. As a result we have jurisdictions where non-combustible materials are required adjoining jurisdictions where combustible foams are approved. Quite honestly, this is not fair to either the building departments or the builders. The code should be clear in its intent so as to allow building officials and builders a better understanding as to what is really trying to be accomplished in these locations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RB175–06/07
R602.8

Proponent: Jason C. Lynch, Flame Tech, Inc., representing same

Revise as follows:

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved ~~material~~ <u>fireblocking caulk tested to ASTM E 136</u> to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

Reason: The purpose of the change is to clarify the code and establish a "common fireblocking material" that clearly states one type of material and references a specific material test to determine an "approved material" used for fireblocking penetrations. The current code wording does not identify a specific test or material standard to refer to for fireblocking penetrations. This allows for each individual inspector or municipality to interpret their

own “approved material.” This results in the use of many inappropriate materials that have fire endurance tests irrelevant to non-rated, wood frame construction. ASTM E 136 fireblocking caulks have been specifically tested and demonstrates nonflammable characteristics and high resistance to burning or smoking at extremely high temperatures. An ASTM E 136 fireblocking caulk “resumes and maintains the integrity of the wood 2 x 4 fireblocks” as specified by **Section R602.8.1.2 Fireblocking Integrity**. With the code wording changed to “approved ASTM E 136 fireblocking caulk”, municipalities have a common appropriate building material and test standard(s) to reference when enforcing this code section.

The noncombustible material test standard is ASTM E 136. ASTM E 136 materials are tested not to flame/burn at 1380°F/750°C. This test demonstrates a material as being capable of “resuming and maintaining the integrity of fireblocks” as stated in Section R602.8.1.2

Bibliography:
All references and wording are compiled from the 2000 *International Residential Code* page 112, Section R602.8 for Fireblocking and page 16 for the definition of “Noncombustible Material”.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing: Committee AS AM D
Assembly: ASF AMF DF

RB176–06/07
R602.8

Proponent: Donald LeBrun, CBO, State of Indiana, representing the Indiana Association of Building Officials

Revise as follows:

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. <u>The material filling this annular space shall not be required to meet the ASTM E 136 requirements.</u>
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

Reason: This proposal and a similar but opposite proposal are presented so that we may better understand the committee’s intent and bring resolution to this issue. In past codes we were directed to use a non-combustible material in this location. Our present commentary also supports the use of a non-combustible material. Unfortunately, our current code language is lacking at best. It leaves the matter to each building official to determine what he will approve without clear guidance.

Building officials are being bombarded with product information, evaluation reports, sales hype and rumors on what products should be approved. As a result we have jurisdictions where non-combustible materials are required adjoining jurisdictions where combustible foams are approved. Quite honestly, this is not fair to either the building departments or the builders. The code should be clear in its intent so as to allow building officials and builders a better understanding as to what is really trying to be accomplished in these locations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB177–06/07
R602.8, M1501.2 (New)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing In-O-Vate Technology, Inc.

1. Revise as follows:

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided inwood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.
7. At openings around dryer exhaust duct in accordance with Section M1501.2.

2. Add new text as follows:

M1501.2 Dryer exhaust duct penetrations. Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, approved fire caulking, or a noncombustible dryer exhaust duct wall receptacle. Clothes dryer exhaust duct penetrations of fire-resistance-rated wall or floor assemblies shall comply with Section R317.3.

Reason: The difference between a dyer exhaust duct penetration and other penetration is that it is in close proximity to a fuel fired appliance or electric heating appliance. Dryers are more prone to fire than other appliances. To protect the structure, it is important to have a higher level of protection.

Another concern with a dryer exhaust duct is the proper connection and installation of the duct behind the wall. The transition between the exposed duct and the duct in the wall must be properly installed. When flexible duct is used, an improper transition can distort the flexible duct leading to a greater buildup of lint in the duct. This can lead to a fire in the duct.

The CPSC identified 15,600 fires associated with dryers in a single year. Studies have shown that metal ducts protect the structure from the spread of fire. Additionally, noncombustible material or fire caulk around the annular space prevents the fire from spreading into the wall or ceiling cavity. The same can be accomplished with manufactured noncombustible receptacles. The noncombustible receptacles also allow for the proper storage and recoil of the transition flexible duct to a metal duct.

This new section complements the fireblocking requirements in Section R602.8.

When a dryer exhaust duct penetrates a fire-resistance-rated assembly, the penetration must be properly protected. The last sentence references the appropriate section for penetration protection. There are available rated dryer exhaust vent through penetration assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB178–06/07
R602.9

Proponent: James Bela, Oregon Earthquake Awareness

Revise as follows:

R602.9 Cripple walls. Foundation cripple walls shall be framed of studs not ~~smaller~~ less in size than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story. Cripple walls supporting three stories shall be framed with 2 x 6 (51 mm x 153 mm) studs spaced not more than 16 inches (406 mm) on center.

Cripple walls with a stud height less than 14 inches (356 mm) supporting exterior walls or an interior braced wall line which is supported by a continuous foundation as required by Section R602.10.9 shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1), or ~~the~~ these cripple walls shall be constructed of solid blocking. ~~Cripple walls shall be supported on continuous foundations~~.

Reason: To substitute new or revised material for current provisions of the Code.

"The Building Code should be a consensus; it's not something to 'chip-away' at, because then you don't know what you've got!" -- George Housner

State of Oregon Amendment to 2000 IRC:
Code Change Proponent – Patrick Bridges: on behalf of Oregon Building Industry Association (OBIA) and Oregon Building Officials Association (OBOA)

State of Oregon Amendment to 2003 IRC: adopted as the "base code" for 2005 OREGON RESIDENTIAL SPECIALTY CODE (effective date of April 1, 2005)
Code Change Proponent – Richard Rogers, Structural Program Chief, Oregon Building Codes Division: on behalf of Oregon Building Codes Division

These changes to model code language of the *International Residential Code (IRC)* were effected by basically just "voting them in" by members of the Oregon Building Codes Division's (a) code development committees; (b) appropriate Advisory Boards; and (c) finally the concurrence of the BCD Administrator. Where technical supporting information was presented in the Oregon code change process, that same information is presented here. Where none was given in the Oregon code change process, the "supporting information" is "voting yes" in support by all of the above - to change the model code.

Finally, one reasonably expects that the Board of Directors of the ICC, the "People Helping People Build a Safer World™" see nothing in conflict with the Vision, Mission and Values of the ICC, since they agreeably have printed them under their copyright ownership now for two code cycles (2003 & 2005):

Vision: Protecting the health, safety, and welfare of people by creating better buildings and safer communities.

Mission: Providing the highest quality codes, standards, products, and services for all concerned with the safety and performance of the built environment

Values: Customer Value, Integrity and trust, Member-focus, Professionalism, Public service, Quality

The fact that these revisions do not conform to ASCE 7-05, below, therefore should be considered "non-persuasive" – which presumably is the concurring view of the ICC Board and it's CEO, James Lee Witt. Even though a "uniform adoption would lead to consistent code enforcement and higher quality construction," the continued evisceration of the ICC copyright protections can continue to provide, well, "*A New Era of Building and Fire Safety"* -- throughout the seismic regions of the West, and particularly the Pacific Northwest, which is subject to Magnitude 9 subduction zone earthquakes, as have occurred in Chile (1960), Alaska (1964), and Sumatra (2004).

SECTION 11
SEISMIC DESIGN CRITERIA

11.1.4 Alternate Materials and Methods of Construction. Alternate materials and methods of construction to those prescribed in the seismic provisions of this standard shall not be used unless approved by the authority having jurisdiction. Substantiating evidence shall be submitted demonstrating that the proposed alternate, for the purpose intended, will be at least equal in strength, durability, and seismic resistance.

Bibliography:
ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, including Supplement No. 1; American Society of Civil Engineers Structural Engineering Institute, Reston, VA.
2005 OREGON RESIDENTIAL SPECIALTY CODE, 2005 Edition (Effective date April 1, 2005), copyright 2005 by International Code Council, Inc., Falls Church, VA., 516 p. + 6 p. errata.
State of Oregon One- and Two-Familty6 Dwelling Specialty Code, 2003 Edition, (Effective date April 1, 2003, copyright 2002 by International Code Council, Inc., Falls Church, VA., 350 p. (Remove 2000 IRC Page / Insert 2003 Oregon Page)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB179–06/07
R602.10 through R602.10.11.2

Proponent: Edward L. Keith, APA-The Engineered Wood Association

Delete Sections R602.10 through R602.11.2 and substitute as follows:

R602.10 Wall bracing. All exterior walls shall be braced in accordance with this section. In addition, interior braced wall lines shall be provided in accordance with Section R602.10.1. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

> **Exception**: Detached one-and two-family dwellings located in Seismic Design Category C are exempt from the seismic bracing requirements of this section. Wind speed provisions for bracing shall be applicable to detached one- and two-family dwellings.

R602.10.1 Braced wall lines. Braced wall lines, both interior and exterior, shall be provided with braced wall panels in the amount and location specified in this section. Braced wall panels shall consist of construction methods listed in Section R602.10.2 or the alternate bracing panels described in Section R602.10.3.2.

R602.10.1.1 Amount of bracing. The amount of bracing along each braced wall line shall be in accordance with Table R602.10.1(1) and shall be the greater of that required by the Seismic Design Category or the design wind speed. Adjustments to the percent of braced wall specified in Table R602.10.1(1) shall be as specified in Table R602.10.1(2)

TABLE R602.10.1(1)[a,b,c]
WALL BRACING

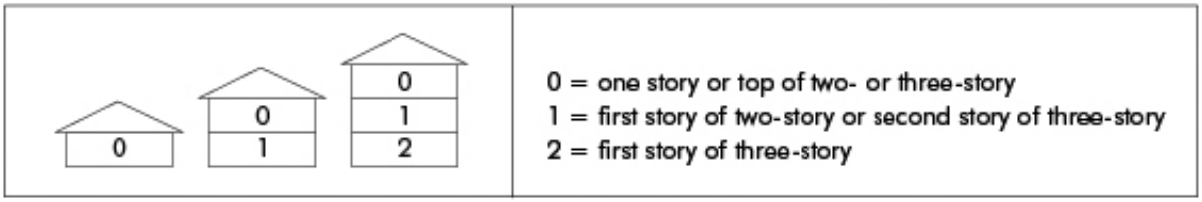
SEISMIC DESIGN CATEGORY (SDC) OR WIND SPEED	STORIES ABOVE BRACED WALL LINE[d]	METHOD OF BRACING PERMITTED	AMOUNT OF FULL-HEIGHT BRACING PER WALL LINE		MAXIMUM SPACING BETWEEN BRACED WALL LINES (FT)
			For Method 3 Bracing	For other methods permitted[e]	
SDC A and B ($S_s \leq$ 0.35g and $S_{ds} \leq$ 0.33g), $\leq$ 100 mph	0	Methods 1-8	16%	16%	35 (See Section R602.10.1.3 for exceptions)
	1	Methods 1-8	16%	25%	
	2	Methods 2-8	25%	35%	
SDC C ($S_s \leq$ 0.6g and $S_{ds} \leq$ 0.53g), < 110 mph	0	Methods 1-8	16%	25%	
	1	Methods 2-8	30%	45%	
	2	Methods 2-8	45%	60%	
SDC D_0 & D_1 ($S_s \leq$ 1.25g and $S_{ds} \leq$ 0.83g), < 110 mph	0	Methods 2-8	20%	30%	25 (See Section R602.10.1.3.1 for exceptions)
	1	Methods 2-8	45%	60%	
	2	Methods 2-8	60%	85%	
SDC D_2, < 110 mph	0	Methods 2-8	25%	40%	
	1	Methods 2-8	55%	75%	
	Cripple wall	Method 3	75%	Not Permitted	

a. Wall bracing amounts are based on a soil site class "D." Interpolation of bracing amounts between the S_{ds} values associated with the Seismic Design Categories shall be permitted when a site-specific S_{ds} value is determined in accordance with Section 1613.5 of the *International Building Code*.

b. Foundation cripple wall panels shall be braced in accordance with Section R602.10.8.

c. Methods of bracing shall be as described in Section R602.10.2. The alternate braced wall panels described in Section R602.10.3.2 shall also be permitted

d. Stories above braced wall line. 0 = one story or top of two or three story. 1 = first story of two story or second story of three story. 2 = first story of three story.



e. Method 1 bracing exempt from % bracing requirement.

TABLE R602.10.1 (2)
ADJUSTMENT FACTORS TO THE AMOUNT OF REQUIRED WALL BRACING [a]

ADJUSTMENT BASED ON:			MULTIPLY AMOUNT OF BRACING PER WALL LINE BY:	APPLIES TO:
Story height[b] (Section 301.3)		< 10 ft	1.0	All bracing methods - R602.10.2
		12 ft	1.2	
Braced wall line spacing in SDC A-C[b,d]		< 35 ft	1.0	
		50 ft	1.43	
Wall dead load[e]		8-15 psf	1.0	
		< 8 psf	0.85	
Roof/ceiling dead load for wall supporting [b,c]:	roof only or roof plus one story	< 15 psf	1.0	
	roof only	25 psf	1.1	
	roof plus one story	25 psf	1.2	
Walls with stone of masonry veneer in SDC C-D_2		See Section R703.7, Exception 1-4		
Cripple walls		See Section R 602.10.8		

a. The total amount of bracing required for a given wall line is the product of all applicable adjustment factors
b. Linear interpolation shall be permitted.
c. Bracing required for a site's wind speed shall not be adjusted for dead load.
d. Braced wall line spacing in excess of 35-ft shall be in accordance with R602.10.1.3.

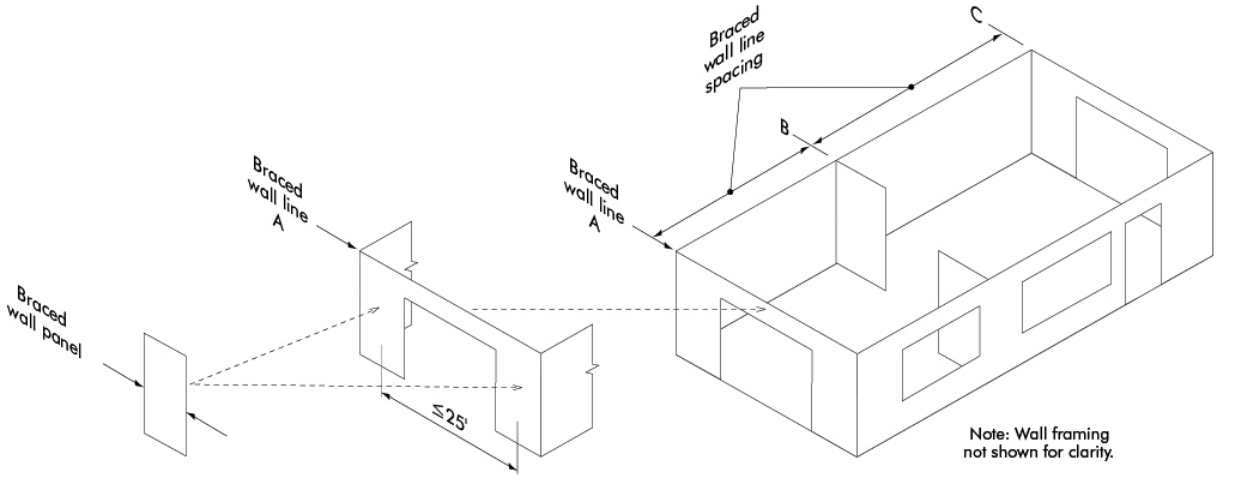
R602.10.1.2 Braced wall panel location. Braced wall panels shall be located in accordance with Table R602.10.1(1) and Figure R602.10.1(1). Braced wall panels shall be no more than 12.5 feet (3810 mm) from each end of a braced wall line per Figure R602.10.1(2). Braced wall panels may be offset out-of-plane up to 4 feet (1219 mm) provided that the total out-to-out offset in any braced wall line is not more than 8 feet (2438 mm) per Figure R602.10.1(3). Braced wall segments shall be located in accordance with Section R602.10 and at least every 25-ft (7620 mm) o.c. but not less than the percentages given in Table R602.10.1(1).

R602.10.1.2.1 Braced wall panel location in Seismic Design Categories D_0, D_1 and D_2. Exterior braced wall lines shall have a braced wall panel located at each end of the braced wall line.

Exception: For braced wall panel construction Method 3 of Section R602.10.2, the braced wall panel shall be permitted to begin no more than 8 feet (2438 mm) from each end of the braced wall line provided one of the following is satisfied per Figure R602.10.1.2.1:

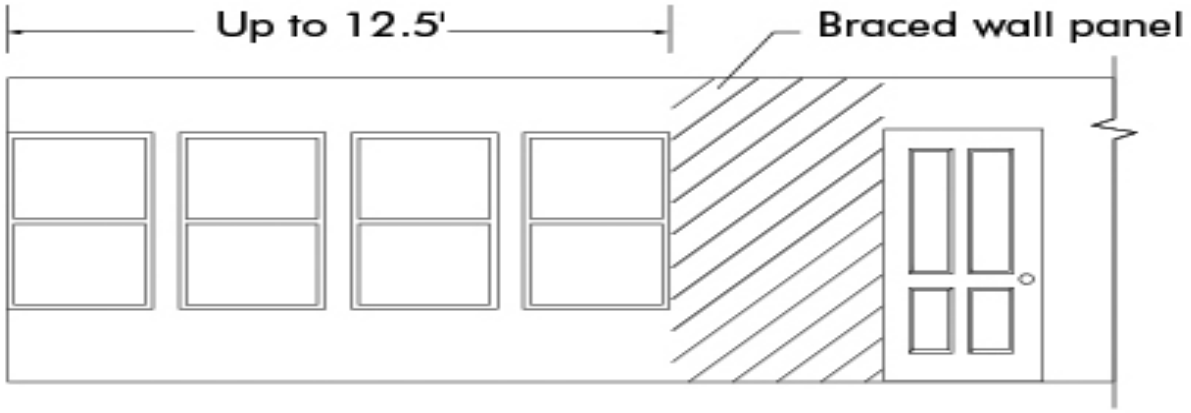
1. A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch-wide (610 mm) panels at the corner shall be attached to framing in accordance with Figure R602.10.4, or
2. The end of each braced wall panel closest to the corner shall have a tie-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The tie-down device shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8007 N). The tie-down device shall be installed in accordance with the manufacturer's recommendations.

R602.10.1.2.1.1 Collectors in Seismic Design Categories D_0, D_1 and D_2. A designed collector shall be provided if a braced wall panel is not located at each end of a braced wall line as indicated in Section R602.10.1.2.1 or, when using the Section R602.10.1.2.1 Exception, if a braced wall panel is more than 8 feet (2438 mm) from each end of a braced wall line.



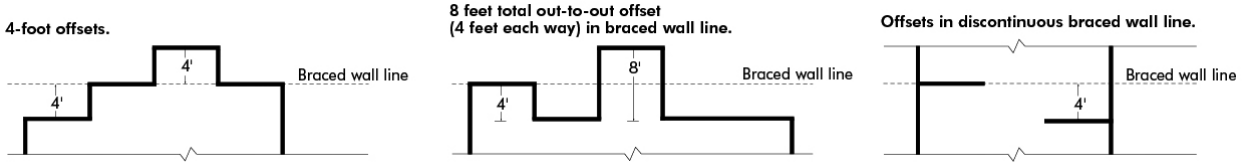
Pacific A 1

FIGURE R602.10.1 (1)
BRACED WALL PANELS AND BRACED WALL LINES



Pacific A 2

FIGURE R602.10.1(2)
PERMITTED BRACED WALL PANEL DISTANCES FROM ENDS OF A BRACED WALL LINE (SDC A, B and C)



Pacific A 3

FIGURE R602.10.1(3)
OFFSETS PERMITTED FOR BRACED WALL LINES

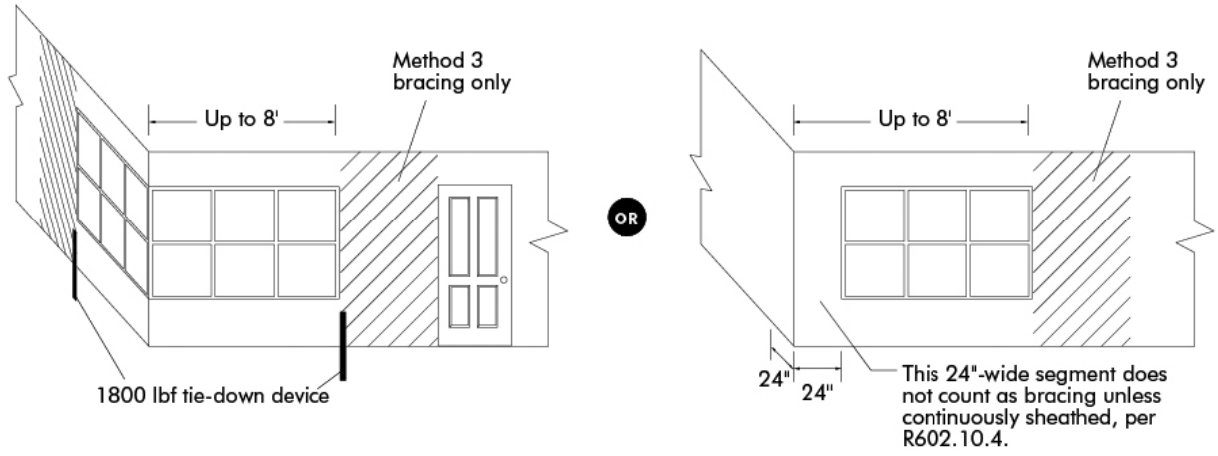


FIGURE R602.10.1.2.1
BRACED WALL PANELS AT BRACED WALL-LINE ENDS IN SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2.

R602.10.1.3 Braced wall line spacing. Spacing of braced wall lines shall not exceed 35 feet (10,668 mm) on center in both the longitudinal and transverse direction in each story.

Exception: Spacing of braced wall lines not exceeding 50 feet (15,240 mm) shall be permitted where:

1. The wall bracing provided equals or exceeds the amount of bracing required by Table R602.10.1(1) multiplied by a factor equal to the braced wall line spacing divided by 35 feet (10,668 mm), and
2. The length-to-width ratio for the floor/roof diaphragm as measured between braced wall lines does not exceed 3:1.

R602.10.1.3.1 Braced wall line spacing for Seismic Design Categories D_0, D_1 and D_2. Spacing between braced wall lines in each story shall not exceed 25 feet (7620 mm) on center in both the longitudinal and transverse directions.

Exception: In one-and two-story buildings, spacing between braced wall lines shall not exceed 35 feet (10,668 mm) on center in order to accommodate one single room not exceeding 900 square feet (84 m^2) in each dwelling unit.

R602.10.2 Braced wall panel construction methods. The construction of braced wall panels shall be in accordance with one of the following methods:

1. Nominal 1-inch-by-4-inch (19.1 mm by 88.9 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.
2. Wood boards of 5/8-inch (15.9 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with Table R602.3(1).
3. Wood structural panel sheathing with a thickness not less than 5/16 inch (7.9 mm) for 16-inch (406 mm) stud spacing and not less than 3/8 inch (9.5 mm) for 24-inch (610 mm) stud spacing. Wood Structural panels shall be installed in accordance with Table R602.3(3) and Table R602.3(1).
4. One-half-inch (12.7 mm) or 25/32-inch (19.8 mm) thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with Table R602.3(1).
5. Gypsum board with minimum ½-inch (12.7 mm) thickness placed on studs spaced a maximum of 24 inches 610 mm) on center and fastened at 7 inches (178 mm) on center with the size nails specified in Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.
6. Particleboard wall sheathing panels installed in accordance with Table R602.3(4) and Table R602.3(1).
7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with Section R703.6.
8. Hardboard panel siding when installed in accordance with Table R703.4.

Exception: Alternate braced wall panels constructed in accordance with Sections R602.10.3.2.1 or R602.10.3.2.2 shall be permitted to replace any braced wall panel in any of the above methods of braced wall panels.

R602.10.2.1 Adhesive attachment of sheathing in Seismic Design Categories C, D_0, D_1 and D_2. Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories C, D_0, D_1 and D_2.

R602.10.3 Minimum length of braced panels. For Methods 2, 3, 4, 6, 7 and 8 above, each braced wall panel shall be at least 48 inches (1219 mm) in length, covering a minimum of three stud spaces where studs are spaced 16 inches (406 mm) on center and covering a minimum of two stud spaces where studs are spaced 24 inches (610 mm) on center. For Method 5 above, each braced wall panel and shall be at least 96 inches (2438 mm) in length where applied to one face of a braced wall panel and at least 48 inches (1219 mm) where applied to both faces. For Methods 2, 3, 4, 6, 7 and 8, for purposes of computing the percentage of panel bracing required in Table R602.10.1(1), the effective length of the braced wall panel shall be equal to the actual length of the panel.

Exceptions:

1. Lengths of braced wall panels for continuous wood structural panel sheathing shall be in accordance with Section R602.10.4.
2. Lengths of alternate braced wall panels shall be in accordance with Section R602.10.3.2.1 or Section R602.10.3.2.2.

R602.10.3.1 Adjustment of length of braced panels. When story height (H), measured in ft, exceeds 10 ft, in accordance with Section R301.3, the minimum length of braced wall panels specified in R602.10.2 shall be increased by a factor H/10. See Table R602.10.3.1. Interpolation is permitted.

TABLE R602.10.3.1
MINIMUM LENGTH REQUIREMENTS FOR BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED	BRACING METHOD	HEIGHT OF BRACED WALL PANEL				
		8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
SDC A, B, C, D_0, D_1 and D_2 Wind speed < 110 mph	2,3,4,6,7,8 and Method 5 when double sided	4'-0"	4'-0"	4'-0"	4'-5"	4'-10"
	Method 5, single sided	8'-0"	8'-0".	8'-0"	8'-10"	9'-8"

For SI: I inch = 25.4mm, 1 foot = 305 mm

R602.10.3.2 Alternative bracing panels.

R602.10.3.2.1 Alternate braced wall panels. Alternate braced wall panels constructed in accordance with one of the following provisions shall be permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.2. The maximum height and minimum length and tie-down force of each panel shall be in accordance with Table R602.10.3.2.1:

1. In one-story buildings, each panel shall be sheathed on one face with 3/8-inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Table R602.3(1) and blocked at all wood structural panel sheathing edges. Two anchor bolts installed in accordance with Figure R403.1(1) shall be provided in each panel. Anchor bolts shall be placed at panel quarter points. Each panel end stud shall have a tie-down device fastened to the foundation, capable of providing an uplift capacity in accordance with Table R602.10.3.2.1. The tie-down device shall be installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation or on floor framing supported directly on a foundation, which is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. When the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No.4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.
2. In the first story of two-story buildings, each braced wall panel shall be in accordance with Item 1 above, except that the wood structural panel sheathing shall be provided on both faces, sheathing edge nailing spacing shall not exceed four inches on center, at least three anchor bolts shall be placed at one-fifth points.

TABLE R602.10.3.2.1
MINIMUM LENGTH REQUIREMENTS AND TIE-DOWN FORCES FOR ALTERNATE BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED		HEIGHT OF BRACED WALL PANEL				
		8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
SDC A, B and C Wind speed < 110 mph	Sheathed Length	2'-4"	2'-8"	2'-8"	3'-2"	3'-6"
	R602.10.3.2.1, Item 1 Tie-down Force (lbs)	1800	1800	1800	2000	2200
	R602.10.3.2.1, Item 2 Tie-down Force (lbs)	3000	3000	3000	3300	3600
SDC D_0, D_1 and D_2 Wind speed < 110 mph	Sheathed Length	2'-8"	2'-8"	2'-8"	NP[a]	NP[a]
	R602.10.3.2.1, Item 1 Tie-down Force (lbs)	1800	1800	1800	NP[a]	NP[a]
	R602.10.3.2.1, Item 2 Tie-down Force (lbs)	3000	3000	3000	NP[a]	NP[a]

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound = 4.44822 Newtons
a. NP = Not Permitted. Maximum height of 10 feet (3,048 mm).

R602.10.3.2.2 Alternate bracing wall panel adjacent to a door or window opening. Alternate braced wall panels constructed in accordance with one of the following provisions are also permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.2 for use adjacent to a window or door opening with a full-length header:

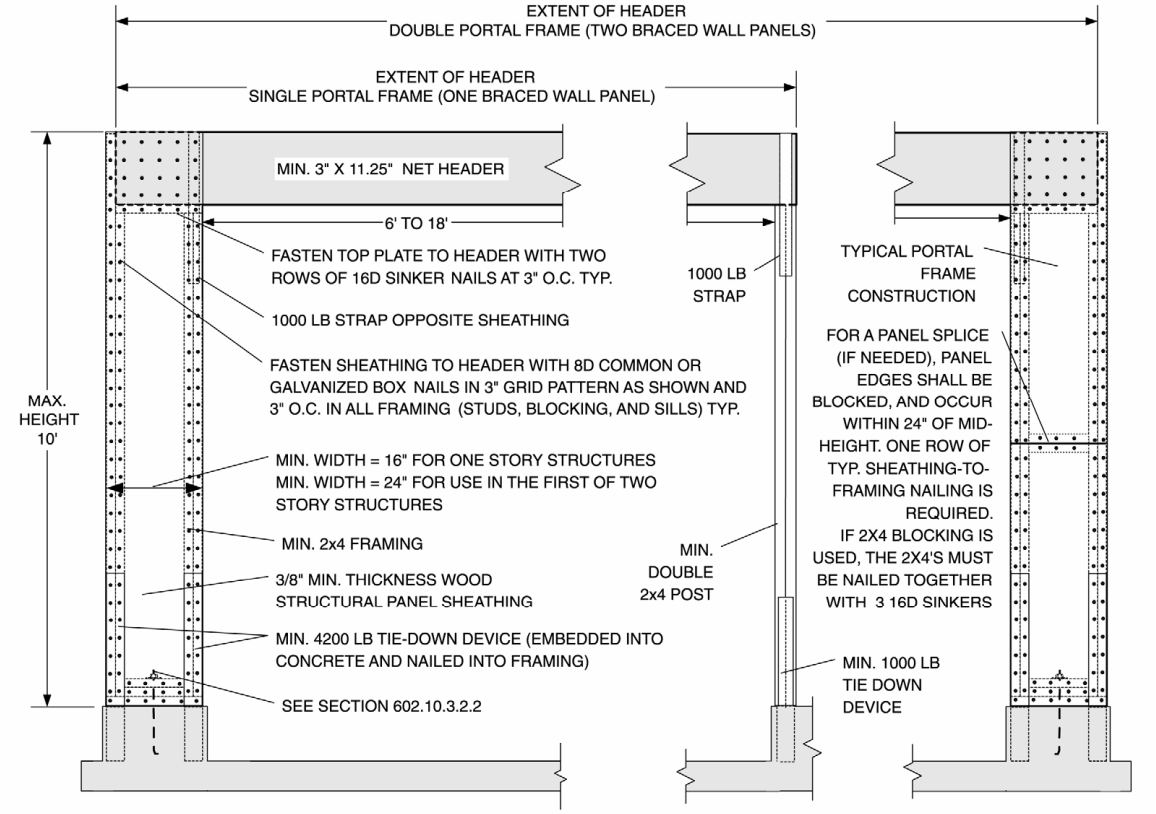
1. In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of 3/8-inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Figure R602.10.3.2.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.2.2. A built-up header consisting of at least two 2 X 12s and fastened in accordance with Table R602.3(1) shall be permitted to be used. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the side of the inner studs opposite the sheathing. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill plate. The studs at each end of the panel shall have a tie-down device fastened to the foundation with an uplift capacity of not less than 4,200 pounds (18683 N). The tie-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations.

   Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the bearing studs. The bearing studs shall also have a tie-down device fastened to the foundation with an uplift capacity of not less than 1000 pounds (4448 N).

   The panels shall be supported directly on a foundation, which is continuous across the entire length of the braced wall line. The foundation shall be reinforced with not less than one No. 4 bar top and bottom.

   Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-Inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.
2. In the first story of two-story buildings, each wall panel shall be braced in accordance with item 1 above, except that each panel shall have a length of not less than 24 inches (610 mm).

FIGURE R602.10.3.2.2
ALTERNATE BRACED WALL PANEL ADJACENT TO A DOOR OR WINDOW OPENING



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

R602.10.4 Continuous wood structural panel sheathing. Continuous wood structural panel sheathing shall be constructed of wood structural panels with a thickness not less than 5/16 inch (7.9 mm) for 16-inch (406 mm) stud spacing and not less than 3/8 inch (9.5 mm) for 24-inch (610 mm) stud spacing. Wood Structural panels shall be installed in accordance with Table R602.3(3) and Figure R602.4(1). Percent bracing for the continuously sheathed method shall be as provided for in Table R602.10.1(1) for Method 3 bracing and shall be adjusted based on wall opening height as specified in Table R602.10.4(1).

When using continuous wood structural panel sheathing on all exterior walls, and interior braced wall lines, where required, including areas above and below openings, minimum braced wall panel lengths shall be in accordance with Table R602.10.4(2). Wood structural panel sheathing shall be installed at corners in accordance with Figure R602.10.4 (2).

TABLE R602.10.4 (1)
ADJUSTMENT FACTORS TO THE AMOUNT OF REQUIRED BRACING PER WALL LINE – CONTINUOUSLY SHEATHED

ADJUSTMENT BASED ON MAXIMUM WALL OPENING HEIGHT:		MULTIPLY AMOUNT OF BRACING PER WALL LINE BY:
Continuous wood structural panel sheathing when maximum opening height in wall line does not exceed [a] (Section 301.2.2.2.1)	85% of wall height	0.9
	67% of wall height	0.8

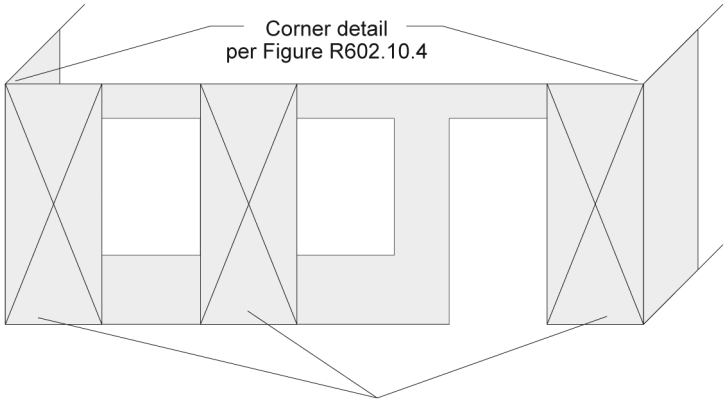
a. Amounts of bracing for continuous wood structural panel sheathing shall be based on Method 3 requirements.

TABLE R602.10.4(2)
LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN A CONTINUOUSLY SHEATHED WALL [a,b,c]

MINIMUM LENGTH OF BRACED WALL PANEL (inches)			MINIMUM OPENING HEIGHT NEXT TO THE BRACED WALL PANEL (% of wall height)
8-foot wall	9-foot wall	10-foot wall	
48	54	60	100%
32	36	40	85%
24	27	30	65%

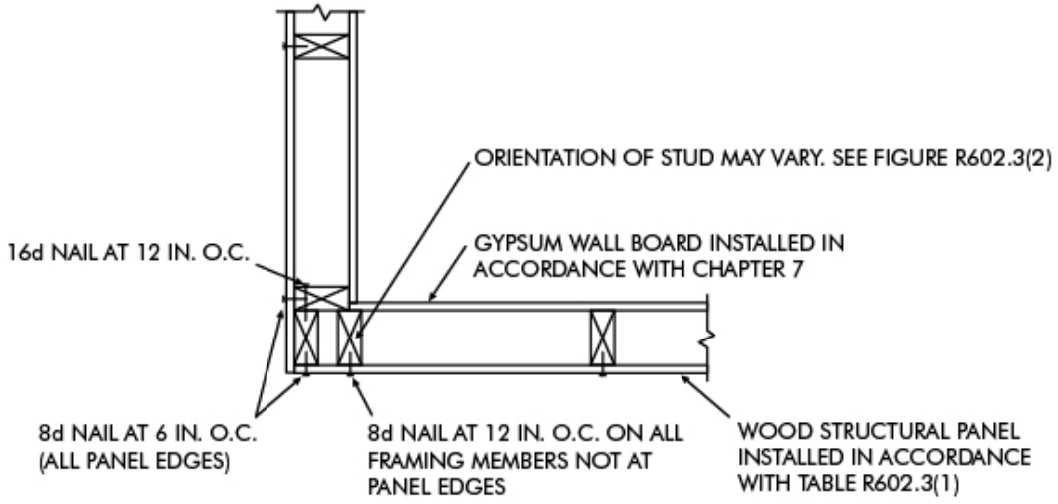
For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

a. Interpolation shall be permitted.
b. Full-height sheathed wall segments to either side of garage openings that support light frame roofs only, with roof covering dead loads of 3 psf or less shall be permitted to have a 4:1 aspect ratio.
c. Walls on either or both sides of openings in garages attached to fully sheathed dwellings shall be permitted to be built in accordance with Section R602.10.3.2.2 and Figure R602.10.3.2.2 except that a single bottom plate shall be permitted and two anchor bolts shall be placed at 1/3 points. In addition, tie-down devices shall not be required and the vertical wall segment shall have a maximum 6:1 height-to-length ratio (with height being measured from top of header to the bottom of the sill plate). This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C.

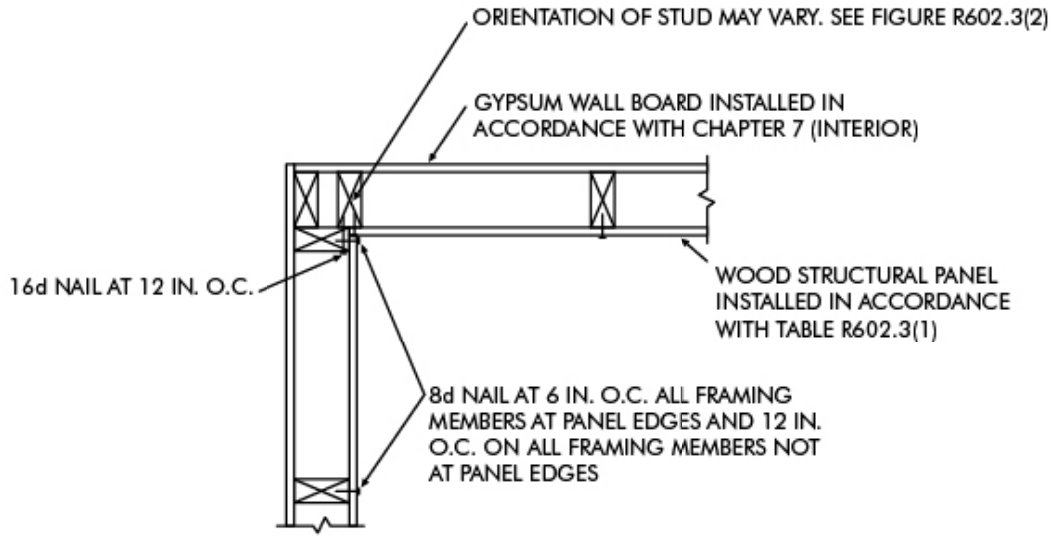


Braced wall panels meeting minimum required width based on maximum opening height adjacent to each panel per Table R602.10.4(2).
(All other framed portions of wall also are sheathed with wood structural panels)

FIGURE R602.10.4(1)
TYPICAL CONTINUOUSLY-SHEATHED BRACED WALL LINE



(a) OUTSIDE CORNER DETAIL



(b) INSIDE CORNER DETAIL

For SI: 1 inch = 25.4 mm.
Gypsum board nails deleted for clarity.

FIGURE R602.10.4 (2)
TYPICAL EXTERIOR CORNER FRAMING FOR CONTINUOUS STRUCTURAL PANEL SHEATHING SHOWING REQUIRED STUD-TO-STUD NAILING

R602.10.5 Connections. Braced wall panel sole plates shall be fastened to the floor framing and top plates shall be connected to the framing above in accordance with Table R602.3(1). Sills shall be fastened to the foundation or slab in accordance with Sections R403.1.6 and R602.11. Where joists are perpendicular to the braced wall lines above, blocking shall be provided under and in line with the braced wall panels.

R602.10.5.1 Interior braced wall panel connections for Seismic Design Categories D_0, D_1 and D_2. Interior braced wall lines shall be fastened to floor and roof framing in accordance with Table R602.3(1), to required foundations in accordance with Section R602.11.1, and in accordance with the following requirements:

1. Floor joists parallel to the top plate shall be toe-nailed to the top plate with at least 8d nails spaced a maximum of 6 inches (150 mm) on center.
2. Top plate laps shall be face-nailed with at least eight 16d nails on each side of the splice.

R602.10.6 Interior braced wall support. In Seismic Design Categories A through D_1, interior braced wall lines shall be supported as provided in Section R502.4.

R602.10.6.1 Interior braced wall support for Seismic Design Category D_2. In one-story buildings located in Seismic Design Category D_2, interior braced wall lines shall be supported on continuous foundations at intervals not exceeding 50 feet (15,240 mm). In two story buildings located in Seismic Design Category D_2, all interior braced wall panels shall be supported on continuous foundations.

Exception: Two-story buildings shall be permitted to have interior braced wall lines supported on continuous foundations at intervals not exceeding 50 feet (15,240 mm) provided that:

1. The height of cripple walls does not exceed 4 feet (1219 mm).
2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

R602.10.7 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to common blocking of a minimum 1-1/2 inch (38 mm) thickness.

Exception: Blocking is not required behind horizontal joints in Seismic Design Categories A and B and detached dwellings in Seismic Design Category C when constructed in accordance with Section R602.10.2, braced-wall-panel construction Method 3 and Table R602.10.1(1), Method 3, or where permitted by the manufacturer's installation requirements for the specific sheathing material.

R602.10.8 Cripple wall bracing. In Seismic Design Categories other than D_2, cripple walls shall be braced with an amount and type of bracing as required for the wall above in accordance with Table R602.10.1(1) with the following modifications for cripple wall bracing:

1. The percent bracing amount as determined from Table R602.10.1(1) shall be multiplied by a factor of 1.15, and
2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

R602.10.8.1 Cripple wall bracing in Seismic Design Categories D_0, D_1 and D_2. In addition to the requirements of Section R602.10.8, where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.1(1). Where cripple walls braced using Method 3 of Section R602.10.2 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

In Seismic Design Category D_2, cripple walls shall be braced in accordance with Table R602.10.1(1).

R602.10.8.2 Redesignation of cripple walls. In any Seismic Design Category, cripple walls shall be permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

R602.11 Wall anchorage. Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11.1

R602.11.1 Wall anchorage for all buildings in Seismic Design Categories D_0, D_1 and D_2 and townhouses in Seismic Design Category C. Plate washers, a minimum of ¼ inch by 3 inches by 3 inches (6.4mm by 76 mm by 76 mm) in size, shall be provided between the foundation sill plate and the nut. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 1-3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

R602.11.2 Stepped foundations. Where stepped foundations occur, the following requirements apply:

1. Where the height of a required braced wall panel that extends from foundation to floor above varies more than 4 feet (1220 mm), the braced wall panel shall be constructed in accordance with Figure R602.11.3.
2. Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8 feet (2440 mm) in length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4 feet (1219 mm) along the foundation. Anchor bolts shall be located a maximum of 1 foot and 3 feet (305 and 914 mm) from the step in the foundation.
3. Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements for a story shall apply.
4. Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of Section R602.11.1 shall apply.

Reason: The purpose of the proposal is to clarify the existing bracing provisions of the IRC through a reorganization of the existing bracing provisions without the addition of new provisions.

After the debacle at the last code hearing over bracing issues, a number of organizations representing a wide range of industries and interests formed a committee – The IRC Bracing Committee (a committee NOT formed under the auspicious of the ICC) – coordinated by Dr. Dan Dolan. This committee met twice to resolve the contentious issues associated with the bracing provisions and has future meetings planned to continue with this resolution. This specific proposal is one of this committee's action items. While the committee was not unanimous on this issue, the proposal represents the majority position.

The committee recognized unanimously that the current bracing provisions of the IRC had evolved to the point where they were very confusing and difficult to interpret and use. In order to properly determine the bracing requirements for a given structure, the user would have to know to use information in Chapters 3, 4 and 6. In addition, important information is currently "hidden" in footnotes that are often overlooked. In addition the seismic provisions for a given application are scattered around in Section R602.10 and in Chapter 3 in a seemingly random pattern.

These sections have evolved to the point where a number of state jurisdictions have already or are contemplating adoption of the bracing provisions of the 2000 IRC.

In order to correct/improve the bracing provisions, the IRC Bracing Committee decided on a two-pronged approach to correcting the deficiencies in the current provisions of the IRC. The first approach was to do a complete rewrite of the bracing provisions without making any technical changes in the existing provisions – this is called the non-technical rewrite – and the second was to develop technical code changes to improve the current bracing provisions of the building code. This proposal is the result of this committee's work on the non-technical rewrite of the bracing provisions of the IRC.

This proposal is simply a rewrite of the provisions that are already in the 2006 IRC. No new technical content has been added. Along with the reorganization, it was necessary to insert some text clarifying the intent of specific sections but not changing the current meaning. In addition a number of text sections have been replaced or supplemented with tables and/or figures where it was thought by the committee to clarify the intent of the existing provisions. During this reorganization, the seismic provisions were placed in the section where they were applicable. This eliminates the necessity to thumb back and forth throughout the code to ensure all of the provisions have been met for a specific section.

During the committee review process, an additional non-technical rewrite was considered as well as the proposed Code Masters format for the same subject. The attached proposal was modified to more closely follow the Code Masters format and material from the other non-technical rewrite that was considered superior in its presentation was added.

The committee was not unanimous on this issue, and the list below represents the committee participants and their organizations/interests that supported the proposal. At the end of the reason statement is a similar list of the opponents and their reasons for opposing the proposal. Per his specific request, Jay Crandall of ARES Consulting has been left off of both lists.

Organizations supporting the proposal:
Louis Wagner – American Fiberboard Association
Brad Douglas – American Forest and Paper Association
Ed Keith, B.J. Yeh, Zeno Martin - APA – The Engineered Wood Association
Scott Beard - City of Tacoma
Brian Foley, Chris McArtor - Fairfax County, Virginia
Ed Price - Georgia Pacific
James E. Russell - Engineer
Kelly Cobeen - Engineer
Randy Shakelford, Shane Vilasineekul, Steve Pryor – Simpson Strong-Tie
Dave Gromala – Weyerhaeuser
Taylor Blake, Ping Cheng – Louisiana Pacific
Susan Herrenbruck – Extruded Polystyrene Foam Association
David Geisler – Temple-Inland

Organizations opposed to the proposal:
Greg Bergtold - Dow Chemical
Edward Chan, Brad Allshouse – Covalence Coated Products

Reasons for opposition:
Greg Bergtold – I believe Jay Crandell's competing proposal had some clarifications that made sense to incorporate to help clarify this section of the code. Some time should have been spent to merge the two proposals and create a better product.
Edward Chan – Is opposed but was unable due to prior commitments to generate an opposing statement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RB180–06/07
R602.10, R602.11

Proponent: Jay H. Crandell, P.E., Ares Consulting, representing Foam Sheathing Coalition

Delete current Sections R602.10 and R602.11 and substitute as follows:

R602.10 Wall bracing. Walls shall be braced in accordance with this section. For buildings in Seismic Design Categories C, D_0, D_1 and D_2, walls shall be constructed in accordance with the additional requirements of Sections R602.10.4 and R602.10.5. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

R602.10.1 Braced wall lines. All exterior walls, and interior walls as required by Section R602.10.1.3, shall be designated as braced wall lines as shown in Figure R602.10.1(1). Braced wall lines shall consist of braced wall panel construction methods in accordance with Section R602.10.2.