Some framing members and requirements such as floor sheathing, temporary bracing, and blocking panels have been omitted for clarity.

NOTE: Except for cutting to length and as shown in this guide, never cut or notch the flanges.

Holes may be cut in web for plumbing, wiring and duct work. See table on page 27.

Figures on pages 19 and 20

NOTE: Unlike with some conventional lumber sizes, Broadspan I-joists do not require mid-span blocking or bridging for I-joist strength or stability.

Reference APA Form No. EWS Y250 for additional information on shear transfer at engineered wood framing systems.
**Floor Details**

**GENERAL NOTES**

1. All nails shown in the details below are assumed to be common nails unless otherwise noted. 10d box nails may be substituted for 8d common shown in details. Individual components not shown to scale for clarity.

2. To minimize splitting of flange and bearing plate at I-joist ends, angle nails and start at least 1½” from end.

3. For shear transfer at BSI Joists or rim board used as blocking or continuous rim, use same nailing as required for floor sheathing, but meeting flange nail spacing in this guide (see page 3).

### Diagrams

1a. BSI Joist blocking panel; uniform vertical load transfer = 2000 plf maximum.

1b. Rim Board or rim board blocking panel; uniform vertical load transfer = 2000 plf maximum.

1c. BSI rim joist vertical load transfer = 2000 plf maximum.

1d. AT INTERMEDIATE WALL

Provide lateral bracing per Details 1a, 1b or 1c

### Table

<table>
<thead>
<tr>
<th>Pair of Squash Blocks</th>
<th>Vertical load transfer capacity per pair of squash blocks (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3½” wide</td>
<td>3½” wide</td>
</tr>
<tr>
<td>5½” wide</td>
<td>5½” wide</td>
</tr>
<tr>
<td>2x Lumber</td>
<td>4000</td>
</tr>
<tr>
<td>1¾” Broadspan (APA) Rim Board Plus, APA Rim Board, or APA Rated® Sturd-I-Floor® panels 48 o.c.</td>
<td>3000</td>
</tr>
<tr>
<td>1” Broadspan (APA) Rim Board or Rated Sturd-I-Floor panels 32 o.c.</td>
<td>2700</td>
</tr>
</tbody>
</table>
Floor Details (continued)

Refer to General Notes on page 15.

Solid block all posts from above to bearing below. Install squash blocks per Detail 1d. Match bearing area of blocks below to post above.

Use single I-joist for loads up to 2000 plf, double I-joists for loads up to 4000 plf (filler block not required). Bearing must be provided across the full flange width to reach load capacity.

Provide backer as required for siding and/or wall sheathing attachment.

Rim board may be used in lieu of I-joists. Backer is not required when rim board is used.

Solid block all posts from above to bearing below. Install squash blocks per Detail 1d. Match bearing area of blocks below to post above.

Load bearing wall above shall align vertically with the wall below. Other conditions such as offset walls are not covered by this detail.

Blocking required over all interior supports under load bearing walls, or when floor joists are not continuous over supports (regardless of whether load bearing wall is present).

When two joists meet over wall, provide 1¼” minimum bearing for each joist, overlapping each end at bearing when necessary.

BSI Joist blocking panel vertical load transfer = 2000 plf max. See Detail 1b for vertical load capacity if rim board is used.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

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One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

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8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

Note: Unless hanger sides laterally restrain the top flange, bearing stiffeners shall be used (see page 18).

Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.

Fasten backer block with ten 10d nails. Clinch all nails when possible. Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Consult hanger manufacturer for hanger capacities on I-joist headers.

One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

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Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

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One 8d face nail each side at bearing.

8d nails at 6” o.c.

Backer block required if top-mount hanger load exceeds 250 lbs. Install backer tight to top flange.

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Backer block required both sides for any hanger or fastener through the face. Install deep backer block** tight to bottom flange.

Modification factors may apply to hanger capacities for I-joist headers. See hanger manufacturer’s recommendations. Verify double I-joist capacity to support concentrated loads.
Floor Details (continued)

Refer to General Notes on page 15.

**Note:** Bearing stiffeners shall be used unless hanger sides laterally restrain the top flange, and as noted in the Web Stiffener Section (see page 18).

**Blocking Panels**

Blocking panels prevent floor joists from overturning and transfer loads through the floor system into the structure below. Framing lumber installed on edge is unacceptable to use as blocking for I-joist floor and roof systems, due to the differences in product depths and shrinkage characteristics. I-joists and rim board are acceptable to use as blocking panels. Blocking panels must be cut to the proper length to fit tightly between the I-joists, and their depth must match the depth of the I-joists.

Blocking panels may be used as shown in Details 1a-1g, 2b-2f, 2f-2k, and 2n to accomplish the following:

1. To stabilize the I-joists laterally at supports. Lateral support is required during installation and is necessary to obtain design carrying capacity.
2. To transmit vertical loads from the framing above to the framing below.
3. To provide closure of the framed space.
4. To transmit lateral forces to shear walls. Nailing into flanges must be as required to transfer shear (must be at least the same as required for the floor sheathing).
5. To provide lateral stability to walls where required by local codes. The blocking is sometimes required in the first and second joist spaces next to the starter joist or starter rim on the exterior wall.
Web Stiffener Requirements

Web stiffeners are not required to attain the spans shown in this guide, but are required for conditions as described in this section. There are two main types of web stiffeners: bearing stiffeners and “load” stiffeners. Both types reinforce the I-joist at locations of concentrated loads. The bearing stiffeners are located at bearing points and may also be required for hangers with side or angle nailing, or to provide lateral restraint to the I-joist in some hanger applications and at birdsmouth cuts. The load stiffeners are located away from bearing supports anywhere large point loads are applied to the top flange of the I-joist.

**BEARING STIFFENERS:**
1. Bearing stiffeners are required:
   - When sides of the hangers or adjacent framing do not laterally brace the top flange of each I-joist.
   - For all I-joists that have a design end reaction exceeding 1550 lbs (1900 lbs for BSI 900).
2. Install bearing stiffeners tight against the bottom flange of the I-joist, leaving 1/8” – 1/4” gap at the top.

**LOAD STIFFENERS:**
3. Load stiffeners are required:
   - When I-joists are designed to support concentrated loads that exceed 1500 lbs applied to the top flange between supports.
   - For concentrated loads on cantilevers that exceed 1500 lbs, but do not exceed the un-reinforced I-joist shear capacity. If the full loading on the cantilever exceeds the shear capacity of the un-reinforced joist, cantilever reinforcement is required per the instructions in this guide.
4. Install load stiffeners tight against the top flange of the I-joist, leaving 1/8” – 1/4” gap at the bottom.
5. Concentrated loads require 3 1/2” minimum bearing length above the top flange.
6. Except for pre-scored knock-outs, concentrated loads must be applied with 6” minimum horizontal distance between the edge of the load and the edge of the web hole.

Web stiffeners may be supplied by the distributor, or may be cut in the field as required.

<table>
<thead>
<tr>
<th>Joist Series</th>
<th>Flange Width</th>
<th>Web Stiffener Size Each Side of Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSI 200</td>
<td>1 3/4”</td>
<td>19/32” x 25/64” minimum width</td>
</tr>
<tr>
<td>BSI 400, 700, 40S, 60S</td>
<td>25/32”</td>
<td>2 7/16” x 1 1/2” minimum width</td>
</tr>
<tr>
<td>BSI 900, 80S</td>
<td>3 1/2”</td>
<td>1 1/8” x 2 5/32” minimum width</td>
</tr>
</tbody>
</table>

SI units conversion: 1 inch = 25.4 mm

*Scraping glue that extends out of joints may be required to achieve a tight joint with no gap.
Double I-Joists

1. Double I-joists may be required to frame openings, support concentrated loads, support partitions parallel to floor joists, or support any other loads which would exceed the capacity of a single I-joist. Install double I-joists where drawn or noted on framing plans.

2. Filler blocks can be omitted only when double joists are loaded evenly from above along the tops of both joists, such as when a parallel bearing wall is directly centered over the double joists.

3. Support back of I-joist web during nailing to prevent damage to web/flange connection.

4. Leave a ¼-inch gap between top of filler block and bottom of top I-joist flange.

5. Filler must extend the full span length, but does not have to be one continuous piece, except at cantilever reinforcements. Cantilever reinforcement fillers must be one continuous piece extending the full length of reinforcement.

6. Fasten joists together with two rows of 10d (16d for BSI 900 and BSI 80S) minimum nails at 12” o.c. from each side, clinching nails when possible. A total of 4 nails per foot is required if nails cannot be fully clinched and 2 nails per foot if fully clinched.

**Filler Block Size for Double I-Joist**

<table>
<thead>
<tr>
<th>Flange Width</th>
<th>Joist Series</th>
<th>Depth</th>
<th>Shallow Filler Block Size</th>
<th>Deep Filler Block Size (for cantilevers and web fasteners)</th>
<th>Overall Dimensions</th>
<th>Allowable Lumber Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ⅛”</td>
<td>BSI 200</td>
<td>9 ⅞”</td>
<td>2x6</td>
<td>1⅞” x 6”</td>
<td>2x6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 400</td>
<td>9 ⅞”</td>
<td>2x6</td>
<td>1⅞” x 6”</td>
<td>2x6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 400,</td>
<td>11 ⅛”</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 700</td>
<td>14</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td>2 ⅛”</td>
<td>BSI 40S,</td>
<td>9 ⅞”</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 60S</td>
<td>11 ⅛”</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 900,</td>
<td>14</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 80S</td>
<td>16</td>
<td>2x6 + ⅜” WSP*</td>
<td>2⅞” x 6”</td>
<td>2x6 + ⅜” WSP*</td>
<td></td>
</tr>
<tr>
<td>3 ⅛”</td>
<td>BSI 900,</td>
<td>11 ⅛”</td>
<td>(2) 2x6</td>
<td>3” x 8</td>
<td>(2) 2x8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSI 80S</td>
<td>14</td>
<td>(2) 2x6</td>
<td>3” x 10”</td>
<td>(2) 2x10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>(2) 2x8</td>
<td>3” x 12”</td>
<td>(2) 2x12</td>
<td></td>
</tr>
</tbody>
</table>

* WSP = wood structural panel (OSB, plywood, etc.)

**Cantilevers**

**Lumber Cantilever Detail for Balconies**

Full web-depth backer block with ¼" gap between block and top flange of I-joist. See Detail 1h. Nail with 2 rows of 10d nails at 6” o.c. and clinch.

2 x 8 minimum (designed by others). Nail to backer block extending the full length of the lumber backspan and joist with 2 rows of 10d nails at 6” o.c. and clinch (when possible.) Lumber cantilever nails may be used to attach backer block if length of nail is sufficient to allow clinching.

Attach I-joists to plate at all supports with one 8d face nail each side at bearing.

Cantilever extension supporting uniform floor loads only (load bearing wall not allowed)

Lumber or wood structural panel closure (designed and attached by others)

3 ½” min. bearing required

BSI Joist or rim board

1 ⅝ x L 4” minimum backspan

1 ½” 4” maximum, where L is length of cantilever

Note: Protect cantilever from the weather to prevent moisture intrusion into the structure and potential decay of untreated extensions.
Load-Bearing Cantilever Floor Details

I-Joist Cantilever without Reinforcement

Cantilever extension supporting uniform floor loads:
- Floor only – balcony
- Floor plus wall/roof loads on cantilever end

Broadspan® (APA) Rim Board or wood structural panel closure, attach to I-joist ends with one 8d nail at top and bottom flange

BSI Joist or rim board

Note: Protect I-joist from the weather to prevent moisture intrusion into the structure and potential decay of untreated I-joist extensions

3½” min. bearing required

L/4 max. (where L is nearest backspan of joist) = 4’ maximum for balconies = 2’ maximum for load-bearing cantilevers

For cantilever capacities without reinforcement, use cantilever tables or software.

I-Joist Cantilever with Reinforcement

Method 1 Sheathing Reinforcement – One Side

Broadspan® (APA) Rim Board or wood structural panel closure (³/₅₆” minimum thickness), attach to I-joist ends with one 8d nail at top and bottom flange

BSI Joist blocking panel or rim board blocking, attach with 8d nails at 6” o.c.

8d nails

2’-0” maximum

3½” min. bearing required

Alternate Method 2 I-Joist Reinforcement – One Side (Double I-Joist)

Broadspan® (APA) Rim Board or wood structural panel closure (³/₅₆” minimum thickness), attach to I-joist ends with one 8d nail at top and bottom flange

BSI Joist blocking panel or rim board blocking, attach with 8d nails at 6” o.c.

2’-0” maximum

3½” min. bearing required

4’-0” minimum

Attach I-joists to plate at all supports with one 8d face nail each side at bearing

Attach I-joists to top plate at all supports with one 8d face nail on both sides of flange

Note: Wood structural panel, APA Rated Sheathing 48/24 (minimum thickness ³/₅₆”) or Broadspan® (APA) Rim Board required on sides of joist. Depth shall match the full height of the joist. Nail with 8d nails at 6” o.c., top and bottom flange. Install with strength axis horizontal. Attach I-joist to plate at all supports with one 8d face nail on both sides of flange.

Use same installation as Method 1 but reinforce both sides of I-joist with sheathing or rim board

Use nailing pattern shown for Method 1 with opposite face nailing offset by 3”

Alternate Method 2 I-Joist Reinforcement – One Side (Double I-Joist)

Block I-joists together with deep filler blocks for the full length of the reinforcement, sized and attached in accordance with the Double I-Joists section (see page 19).
**Load-Bearing Cantilever Reinforcement**

See table below for BSI Joist reinforcement requirements at cantilever.

<table>
<thead>
<tr>
<th>Joist Depth (in)</th>
<th>Roof Truss Span (ft)</th>
<th>TL = 35 psf LL not to exceed 20 psf</th>
<th>Roof Loadings</th>
<th>TL = 45 psf LL not to exceed 30 psf</th>
<th>TL = 55 psf LL not to exceed 40 psf</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Joist Spacing (in)</td>
<td></td>
<td>Joist Spacing (in)</td>
<td>Joist Spacing (in)</td>
</tr>
<tr>
<td>9½</td>
<td>26</td>
<td>N N N 1</td>
<td>N N 1 1 2 1</td>
<td>N 1 2 X</td>
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<td>N 1 1 1 1</td>
<td>N 1 1 1 2</td>
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<td>N 1 2 X</td>
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</tr>
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</table>

**NOTES**

1. N = No I-joist reinforcing required.
2. = BSI Joists reinforced with minimum %” wood structural panel or rim board on one side only. See Method 1 detail on page 20.
3. = BSI Joists reinforced with minimum %” wood structural panel or rim board on two sides or double I-joist reinforcement. See Method 2 or Alternate Method 2 detail on page 20.
4. X = Try a deeper joist or closer spacing.
5. Color coding in table is matched to the cantilever details on page 20.
6. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 psf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening’s cripple studs may be required.
7. Table assumes maximum joist simple spans and applies to joists 12" to 24" o.c. Use 12" o.c. requirements for lesser spacings.
8. X = Try a deeper joist or closer spacing.
9. The required cantilever reinforcement for the loading conditions given in this table are conservative for conventional framing (stick built) roofs that are braced to interior supports. For roofs with a ridge board, use the roof truss span as the span between rafter support walls. For roofs with a ridge beam, use the roof truss span as the span between the rafter support wall and the ridge beam.
Roof Framing

GENERAL NOTES

1. Roof must slope a minimum of 1/4"/12.
3. A support beam or wall (ridge board not adequate) is required at the high end.
4. To minimize splitting of flange and bearing plate at I-joist ends, angle nails and start at least 1 1/2" from end.
5. For shear transfer at BSI Joists or rim board used as blocking or continuous rim, use same nailing as required for floor sheathing, but meeting flange nail spacing in this guide (see page 3).
6. Additional uplift connections may be required for each roof detail.
7. Additional blocking or restraint may be required for shear transfer.
8. Attach I-joist to top plate with one 8d face nail each side at bearing.

Some framing members and requirements such as floor sheathing, temporary bracing, and blocking panels have been omitted for clarity.

NOTE: Except for cutting to length and as shown in this guide, never cut or notch the flanges.

Reference APA Form No. EWS Y250 for additional information on shear transfer at engineered wood framing systems.
Roof Details
Refer to General Notes on page 22.

2a RIDGE JOIST CONNECTION
Minimum Simpson or USP LSTA 24 strap* with (7) 10d x 1 1/2” nails into each flange

* Strap required for members with slope of 3/12 or greater.

2b UPPER END, BEARING ON WALL
BSI Joist or Broadspan® (APA) Rim Board blocking panel, x-bracing, 2 3/4" 48/24 APA rated sheathing, or proper depth of rim board as continuous closure

2c JOISTS ABOVE RIDGE SUPPORT BEAM
BSI Joist or Broadspan (APA) Rim Board blocking panel, or x-bridging

2d BIRDSMOUTH CUT – LOW END OF JOIST ONLY
BSI Joist or Broadspan (APA) Rim Board blocking panel, or x-bridging

2e JOISTS ON BEVELED PLATE
BSI Joist or Broadspan (APA) Rim Board blocking panel, or x-bridging

* Strap required for members with slope of 3/12 or greater.
Roof Details (continued)

Refer to General Notes on page 22.

2f  **BIRDSMOUTH CUT – LOW END OF JOIST ONLY**

Beveled bearing stiffener each side (see page 18)

Bottom flange must have full bearing on plate

X-bridging (validate use of x-bridging with local code)

Broadspan® (APA) Rim board (toenail to plate). Use 8d nails at 6” o.c.

BSI Joist blocking panel (nail through top of flange to plate)

2'-0” max.

2g  **ROOF OPENING, FACE MOUNTED HANGERS**

Face mount hanger

Double joist (use deep filler block size) or Broadspan LVL

Bearing stiffener may be required

I-joist or Broadspan® LVL

Strap required for members with slope of 3/12 or greater.

Backer block required both sides of I-joist web

Provide ventilation as required by code

Bevel backer block

Adjustable slope hanger

2h  **BEVEL CUT BEARING STIFFENER – LOW END ONLY**

Beveled cut bearing stiffener each side of web to match roof slope (see page 18)

2k  **OPTIONAL OVERHANG EXTENSIONS FOR UNIFORMLY DISTRIBUTED LOADS ONLY**

May be used with Details 2d-2f (Low end only)

Stop BSI Joist at wall line and extend top flange with 2x4*. Support extension with 2x4 nailed to web of joist with (2) staggered rows of 8d nails at 8” o.c. clinched from each side. Fasten flange extension to 2x4 support with 8d nails at 8” o.c.

BSI Joist blocking panel, or x-bridging

*Locate 2x4 support to account for flange thickness

Beveled bearing stiffener each side (see page 18)

24” o.c. max

2'-0” max

4'-0” min

2x4 nailed to side of top flange with 10d box nails at 8” o.c. Place 2x4 cripple stud at plate, under 2x4 overhang. Bevel cut to match roof slope.

BSI Joist or Broadspan® (APA) Rim Board blocking panel, or x-bridging

2x4 cripple under 2x4 extension

4'-0” min

2'-0” max

Bearing stiffener each side of web (see page 18)
Roof Details (continued)

Refer to General Notes on page 22.

2m OVERHANG PARALLEL TO JOIST (Blocking at wall not shown for clarity)

*When L exceeds joist spacing, double joist may be required, and end fastening may no longer be valid.

Nail “ladder” with 2 rows of 8d nails at 12” o.c., staggered 6” from the row above.

Backer block per Detail 1h extending full outrigger length (deep enough to permit nailing to match ladder).

2n ROOF BLOCKING WITH PERMITTED VENTILATION

Install vented barriers across any openings per code

Cut blocking to match joist depth and locate on wall.

Taper blocking to match joist depth and locate on wall.

Taper cut is optional unless required for higher shear transfer.

Maximum allowable V-cut

Maximum allowable hole zone

Maximum allowable hole zone blocking length

l-joist blocking

A maximum of 2 round vent holes with a combined diameter \((d_1+d_2)\) = \(\frac{1}{3}\) the lesser of joist height or blocking length

Roof Details (continued)
Web Hole Specifications

One of the benefits of using I-joists in residential floor construction is that holes may be cut in the joist webs to accommodate electrical wiring, plumbing lines and other mechanical systems, therefore minimizing the depth of the floor system.

**Rules for cutting holes in BSI Joists**

1. The distance between the inside edge of the support and the centerline of any hole shall not be less than that shown in table on page 27.

2. Except for cutting to length and birdsmouth cuts, I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.

3. Holes may be located anywhere vertically in the web only. Whenever possible, center holes in the web and always maintain at least $\frac{1}{8}$" of the web at the top and bottom of the hole. The maximum size hole that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus $\frac{1}{4}$".

4. The sides of square holes or longest sides of rectangular holes should not exceed three-fourths (75%) of the maximum round hole diameter permitted at that location. (For example, if a 10" diameter round hole is permitted, then the longest side of a rectangular hole cannot exceed $10" \times 0.75 = 7\frac{1}{2}"$.) Do not over-cut the sides or corners of rectangular holes.

5. Where more than one hole is necessary, the distance between nearest hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole). Each hole must comply with the requirements of table on page 27.

6. A knockout may be utilized anywhere it occurs and may be ignored for purposes of calculating minimum distances between holes.

7. A 1 ½" diameter hole can be placed anywhere in the web, including a cantilevered joist section, provided that it meets the requirements of 5 above, and does not penetrate required cantilever reinforcement.

8. For joists with more than one span, use the longest span to determine hole location in either span. For large differences in adjacent span lengths, use software to determine allowable hole locations.

9. Limit 3 maximum size holes per span.

10. A group of round holes at approximately the same location shall be permitted if they meet requirements for a single round hole circumscribed around them.

Never drill, cut or notch the flange, or over-cut the web. Holes in webs should be cut with a sharp saw or drill bit, not by hammering (except at pre-scored knockouts.)

For rectangular holes, avoid over cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Start the rectangular hole by drilling a 1" diameter hole in each of the four corners and then make the cuts between the holes to minimize damage to I-joist.
## Typical Holes

Minimum distance from face of Joist supports to center of hole. See table below.

- Knockouts are prescored holes often provided for the contractor's convenience to install electrical or small plumbing lines. They are typically \(\frac{3}{4}\)" to \(\frac{7}{8}\)" in diameter, and are spaced 12" to 24" on center along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field cutting additional holes. **DO NOT** hammer holes in web, except at pre-scored knockouts.

### Minimum Distance from Face of Joist Supports to Center of Hole – Worst Case Single or Multiple Span, 40 psf Live Load and 10 or 20 psf Dead Load

#### I-Joist Depth

<table>
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<tr>
<th>I-Joist Depth</th>
<th>Broadspan® Joist Series</th>
<th>Span Adjustment Factor</th>
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<th>4</th>
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<th>6(\frac{1}{4})</th>
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<th>8</th>
<th>8%</th>
<th>9</th>
<th>10</th>
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<tr>
<td>9(\frac{1}{2})&quot;</td>
<td>BSI 200</td>
<td>13&quot; – 10&quot;</td>
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<td>1'–0&quot;</td>
<td>2'–6&quot;</td>
<td>3'–0&quot;</td>
<td>3'–6&quot;</td>
<td>4'–6&quot;</td>
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<tr>
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#### Round Hole Diameter (in.)

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<td>6&quot;</td>
<td>14&quot;</td>
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#### Limit Table for Reducing Minimum Distance

When calculating hole locations by this optional method, the following limits for minimum distances between the inside face of the joist supports and the centerline of the hole apply:

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<thead>
<tr>
<th>Round Hole Diameter</th>
<th>Minimum Distance from Inside Face of Joist Supports to Center of Hole</th>
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<td>12&quot;</td>
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<tr>
<td>6&quot;</td>
<td>14&quot;</td>
</tr>
</tbody>
</table>

### Notes

1. Above tables may be used for I-joist spacing of 24" on center or less.
2. Hole location distance is measured from inside face of supports to center of hole. The minimum distance should be satisfied from both supports of the span where the hole is located.

#### Optional Minimum Distance Reduction

The above table is based on the I-joists being used at their maximum span. If the I-joists are placed at less than their full allowable span as shown on page 7, the minimum distances between the inside face of the joist supports and the centerline of the hole apply:

\[
D_{\text{Reduced}} = \frac{L_{\text{Actual}} \times D}{\text{SAF}}
\]

Where:

\[
D_{\text{Reduced}} = \text{Distance from the inside face of the joist supports to center of hole, reduced for less-than-maximum span applications (ft)}
\]

\[
L_{\text{Actual}} = \text{The actual measured span distance between the inside faces of supports (ft)}
\]

\[
\text{SAF} = \text{Span Adjustment Factor given in table above.}
\]

\[
D = \text{The minimum distance from the inside face of the joist supports to the center of hole from table above.}
\]

Note: If \(L_{\text{Actual}}\) is greater than 1.0, use \(L_{\text{Actual}} = 1.0\) in the above calculation for \(D_{\text{Reduced}}\).

#### Round Table for Reducing Minimum Distance

When calculating hole locations by this optional method, the following limits for minimum distances between the inside face of the joist supports and the centerline of the hole apply: