**Construction Details for Nordic Lam™**

### Top-Load Beams

**3-1/2" Width Pieces:**

- 4-ply beams shall be attached with a minimum of 2 rows 1/2-inch-diameter bolts or 1/4 x 6-inch wood screws at 24" o.c.
- Minimum of 2 rows 16d common wire nails (0.162 x 3-1/2 inches) at 12" o.c. for beam depths less than 14".

**1-3/4" Width Pieces:**

- Offset connector spacing so that protruding fasteners do not interfere with intersecting side members. Stagger all fasteners.
- USP SDS Screws: Screws to be installed from both sides always, except in case of 1-3/4" 2-ply and 1-3/4" + 3-1/2" beams. If required, fastener distances: to beam end: 4"; vertically from top/bottom edges: 1-1/2"; vertically in between screws: 2-1/2".
- Simpson SDW Screws: All screw pattern to be installed from one side only. Screws shall be installed with the screw head minimally flush to beam end and edges. Standard cut washers shall be used between head and nut of the bolt and the glulam.

### Side-Load Beams

- Maximum number of holes should not exceed 1 hole per 5 feet of beam length. In other words, the maximum number of holes should not exceed 4 for a 20-foot-long beam. The hole spacing limitation, as given above, should be satisfied separately.

For glulam members that have been covered, the guidelines given above may be relaxed based on an engineering analysis. Regardless of the hole location, holes drilled horizontally through a member should be positioned and sized with the understanding that the beam will deflect over a period of time under in-service loading conditions. This deflection could cause distress to supported equipment or piping unless properly considered.

### Vertical Holes

When possible, avoid drilling vertical holes through glulam beams. As a rule of thumb, vertical holes drilled through the depth of a glulam beam cause rotation in the capacity of that section directly proportional to the ratio of 1/2 of the diameter of the hole to the width of the beam. For example, a 1-inch hole drilled in a 4-inch-wide beam would reduce the capacity of the beam by 25%. This hole location can be determined using the following guidelines:

- The maximum minimum safe hole diameter is 1-inch for holes braced by bolts or screws.
- The hole diameter should be less than 1/4 of the beam depth.
- The hole should be at least 4 times the beam thickness away from the beam end.

**Notes:**

1. Distances are measured to the face of the beam. Use a center, broad, or diamond drill bit.
2. Drilled holes shall be tapped with 2 rows of 1/2-inch-diameter bolts or 1/4 x 6-inch wood screws at 24" o.c.

### Allowable Holes and Notches

**Zones Where Small Horizontal Holes Are Permitted for Passage of Wires, Conduit, etc.**

**Typical Tall Wall Framing**

**Allowable Holes and Notches**

- One hole may be cut anywhere along the length of the stud or column but must be no closer than 3/4" from the edge.

**FRAMING CONNECTORS**

- Drill holes to a depth of 1-1/2".
- One hole may be cut anywhere except the middle 1/3 of the length of the stud or column.

**FRAMING CONNECTORS**

### Allowable Loads

| Type | Nails |_connector Dimensions | Allowable Load (lbs) | End 1 | W2 | L | End 2 | M (lbs) | End 1 | W2 | L | End 2 | M (lbs) |
|------|-------|----------------------|---------------------|-------|----|----|-------|--------|-------|----|----|----|-------|--------|
| A25 | 8-10d (0.135") | 1-7/16" | 1-7/16" | 2-3/8" | 265 | 265 |
| A25 | 8-10d (0.180") | 1-1/2" | 1-1/2" | 2-7/8" | 340 | 340 |
| A25 | 8-10d (0.207") | 1-7/16" | 1-7/16" | 2-3/4" | 380 | 380 |
| A25 | 8-10d (0.250") | 1-1/2" | 1-1/2" | 2-7/8" | 465 | 465 |
| A25 | 8-10d (0.375") | 1-1/2" | 1-1/2" | 2-7/8" | 775 | 775 |

**Notes:**

1. All loads have been increased by wind and earthquake loading (ACI building code factor of 1.40) to further increase the overall strength of the beam.
2. Interperticular connections are specified for 811 Laminated Studs (ACI 440).
3. All nails are common wire nails. 10d (1/2" x 3") @ 6" o.c. (USP SDS), in groups of 4. 10d (3") @ 12" o.c. (USP Structual Connectors™) in groups of 4.

### Typical Tall Wall Framing

**Lateral Connections — Angle Clips**

<table>
<thead>
<tr>
<th>Type</th>
<th>Nails</th>
<th>Connector Dimensions</th>
<th>Allowable Load (lbs)</th>
<th>End 1</th>
<th>W2</th>
<th>L</th>
<th>End 2</th>
<th>M (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A21</td>
<td>6-10d (0.100&quot;)</td>
<td>1-1/2&quot;</td>
<td>1-1/2&quot;</td>
<td>1-3/8&quot;</td>
<td>310</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A21</td>
<td>6-10d (0.135&quot;)</td>
<td>1-1/2&quot;</td>
<td>1-1/2&quot;</td>
<td>1-3/8&quot;</td>
<td>345</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A21</td>
<td>6-10d (0.207&quot;)</td>
<td>1-1/2&quot;</td>
<td>1-1/2&quot;</td>
<td>1-3/8&quot;</td>
<td>775</td>
<td>385</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. All loads have been increased by wind and earthquake loading (ACI building code factor of 1.40) to further increase the overall strength of the beam.
2. Interperticular connections are specified for 811 Laminated Studs (ACI 440).
3. All nails are common wire nails. 10d (1/2" x 3") @ 6" o.c. (USP SDS), in groups of 4. 10d (3") @ 12" o.c. (USP Structual Connectors™) in groups of 4.
4. For tee-end connections, use 813 half tenon used (NDS 2012).

**Columns Connector Dimensions**

<table>
<thead>
<tr>
<th>Column</th>
<th>Fastener Size</th>
<th>Nails and Bolts</th>
<th>Number of Rows</th>
<th>Maximum Distance</th>
<th>Minimum Distance</th>
<th>Maximum End Distance</th>
<th>Minimum End Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x4 (nominal)</td>
<td></td>
<td>2</td>
<td>1/2&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x6 (nominal)</td>
<td></td>
<td>2</td>
<td>1/2&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Connection patterns shown are those required per NDS 2012. Capacities shall be calculated per NDS 2012.
2. Columns must be supported by a built-up column.
3. Nails shall be driven with equal duration in-plane and out-of-plane.
4. All columns must have fasteners installed in all rows at the maximum distance specified above. BOLTS shall be re-threaded when a column is cut or notched.
5. Shear connector sizes, shall be re-threaded at A23 or A3.4 Structural Connectors™ and have a minimum yield strength of 46,000 psi.
6. All columns must be connected to a built-up column or beam with a minimum yield strength of 46,000 psi. BOLTS shall be re-threaded when a column is cut or notched.
7. Nails shall be driven alternately. See Figure 6.2.3 of the NDS 2012.