Engineered Wood Products
CONSTRUCTION DETAILS
NORDIC LAM
Nordic Structures is the leading innovator in engineered wood products. Its resource comes from responsibly managed lands within the regional boreal forest. Vertical integration, from forest to structure, bolstered by Nordic’s experienced design and development team, ensures consistent quality and unparalleled level of service.
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1.0 General

1.1 This document supersedes all previous versions. For the latest version, consult nordic.ca or contact Nordic Structures.

1.2 While this guide emphasizes residential construction, much of the basic design information can be used for other construction applications. Review by a design professional is required for applications beyond the scope of this document.

1.3 Refer to the Nordic Lam Technical Guide (NS-GT4) for selection and sizing tables, or to the floor or roof layout provided by your distributor.

1.4 For more information, consult nordic.ca or contact Nordic Structures.

2.0 Fire Resistance

2.1 Nordic Lam beams with fire-resistance ratings are special orders. Contact Nordic Structures for more information.

3.2 In some designs, sprinkler systems are used with Nordic Lam beams. There are a variety of sprinkler attachments that incorporate fasteners permitted by the National Fire Protection Association (NFPA), design load assumptions published by the NFPA, and published design fastener capacities. These sprinkler attachments are illustrated in details 6.
# LIST OF DETAILS

## 1 Floor Framing Details

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## 2 Header, Wall and Column Framing Details

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NORDIC LAM
GLUED-LAMINATED TIMBER

Nordic Lam glued-laminated timber of industrial appearance classification consists of small wood laminations bonded together in parallel using structural adhesives.

BEAMS AND HEADERS
Widths
1-3/4, 3-1/2, 5-1/2 and 7 in.

Depths
9-1/2, 11-1/2, 14, 16, 18, 20, 22 and 24 in.

Lengths*
Up to 48 ft

Stress grade
24F-1.9E

STUDS
Widths
1-1/2 and 1-3/4 in.

Depths
5-1/2 and 7-1/4 in.

Lengths*
Up to 48 ft

Stress grade
ES11

* Larger sizes available upon request

COLUMNS
Widths
3-1/2, 5-1/2 and 7 in.

Depths
3-1/2, 5-1/2 and 7 in.

Lengths*
Up to 48 ft

Stress grade
ES12

Check availability of products with your local distributor.
Notes:
1. Provide adequate bearing length and bearing across the full width to support Nordic Lam beam. Refer to the Nordic Lam Technical Guide (NS-GT4) for bearing length requirements, and consult local building code for specific requirements.
2. Heavy concentrated loads such as heating/cooling units, crane rails or main framing members suspended from the bottom of beams induce tension perpendicular to grain and may cause splitting. Except for light loads such as hung ceilings (including 2x-framing), sprinkler systems, lighting appliances, etc., always suspend concentrated loads from the beam top, unless designed otherwise by a qualified engineer.
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Notes:
1. Blocking required between joists at bearing for lateral support, not shown for clarity.
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Notes:
1. Hangers installed per manufacturer's recommendations.
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Notes:
1. See detail 1m for similar details with continuous floor beam over intermediate wood supports.
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Steel cap plate 1/2" lag screws or equivalent
Steel tube column or adjustable steel post
HEADER, WALL AND COLUMN FRAMING DETAILS
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Note:
1. All additional blocking, trimmers, plates, etc. not specified should be the same as the typical stud material.
Note:
1. Plate width must equal wall thickness to provide lateral bracing. (Plate not required if header width equals the wall thickness.)
## Typical Wall and Column Framing Details

<table>
<thead>
<tr>
<th>TITLE</th>
<th>DRAWING</th>
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<tr>
<td>Column to Bottom Plate</td>
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### Details

- **Framing angles**
- **Nordic Lam column**
- **Blocking panel as required**
- **Rim board**
- **Sill plate**

Solid blocking is required if column and trimmer studs do not extend to sill plate.
Typical Wall and Column Framing Details

Column to Top Plate

- Double top plate
- Framing angles
- Trimmer stud(s)
Strap per code if top plate is not continuous over header.
Rim board or blocking for lateral support

Nordic Lam column
Strap tie required if top plate is not continuous over header.
Typical Wall and Column Framing Details

**Title:** Column Base

**Category:** Typical Wall and Column Framing Details

**Drawing:** 3g

**Scale:** -

**Date:** 2021-08-01

**Page:** 2.13
Optional non-shrink grout
Note:
1. Wall bracing is necessary if double top plate is not attached directly to the roof/floor diaphragm.
Additional nailing may be required between sheathing and outlooker.

Connections of outlooker to truss (by others)

Blocking between outlookers as required

Connection to double top plate (not shown)

Continuous tall-wall framing (from sill plate to top plate)

Note:
1. Connection of double top plate to outlooker must be designed to transfer lateral load to roof.
Notes:
1. The ledger capacity represents the ledger-to-stud connection capacity in pounds per linear foot (plf). To convert the joist reaction to a uniform load (in plf), divide the joist reaction (in lbf) by the joist spacing (in ft).
2. Studs shall be grade S-P-F No. 3/Stud or better.

### Ledger Capacity

<table>
<thead>
<tr>
<th>Depth (in.)</th>
<th>Number of 16d nails per stud</th>
<th>Stud spacing (in.)</th>
<th>Capacity (plf)</th>
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<tbody>
<tr>
<td>9-1/2</td>
<td>3</td>
<td>12</td>
<td>360</td>
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<tr>
<td>3</td>
<td>16</td>
<td>480</td>
<td></td>
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<tr>
<td>4</td>
<td>24</td>
<td>720</td>
<td></td>
</tr>
<tr>
<td>11-7/8</td>
<td>4</td>
<td>12</td>
<td>480</td>
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<td>4</td>
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<td>12</td>
<td>720</td>
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<td>6</td>
<td>16</td>
<td>960</td>
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</tr>
<tr>
<td>6</td>
<td>24</td>
<td>1,440</td>
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</table>

Notes:
1. Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.
2. Ledger depth shall match the height of the joists.
Holes in beams and studs
Beam Hole Specifications

Horizontal Holes

Horizontal holes in glued laminated timbers are limited in size and location to maintain the structural integrity of the beam. Detail 4 shows the zones of a uniformly loaded, simply supported beam where the field drilling of holes may be considered. These non-critical zones are located in portions of the beam stressed to less than 50 percent of specified bending strength and less than 50 percent of specified shear strength. For beams, of more complex loading or other than simple spans, similar diagrams may be developed.

Field-drilled horizontal holes should be used for access only and should not be used as attachment points for brackets or other load bearing hardware unless specifically designed as such by the engineer or designer of record.

These field drilled horizontal holes should meet the following guidelines:

1. **Hole size**: The hole diameter should not exceed 1-1/2 inch or 1/10 the beam depth, whichever is smaller.

2. **Hole location**: The hole should have a minimum clear distance, as measured from the edge of the hole to the nearest edge of the beam, of four hole diameters to the top or bottom face of the beam and eight hole diameters from the end of the beam. Note that the horizontal hole should not be drilled in the moment-critical zone, as defined in detail 4, unless approved by an engineer or architect qualified in engineered timber design.

3. **Hole spacing**: The minimum clear spacing between adjacent holes, as measured between the nearest edge of the holes, should be eight hole diameters based on the largest diameter of any adjacent hole in the beam.

4. **Number of holes**: The maximum number of holes should not exceed one hole per five feet of beam length. The hole spacing limitation, as given above, should be satisfied separately.

For glulam members that have been oversized or for glulam joists, 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.
Note:
1. This detail represents the zones where small horizontal holes are permitted holes in a uniformly loaded, simply supported beam.

<table>
<thead>
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<th>ZONE</th>
<th>Details</th>
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<td>Moment critical zone</td>
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<tr>
<td>Shear critical zone</td>
<td>Shear critical zone</td>
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<tr>
<td>Bearing critical zone</td>
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Zones where horizontal holes are permitted for passage of wires, conduit, etc.
Maximum Holes in Studs

Notes:
1. One hole may be cut anywhere along the length of the stud or column but must be no closer than 5/8 inch from the edge.
2. One notch may be cut anywhere except the middle 1/3 of the length of the stud or column.
3. Bored holes shall not be located in the same section as a cut or notch in stud.
Install per NFPA 13 and manufacturer's instructions. Steel sprinkler system pipe 4" maximum diameter or 500 lb maximum point load.

Ceiling flange, minimum 2 screws

Fastener centered on Nordic Lam
<table>
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<th>NS-DC4</th>
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**Beam Clamp Hanger**

**Sprinkler Pipe Installation for Beams**

Install per NFPA 13 and manufacturer's instructions. Steel sprinkler system pipe 4” maximum diameter or 500 lb maximum point load.

Joist clamp hanger per manufacturer’s specifications (dimension and capacity)
Install per NFPA 13 and manufacturer's instructions.

Steel sprinkler system pipe 4" maximum diameter or 500 lb maximum point load.

Two sheet metal screws #10 x 1-1/2"
Option: Two clinched 8d nails (0.113" x 2-1/2")
Option 1
Install per NFPA 13, CPVC sprinkler system pipe 2-1/2" maximum diameter = 290 lb maximum point load (145 lb per beam)

Option 2
Install per NFPA 13, Steel sprinkler system pipe 4", maximum diameter = 500 lb maximum point load (250 lb per beam)

Install 48" maximum length NFPA 13 angle iron
Centering hanger location not required

One 1/4" x 3" lag screw
One #14 x 3" sheet metal screw

Sprinkler Pipe Installation for Beams
NFPA 13 Steel Angle Trapeze with Hanger

Title
NFPA 13 Steel Angle Trapeze with Hanger

Category
Sprinkler Pipe Installation for Beams

Scale
6d

Date
2021-08-01

Page
4.4
Install per NFPA 13 and manufacturer's instructions. CPVC sprinkler system pipe 3” maximum diameter or 310 lb maximum point load.

Four sheet metal screws #10 x 1-1/2”
Option: Four clinched 8d nails (0.113” x 2-1/2”)

CPVC Hanger - Double Offset
Sprinkler Pipe Installation for Beams

Title: CPVC Hanger - Double Offset
Category: Sprinkler Pipe Installation for Beams
Drawing: 6e
Page: 4.5
Date: 2021-08-01
Install per NFPA 13 and manufacturer’s instructions. CPVC sprinkler system pipe 3” maximum diameter or 310 lb maximum point load.

Four sheet metal screws #10 x 1-1/2”
Option: Four clinched 8d nails (0.113” x 2-1/2"

Sprinkler Pipe Installation for Beams
CPVC Hanger - Surface Mount
TITLE
CATEGORY
DRAWING
6f
Sprinkler Pipe Installation for Beams
- 2021-08-01
4.6
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<td>-</td>
<td>2021-08-01</td>
<td>4.7</td>
</tr>
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</table>
Tapered cut allowed on Nordic Lam only

Truss chord size

Roof slope

D (outside)

Beam bearing length
Roof Framing Details

Conventional (Stick) Roof

- Roof slope
- Beam bearing length
- Ceiling joist
- Rafter size
- Tapered cut allowed on Nordic Lam only
- D (outside)
- Beam bearing length