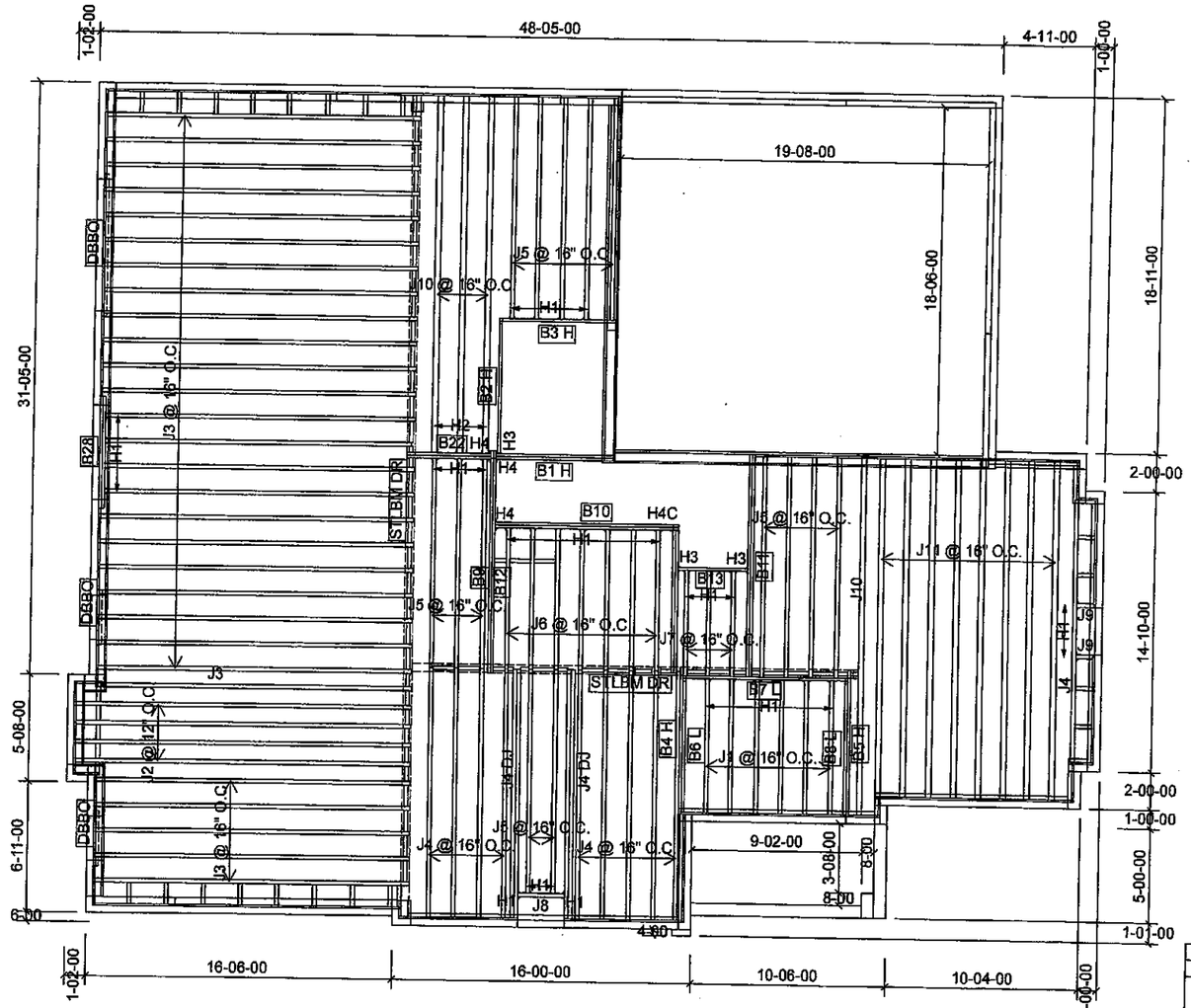



| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 6 | H1 | IUS2.56/11.88 |
| 7 | H1 | IUS2.56/11.88 |
| 14 | H1 | IUS2.56/11.88 |
| 2 | H1 | IUS2.56/11.88 |
| 4 | H1 | IUS2.56/11.88 |
| 3 | H2 | IUS3.56/11.88 |
| 3 | H3 | HUS1.81/10 |
| 1 | H4C | HUC410 |
| 3 | H4 | HGUS410 |

| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 8-00-00 | 9 1/2" NI-40x | 1 | 6 |
| J2 | 20-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J3 | 18-00-00 | 11 7/8" NI-40x | 1 | 29 |
| J4 | 14-00-00 | 11 7/8" NI-40x | 1 | 10 |
| J4 DJ | 14-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J5 | 12-00-00 | 11 7/8" NI-40x | 1 | 14 |
| J6 | 8-00-00 | 11 7/8" NI-40x | 1 | 7 |
| J7 | 6-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J8 | 4-00-00 | 11 7/8" NI-40x | 1 | 1 |
| J9 | 2-00-00 | 11 7/8" NI-40x | 1 | 2 |

| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J10 | 20-00-00 | 11 7/8" NI-80 | 1 | 4 |
| J11 | 18-00-00 | 11 7/8" NI-80 | 1 | 8 |
| B7 L | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B6 L | 8-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 L | 8-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B11 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B9 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B10 | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B2 H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B3 H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| B4 H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B5 H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B1 H | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B12 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B22 | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B28 | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B13 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

CITY OF HAMILTON
Building Division
Permit No. 21-161980
THESE STAMPED DRAWINGS SHALL BE AVAILABLE ON SITE
THE OWNER AND/OR CONTRACTOR SHALL COMPLY WITH THE ONTARIO BUILDING CODE AND ALL OTHER APPLICABLE LAW
These drawings and/or specifications have been reviewed by
FOR CHIEF BUILDING OFFICIAL
APR 11 22
DATE

**DATE:** 2022-03-24

1st FLOOR Walk-out

TAMARACK LUMBER INC
ALPA LUMBER GROUP

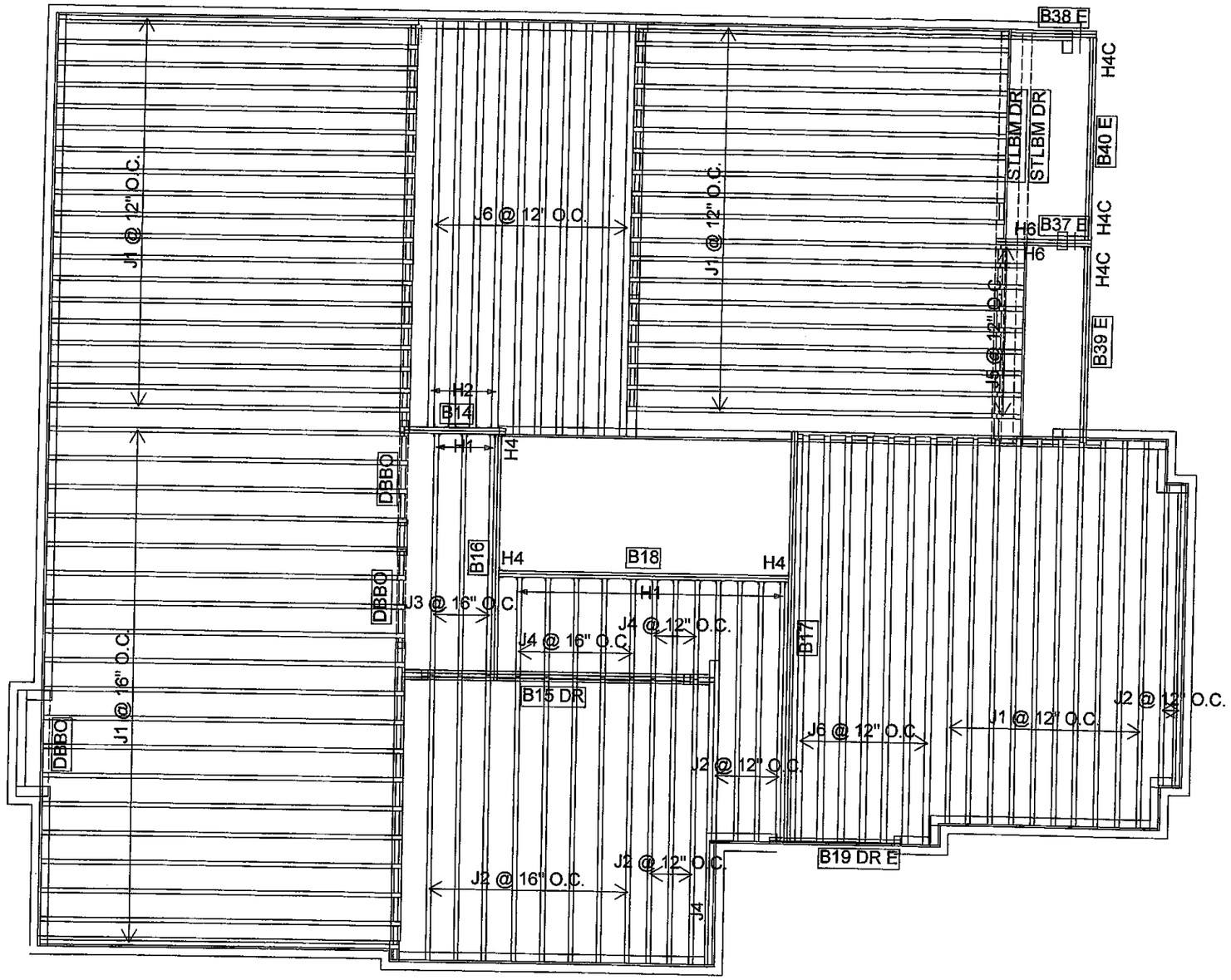
**FROM PLAN DATED: FEB 9, 2021**
**BUILDER:** GREENPARK HOMES
**SITE:** RUSSELL GARDENS
**MODEL:** GRANDVILLE 12 - 601
**ELEVATION:** 3
**LOT:**
**CITY:** HAMILTON

**SALESMAN:** RICK DICIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK** REC I-JOIST BLOCKING ALONG BEARING AND RIMBOARD CLOSURE AT ENDS. SEE FIGURES 4 & 5 FOR REINFORCEMENT REQUIREMENTS. FOR **HOLES** INCLUDING **DUCT CHASE** AND **FIELD CUT OPENINGS** SEE FIGURE 7, TABLES 1 & 2. **CERAMIC TILI** APPLICATION AS PER O.B.C 9.30.6.

**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILE LOAD: 20.0 lb/ft²

**SUBFLOOR:** 3/4" GLUED AND NAILED




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 67 |
| J2 | 14-00-00 | 11 7/8" NI-40x | 1 | 17 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J4 | 6-00-00 | 11 7/8" NI-40x | 1 | 9 |
| J5 | 2-00-00 | 11 7/8" NI-40x | 1 | 9 |
| J6 | 20-00-00 | 11 7/8" NI-80 | 1 | 17 |
| B17 | 20-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B18 | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B15 DR | 14-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 3 | 3 |
| B16 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| B39 E | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B40 E | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B19 DR E | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B14 | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B37 E | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B38 E | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 15 | H1 | IUS2.56/11.88 |
| 4 | H2 | IUS3.56/11.88 |
| 3 | H4C | HUC410 |
| 3 | H4 | HGUS410 |
| 2 | N/A | H6 |

**DATE:** 2022-03-24

## 2ND FLOOR STD, GUEST

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: FEB 9, 2021**
**BUILDER:** GREENPARK HOMES
**SITE:** RUSSELL GARDENS
**MODEL:** GRANDVILLE 12 - 601
**ELEVATION:** 3
**LOT:**
**CITY:** HAMILTON

**SALESMAN:** RICK DICIANO
**DESIGNER:** L.D.
**REVISION:** lbv

**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK** REC I-JOIST BLOCKING ALONG BEARING AND RIMBOARD CLOSURE AT ENDS. SEE FIGURES 4 & 5 FOR REINFORCEMENT REQUIREMENTS. FOR **HOLES** INCLUDING **DUCT CHASE** AND **FIELD CUT OPENINGS** SEE FIGURE 7, TABLES 1 & 2. **CERAMIC TILI** APPLICATION AS PER O.B.C 9.30.6.

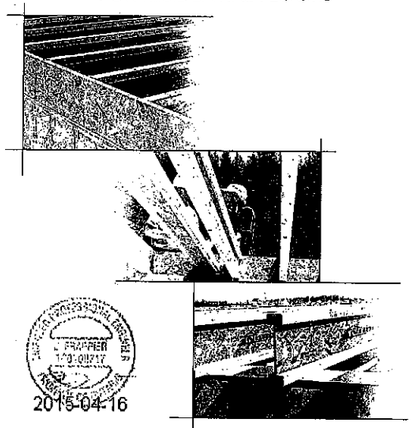
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILE LOAD: 20.0 lb/ft²

**SUBFLOOR:** 5/8" GLUED AND NAILED

# NORDIC ENGINEERED WOOD

# INSTALLATION GUIDE

## FOR RESIDENTIAL FLOORS



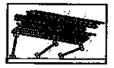


Distributed by:

N-C201 / November 2014

## SAFETY AND CONSTRUCTION PRECAUTIONS

Do not walk on I-joists until fully fastened and braced, or serious injuries can result.



Never stack building materials over unsheathed I-joists. Once sheathed, do not over-stress I-joist with concentrated loads from building materials.

WARNING

I-joists are not stable until completely installed, and will not carry any load until fully braced and sheathed.

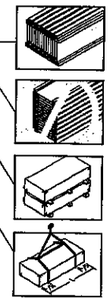
**Avoid Accidents by Following these Important Guidelines:**

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. Where I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
   - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centre, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
   - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. Never install a damaged I-joist.

Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.

## STORAGE AND HANDLING GUIDELINES

1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store, stack, and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or flatwise.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. When handling I-joists with a crane on the job site, take a few simple precautions to prevent damage to the I-joists and injury to your work crew.
   - Pick I-joists in bundles as shipped by the supplier.
   - Orient the bundles so that the webs of the I-joists are vertical.
   - Pick the bundles at the 5th points, using a spreader bar if necessary.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.



## MAXIMUM FLOOR SPANS

1. Maximum **clear** spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGSB-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the used of gypsum and/or a row of blocking at mid-span.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
6. Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
7. SI units conversion: 1 inch = 25.4 mm
   1 foot = 0.305 m

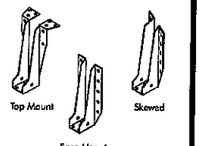
**MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS**
SIMPLE AND MULTIPLE SPANS

| Joist Depth | Joist Series | Simple spans On centre spacing 12" | 16" | 19.2" | 24" | Multiple spans On centre spacing 12" | 16" | 19.2" | 24" |
|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 15'-1" | 14'-2 | 13'-9" | 13'-5" | 16'-3" | 15'-4" | 14'-10" | 14'-7" |
| | NI-40x | 16'-1" | 15'-2" | 14'-8" | 14'-9" | 17'-5" | 16'-5" | 15'-10" | 15'-5" |
| | NI-60 | 16'-3" | 15'-4" | 14'-10" | 14'-11" | 17'-7" | 16'-7" | 16'-0" | 16'-1" |
| | NI-70 | 17'-1" | 16'-1" | 15'-6" | 15'-7" | 18'-7" | 17'-4" | 16'-9" | 16'-10" |
| | NI-80 | 17'-3" | 16'-3" | 15'-8" | 15'-9" | 18'-10" | 17'-6" | 16'-11" | 17'-0" |
| 11-7/8" | NI-20 | 16'-11" | 16'-0" | 15'-5" | 15'-6" | 18'-4" | 17'-3" | 16'-8" | 16'-7" |
| | NI-40x | 18'-1" | 17'-0" | 16'-5" | 16'-6" | 20'-0" | 18'-6" | 17'-9" | 17'-7" |
| | NI-60 | 18'-4" | 17'-3" | 16'-7" | 16'-9" | 20'-3" | 18'-9" | 18'-0" | 18'-1" |
| | NI-70 | 19'-6" | 18'-0" | 17'-4" | 17'-5" | 21'-6" | 19'-11" | 19'-0" | 19'-1" |
| | NI-80 | 19'-9" | 18'-3" | 17'-6" | 17'-7" | 21'-9" | 20'-2" | 19'-3" | 19'-4" |
| | NI-90 | 20'-2" | 18'-7" | 17'-10" | 17'-11" | 22'-3" | 20'-7" | 19'-8" | 19'-9" |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | 18'-0" | 22'-5" | 20'-9" | 19'-10" | 19'-11" |
| 14" | NI-40x | 20'-1" | 18'-7" | 17'-10" | 17'-11" | 22'-2" | 20'-6" | 19'-8" | 19'-4" |
| | NI-60 | 20'-5" | 18'-11" | 18'-1" | 18'-2" | 22'-7" | 20'-11" | 20'-0" | 20'-1" |
| | NI-70 | 21'-7" | 20'-0" | 19'-1" | 19'-2" | 23'-10" | 22'-1" | 21'-1" | 21'-2" |
| | NI-80 | 21'-11" | 20'-3" | 19'-4" | 19'-5" | 24'-3" | 22'-5" | 21'-5" | 21'-6" |
| | NI-90 | 22'-5" | 20'-8" | 19'-9" | 19'-10" | 24'-9" | 22'-10" | 21'-10" | 21'-10" |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | 20'-0" | 25'-0" | 23'-1" | 22'-0" | 22'-2" |
| 16" | NI-60 | 22'-3" | 20'-8" | 19'-9" | 19'-10" | 24'-7" | 22'-9" | 21'-9" | 21'-10" |
| | NI-70 | 23'-6" | 21'-9" | 20'-9" | 20'-10" | 26'-0" | 24'-0" | 22'-11" | 23'-0" |
| | NI-80 | 23'-11" | 22'-1" | 21'-1" | 21'-2" | 26'-5" | 24'-5" | 23'-3" | 23'-4" |
| | NI-90 | 24'-5" | 22'-6" | 21'-5" | 21'-6" | 26'-11" | 24'-10" | 23'-8" | 23'-9" |
| | NI-90x | 24'-5" | 22'-9" | 21'-5" | 21'-10" | 27'-3" | 25'-2" | 24'-0" | 24'-1" |

CCMC EVALUATION REPORT 13032-R

## I-JOIST HANGERS

1. Hangers shown illustrate the three most commonly used metal hangers to support I-joists.
2. All nailing must meet the hanger manufacturer's recommendations.
3. Hangers should be selected based on the joist depth, flange width and load capacity based on the maximum spans.
4. Web stiffeners are required when the sides of the hangers do not laterally brace the top flange of the I-joist.



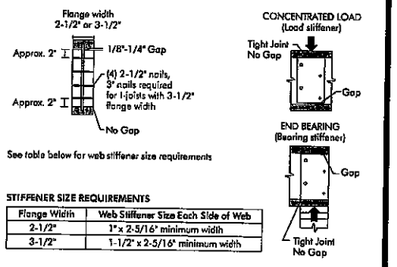

## WEB STIFFENERS

**RECOMMENDATIONS:**

- **A *bearing stiffener*** is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found of the I-joist Construction Guide (C101).The gap between the stiffener and the flange is at the top.
- **A *bearing stiffener*** is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- **A *load stiffener*** is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

SI units conversion: 1 inch = 25.4 mm

FIGURE 2
**WEB STIFFENER INSTALLATION DETAILS**

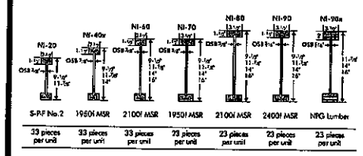



See table below for web stiffener size requirements

**STIFFENER SIZE REQUIREMENTS**

| Flange Width | Web Stiffener Size Each Side of Web |
|---|---|
| 2-1/2" | 1" x 2-5/16" minimum width |
| 3-1/2" | 1-1/2" x 2-5/16" minimum width |

## NORDIC I-JOIST SERIES




Chantiers Chibougamau Ltd. harvests its own trees, which enables Nordic products to adhere to strict quality control procedures throughout the entire manufacturing process. Every phase of the operation, from forest to the finished product, reflects our commitment to quality.

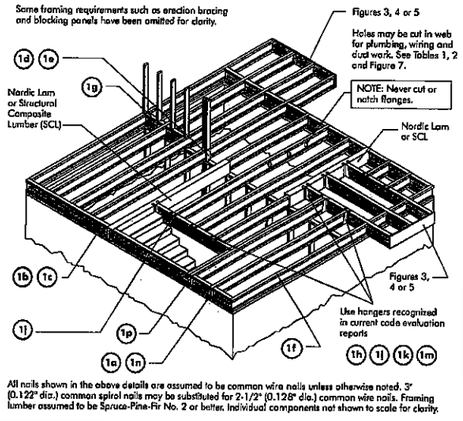
Nordic Engineered Wood I-joists use only finger-jointed black spruce lumber in their flanges, ensuring consistent quality, superior stock supply, longer span carrying capacity.



## INSTALLING NORDIC I-JOISTS

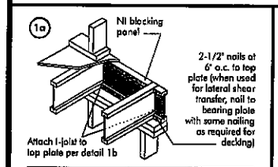
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, consult your supplier.
2. Except for cutting to length, I-joist flanges should never be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. I-joists must be anchored securely to supports before floor sheathing is attached, and supports for multiple-span I-joists must be level.
5. Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
6. When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16-inch gap between the I-joist end and a header.
8. Concentrated loads greater than those that can normally be expected in residential construction should only be applied to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment and security cameras. Never suspend unusual or heavy loads from the I-joist's bottom flange. Whenever possible, suspend all concentrated loads from the top of the I-joist. Or, attach the load to blocking that has been securely fastened to the I-joist webs.
9. Never install I-joists where they will be permanently exposed to weather, or where they will remain in direct contact with concrete or masonry.
10. Restrain ends of floor joists to prevent rollover. Use rim board, rim joists or I-joist blocking panels.
11. For I-joists installed over and beneath bearing walls, use full depth blocking panels, rim board, or squash blocks (cripple members) to transfer gravity loads through the floor system to the wall or foundation below.
12. Due to shrinkage, common framing lumber set on edge may never be used as blocking or rim boards. I-joist blocking panels or other engineered wood products – such as rim board – must be cut to fit between the I-joists, and an I-joist-compatible depth selected.
13. Provide permanent lateral support of the bottom flange of all I-joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered I-joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
14. If square-edge panels are used, edges must be supported between I-joists with 2x4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
15. Nail spacing: Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.

FIGURE 1
**TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS**



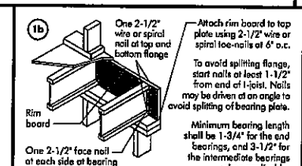

All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.





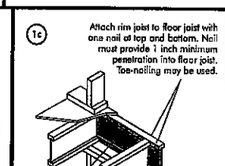

| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

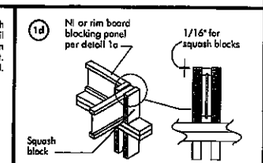
*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.




| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| 1-1/8" Rim Board Plus | 8,090 |

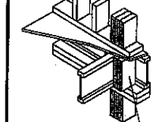
*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

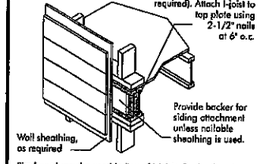


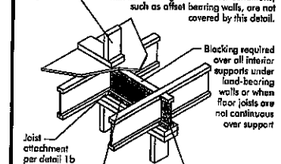



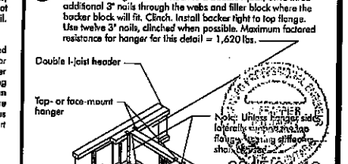

| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) 3-1/2" wide | 5-1/2" wide |
|---|---|---|
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

Provide lateral bracing per detail 1c, 1b, or 1c



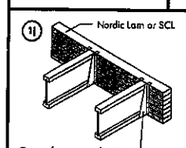



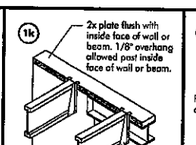

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

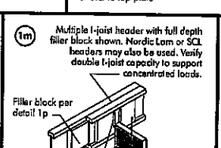
**BACKER BLOCKS** (Blocks must be long enough to permit required nailing without splitting)

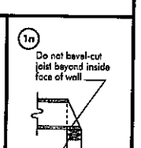
| Flange Width | Material Thickness Required* | Minimum Depth** |
|---|---|---|
| 2-1/2" | 1" | 5-1/2" |
| 3-1/2" | 1-1/2" | 7-1/4" |

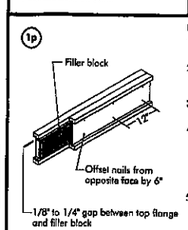
* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O437 Standard.
** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".



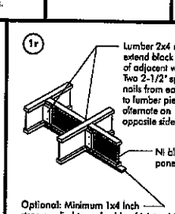



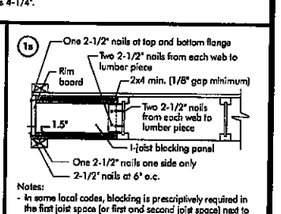




Notes:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 3" nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of four nails per foot required. If nails can be clinched, only two nails per foot are required.
5. The maximum factored load that may be applied to one side of the double joist using this detail is 860 lbf/ft. Verify double I-joist capacity.

**FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION**

| Flange Size | Joist Depth | Filler Block Size |
|---|---|---|
| 2-1/2" x 1-1/2" | 9-1/2" | 2-1/8" x 6" |
| | 11-7/8" | 2-1/8" x 8" |
| | 14" | 2-1/8" x 10" |
| | 16" | 2-1/8" x 12" |
| 3-1/2" x 1-1/2" | 9-1/2" | 3" x 6" |
| | 11-7/8" | 3" x 8" |
| | 14" | 3" x 10" |
| | 16" | 3" x 12" |
| 3-1/2" x 2" | 11-7/8" | 3" x 7" |
| | 14" | 3" x 9" |
| | 16" | 3" x 11" |

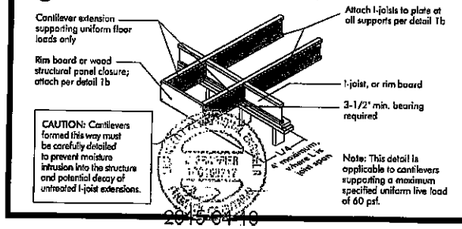


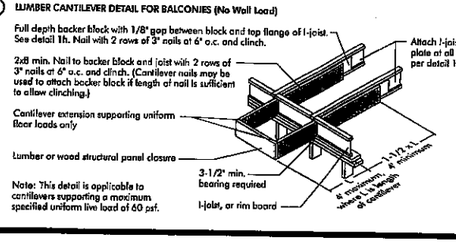

Notes:
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.

## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

### 3a) I-JOIST CANTILEVER DETAIL FOR BALCONIES (No Wall Load)




### 3b) LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)

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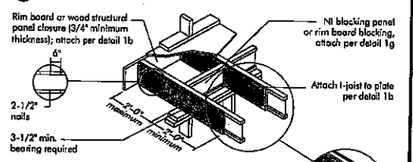
## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

### 4a) Method 1 — SHEATHING REINFORCEMENT ONE SIDE

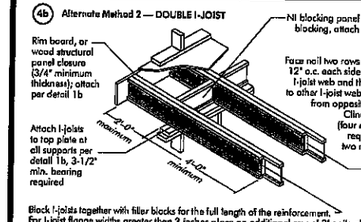



**Method 2 — SHEATHING REINFORCEMENT TWO SIDES**

- Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.
- Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

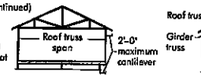
### 4b) Alternate Method 2 — DOUBLE I-JOIST

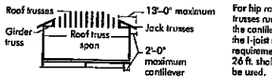



Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 3" nails along the centreline of the reinforcing panel from each side. Clinch when possible.

FIGURE 4 (continued)

See table below for NI reinforcement requirements at cantilever.




For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

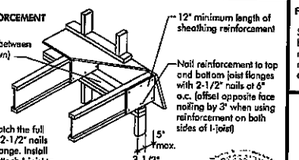
**CANTILEVER REINFORCEMENT METHODS ALLOWED**

| JOIST DEPTH (in.) | ROOF TRUSS SPAN (ft) | ROOF LOADING (UNFACTORED) LL = 30 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 40 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 50 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | 26 | N | N | 1 | 2 | N | 1 | 2 | X | N | 2 | X | X |
| | 28 | N | N | 1 | X | N | 1 | 2 | X | N | 2 | X | X |
| | 30 | N | 1 | 1 | X | N | 1 | 2 | X | 1 | 2 | X | X |
| | 32 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 34 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 36 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| 11-7/8" | 26 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 28 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 30 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 32 | N | N | 1 | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 34 | N | N | 1 | 2 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 36 | N | N | 1 | 2 | N | 1 | 2 | X | N | 1 | 2 | X |
| | 38 | N | N | 1 | 2 | N | 1 | 2 | X | N | 2 | X | X |
| 14" | 26 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 28 | N | N | N | N | N | N | N | 1 | N | N | 1 | 1 |
| | 30 | N | N | N | N | N | N | N | 1 | N | N | 1 | 2 |
| | 32 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 34 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 36 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 1 | 2 |
| | 38 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 40 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| 16" | 26 | N | N | N | N | N | N | N | N | N | N | N | 1 |
| | 28 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 30 | N | N | N | N | N | N | N | 1 | N | N | N | 1 |
| | 32 | N | N | N | N | N | N | N | 1 | N | N | 1 | 1 |
| | 34 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 36 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 38 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 1 | 2 |
| | 40 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |
| | 42 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |

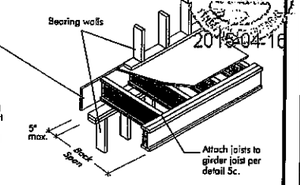
1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 60 plf 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.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

### 5a) SHEATHING REINFORCEMENT




### 5b) SET-BACK DETAIL




### 5c) SET-BACK CONNECTION

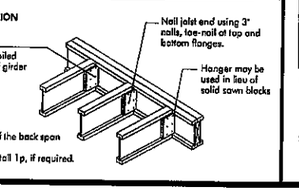
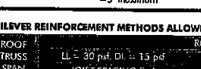



FIGURE 5 (continued)

See table below for NI reinforcement requirements at cantilever.





For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

**BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED**

| JOIST DEPTH (in.) | ROOF TRUSS SPAN (ft) | ROOF LOADING (UNFACTORED) LL = 30 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 40 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 | LL = 50 psf, DL = 15 psf — JOIST SPACING (in.) 12 | 16 | 19.2 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | 26 | 1 | X | X | X | 2 | X | X | X | 2 | X | X | X |
| | 28 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 30 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 32 | 2 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 34 | 2 | X | X | X | X | X | X | X | X | X | X | X |
| | 36 | X | X | X | X | X | X | X | X | X | X | X | X |
| 11-7/8" | 26 | N | 2 | X | X | 1 | X | X | X | 1 | X | X | X |
| | 28 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 30 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 32 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 34 | 1 | 2 | X | X | 2 | X | X | X | 2 | X | X | X |
| | 36 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| | 38 | 1 | X | X | X | 2 | X | X | X | X | X | X | X |
| 14" | 26 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 28 | N | 1 | X | X | 1 | 2 | X | X | 1 | X | X | X |
| | 30 | N | 2 | X | X | 1 | 2 | X | X | 1 | X | X | X |
| | 32 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 34 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 36 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 38 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 40 | 1 | X | X | X | 2 | X | X | X | 2 | X | X | X |
| 16" | 26 | N | 1 | 2 | X | N | 1 | X | X | N | 2 | X | X |
| | 28 | N | 1 | 2 | X | N | 2 | X | X | 1 | 2 | X | X |
| | 30 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 32 | N | 1 | 2 | X | N | 2 | X | X | 1 | X | X | X |
| | 34 | N | 2 | X | X | 1 | 2 | X | X | 1 | X | X | X |
| | 36 | N | 2 | X | X | 1 | X | X | X | 1 | X | X | X |
| | 38 | N | 2 | X | X | 1 | X | X | X | 2 | X | X | X |
| | 40 | N | N | X | X | 1 | X | X | X | 2 | X | X | X |
| | 42 | 1 | 2 | X | X | 1 | X | X | X | 2 | X | X | X |

1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 plf 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.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## WEB HOLES

**RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:**

1. The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
2. I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut holes should be centred on the middle of the web.
4. The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole *for twice the length of the longest side of the largest rectangular hole or duct chase opening)* and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
10. All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. A group of round holes of approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

TABLE 1
**LOCATION OF CIRCULAR HOLES IN JOIST WEBS**
**Simple or Multiple Span for Dead Loads up to 15 psf and Live Loads up to 40 psf**

| Joist Depth | Joist Series | Minimum distance from inside face of any support to centre of hole (ft-in.) — Round hole diameter (in.) 2 | 3 | 4 | 5 | 6 | 6-3/4 | 7 | 8 | 8-5/8 | 9 | 10 | 10-3/4 | 11 | 12 | 12-3/4 | Span Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 0'-7" | 1'-6" | 2'-10" | 4'-3" | 5'-8" | 6'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 10.00 |
| | NI-40x | 0'-7" | 1'-6" | 3'-0" | 4'-4" | 5'-6" | 6'-1" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14.91 |
| | NI-60 | 0'-7" | 1'-7" | 2'-6" | 4'-0" | 5'-4" | 7'-0" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14.91 |
| | NI-70 | 2'-0" | 3'-4" | 4'-9" | 6'-3" | 8'-0" | 8'-9" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14.91 |
| | NI-80 | 2'-0" | 3'-4" | 5'-0" | 6'-5" | 8'-2" | 9'-0" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18.72 |
| 11-7/8" | NI-20 | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 5'-8" | 6'-10" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 13.99 |
| | NI-40x | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 4'-6" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- | --- | 19.56 |
| | NI-60 | 0'-7" | 0'-8" | 1'-9" | 2'-8" | 4'-0" | 4'-4" | 5'-5" | 7'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | 16.56 |
| | NI-70 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 6'-9" | 7'-3" | 8'-4" | 10'-0" | --- | --- | --- | --- | --- | --- | --- | 19.56 |
| | NI-80 | 1'-3" | 2'-10" | 4'-0" | 5'-4" | 6'-9" | 7'-3" | 8'-4" | 10'-0" | 11'-2" | --- | --- | --- | --- | --- | --- | 17.59 |
| | NI-90 | 0'-7" | 0'-8" | 1'-9" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | --- | 17.59 |
| | NI-90x | 0'-7" | 0'-8" | 1'-9" | 3'-2" | 4'-6" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- | --- | 17.11 |
| 14" | NI-40x | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 4'-6" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- | --- | 18.07 |
| | NI-60 | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 4'-6" | 5'-0" | 6'-6" | 7'-9" | 8'-8" | 10'-2" | --- | --- | --- | --- | --- | 19.11 |
| | NI-70 | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 5'-8" | 6'-4" | 7'-9" | 9'-6" | 10'-7" | --- | --- | --- | --- | --- | --- | 18.09 |
| | NI-80 | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 5'-8" | 7'-2" | 8'-0" | 9'-8" | 10'-9" | --- | --- | --- | --- | --- | --- | 19.56 |
| | NI-90 | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 5'-8" | 7'-2" | 8'-0" | 9'-8" | 10'-9" | 12'-4" | --- | --- | --- | --- | --- | 19.56 |
| | NI-80x | 0'-10" | 2'-0" | 3'-4" | 4'-9" | 6'-2" | 6'-8" | 7'-9" | 9'-0" | 10'-0" | 11'-2" | --- | --- | --- | --- | --- | 19.56 |
| | NI-90x | 0'-7" | 0'-8" | 1'-9" | 3'-4" | 5'-8" | 6'-4" | 7'-9" | 8'-8" | 9'-8" | 11'-1" | --- | --- | --- | --- | --- | 19.56 |
| 16" | NI-20 | 0'-7" | 0'-8" | 1'-9" | 2'-10" | 4'-3" | 4'-10" | 6'-0" | 7'-6" | 8'-5" | 9'-8" | 10'-2" | 10'-9" | 11'-3" | 12'-0" | 13'-9" | 19.10 |
| | NI-40x | 0'-7" | 1'-0" | 2'-3" | 3'-7" | 5'-4" | 6'-0" | 7'-5" | 8'-9" | 9'-9" | 10'-9" | 12'-1" | 12'-8" | 13'-3" | 14'-0" | 15'-9" | 20.00 |
| | NI-60 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-9" | 7'-1" | 8'-6" | 9'-6" | 10'-6" | 11'-9" | 12'-3" | 12'-9" | 13'-6" | 15'-2" | 21.22 |
| | NI-70 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-9" | 7'-1" | 8'-6" | 9'-6" | 10'-6" | 11'-9" | 12'-3" | 12'-9" | 13'-6" | 15'-2" | 21.22 |
| | NI-80 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-9" | 7'-1" | 8'-6" | 9'-6" | 10'-6" | 11'-9" | 12'-3" | 12'-9" | 13'-6" | 15'-2" | 21.22 |
| | NI-90 | 0'-7" | 0'-8" | 1'-9" | 3'-2" | 5'-0" | 5'-6" | 6'-9" | 8'-0" | 9'-0" | 9'-10" | 11'-0" | 11'-6" | 12'-0" | 12'-8" | 14'-2" | 21.45 |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-0" | 3'-6" | 4'-0" | 5'-0" | 6'-9" | 7'-9" | 8'-4" | 9'-5" | 9'-10" | 10'-3" | 10'-9" | 12'-0" | 21.10 |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Hole location distance is measured from inside face of supports to centre of hole.
3. Distances in this chart are based on uniformly loaded joists.

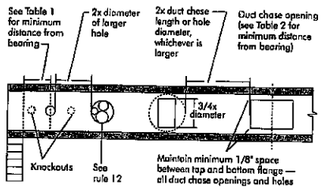
**OPTIONAL:**

The above table is based on the I-joists used at their maximum span. If the I-joists are placed at less than their full maximum span (see Maximum Joist Spans), the minimum distance from the centreline of the hole to the face of any support (D) as given above may be reduced as follows:

$$D_{reduced} = \frac{L_{actual}}{SAF} \times D$$

Where: $D_{reduced}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft). This distance shall not be less than 6 inches from the face of the support to edge of the hole.
$L_{actual}$ = The actual measured span distance between the inside faces of supports (ft).
SAF = Span Adjustment Factor given in this table.
D = The minimum distance from the inside face of any support to centre of hole from this table. If $\frac{L_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{L_{actual}}{SAF}$.

FIGURE 7
**FIELD-CUT HOLE LOCATOR**




A knockout is NOT considered a hole, may be utilized wherever it occurs and may be ignored for purposes of calculating minimum distances between holes.

Knockouts are prescored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

**Never** drill, cut or notch the flange, or over-cut the web.

Holes in webs should be cut with a sharp saw.

For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

TABLE 2
**DUCT CHASE OPENING SIZES AND LOCATIONS — Simple Span Only**

| Joist Depth | Joist Series | Minimum distance from inside face of any support to centre of opening (ft-in.) — Duct chase length (in.) 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 4'-1" | 4'-5" | 4'-10" | 5'-4" | 5'-8" | 6'-1" | 6'-6" | 7'-1" | 7'-5" |
| | NI-40x | 4'-2" | 4'-6" | 4'-9" | 5'-1" | 5'-5" | 5'-10" | 6'-3" | 6'-8" | 6'-11" |
| | NI-60 | 3'-9" | 4'-1" | 4'-5" | 4'-9" | 5'-2" | 5'-6" | 5'-11" | 6'-3" | 6'-6" |
| | NI-70 | 3'-9" | 4'-1" | 4'-5" | 4'-9" | 5'-2" | 5'-6" | 5'-11" | 6'-3" | 6'-6" |
| | NI-80 | 3'-9" | 4'-1" | 4'-5" | 4'-9" | 5'-2" | 5'-6" | 5'-11" | 6'-3" | 6'-6" |
| 11-7/8" | NI-20 | 5'-0" | 5'-5" | 5'-10" | 6'-3" | 6'-7" | 7'-1" | 7'-6" | 8'-1" | 8'-4" |
| | NI-40x | 4'-9" | 5'-2" | 5'-6" | 5'-11" | 6'-4" | 6'-8" | 7'-2" | 7'-6" | 7'-10" |
| | NI-60 | 4'-3" | 4'-7" | 4'-11" | 5'-3" | 5'-7" | 5'-11" | 6'-4" | 6'-8" | 6'-11" |
| | NI-70 | 4'-3" | 4'-7" | 4'-11" | 5'-3" | 5'-7" | 5'-11" | 6'-4" | 6'-8" | 6'-11" |
| | NI-80 | 4'-3" | 4'-7" | 4'-11" | 5'-3" | 5'-7" | 5'-11" | 6'-4" | 6'-8" | 6'-11" |
| | NI-90 | 4'-3" | 4'-7" | 4'-11" | 5'-3" | 5'-7" | 5'-11" | 6'-4" | 6'-8" | 6'-11" |
| | NI-90x | 4'-3" | 4'-7" | 4'-11" | 5'-3" | 5'-7" | 5'-11" | 6'-4" | 6'-8" | 6'-11" |
| 14" | NI-40x | 5'-1" | 5'-6" | 5'-11" | 6'-4" | 6'-8" | 7'-2" | 7'-7" | 8'-1" | 8'-5" |
| | NI-60 | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| | NI-70 | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| | NI-80 | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| | NI-90 | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| | NI-80x | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| | NI-90x | 4'-8" | 5'-1" | 5'-5" | 5'-10" | 6'-2" | 6'-7" | 7'-0" | 7'-5" | 7'-8" |
| 16" | NI-20 | 5'-5" | 5'-9" | 6'-2" | 6'-6" | 6'-10" | 7'-3" | 7'-7" | 8'-1" | 8'-4" |
| | NI-40x | 5'-1" | 5'-5" | 5'-9" | 6'-1" | 6'-5" | 6'-9" | 7'-2" | 7'-6" | 7'-9" |
| | NI-60 | 4'-10" | 5'-2" | 5'-6" | 5'-10" | 6'-2" | 6'-6" | 6'-10" | 7'-2" | 7'-5" |
| | NI-70 | 4'-10" | 5'-2" | 5'-6" | 5'-10" | 6'-2" | 6'-6" | 6'-10" | 7'-2" | 7'-5" |
| | NI-80 | 4'-10" | 5'-2" | 5'-6" | 5'-10" | 6'-2" | 6'-6" | 6'-10" | 7'-2" | 7'-5" |
| | NI-90 | 4'-10" | 5'-2" | 5'-6" | 5'-10" | 6'-2" | 6'-6" | 6'-10" | 7'-2" | 7'-5" |
| | NI-90x | 4'-10" | 5'-2" | 5'-6" | 5'-10" | 6'-2" | 6'-6" | 6'-10" | 7'-2" | 7'-5" |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. For other applications, contact your local distributor.

## INSTALLING THE GLUED FLOOR SYSTEM

1. Wipe any mud, dirt, water, or ice from I-joist flanges before gluing.
2. Snap a chalk line across the I-joists four feet in from the wall for panel edge alignment and as a boundary for spreading glue.
3. Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
4. Lay the first panel with tongue side to the wall, and nail in place. This protects the tongue of the next panel from damage when tapped into place with a block and sledgehammer.
5. Apply a continuous line of glue (about 1/4-inch diameter) to the top flange of a single I-joist. Apply glue in a winding pattern on wide areas, such as with double I-joists.
6. Apply two lines of glue on I-joists where panel ends butt to assure proper gluing of each end.
7. After the first row of panels is in place, spread glue in the groove of one or two panels at a time before laying the next row. Glue line may be continuous or spaced, but avoid squeeze-out by applying a thinner line (1/8 inch) than used on I-joist flanges.
8. Tap the second row of panels into place, using a block to protect groove edges.
9. Stagger end joints in each succeeding row of panels. A 1/8-inch space between all end joints and 1/8-inch at all edges, including T&G edges, is recommended. (Use a spacer tool or an 2-1/2" common nail to assure accurate and consistent spacing.)
10. **Complete all nailing of each panel before glue sets.** Check the manufacturer's recommendations for cure time. (Warm weather accelerates glue setting.) Use 2" ring- or screw-shank nails for panels 3/4-inch thick or less, and 2-1/2" ring- or screw-shank nails for thicker panels. Space nails per the table below. Closer nail spacing may be required by some codes, or for diaphragm construction. The finished deck can be walked on right away and will carry construction loads without damage to the glue bond.

**FASTENERS FOR SHEATHING AND SUBFLOORING[1]**

| Maximum Joist Spacing (in.) | Minimum Panel Thickness (in.) | Nail Size and Type — Common Wire or Spiral Nails | Ring Thread Nails or Screws | Staples | Maximum Spacing of Fastening — Edges | Interior Supports |
|---|---|---|---|---|---|---|
| 16 | 5/8 | 2" | I-3/4" | 2" | 6" | 12" |
| 20 | 5/8 | 2" | I-3/4" | 2" | 6" | 12" |
| 24 | 3/4 | 2" | I-3/4" | 2" | 6" | 12" |

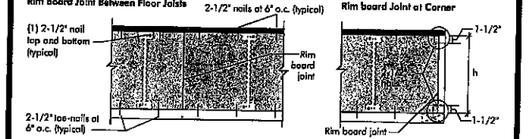
1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.
5. Use only adhesives conforming to CAN/CGSB-71.26 Standard, Adhesives for Field-Gluing Plywood to Lumber Framing for Floor System, applied in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.

*Ref.: NRC-CNRC, National Building Code of Canada 2010, Table 9.23.3.5.*

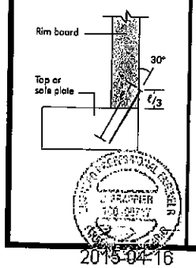
**IMPORTANT NOTE:**
**Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.**

## RIM BOARD INSTALLATION DETAILS

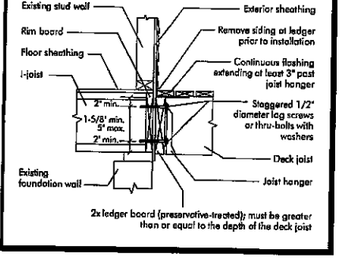
### 8a) ATTACHMENT DETAILS WHERE RIM BOARDS ABUT




### 8b) TOE-NAIL CONNECTION AT RIM BOARD




### 8c) 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL

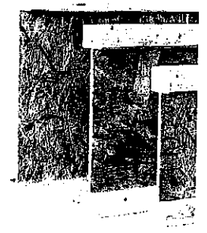



2015-04-16

**PRODUCT WARRANTY**

*Chantiers Chibougamau guarantees that, in accordance with our specifications, Nordic products are free from manufacturing defects in material and workmanship.*

*Furthermore, Chantiers Chibougamau warrants that our products, when utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.*



# CONSTRUCTION DETAILS FOR RESIDENTIAL FLOORS

N-C303 / April 2014

NORDIC ENGINEERED WOOD

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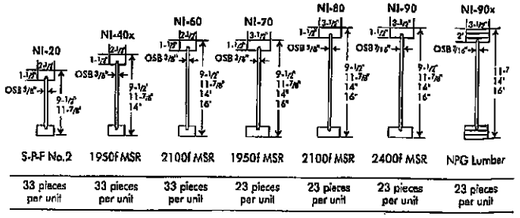
FSC mixed sources

Refer to the *Installation Guide for Residential Floors* for additional information.
CCMC EVALUATION REPORT 13032-R




| 33 pieces per unit | 33 pieces per unit | 33 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 pieces per unit |
|---|---|---|---|---|---|---|

## WEB HOLE SPECIFICATIONS

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

1. The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
2. I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut holes should be centred on the middle of the web.
4. The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent 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 or duct chase opening)* and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is **not** considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller are permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
10. All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

TABLE 1

### LOCATION OF CIRCULAR HOLES IN JOIST WEBS

Simple or Multiple Span for Dead Loads up to 15 psf and Live Loads up to 40 psf

| Joist Depth | Joist Series | Minimum Distance from Inside Face of Any Support to Centre of Hole (ft - in.) Round Hole Diameter (in.) 2 | 3 | 4 | 5 | 6 | 6-1/4 | 7 | 8 | 8-5/8 | 9 | 10 | 10-3/4 | 11 | 12 | 12-3/4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 0'-7" | 1'-6" | 2'-10" | 4'-3" | 5'-8" | 6'-0" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-40x | 0'-7" | 1'-6" | 3'-0" | 4'-4" | 6'-0" | 6'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-60 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 7'-0" | 7'-5" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-70 | 2'-0" | 3'-4" | 4'-9" | 6'-3" | 8'-0" | 8'-6" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-80 | 2'-5" | 3'-8" | 5'-0" | 6'-6" | 8'-2" | 8'-8" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11-7/8" | NI-20 | 0'-7" | 0'-8" | 1'-0" | 2'-4" | 3'-8" | 4'-0" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- |
| | NI-40x | 0'-7" | 0'-8" | 1'-0" | 2'-6" | 4'-0" | 4'-4" | 5'-5" | 7'-0" | 8'-4" | --- | --- | --- | --- | --- | --- |
| | NI-60 | 0'-7" | 1'-8" | 3'-0" | 4'-3" | 5'-9" | 6'-0" | 7'-3" | 8'-10" | 10'-0" | --- | --- | --- | --- | --- | --- |
| | NI-70 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 6'-9" | 7'-2" | 8'-4" | 10'-0" | 11'-2" | --- | --- | --- | --- | --- | --- |
| | NI-80 | 1'-6" | 2'-10" | 4'-2" | 5'-6" | 7'-0" | 7'-5" | 8'-6" | 10'-3" | 11'-4" | --- | --- | --- | --- | --- | --- |
| | NI-90 | 0'-7" | 0'-8" | 1'-5" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | --- |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-5" | 4'-4" | 4'-9" | 6'-3" | --- | --- | --- | --- | --- | --- | --- | --- |
| 14" | NI-40x | 0'-7" | 0'-8" | 0'-8" | 1'-0" | 2'-4" | 2'-9" | 3'-9" | 5'-2" | 6'-0" | 6'-6" | 8'-3" | 10'-2" | --- | --- | --- |
| | NI-60 | 0'-7" | 0'-8" | 1'-8" | 3'-0" | 4'-3" | 4'-8" | 5'-8" | 7'-2" | 8'-0" | 8'-8" | 10'-4" | 11'-9" | --- | --- | --- |
| | NI-70 | 0'-8" | 1'-10" | 3'-0" | 4'-5" | 5'-10" | 6'-2" | 7'-3" | 8'-9" | 9'-9" | 10'-4" | 12'-0" | 13'-5" | --- | --- | --- |
| | NI-80 | 0'-10" | 2'-0" | 3'-4" | 4'-9" | 6'-2" | 6'-5" | 7'-6" | 9'-0" | 10'-0" | 10'-8" | 12'-4" | 13'-9" | --- | --- | --- |
| | NI-90 | 0'-7" | 0'-8" | 0'-10" | 2'-5" | 4'-0" | 4'-5" | 5'-9" | 7'-5" | 8'-8" | 9'-4" | 11'-4" | 12'-11" | --- | --- | --- |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 2'-0" | 3'-9" | 4'-2" | 5'-5" | 7'-3" | 8'-5" | 9'-2" | --- | --- | --- | --- | --- |
| 16" | NI-60 | 0'-7" | 0'-8" | 0'-8" | 1'-6" | 2'-10" | 3'-2" | 4'-2" | 5'-6" | 6'-4" | 7'-0" | 8'-5" | 9'-8" | 10'-2" | 12'-2" | 13'-9" |
| | NI-70 | 0'-7" | 1'-0" | 2'-3" | 3'-6" | 4'-10" | 5'-3" | 6'-3" | 7'-8" | 8'-6" | 9'-2" | 10'-8" | 12'-0" | 12'-4" | 14'-0" | 15'-6" |
| | NI-80 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-6" | 6'-6" | 8'-0" | 9'-0" | 9'-5" | 11'-0" | 12'-3" | 12'-9" | 14'-5" | 16'-0" |
| | NI-90 | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-3" | 3'-8" | 4'-9" | 6'-5" | 7'-5" | 8'-0" | 9'-10" | 11'-5" | 11'-9" | 13'-9" | 15'-4" |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-0" | 3'-6" | 4'-0" | 5'-0" | 6'-9" | 7'-9" | 8'-4" | 10'-2" | 11'-6" | 12'-0" | — | — |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Hole location distance is measured from inside face of supports to centre of hole.
3. Distances in this chart are based on uniformly loaded joists.
4. The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

TABLE 2

### DUCT CHASE OPENING SIZES AND LOCATIONS

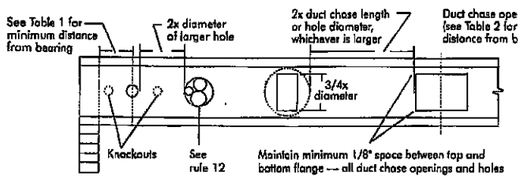
Simple Span Only

| Joist Depth | Joist Series | Minimum distance from inside face of supports to centre of opening (ft - in.) Duct Chase Length (in.) 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9-1/2" | NI-20 | 4'-1" | 4'-5" | 4'-10" | 5'-4" | 5'-8" | 6'-1" | 6'-6" | 7'-1" | 7'-5" |
| | NI-40x | 5'-3" | 5'-8" | 6'-0" | 6'-5" | 6'-10" | 7'-3" | 7'-8" | 8'-2" | 8'-7" |
| | NI-60 | 5'-4" | 5'-9" | 6'-2" | 6'-7" | 7'-1" | 7'-5" | 8'-0" | 8'-5" | 8'-9" |
| | NI-70 | 5'-1" | 5'-5" | 5'-10" | 6'-3" | 6'-7" | 7'-1" | 7'-6" | 8'-1" | 8'-4" |
| | NI-80 | 5'-3" | 5'-8" | 6'-0" | 6'-5" | 6'-10" | 7'-3" | 7'-8" | 8'-2" | 8'-6" |
| 11-7/8" | NI-20 | 5'-9" | 6'-2" | 6'-6" | 7'-1" | 7'-5" | 7'-9" | 8'-3" | 8'-9" | 9'-4" |
| | NI-40x | 6'-8" | 7'-2" | 7'-6" | 8'-1" | 8'-6" | 9'-1" | 9'-6" | 10'-1" | 10'-9" |
| | NI-60 | 7'-3" | 7'-8" | 8'-0" | 8'-6" | 9'-0" | 9'-3" | 9'-9" | 10'-3" | 11'-0" |
| | NI-70 | 7'-1" | 7'-4" | 7'-9" | 8'-3" | 8'-7" | 9'-1" | 9'-6" | 10'-1" | 10'-4" |
| | NI-80 | 7'-2" | 7'-7" | 8'-0" | 8'-5" | 8'-10" | 9'-3" | 9'-8" | 10'-2" | 10'-8" |
| | NI-90 | 7'-6" | 7'-11" | 8'-4" | 8'-9" | 9'-2" | 9'-7" | 10'-1" | 10'-7" | 10'-11" |
| | NI-90x | 7'-7" | 8'-1" | 8'-5" | 8'-10" | 9'-4" | 9'-8" | 10'-2" | 10'-8" | 11'-2" |
| 14" | NI-40x | 8'-1" | 8'-7" | 9'-0" | 9'-6" | 10'-1" | 10'-7" | 11'-2" | 12'-0" | 12'-8" |
| | NI-60 | 8'-9" | 9'-3" | 9'-8" | 10'-1" | 10'-6" | 11'-1" | 11'-6" | 13'-3" | 13'-0" |
| | NI-70 | 8'-7" | 9'-1" | 9'-5" | 9'-10" | 10'-4" | 10'-8" | 11'-2" | 11'-7" | 12'-3" |
| | NI-80 | 9'-0" | 9'-3" | 9'-9" | 10'-1" | 10'-7" | 11'-1" | 11'-6" | 12'-1" | 12'-6" |
| | NI-90 | 9'-2" | 9'-8" | 10'-0" | 10'-6" | 10'-11" | 11'-5" | 11'-9" | 12'-4" | 12'-11" |
| | NI-90x | 9'-4" | 9'-9" | 10'-3" | 10'-7" | 11'-1" | 11'-7" | 12'-1" | 12'-7" | 13'-2" |
| 16" | NI-60 | 10'-3" | 10'-8" | 11'-2" | 11'-6" | 12'-1" | 12'-6" | 13'-2" | 14'-1" | 14'-10" |
| | NI-70 | 10'-1" | 10'-5" | 11'-0" | 11'-4" | 11'-10" | 12'-3" | 12'-8" | 13'-3" | 14'-0" |
| | NI-80 | 10'-4" | 10'-9" | 11'-3" | 11'-9" | 12'-1" | 12'-7" | 13'-1" | 13'-8" | 14'-4" |
| | NI-90 | 10'-9" | 11'-2" | 11'-8" | 12'-0" | 12'-6" | 13'-0" | 13'-6" | 14'-2" | 14'-10" |
| | NI-90x | 11'-1" | 11'-5" | 11'-10" | 12'-4" | 12'-10" | 13'-2" | 13'-9" | 14'-4" | 15'-2" |

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480.
5. The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

FIGURE 7

### FIELD-CUT HOLE LOCATOR




Knockouts are prescored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

Never drill, cut or notch the flange, or over-cut the web.

Holes in webs should be cut with a sharp saw.

For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

## SAFETY AND CONSTRUCTION PRECAUTIONS

Do not walk on I-joists until fully fastened and braced, or serious injuries can result.

Never stack building materials over unsheathed I-joists. Once sheathed, do not overstress I-joists with concentrated loads from building materials.

WARNING: I-joists are not stable until completely installed, and will not carry any load until fully braced and sheathed.

AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
   - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centre, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
   - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. Never install a damaged I-joist.

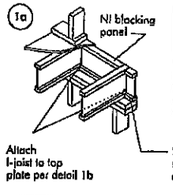
Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.

CANTIERS CHIBOUGAMAU

## PRODUCT WARRANTY

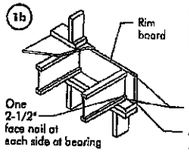
*Cantiers Chibougamau guarantees that, in accordance with our specifications, Nordic products are free from manufacturing defects in material and workmanship.*

*Furthermore, Cantiers Chibougamau warrants that our products, when utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.*




| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

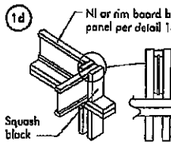



| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| 1-1/8" Rim Board Plus | 8,090 |

*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

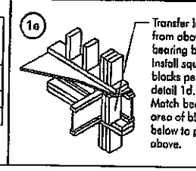
To avoid splitting flange, start nails at least 1-1/2" from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

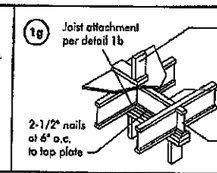
Minimum bearing length shall be 1-3/4" for the end bearings, and 3-1/2" for the intermediate bearings when applicable.

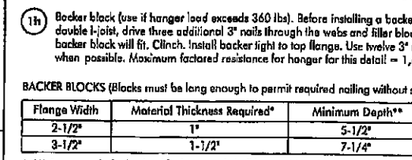



| Pair of Squash Blocks | Maximum Factored Vertical Load per Pair of Squash Blocks (lbs) 3-1/2" wide | 5-1/2" wide |
|---|---|---|
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

Provide lateral bracing per detail 1a or 1b



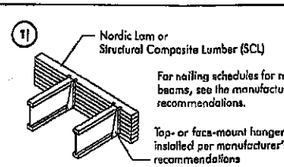

Backer block (use if hanger load exceeds 360 lbs). Before installing a backer block to a double I-joist, drive three additional 3" nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 3" nails, clinched when possible. Maximum factored resistance for hanger for this detail = 1,620 lbs.

BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

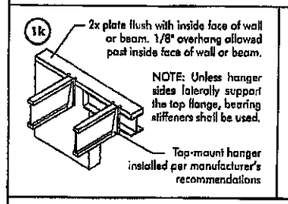
| Flange Width | Material Thickness Required* | Minimum Depth** |
|---|---|---|
| 2-1/2" | 1" | 5-1/2" |
| 3-1/2" | 1-1/2" | 7-1/4" |

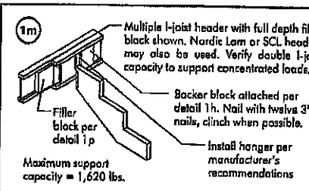
* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O437 Standard.
** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".

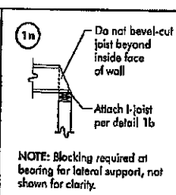
For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.



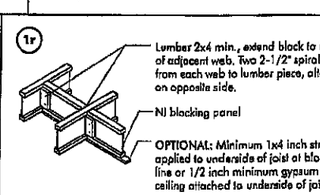

NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

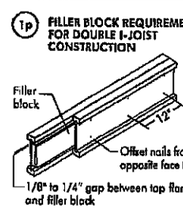


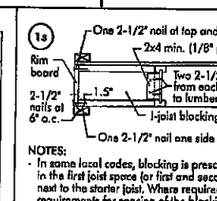

NOTE: Blocking required at bearing for lateral support, not shown for clarity.




NOTES:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 3" nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of four nails per foot required. If nails can be clinched, only two nails per foot are required.
5. The maximum factored load that may be applied to one side of the double joist using this detail is 860 lbf/ft. Verify double I-joist capacity.

| Flange Size | Net Depth | Filler Block Size |
|---|---|---|
| 2-1/2" x 1-1/2" | 9-1/2" 11-7/8" 14" 16" | 2-1/8" x 6" 2-1/8" x 8" 2-1/8" x 10" 2-1/8" x 12" |
| 3-1/2" x 1-1/2" | 9-1/2" 11-7/8" 14" 16" | 3" x 6" 3" x 8" 3" x 10" 3" x 12" |
| 3-1/2" x 2" | 11-7/8" 14" 16" | 3" x 7" 3" x 9" 3" x 11" |




NOTES:
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.

**All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.**

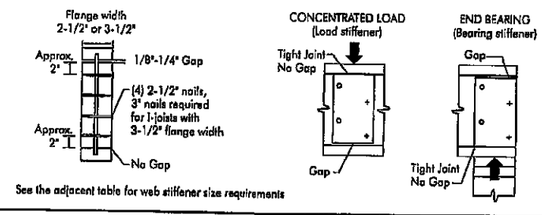
## WEB STIFFENERS

RECOMMENDATIONS:

- A *bearing stiffener* is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found of the *I-joist Construction Guide* (C101). The gap between the stiffener and the flange is at the top.
- A *bearing stiffener* is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- A *load stiffener* is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

FIGURE 2

### WEB STIFFENER INSTALLATION DETAILS



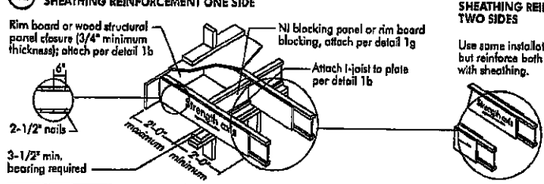

See the adjacent table for web stiffener size requirements

STIFFENER SIZE REQUIREMENTS

| Flange Width | Web Stiffener Size Each Side of Web |
|---|---|
| 2-1/2" | 1" x 2-5/16" minimum width |
| 3-1/2" | 1-1/2" x 2-5/16" minimum width |

## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE




Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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



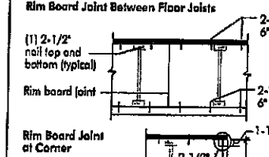

Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

NOTE: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

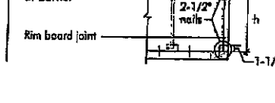
## RIM BOARD INSTALLATION DETAILS

8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

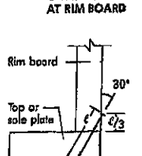
Rim Board Joint Between Floor Joists




Rim Board Joint at Corner




8b TOE-NAIL CONNECTION AT RIM BOARD



| NORDIC STRUCTURES | COMPANY<br>Mar. 24, 2021 13:26 | PROJECT<br>J11 - 1ST FLOOR |
|---|---|---|

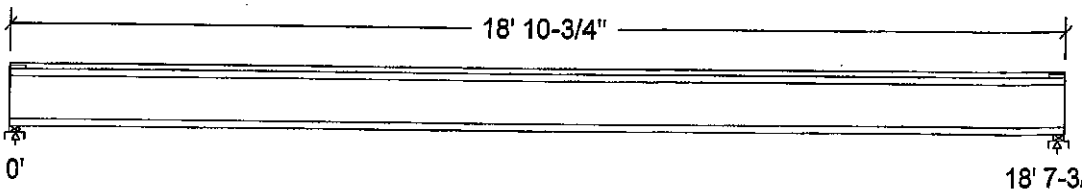
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

| Load | Type | Distribution | Pat-tern | Location [ft] Start | End | Magnitude Start | End | Unit |
|---|---|---|---|---|---|---|---|---|
| Load1 | Dead | Full Area | | | | 20.00 | | psf |
| Load2 | Live | Full Area | | | | 40.00 | | psf |

### Maximum Reactions (lbs) and Support Bearing (in):




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 186 | | 186 |
| Live | 373 | | 373 |
| Factored: | | | |
| Total | 792 | | 792 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 2188 | | 2188 |
| Support | 5573 | | 5573 |
| Des ratio | | | |
| Joist | 0.36 | | 0.36 |
| Support | 0.14 | | 0.14 |
| Load case | #2 | | #2 |
| Length | 2-3/8 | | 2-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | 1.00 | | 1.00 |
| fcp sup | 769 | | 769 |
| Kzcp sup | 1.09 | | 1.09 |

**Nordic Joist 11-7/8" NI-80 Floor joist @ 12" o.c.**

Supports: All - Lumber Sill plate, No.1/No.2

Total length: 18' 10-3/4"; Clear span: 18' 6"; 3/4" nailed and glued OSB sheathing

**This section PASSES the design code check.**

LICENSED PROFESSIONAL ENGINEER
3252
S. KATSOULAKOS
PROVINCE OF ONTARIO

pg 4

BWB NO. TAM 7387-21
STRUCTURAL
COMPONENT ONLY

## Limit States Design using CSA O86-14 and Vibration Criterion:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 792 | Vr = 2336 | lbs | Vf/Vr = 0.34 |
| Moment(+) | Mf = 3694 | Mr = 11609 | lbs-ft | Mf/Mr = 0.32 |
| Perm. Defl'n | 0.10 = < L/999 | 0.62 = L/360 | in | 0.16 |
| Live Defl'n | 0.20 = < L/999 | 0.47 = L/480 | in | 0.43 |
| Total Defl'n | 0.30 = L/742 | 0.93 = L/240 | in | 0.32 |
| Bare Defl'n | 0.23 = L/990 | 0.62 = L/360 | in | 0.36 |
| Vibration | Lmax = 18'-7.8 | Lv = 21'-2.7 | ft | 0.88 |
| Defl'n | = 0.024 | = 0.034 | in | 0.73 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2336 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 11609 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 547.1 million | - | - | - | - | - | - | - | #2 |

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L
Moment(+) : LC #2 = 1.25D + 1.5L
Deflection: LC #1 = 1.0D (permanent)
LC #2 = 1.0D + 1.0L (live)
LC #2 = 1.0D + 1.0L (total)
LC #2 = 1.0D + 1.0L (bare joist)
Bearing : Support 1 - LC #2 = 1.25D + 1.5L
Support 2 - LC #2 = 1.25D + 1.5L
Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake
L=live(use,occupancy) Ls=live(storage,equipment) f=fire
Load Patterns: s=S/2 L=L+Ls _=no pattern load in this span
All Load Combinations (LCs) are listed in the Analysis output

CALCULATIONS:

EIeff = 625.37 lb-in^2 K= 6.18e06 lbs
"Live" deflection is due to all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

## Design Notes:

AMENDED 2020

1. WoodWorks analysis and design are in accordance with the 2015 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-14 Engineering Design in Wood standard, Update No. 2 (June 2017).
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to Nordic Structures technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.


BUILDING NO. TAM7367-21
STRUCTURAL
COMPONENT ONLY

**NORDIC STRUCTURES**

| COMPANY | PROJECT |
|---|---|
| Mar. 24, 2021 11:40 | J7 - 2ND FLOOR |

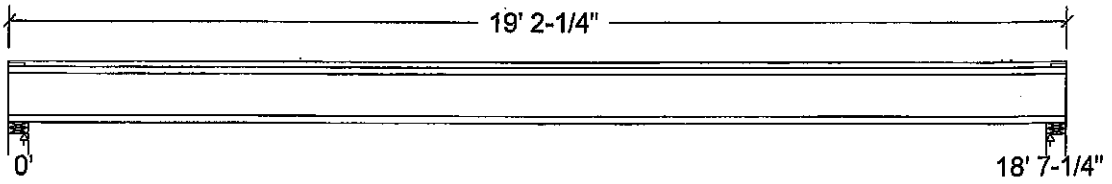
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

| Load | Type | Distribution | Pat-tern | Location [ft] Start | Location [ft] End | Magnitude Start | Magnitude End | Unit |
|---|---|---|---|---|---|---|---|---|
| Load1 | Dead | Full Area | | | | 20.00 | | psf |
| Load2 | Live | Full Area | | | | 40.00 | | psf |

### Maximum Reactions (lbs) and Support Bearing (in):




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 186 | | 186 |
| Live | 372 | | 372 |
| Factored: | | | |
| Total | 791 | | 791 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 2336 | | 2336 |
| Support | 10841 | | 10841 |
| Des ratio | | | |
| Joist | 0.34 | | 0.34 |
| Support | 0.07 | | 0.07 |
| Load case | #2 | | #2 |
| Length | 4-3/8 | | 4-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | - | | - |
| fcp sup | 769 | | 769 |
| Kzcp sup | - | | - |

Bearing for wall supports is perpendicular-to-grain bearing on top plate. No stud design included.

### Nordic Joist 11-7/8" NI-80 Floor joist @ 12" o.c.

Supports: All - Lumber Wall, No.1/No.2

Total length: 19' 2-1/4"; Clear span: 18' 5-1/2"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

**This section PASSES the design code check.**

### Limit States Design using CSA O86-14 and Vibration Criterion:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 791 | Vr = 2336 | lbs | Vf/Vr = 0.34 |
| Moment (+) | Mf = 3677 | Mr = 11609 | lbs-ft | Mf/Mr = 0.32 |
| Perm. Defl'n | 0.10 = < L/999 | 0.62 = L/360 | in | 0.16 |
| Live Defl'n | 0.20 = < L/999 | 0.47 = L/480 | in | 0.44 |
| Total Defl'n | 0.30 = L/734 | 0.93 = L/240 | in | 0.33 |
| Bare Defl'n | 0.22 = L/996 | 0.62 = L/360 | in | 0.36 |
| Vibration | Lmax = 18'-7.3 | Lv = 20'-5.8 | ft | 0.91 |
| Defl'n | = 0.027 | = 0.034 | in | 0.79 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2336 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 11609 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 547.1 million | | - | - | - | - | - | - | #2 |

CRITICAL LOAD COMBINATIONS:

```
Shear     : LC #2  = 1.25D + 1.5L
Moment(+) : LC #2  = 1.25D + 1.5L
Deflection: LC #1  = 1.0D  (permanent)
            LC #2  = 1.0D + 1.0L  (live)
            LC #2  = 1.0D + 1.0L  (total)
            LC #2  = 1.0D + 1.0L  (bare joist)
Bearing   : Support 1 - LC #2 = 1.25D + 1.5L
            Support 2 - LC #2 = 1.25D + 1.5L
Load Types: D=dead  W=wind  S=snow  H=earth,groundwater  E=earthquake
            L=live(use,occupancy)  Ls=live(storage,equipment)  f=fire
Load Patterns: s=S/2  L=L+Ls  _=no pattern load in this span
All Load Combinations (LCs) are listed in the Analysis output
```

CALCULATIONS:

```
EIeff = 613.27 lb-in^2  K=  6.18e06 lbs
"Live" deflection is due to all non-dead loads (live, wind, snow…)
```

CONFORMS TO OBC 2012

## Design Notes:

AMENDED 2020

1. WoodWorks analysis and design are in accordance with the 2015 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-14 Engineering Design in Wood standard, Update No. 2 (June 2017).
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to Nordic Structures technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.


DWG NO. TAM 7388-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

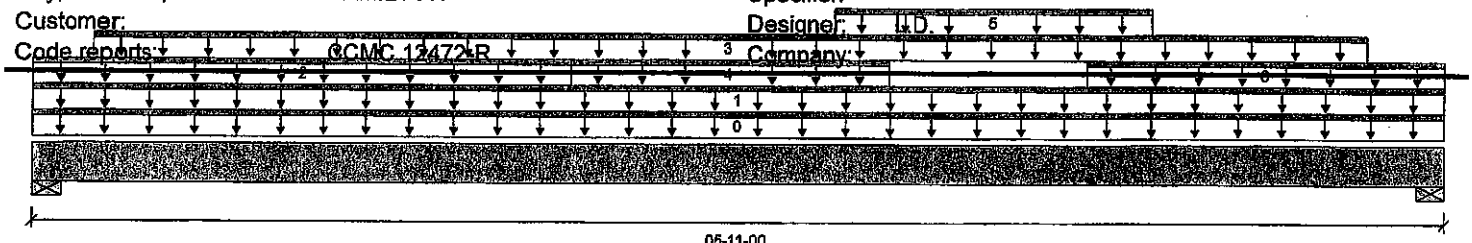
**1ST FLR FRAMING\Flush Beams\B28(i16217) (Flush Beam)**

BC Design Engine Member Report — Dry | 1 span | No cant. — March 24, 2022 12:49:26

Build 8183

Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 13472-R

File name: GRANDVILLE 12 - 601.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B28(i16217)
Specifier:
Designer: J.D.
Company:




**Total Horizontal Product Length = 05-11-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 1968 / 0 | 1662 / 0 | 380 / 0 | |
| B2, 5-1/2" | 1924 / 0 | 1641 / 0 | 380 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-11-00 | Top | | 12 | | | 00-00-00 |
| 1 | E35(i68) | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-11-00 | Top | | 217 | 129 | | n\a |
| 2 | E35(i68) | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-03-00 | Top | 361 | 181 | | | n\a |
| 3 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-03-00 | 05-07-00 | Front | 341 | 171 | | | n\a |
| 4 | E35(i68) | Unf. Lin. (lb/ft) | L | 02-03-00 | 03-07-00 | Top | 312 | 156 | | | n\a |
| 5 | E35(i68) | Unf. Lin. (lb/ft) | L | 03-04-04 | 04-08-04 | Top | 257 | 129 | | | n\a |
| 6 | E35(i68) | Unf. Lin. (lb/ft) | L | 04-05-00 | 05-11-00 | Top | 333 | 167 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 6145 ft-lbs | 35392 ft-lbs | 17.4% | 1 | 03-00-02 |
| End Shear | 3953 lbs | 14464 lbs | 27.3% | 1 | 04-05-10 |
| Total Load Deflection | L/999 (0.022") | n\a | n\a | 35 | 02-11-04 |
| Live Load Deflection | L/999 (0.013") | n\a | n\a | 51 | 02-11-04 |
| Max Defl. | 0.022" | n\a | n\a | 35 | 02-11-04 |
| Span / Depth | 5.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 5410 lbs | 45.7% | 23.0% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 5317 lbs | 44.9% | 22.6% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
22422
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM4906-22
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

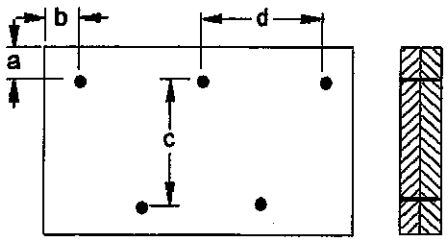
**PASSED**

## 1ST FLR FRAMING\Flush Beams\B28(i16217) (Flush Beam)

BC Design Engine Member Report — Dry | 1 span | No cant. — March 24, 2022 12:49:26
Build 8183

| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12 - 601.mmdl |
| Address: | | Description: | 1ST FLR FRAMING\Flush Beams\B28(i16217) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2" c = 7-7/8"
b minimum = 3" d = 8"

Calculated Side Load = 725.1 lb/ft
Connectors are: 16d Nails

1
3-1/2" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
3-24-22
S. KATSOULAKOS
PROVINCE OF ONTARIO

SWG NO, TAM 4906-22
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

**PASSED**

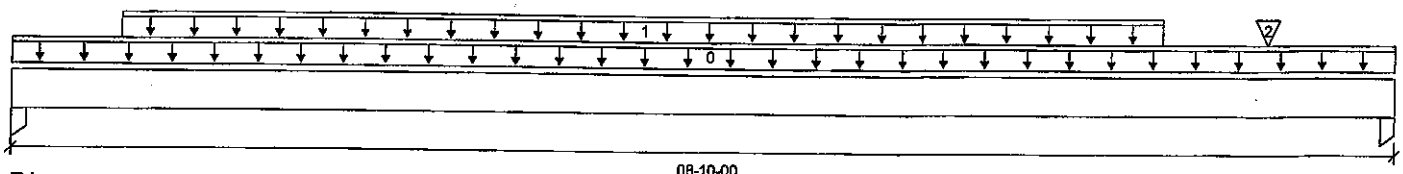
## 1ST FLR FRAMING\Flush Beams\B7 L(I11081) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B7 L(I11081)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 08-10-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 542 / 0 | 294 / 0 | | |
| B2, 1-3/4" | 580 / 0 | 313 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-10-00 | Top | | 5 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-08-00 | 07-04-00 | Top | 145 | 73 | | | n\a |
| 2 | J1(i10672) | Conc. Pt. (lbs) | L | 08-00-00 | 08-00-00 | Top | 157 | 79 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2935 ft-lbs | 11610 ft-lbs | 25.3% | 1 | 04-00-00 |
| End Shear | 1210 lbs | 5785 lbs | 20.9% | 1 | 07-10-12 |
| Total Load Deflection | L/999 (0.111") | n\a | n\a | 4 | 04-05-00 |
| Live Load Deflection | L/999 (0.072") | n\a | n\a | 5 | 04-05-00 |
| Max Defl. | 0.111" | n\a | n\a | 4 | 04-05-00 |
| Span / Depth | 10.9 | | | | |

## Bearing Supports

| | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|
| B1 Column | 1-3/4" x 1-3/4" | 1181 lbs | 47.5% | 31.6% | Unspecified |
| B2 Column | 1-3/4" x 1-3/4" | 1260 lbs | 50.7% | 33.7% | Unspecified |


BNG NO. YAM2389-21
STRUCTURAL
COMPONENT ONLY

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

## Disclosure

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

**PASSED**

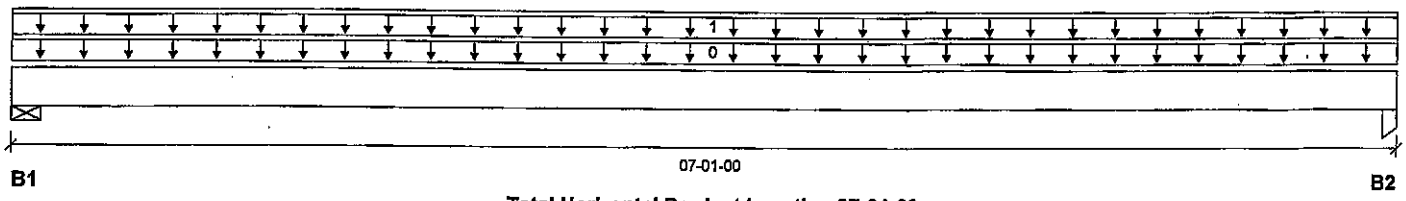
## 1ST FLR FRAMING\Flush Beams\B6 L(i10377) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B6 L(i10377)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 07-01-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-3/8" | 95 / 0 | 65 / 0 | | |
| B2, 1-3/4" | 94 / 0 | 64 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-01-00 | Top | | 5 | | | 00-00-00 |
| 1 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-01-00 | Top | 27 | 13 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 369 ft-lbs | 11610 ft-lbs | 3.2% | 1 | 03-06-13 |
| End Shear | 162 lbs | 5785 lbs | 2.8% | 1 | 00-11-14 |
| Total Load Deflection | L/999 (0.009") | n\a | n\a | 4 | 03-06-13 |
| Live Load Deflection | L/999 (0.005") | n\a | n\a | 5 | 03-06-13 |
| Max Defl. | 0.009" | n\a | n\a | 4 | 03-06-13 |
| Span / Depth | 8.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 2-3/8" x 1-3/4" | 224 lbs | 8.7% | 4.4% | Spruce-Pine-Fir |
| B2 | Column | 1-3/4" x 1-3/4" | 220 lbs | 8.9% | 5.9% | Unspecified |


OWC NO. TAM7390-21
STRUCTURAL
COMPONENT ONLY

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-10-10.

CONFORMS TO OBC 2012
AMENDED 2020

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP

**PASSED**

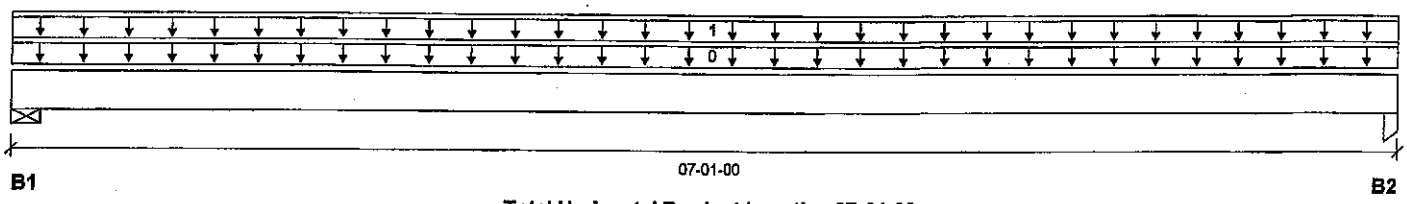
## 1ST FLR FRAMING\Flush Beams\B8 L(i10781) (Flush Beam)

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

March 24, 2021 16:16:54

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B8 L(i10781)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 07-01-00

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-3/8" | 59 / 0 | 47 / 0 | | |
| B2, 1-3/4" | 59 / 0 | 46 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-01-00 | Top | | 5 | | | 00-00-00 |
| 1 | FC2 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-01-00 | Top | 17 | 8 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 244 ft-lbs | 11610 ft-lbs | 2.1% | 1 | 03-06-13 |
| End Shear | 107 lbs | 5785 lbs | 1.8% | 1 | 00-11-14 |
| Total Load Deflection | L/999 (0.006") | n\a | n\a | 4 | 03-06-13 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 03-06-13 |
| Max Defl. | 0.006" | n\a | n\a | 4 | 03-06-13 |
| Span / Depth | 8.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 2-3/8" x 1-3/4" | 148 lbs | 5.8% | 2.9% | Spruce-Pine-Fir |
| B2 | Column | 1-3/4" x 1-3/4" | 146 lbs | 5.9% | 3.9% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM739/ -21
STRUCTURAL
COMPONENT ONLY

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-10-10.

CONFORMS TO OBC 2012
AMENDED 2020

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

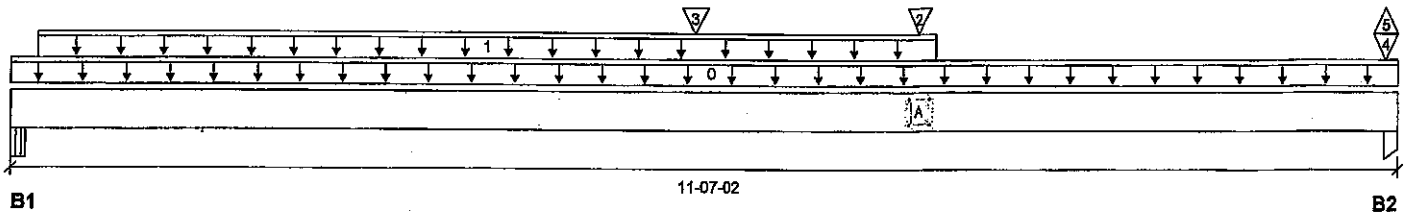
## 1ST FLR FRAMING\Flush Beams\B9(i10835) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B9(i10835)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 11-07-02**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 570 / 0 | 375 / 0 | | |
| B2, 5" | 4019 / 1 | 2832 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-07-02 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-02-10 | 07-08-02 | Top | 27 | 13 | | | n\a |
| 2 | B10(i10816) | Conc. Pt. (lbs) | L | 07-06-06 | 07-06-06 | Top | 1146 | 632 | | | n\a |
| 3 | STAIRS | Conc. Pt. (lbs) | L | 05-07-14 | 05-07-14 | Top | 75 | 38 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 11-05-14 | 11-05-14 | Top | 3125 | 2277 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 11-05-14 | 11-05-14 | Top | -1 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 7236 ft-lbs | 35392 ft-lbs | 20.4% | 1 | 07-06-06 |
| End Shear | 1983 lbs | 14464 lbs | 13.7% | 1 | 10-02-04 |
| Total Load Deflection | L/999 (0.093") | n\a | n\a | 6 | 06-01-08 |
| Live Load Deflection | L/999 (0.058") | n\a | n\a | 8 | 06-01-08 |
| Max Defl. | 0.093" | n\a | n\a | 6 | 06-01-08 |
| Span / Depth | 11.0 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 1325 lbs | 13.5% | 5.9% | Unspecified |
| B2 | Column | 5" x 3-1/2" | 9569 lbs | 67.3% | 44.8% | Unspecified |

## Cautions

Concentrated side load(s) 9,8 are closer than 18" from end of member. Please consult a technical representative or Professional of Record.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 05-01-04.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

BMG NO. TAM1393-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**1ST FLR FRAMING\Flush Beams\B9(i10835) (Flush Beam)**

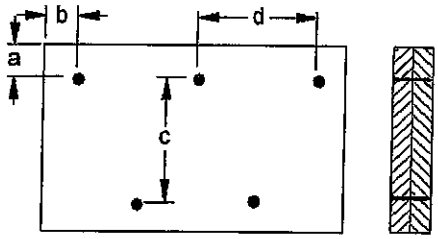
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B9(i10835)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member

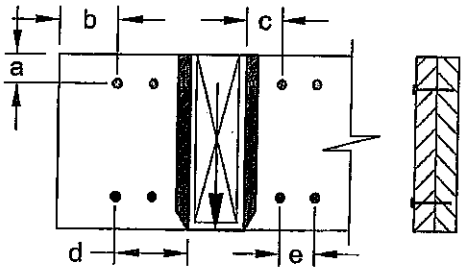



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: ~~A Applies to load~~ tag(s): 6




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
e minimum = 4"
Connectors are: 16d Nails
3½" ARDOX SPIRAL


DWG NO. TAM 7393 -2L
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

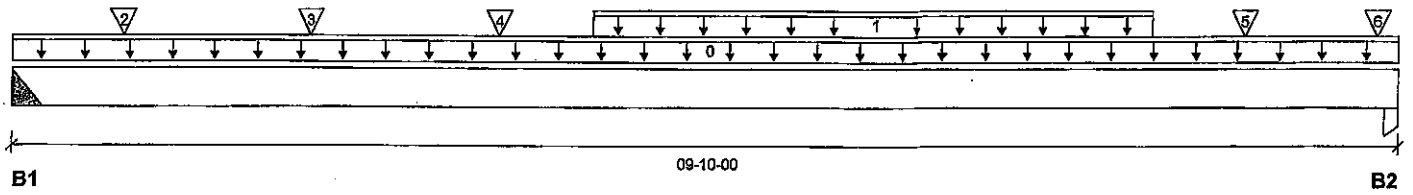
**1ST FLR FRAMING\Flush Beams\B10(i10816) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B10(i10816)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 09-10-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1178 / 0 | 649 / 0 | | |
| B2, 3-1/2" | 1348 / 0 | 783 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-10-00 | Top | | 12 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 04-01-00 | 08-01-00 | Top | 152 | 77 | | | n\a |
| 2 | J7(i9855) | Conc. Pt. (lbs) | L | 00-09-00 | 00-09-00 | Top | 369 | 185 | | | n\a |
| 3 | J7(i9862) | Conc. Pt. (lbs) | L | 02-01-00 | 02-01-00 | Top | 444 | 222 | | | n\a |
| 4 | J7(i9854) | Conc. Pt. (lbs) | L | 03-05-00 | 03-05-00 | Top | 338 | 169 | | | n\a |
| 5 | J7(i10957) | Conc. Pt. (lbs) | L | 08-09-00 | 08-09-00 | Top | 178 | 89 | | | n\a |
| 6 | B12(i10893) | Conc. Pt. (lbs) | L | 09-08-04 | 09-08-04 | Top | 588 | 343 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4768 ft-lbs | 35392 ft-lbs | 13.5% | 1 | 04-09-00 |
| End Shear | 2105 lbs | 14464 lbs | 14.6% | 1 | 01-03-14 |
| Total Load Deflection | L/999 (0.054") | n\a | n\a | 4 | 04-09-00 |
| Live Load Deflection | L/999 (0.035") | n\a | n\a | 5 | 04-09-00 |
| Max Defl. | 0.054" | n\a | n\a | 4 | 04-09-00 |
| Span / Depth | 9.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 2579 lbs | n\a | 15.1% | HGUS410 |
| B2 | Column | 3-1/2" x 3-1/2" | 3001 lbs | 30.2% | 20.1% | Unspecified |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012
AMENDED 2020

PROFESSIONAL ENGINEERS
S. KATSOULAKOS
PROVINCE OF ONTARIO

P64/2

BCIN NO. TAN7394-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**1ST FLR FRAMING\Flush Beams\B10(i10816) (Flush Beam)**

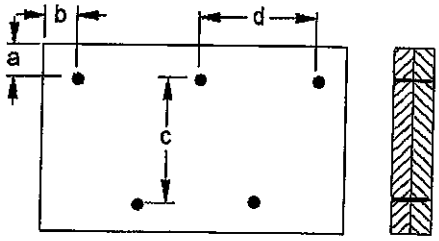
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B10(i10816)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Calculated Side Load = 830.9 lb/ft
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL


DWG NO. TAM 7394-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

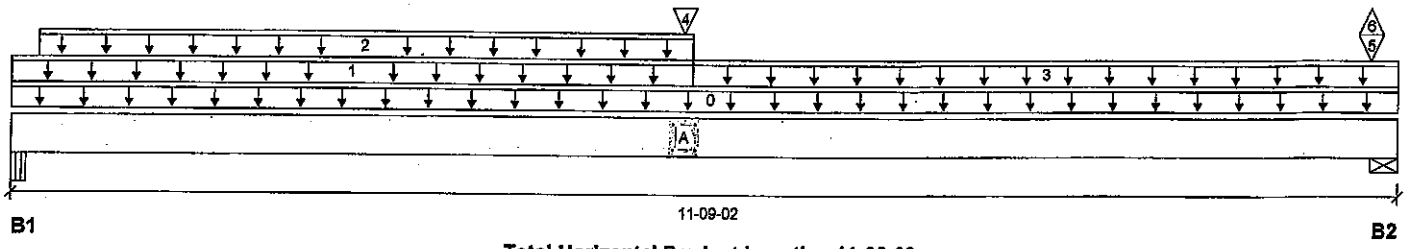
## 1ST FLR FRAMING\Flush Beams\B11(i10714) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B11(i10714)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 11-09-02**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 446 / 0 | 299 / 0 | | |
| B2, 5-1/2" | 872 / 3 | 596 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-09-02 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-08-10 | Top | 7 | 4 | | | n\a |
| 2 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-02-10 | 05-08-10 | Top | 17 | 9 | | | n\a |
| 3 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 05-08-10 | 11-09-02 | Top | 10 | 5 | | | n\a |
| 4 | B13(i10976) | Conc. Pt. (lbs) | L | 05-07-12 | 05-07-12 | Top | 629 | 325 | | | n\a |
| 5 | 12(i142) | Conc. Pt. (lbs) | L | 11-06-06 | 11-06-06 | Top | 493 | 330 | | | n\a |
| 6 | 12(i142) | Conc. Pt. (lbs) | L | 11-06-06 | 11-06-06 | Top | -3 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4476 ft-lbs | 35392 ft-lbs | 12.6% | 1 | 05-07-12 |
| End Shear | 955 lbs | 14464 lbs | 6.6% | 1 | 01-05-02 |
| Total Load Deflection | L/999 (0.059") | n\a | n\a | 6 | 05-08-10 |
| Live Load Deflection | L/999 (0.036") | n\a | n\a | 8 | 05-08-10 |
| Max Defl. | 0.059" | n\a | n\a | 6 | 05-08-10 |
| Span / Depth | 11.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 1042 lbs | 10.6% | 4.6% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 2053 lbs | 17.3% | 8.7% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 05-07-00.

CONFORMS TO OBC 2012
AMENDED 2020


DWG NO. TAM 7392-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**1ST FLR FRAMING\Flush Beams\B11(i10714) (Flush Beam)**

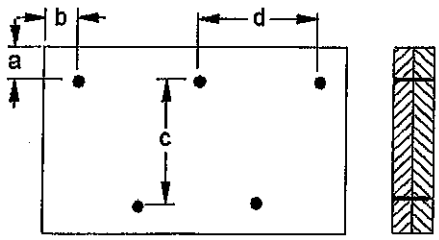
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B11(i10714)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member

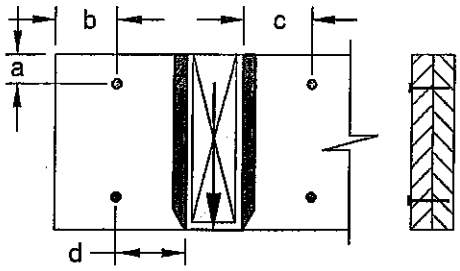



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = ~~8~~ 8d

Connectors are: 1 .... .ı Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: ~~A Applies to load~~ tag(s): 3




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d 1 . Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM7392-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

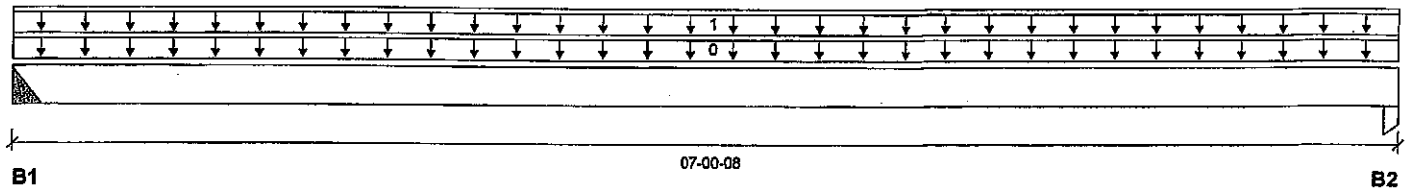
## 1ST FLR FRAMING\Flush Beams\B2 H(i11053) (Flush Beam)

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

March 24, 2021 16:16:54

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B2 H(i11053)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 07-00-08**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 52 / 0 | 48 / 0 | | |
| B2, 1-3/4" | 51 / 0 | 46 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-00-08 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-00-08 | Top | 15 | 7 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 221 ft-lbs | 17696 ft-lbs | 1.2% | 1 | 03-06-14 |
| End Shear | 90 lbs | 7232 lbs | 1.2% | 1 | 01-02-14 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 4 | 03-06-14 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 5 | 03-06-14 |
| Max Defl. | 0.003" | n\a | n\a | 4 | 03-06-14 |
| Span / Depth | 6.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 138 lbs | n\a | 2.1% | HUS1.81/10 |
| B2 | Column | 1-3/4" x 1-3/4" | 134 lbs | 5.4% | 3.6% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
3254
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 7385-21
STRUCTURAL
COMPONENT ONLY

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 07-00-08.

CONFORMS TO OBC 2012
AMENDED 2020

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

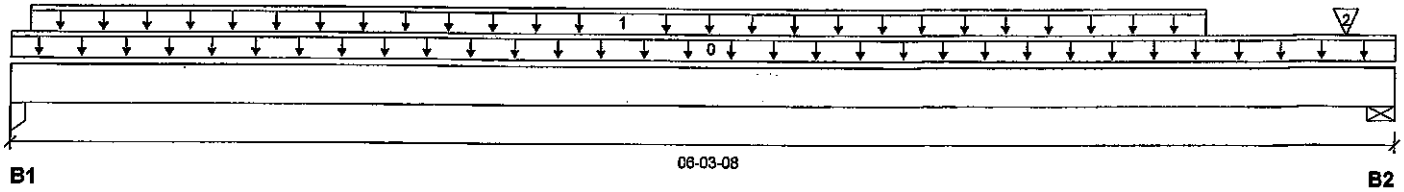
## 1ST FLR FRAMING\Flush Beams\B3 H(i10753) (Flush Beam)

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

March 24, 2021 16:16:54

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B3 H(i10753)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 06-03-08**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 1-3/4" | 691 / 0 | 364 / 0 | | |
| B2, 5-1/2" | 634 / 0 | 349 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-03-08 | Top | | 6 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-01-00 | 05-05-00 | Top | 239 | 120 | | | n\a |
| 2 | 1(i84) | Conc. Pt. (lbs) | L | 06-00-12 | 06-00-12 | Top | 49 | 36 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2214 ft-lbs | 17696 ft-lbs | 12.5% | 1 | 03-05-00 |
| End Shear | 1259 lbs | 7232 lbs | 17.4% | 1 | 04-10-02 |
| Total Load Deflection | L/999 (0.019") | n\a | n\a | 4 | 03-00-00 |
| Live Load Deflection | L/999 (0.013") | n\a | n\a | 5 | 03-00-00 |
| Max Defl. | 0.019" | n\a | n\a | 4 | 03-00-00 |
| Span / Depth | 5.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 1-3/4" x 1-3/4" | 1491 lbs | 60.0% | 39.9% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 1-3/4" | 1388 lbs | 23.4% | 11.8% | Spruce-Pine-Fir |


DWG NO. TAM 7396-2L
STRUCTURAL
COMPONENT ONLY

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO O86 2012
AMENDED 2020

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

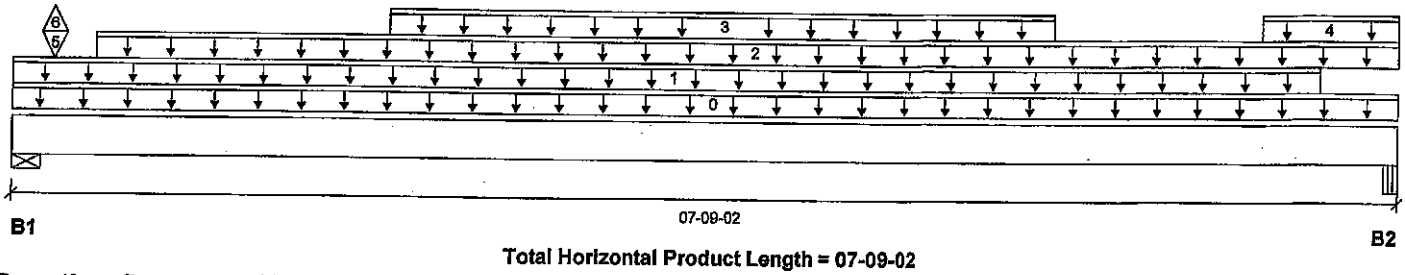
**1ST FLR FRAMING\Flush Beams\B4 H(i10751) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B4 H(i10751)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 07-09-02**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 166 / 7 | 500 / 0 | 119 / 0 | |
| B2, 5-1/4" | 287 / 0 | 475 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-09-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-03-14 | Top | 5 | 3 | | | n\a |
| 2 | 8(i130) | Unf. Lin. (lb/ft) | L | 00-05-08 | 07-09-02 | Top | | 81 | | | n\a |
| 3 | 8(i130) | Unf. Lin. (lb/ft) | L | 02-00-15 | 05-09-09 | Top | 48 | 22 | | | n\a |
| 4 | 8(i130) | Unf. Lin. (lb/ft) | L | 06-11-14 | 07-09-02 | Top | 229 | 105 | | | n\a |
| 5 | E70(i144) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 59 | 156 | 119 | | n\a |
| 6 | E70(i144) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | -7 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 955 ft-lbs | 11502 ft-lbs | 8.3% | 0 | 03-09-14 |
| End Shear | 466 lbs | 4701 lbs | 9.9% | 0 | 01-03-06 |
| Total Load Deflection | L/999 (0.018") | n\a | n\a | 58 | 03-09-14 |
| Live Load Deflection | L/999 (0.005") | n\a | n\a | 85 | 03-09-14 |
| Max Defl. | 0.018" | n\a | n\a | 58 | 03-09-14 |
| Span / Depth | 7.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 1-3/4" | 700 lbs | 28.6% | 14.4% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/4" x 1-3/4" | 1024 lbs | 20.9% | 9.1% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 07-00-06.

CONFORMS TO OBC 2012
AMENDED 2020


OHC NO. FAM 7397-21

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

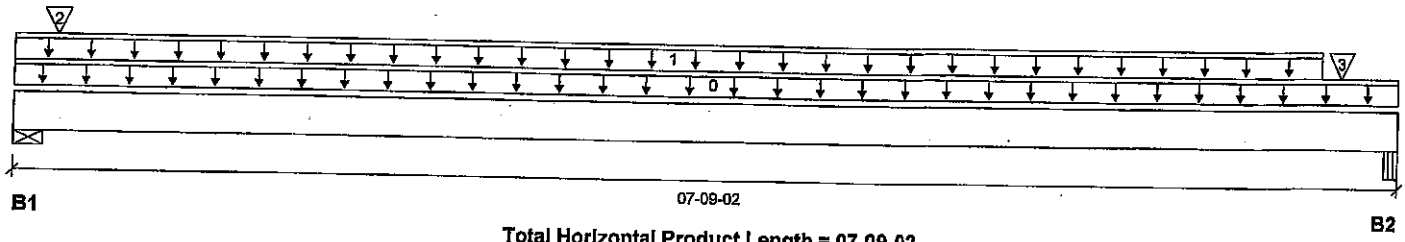
**1ST FLR FRAMING\Flush Beams\B5 H(i10726) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B5 H(i10726)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 07-09-02

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 154 / 0 | 192 / 0 | 118 / 0 | |
| B2, 5-1/4" | 54 / 0 | 51 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-09-02 | Top | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-03-14 | Top | 14 | 7 | | | n\a |
| 2 | E40(i79) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 99 | 142 | 118 | | n\a |
| 3 | FC1 Floor Decking (Plan View Fill) | Conc. Pt. (lbs) | L | 07-05-03 | 07-05-03 | Top | 3 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 244 ft-lbs | 17696 ft-lbs | 1.4% | 1 | 03-09-11 |
| End Shear | 96 lbs | 7232 lbs | 1.3% | 1 | 01-03-06 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 35 | 03-09-11 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 51 | 03-09-11 |
| Max Defl. | 0.003" | n\a | n\a | 35 | 03-09-11 |
| Span / Depth | 7.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 1-3/4" | 589 lbs | 15.6% | 7.9% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/4" x 1-3/4" | 144 lbs | 2.9% | 1.3% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 07-00-06.

CONFORMS TO OBC 2012
AMENDED 2020


DWG NO. TAM7398-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

Boise Cascade ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

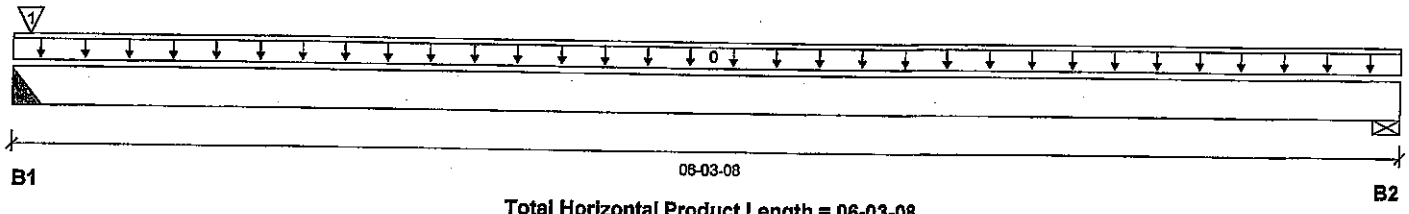
## 1ST FLR FRAMING\Flush Beams\B1 H(i10719) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B1 H(i10719)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 06-03-08

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-1/2" | 52 / 0 | 592 / 0 | | |
| B2, 5-1/2" | | 39 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-03-08 | Top | | 12 | | | 00-00-00 |
| 1 | - | Conc. Pt. (lbs) | L | 00-00-14 | 00-00-14 | Top | 52 | 556 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 70 ft-lbs | 21267 ft-lbs | 0.3% | 0 | 03-00-04 |
| End Shear | 31 lbs | 9401 lbs | 0.3% | 0 | 01-02-06 |
| Total Load Deflection | L/999 (0") | n\a | n\a | 4 | 03-00-04 |
| Max Defl. | 0" | n\a | n\a | 4 | 03-00-04 |
| Span / Depth | 5.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 2-1/2" x 3-1/2" | 829 lbs | n\a | 12.0% | HUC410 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 55 lbs | 0.7% | 0.4% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUC410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. Okay

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 06-01-12, Bottom: 05-08-04.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
3254
S. KATSOULIDIS
PROVINCE OF ONTARIO

P6 4/2

BUILDING PERMIT NO. TAM B99-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B1 H(i10719) (Flush Beam)

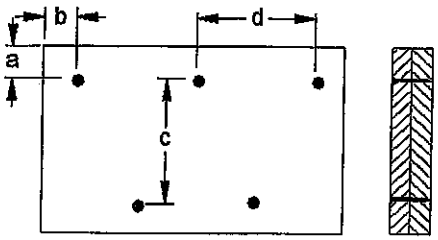
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B1 H(i10719)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible] 4

Calculated Side Load = 67.0 lb/ft
Connectors are: [illegible] Nails
3½" ARDOX SPIRAL


DWG NO. TAM 7399-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

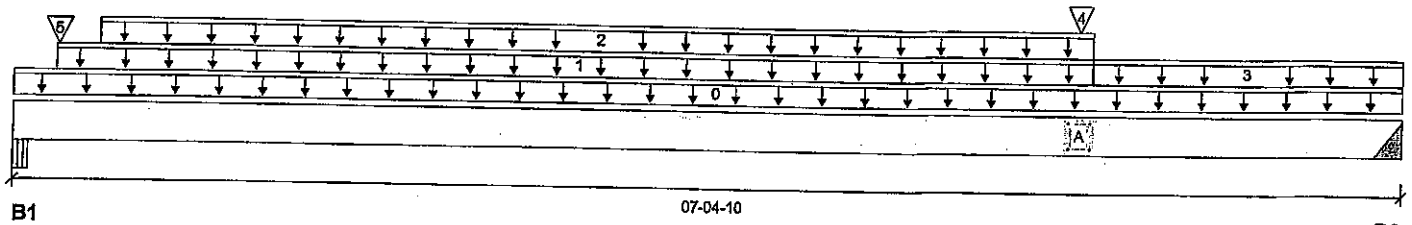
## 1ST FLR FRAMING\Flush Beams\B12(i10893) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B12(i10893)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 07-04-10

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 347 / 0 | 246 / 0 | | |
| B2, 2-1/2" | 591 / 0 | 347 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-04-10 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-02-10 | 05-08-10 | Top | 19 | 9 | | | n\a |
| 2 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-05-04 | 05-08-10 | Top | 12 | 6 | | | n\a |
| 3 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 05-08-10 | 07-04-10 | Top | 22 | 11 | | | n\a |
| 4 | B13(i10976) | Conc. Pt. (lbs) | L | 05-07-12 | 05-07-12 | Top | 643 | 332 | | | n\a |
| 5 | 9(i129) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | 90 | 69 | | | n\a |

## Controls Summary

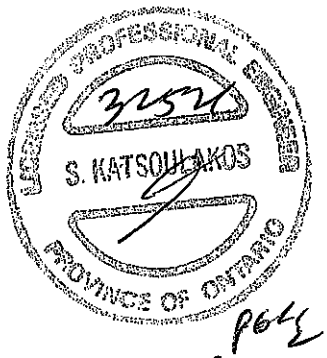
| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2009 ft-lbs | 35392 ft-lbs | 5.7% | 1 | 05-07-12 |
| End Shear | 1246 lbs | 14464 lbs | 8.6% | 1 | 06-02-04 |
| Total Load Deflection | L/999 (0.011") | n\a | n\a | 4 | 04-01-09 |
| Live Load Deflection | L/999 (0.007") | n\a | n\a | 5 | 04-01-09 |
| Max Defl. | 0.011" | n\a | n\a | 4 | 04-01-09 |
| Span / Depth | 6.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 829 lbs | 8.4% | 3.7% | Unspecified |
| B2 | Hanger | 2-1/2" x 3-1/2" | 1320 lbs | n\a | 12.4% | HUC410 |

## Cautions

Header for the hanger HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUC410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.




JOB NO. TAM 7400-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**1ST FLR FRAMING\Flush Beams\B12(i10893) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

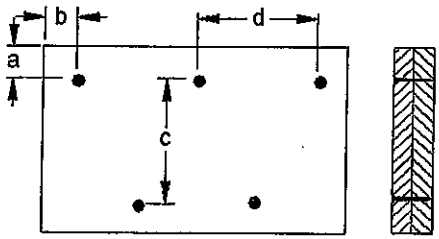
File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B12(i10893)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 05-01-10.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member

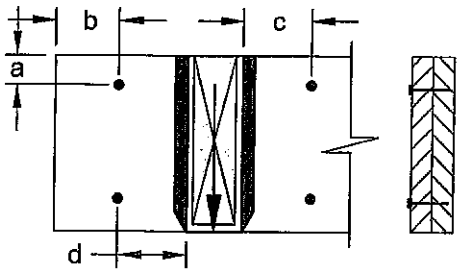



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = ~~8~~ 4

Connectors are: 1 . Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: ~~A Applies to load~~ tag(s): 5




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d 1 " Nails
3½" ARDOX SPIRAL


DWG NO. TAM7400-2L
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

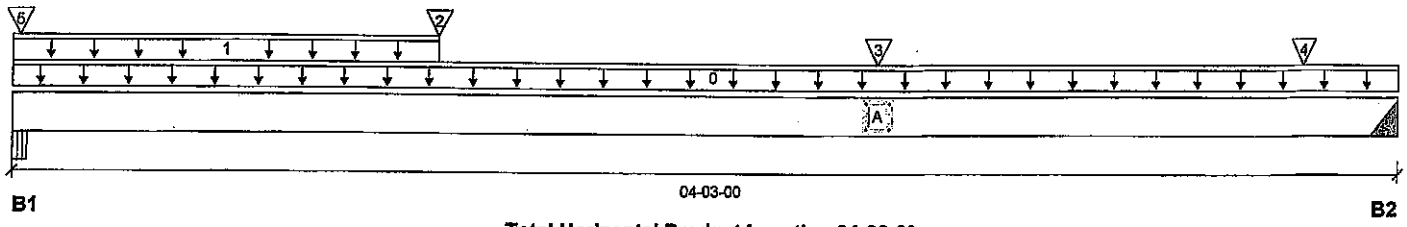
## 1ST FLR FRAMING\Flush Beams\B22(i10870) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B22(i10870)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 04-03-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-5/8" | 1276 / 0 | 696 / 0 | | |
| B2, 2-1/2" | 1391 / 0 | 722 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-03-00 | Top | | 12 | | | 00-00-00 |
| 1 | FC1 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-03-08 | Top | 39 | 20 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 01-03-08 | 01-03-08 | Top | 883 | 442 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 02-07-08 | 02-07-08 | Top | 811 | 406 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 03-11-08 | 03-11-08 | Top | 646 | 323 | | | n\a |
| 5 | 4(i122) | Conc. Pt. (lbs) | L | 00-00-04 | 00-00-04 | Top | 275 | 169 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2565 ft-lbs | 35392 ft-lbs | 7.2% | 1 | 02-07-08 |
| End Shear | 2041 lbs | 14464 lbs | 14.1% | 1 | 01-02-08 |
| Total Load Deflection | L/999 (0.005") | n\a | n\a | 4 | 02-01-08 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 02-01-08 |
| Max Defl. | 0.005" | n\a | n\a | 4 | 02-01-08 |
| Span / Depth | 4.0 | | | | |

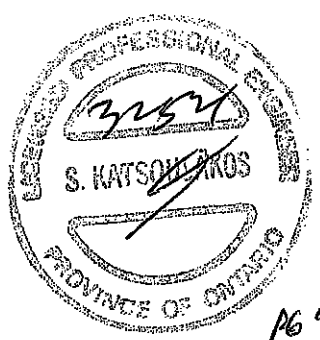
## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 2-5/8" x 3-1/2" | 2783 lbs | 56.7% | 24.8% | Unspecified |
| B2 | Hanger | 2-1/2" x 3-1/2" | 2989 lbs | n\a | 28.0% | HUC410 |

## Cautions

Header for the hanger HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUC410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

ONLY




P6 of 12

BCIN NO. YAM 7401-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**1ST FLR FRAMING\Flush Beams\B22(i10870) (Flush Beam)**

Dry | 1 span | No cant.

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

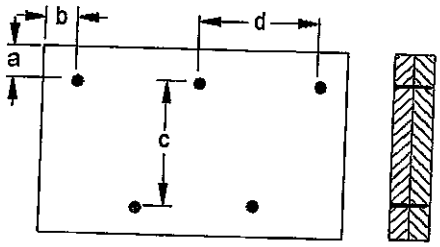
March 24, 2021 16:16:54

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B22(i10870)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
CONFORMS TO OBC 2012
Resistance Factor phi has been applied to all presented results per CSA O86.
AMENDED 2020
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-00-08.

## Connection Diagram: Full Length of Member

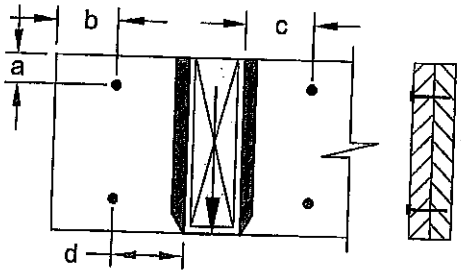



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8 cl

Calculated Side Load = 465.4 lb/ft
Connectors are: 1 Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: ~~A~~ Applies to load tag(s): 5+6




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are:
Nails
1
3½" ARDOX SPIRAL

ASSOCIATION OF PROFESSIONAL ENGINEERS
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 7401-2
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

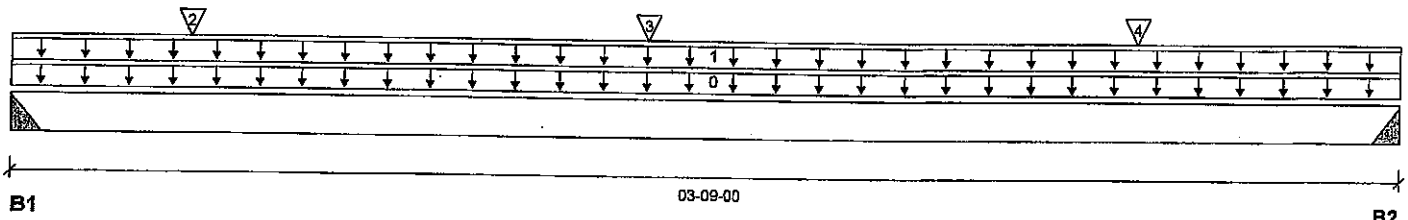
## 1ST FLR FRAMING\Flush Beams\B13(i10976) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B13(i10976)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 03-09-00

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3" | 644 / 0 | 333 / 0 | | |
| B2, 3" | 628 / 0 | 325 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-09-00 | Top | | 6 | | | 00-00-00 |
| 1 | STAIRS | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-09-00 | Top | 240 | 120 | | | n\a |
| 2 | J8(i10818) | Conc. Pt. (lbs) | L | 00-05-10 | 00-05-10 | Top | 103 | 51 | | | n\a |
| 3 | J8(i10000) | Conc. Pt. (lbs) | L | 01-08-06 | 01-08-06 | Top | 145 | 72 | | | n\a |
| 4 | J8(i10422) | Conc. Pt. (lbs) | L | 03-00-06 | 03-00-06 | Top | 124 | 62 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1082 ft-lbs | 17696 ft-lbs | 6.1% | 1 | 01-08-06 |
| End Shear | 570 lbs | 7232 lbs | 7.9% | 1 | 01-02-14 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 4 | 01-10-03 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 5 | 01-10-03 |
| Max Defl. | 0.003" | n\a | n\a | 4 | 01-10-03 |
| Span / Depth | 3.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 3" x 1-3/4" | 1382 lbs | n\a | 21.6% | HUS1.81/10 |
| B2 | Hanger | 3" x 1-3/4" | 1348 lbs | n\a | 21.0% | HUS1.81/10 |

## Cautions

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

CONFORMS TO OBC 2012 AMENDED 2020

LICENSED PROFESSIONAL ENGINEERS
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM7402-21
STRUCTURAL COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

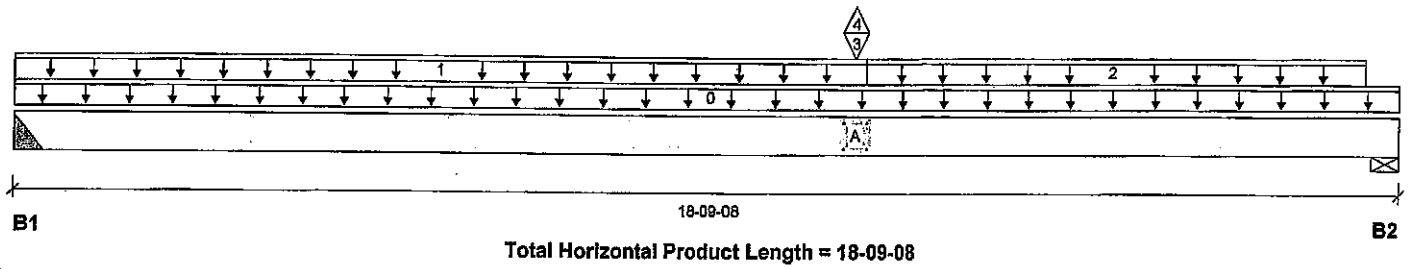
## 2ND FLR FRAMING\Flush Beams\B17(i10732) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B17(i10732)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 18-09-08**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 822 / 2 | 555 / 0 | | |
| B2, 5-1/2" | 1158 / 3 | 741 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 18-09-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-05-08 | Top | 19 | 10 | | | n\a |
| 2 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 11-05-08 | 18-04-00 | Top | 13 | 7 | | | n\a |
| 3 | B18(i10997) | Conc. Pt. (lbs) | L | 11-03-12 | 11-03-12 | Top | 1671 | 915 | | | n\a |
| 4 | B18(i10997) | Conc. Pt. (lbs) | L | 11-03-12 | 11-03-12 | Top | -5 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 17740 ft-lbs | 35392 ft-lbs | 50.1% | 1 | 11-03-12 |
| End Shear | 2613 lbs | 14464 lbs | 18.1% | 1 | 17-04-02 |
| Total Load Deflection | L/347 (0.626") | n\a | 69.1% | 6 | 09-09-00 |
| Live Load Deflection | L/563 (0.387") | n\a | 64.0% | 8 | 09-10-14 |
| Max Defl. | 0.626" | n\a | n\a | 6 | 09-09-00 |
| Span / Depth | 18.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 1927 lbs | n\a | 11.3% | HGUS410 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 2663 lbs | 22.5% | 11.3% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

p0 42

BNB NO. TAM 7405-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**2ND FLR FRAMING\Flush Beams\B17(i10732) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

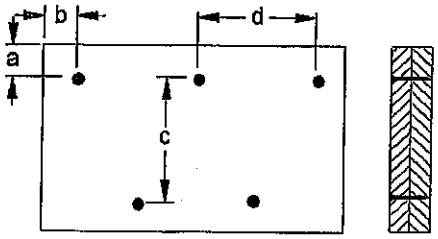
File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B17(i10732)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 11-02-00.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member

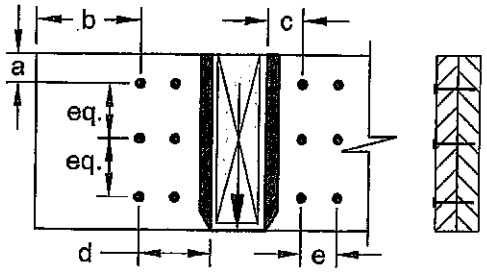



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: 1 Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 2+3




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
e minimum = 4"
Connectors are: 16d 1 Nails
3½" ARDOX SPIRAL


DWG NO. TAM2405-2L
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

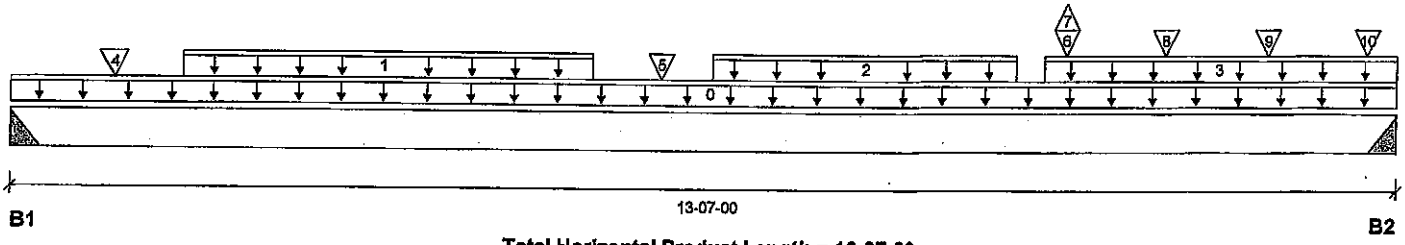
## 2ND FLR FRAMING\Flush Beams\B18(i10997) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B18(i10997)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 13-07-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 682 / 2 | 422 / 0 | | |
| B2, 4" | 1688 / 5 | 924 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 13-07-00 | Top | | 12 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-07-10 | 05-07-10 | Top | 87 | 44 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 06-09-10 | 09-09-10 | Top | 87 | 43 | | | n\a |
| 3 | STAIRS | Unf. Lin. (lb/ft) | L | 10-01-00 | 13-07-00 | Top | 240 | 120 | | | n\a |
| 4 | J5(i10704) | Conc. Pt. (lbs) | L | 00-11-10 | 00-11-10 | Top | 106 | 53 | | | n\a |
| 5 | J5(i10939) | Conc. Pt. (lbs) | L | 06-03-10 | 06-03-10 | Top | 101 | 51 | | | n\a |
| 6 | J3(i10917) | Conc. Pt. (lbs) | L | 10-03-10 | 10-03-10 | Top | 80 | 37 | | | n\a |
| 7 | J3(i10917) | Conc. Pt. (lbs) | L | 10-03-10 | 10-03-10 | Top | -7 | | | | n\a |
| 8 | J3(i10886) | Conc. Pt. (lbs) | L | 11-03-10 | 11-03-10 | Top | 233 | 117 | | | n\a |
| 9 | J3(i10810) | Conc. Pt. (lbs) | L | 12-03-10 | 12-03-10 | Top | 233 | 117 | | | n\a |
| 10 | J3(i10890) | Conc. Pt. (lbs) | L | 13-03-10 | 13-03-10 | Top | 168 | 84 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 6207 ft-lbs | 35392 ft-lbs | 17.5% | 1 | 08-03-10 |
| End Shear | 2615 lbs | 14464 lbs | 18.1% | 1 | 12-03-02 |
| Total Load Deflection | L/1116 (0.14") | n\a | 21.5% | 6 | 07-00-10 |
| Live Load Deflection | L/999 (0.088") | n\a | n\a | 8 | 07-00-10 |
| Max Defl. | 0.14" | n\a | n\a | 6 | 07-00-10 |
| Span / Depth | 13.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 1549 lbs | n\a | 9.1% | HGUS410 |
| B2 | Hanger | 4" x 3-1/2" | 3687 lbs | n\a | 21.6% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.


P6 4

BCIN NO. YAM 74062
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**2ND FLR FRAMING\Flush Beams\B18(i10997) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

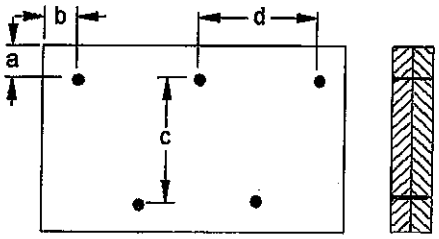
File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B18(i10997)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 01-01-08.

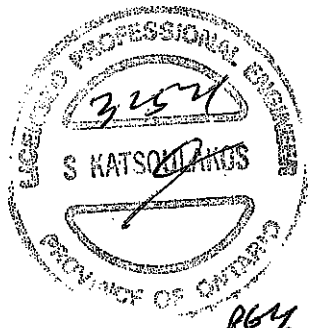
CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = B

Calculated Side Load = 331.0 lb/ft
Connectors are: 16d 1 Nails
3½" ARDOX SPIRAL




DWG NO. TAM 2406-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Triple 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

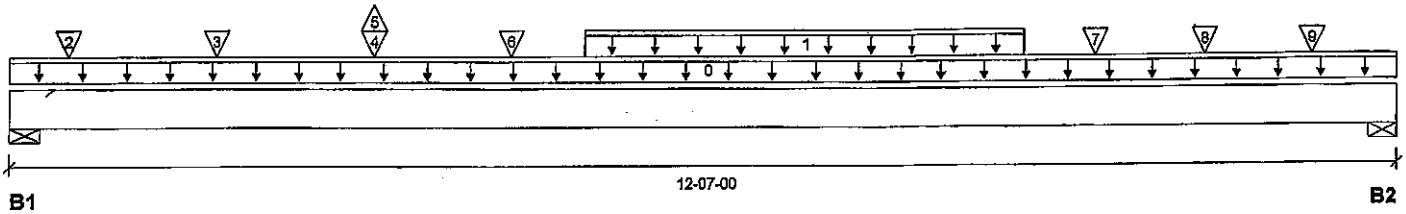
**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B15 DR(I10778) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — March 24, 2021 16:16:54

Build 7773

| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Dropped Beams\B15 DR(I10778) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 12-07-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 3418 / 1 | 1912 / 0 | | |
| B2, 3-1/2" | 2440 / 0 | 1365 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 12-07-00 | Top | | 18 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 05-02-00 | 09-02-00 | Top | 372 | 186 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 00-06-00 | 00-06-00 | Top | 874 | 437 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 01-10-00 | 01-10-00 | Top | 682 | 341 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 03-03-03 | 03-03-03 | Top | 1121 | 682 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 03-03-03 | 03-03-03 | Top | -1 | | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 04-06-00 | 04-06-00 | Top | 492 | 246 | | | n\a |
| 7 | - | Conc. Pt. (lbs) | L | 09-10-00 | 09-10-00 | Top | 434 | 217 | | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 10-10-00 | 10-10-00 | Top | 372 | 186 | | | n\a |
| 9 | - | Conc. Pt. (lbs) | L | 11-10-00 | 11-10-00 | Top | 372 | 186 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 17878 ft-lbs | 55211 ft-lbs | 32.4% | 1 | 05-10-00 |
| End Shear | 5985 lbs | 21696 lbs | 27.6% | 1 | 01-03-06 |
| Total Load Deflection | L/633 (0.23") | n\a | 37.9% | 6 | 06-02-00 |
| Live Load Deflection | L/991 (0.147") | n\a | 36.3% | 8 | 06-02-00 |
| Max Defl. | 0.23" | n\a | n\a | 6 | 06-02-00 |
| Span / Depth | 12.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 5-1/4" | 7517 lbs | 30.7% | 33.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 5-1/4" | 5366 lbs | 21.9% | 23.9% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 01-02-12, Bottom: 12-07-00.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
3521
S. KATSOULAKOS
PROVINCE OF ONTARIO

P64

DWG NO. TAM2407-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Triple 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B15 DR(i10778) (Dropped Beam)

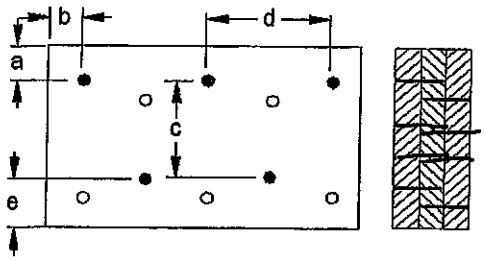
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B15 DR(i10778)
Specifier:
Designer: L.D.
Company:

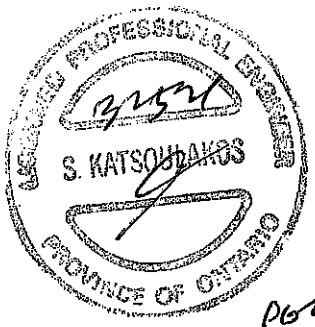
## Connection Diagram: Full Length of Member




4 rows

a minimum = 2"
b minimum = 3"
c = 8-7/8"
d = 12"
e minimum = 2"

Nailing applies to both sides of the member
Connectors are: 1 Nails
3½" ARDOX SPIRAL




pour

DWG NO. TAM 2401-2E
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,

Boise Cascade ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

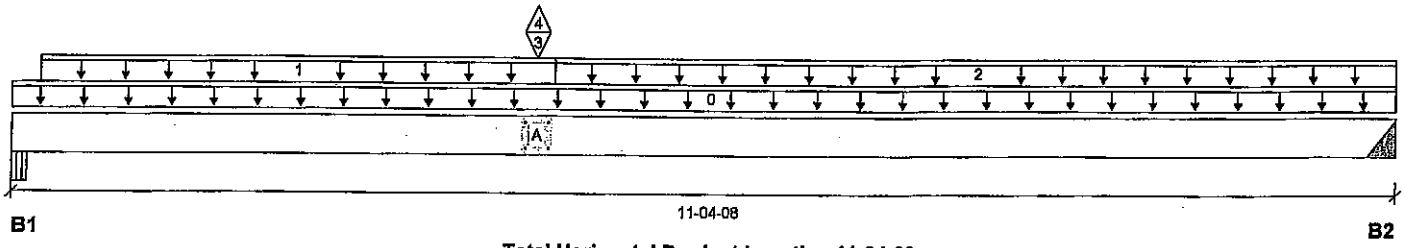
## 2ND FLR FRAMING\Flush Beams\B16(I10989) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B16(I10989)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 11-04-08**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 551 / 1 | 396 / 0 | | |
| B2, 4" | 303 / 1 | 249 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-04-08 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-02-10 | 04-05-00 | Top | 27 | 14 | | | n\a |
| 2 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 04-05-00 | 11-04-08 | Top | 6 | 3 | | | n\a |
| 3 | B18(i10997) | Conc. Pt. (lbs) | L | 04-03-04 | 04-03-04 | Top | 699 | 430 | | | n\a |
| 4 | B18(i10997) | Conc. Pt. (lbs) | L | 04-03-04 | 04-03-04 | Top | -2 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4537 ft-lbs | 35392 ft-lbs | 12.8% | 1 | 04-03-04 |
| End Shear | 1230 lbs | 14464 lbs | 8.5% | 1 | 01-05-02 |
| Total Load Deflection | L/999 (0.056") | n\a | n\a | 6 | 05-03-09 |
| Live Load Deflection | L/999 (0.033") | n\a | n\a | 8 | 05-03-09 |
| Max Defl. | 0.056" | n\a | n\a | 6 | 05-03-09 |
| Span / Depth | 10.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 1322 lbs | 5.9% | 5.9% | VL 2.0 3100 SP |
| B2 | Hanger | 4" x 3-1/2" | 765 lbs | n\a | 4.5% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
3454
S. KATSOULAKOS
PROVINCE OF ONTARIO

REVIEWED FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE BUILDING AND GENERAL COMPLIANCE WITH THE ONTARIO BUILDING CODE. THIS REVIEW DOES NOT INCLUDE SHOP DRAWING CHECKING OR STRUCTURAL COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**2ND FLR FRAMING\Flush Beams\B16(i10989) (Flush Beam)**

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

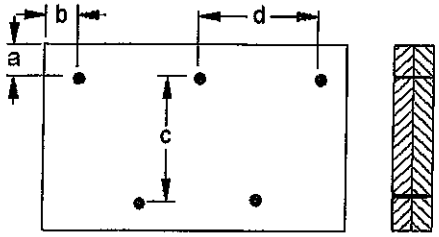
File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B16(i10989)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 06-11-08.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member

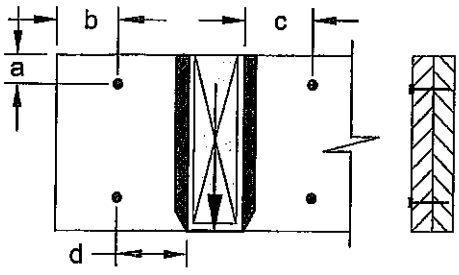



a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: 1 . Nails
3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 2+3




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d 1 . Nails
3½" ARDOX SPIRAL


BUG NO. TAM 2400-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

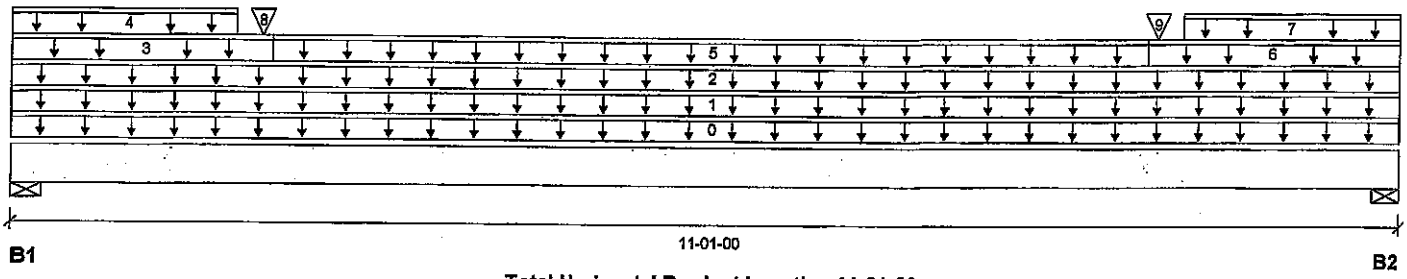
**2ND FLR FRAMING\Dropped Beams\B21 DR(i10786) (Dropped Beam)**

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

March 24, 2021 16:16:54

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B21 DR(i10786)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 11-01-00**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 133 / 0 | 780 / 0 | 432 / 0 | |
| B2, 5-1/2" | 133 / 0 | 779 / 0 | 432 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-00 | Top | | 12 | | | 00-00-00 |
| 1 | J1(i10702) | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-00 | Top | 20 | 13 | | | n\a |
| 2 | R1(i10723) | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-00 | Top | 4 | 5 | | | n\a |
| 3 | R1(i10723) | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-00-08 | Top | | 81 | | | n\a |
| 4 | R1(i10723) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-09-00 | Top | | 45 | 78 | | n\a |
| 5 | R1(i10723) | Unf. Lin. (lb/ft) | L | 02-00-08 | 09-00-08 | Top | | 41 | | | n\a |
| 6 | R1(i10723) | Unf. Lin. (lb/ft) | L | 09-00-08 | 11-01-00 | Top | | 81 | | | n\a |
| 7 | R1(i10723) | Unf. Lin. (lb/ft) | L | 09-04-00 | 11-01-00 | Top | | 45 | 78 | | n\a |
| 8 | R1(i10723) | Conc. Pt. (lbs) | L | 01-11-08 | 01-11-08 | Top | | 228 | 296 | | n\a |
| 9 | R1(i10723) | Conc. Pt. (lbs) | L | 09-01-08 | 09-01-08 | Top | | 227 | 295 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2850 ft-lbs | 18733 ft-lbs | 15.2% | 13 | 05-06-08 |
| End Shear | 1270 lbs | 14464 lbs | 8.8% | 13 | 01-05-06 |
| Total Load Deflection | L/999 (0.047") | n\a | n\a | 35 | 05-06-08 |
| Live Load Deflection | L/999 (0.018") | n\a | n\a | 51 | 05-06-08 |
| Max Defl. | 0.047" | n\a | n\a | 35 | 05-06-08 |
| Span / Depth | 10.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 1756 lbs | 6.8% | 7.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 1754 lbs | 6.8% | 7.5% | Spruce-Pine-Fir |


P6 1/2

DWG NO. TAM 7409-2B
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B21 DR(i10786) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — March 24, 2021 16:16:54
Build 7773

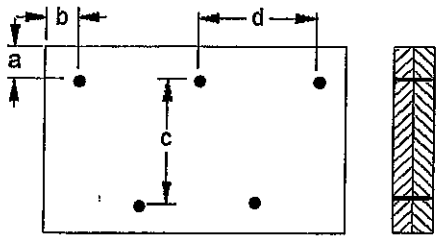
| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Dropped Beams\B21 DR(i10786) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 10-07-08, Bottom: 10-07-08.

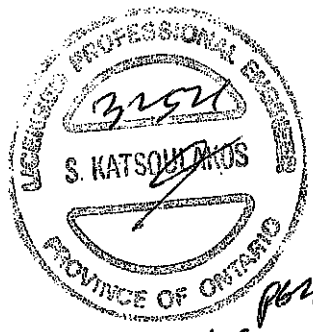
CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: 1 . Nails
3½" ARDOX SPIRAL




OWC NO. TAM 2409-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

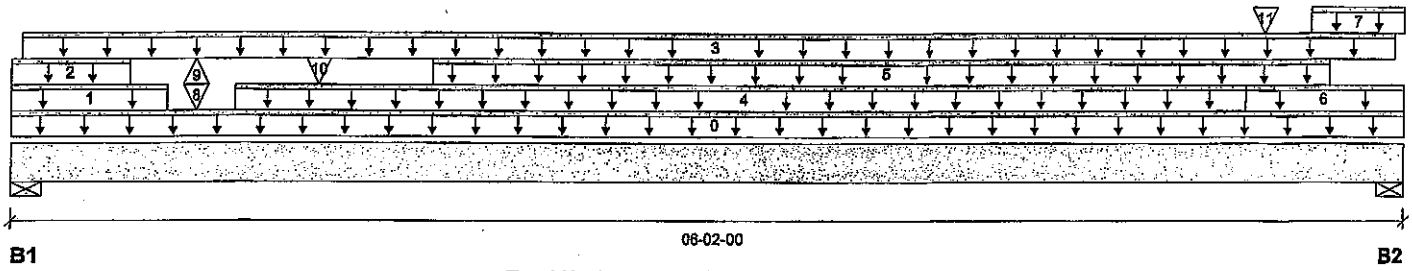
## 2ND FLR FRAMING\Dropped Beams\B19 DR(I12642) (Dropped Beam)

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

June 15, 2021 14:04:40

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B19 DR(I12642)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 06-02-00

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1681 / 2 | 2364 / 0 | 2279 / 0 | |
| B2, 4" | 1090 / 0 | 2103 / 0 | 2590 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-02-00 | Top | | 12 | | | 00-00-00 |
| 1 | R1(i13033) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-08-00 | Top | | 81 | | | n\a |
| 2 | R1(i13033) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-06-00 | Top | | 263 | 520 | | n\a |
| 3 | DRIFT | Unf. Lin. (lb/ft) | L | 00-00-08 | 06-01-08 | Top | | 45 | 78 | | n\a |
| 4 | R1(i13032) | Unf. Lin. (lb/ft) | L | 00-11-08 | 05-05-08 | Top | | 41 | | | n\a |
| 5 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-10-00 | 05-10-00 | Top | 378 | 189 | | | n\a |
| 6 | R1(i13032) | Unf. Lin. (lb/ft) | L | 05-05-08 | 06-02-00 | Top | | 81 | | | n\a |
| 7 | R1(i13032) | Unf. Lin. (lb/ft) | L | 05-09-00 | 06-02-00 | Top | | 125 | 238 | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 00-09-07 | 00-09-07 | Top | 968 | 1596 | 1820 | | n\a |
| 9 | - | Conc. Pt. (lbs) | L | 00-09-07 | 00-09-07 | Top | -2 | | | | n\a |
| 10 | J7(i12836) | Conc. Pt. (lbs) | L | 01-04-00 | 01-04-00 | Top | 291 | 146 | | | n\a |
| 11 | R1(i13032) | Conc. Pt. (lbs) | L | 05-06-08 | 05-06-08 | Top | | 1142 | 2216 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5820 ft-lbs | 35392 ft-lbs | 16.4% | 1 | 03-01-00 |
| End Shear | 4360 lbs | 14464 lbs | 30.1% | 1 | 01-03-14 |
| Total Load Deflection | L/999 (0.028") | n\a | n\a | 58 | 03-01-00 |
| Live Load Deflection | L/999 (0.018") | n\a | n\a | 85 | 03-01-00 |
| Max Defl. | 0.028" | n\a | n\a | 58 | 03-01-00 |
| Span / Depth | 5.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 4" x 3-1/2" | 8056 lbs | 43.1% | 47.2% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 4" x 3-1/2" | 7603 lbs | 66.9% | 44.5% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM/14632/21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**2ND FLR FRAMING\Dropped Beams\B19 DR(I12642) (Dropped Beam)**

BC CALC® Member Report — Dry | 1 span | No cant. — June 15, 2021 14:04:40

Build 7773

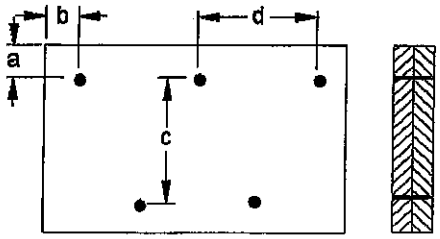
| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Dropped Beams\B19 DR(I12642) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-09-10, Bottom: 06-02-00.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8 "

Connectors are: ... A ... Nails
3½" ARDOX SPIRAL


DWG NO. TAM/4632-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability for a particular application. The output here is based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call (800)232-0788 before installation.

BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

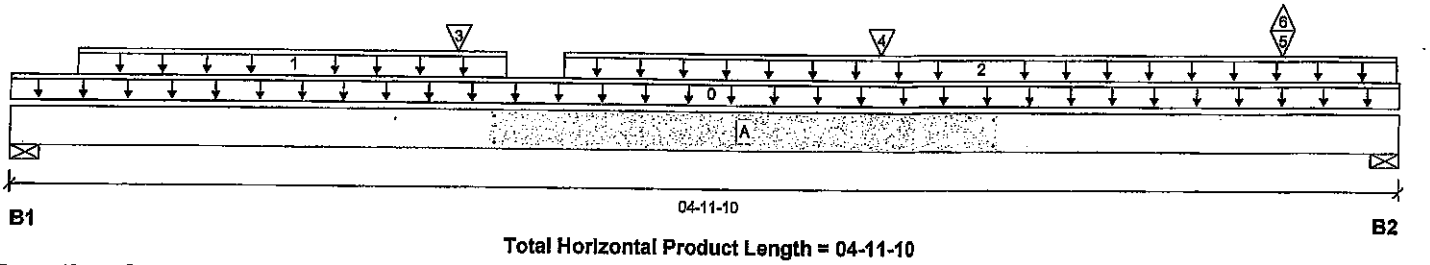
## 2ND FLR FRAMING\Flush Beams\B14(i10937) (Flush Beam)

Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B14(i10937)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 04-11-10

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 1027 / 0 | 545 / 0 | | |
| B2, 3-1/2" | 1678 / 1 | 964 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-11-10 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-02-12 | 01-09-00 | Top | 34 | 17 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-11-08 | 04-11-08 | Top | 378 | 189 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 01-06-15 | 01-06-15 | Top | 712 | 356 | | | n\a |
| 4 | J3(i10933) | Conc. Pt. (lbs) | L | 03-01-00 | 03-01-00 | Top | 298 | 149 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 04-06-09 | 04-06-09 | Top | 506 | 349 | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 04-06-09 | 04-06-09 | Top | -1 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3049 ft-lbs | 35392 ft-lbs | 8.6% | 1 | 02-05-08 |
| End Shear | 2112 lbs | 14464 lbs | 14.6% | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.007") | n\a | n\a | 6 | 02-06-07 |
| Live Load Deflection | L/999 (0.005") | n\a | n\a | 8 | 02-06-07 |
| Max Defl. | 0.007" | n\a | n\a | 6 | 02-06-07 |
| Span / Depth | 4.4 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 2222 lbs | 18.8% | 9.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 3-1/2" | 3721 lbs | 49.4% | 24.9% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-10-04.

CONFORMS TO OBC 2012
AMENDED 2020


BUILDING PERMIT 744-21
STRUCTURAL
COMPONENT ONLY

Boise Cascade® ENGINEERED WOOD PRODUCTS

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

**2ND FLR FRAMING\Flush Beams\B14(i10937) (Flush Beam)**

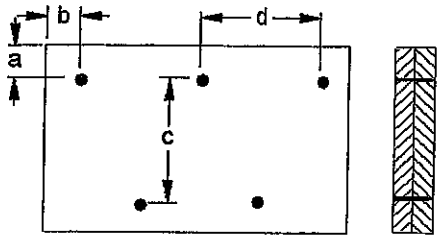
Dry | 1 span | No cant.

March 24, 2021 16:16:54

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B14(i10937)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member



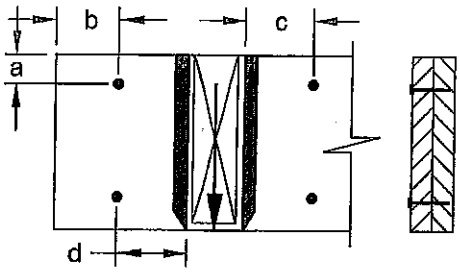

a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Calculated Side Load = 442.0 lb/ft
Connectors are: 16d . . Nails

3½" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 3+4+5+6




a minimum = 2"
b minimum = 4"
c minimum = 4"
d maximum = 12"
Connectors are: 16d . . Nails

3½" ARDOX SPIRAL


BCIN NO. TAM7411-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

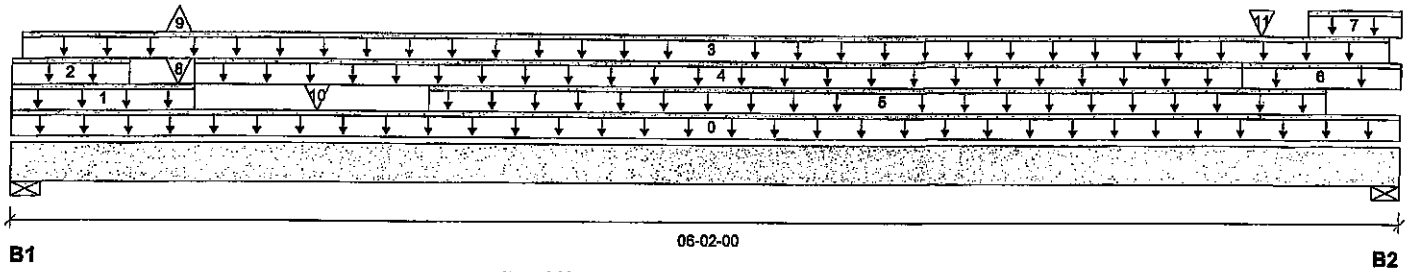
## 2ND FLR FRAMING\Dropped Beams\B19 DR E(i12004) (Dropped Beam)

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

June 15, 2021 14:22:38

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Dropp...eams\B19 DR E(i12004)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 06-02-00

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1681 / 2 | 2393 / 0 | 2361 / 0 | |
| B2, 4" | 1090 / 0 | 2142 / 0 | 2719 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-02-00 | Top | | 12 | | | 00-00-00 |
| 1 | R1(i12363) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-09-08 | Top | | 81 | | | n\a |
| 2 | R1(i12363) | Unf. Lin. (lb/ft) | L | 00-00-00 | 00-06-00 | Top | | 262 | 520 | | n\a |
| 3 | DRIFT | Unf. Lin. (lb/ft) | L | 00-00-08 | 06-01-06 | Top | | 45 | 78 | | n\a |
| 4 | R1(i12363) | Unf. Lin. (lb/ft) | L | 00-09-08 | 05-05-08 | Top | | 41 | | | n\a |
| 5 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-10-00 | 05-10-00 | Top | 378 | 189 | | | n\a |
| 6 | R1(i12363) | Unf. Lin. (lb/ft) | L | 05-05-08 | 06-02-00 | Top | | 81 | | | n\a |
| 7 | R1(i12363) | Unf. Lin. (lb/ft) | L | 05-09-00 | 06-02-00 | Top | | 128 | 243 | | n\a |
| 8 | - | Conc. Pt. (lbs) | L | 00-08-11 | 00-08-11 | Top | 968 | 1587 | 1860 | | n\a |
| 9 | - | Conc. Pt. (lbs) | L | 00-08-11 | 00-08-11 | Top | -2 | | | | n\a |
| 10 | J8(i12228) | Conc. Pt. (lbs) | L | 01-04-00 | 01-04-00 | Top | 291 | 146 | | | n\a |
| 11 | R1(i12363) | Conc. Pt. (lbs) | L | 05-06-08 | 05-06-08 | Top | | 1202 | 2385 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5729 ft-lbs | 35392 ft-lbs | 16.2% | 1 | 03-04-00 |
| End Shear | 4140 lbs | 14464 lbs | 28.6% | 1 | 01-03-14 |
| Total Load Deflection | L/999 (0.028") | n\a | n\a | 58 | 03-01-00 |
| Live Load Deflection | L/999 (0.017") | n\a | n\a | 85 | 03-01-00 |
| Max Defl. | 0.028" | n\a | n\a | 58 | 03-01-00 |
| Span / Depth | 5.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 4" x 3-1/2" | 8214 lbs | 44.0% | 48.1% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 4" x 3-1/2" | 7846 lbs | 69.0% | 45.9% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM/14633-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B19 DR E(i12004) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — June 15, 2021 14:22:38
Build 7773

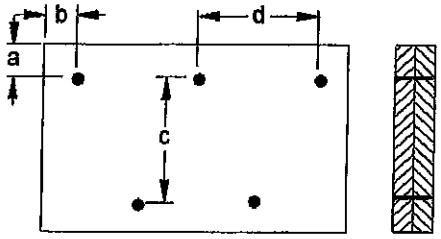
| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12 - EL 3.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Dropp...eams\B19 DR E(i12004) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-09-10, Bottom: 06-02-00.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO
2-22

DWG NO. TAM/4633-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

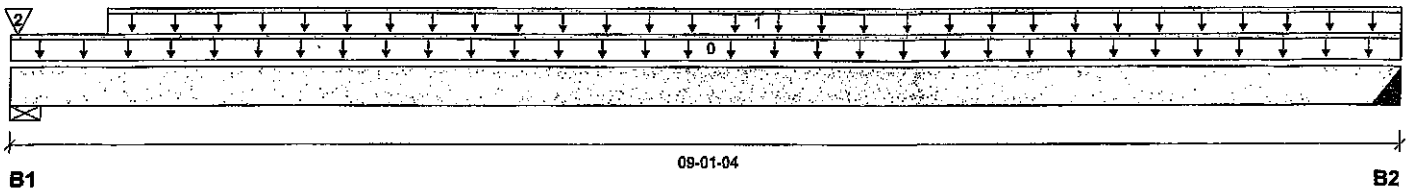
**PASSED**

## 2ND FLR FRAMING\Flush Beams\B39 E(i12413) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — June 15, 2021 14:22:38

Build 7773

| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12 - EL 3.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Flush Beams\B39 E(i12413) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 09-01-04**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-3/4" | 3 / 0 | 140 / 0 | 250 / 0 | |
| B2, 2-1/2" | | 123 / 0 | 285 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-01-04 | Top | | 12 | | | 00-00-00 |
| 1 | DRIFT | Unf. Lin. (lb/ft) | L | 00-07-04 | 09-01-04 | Top | | 15 | 63 | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 00-00-08 | 00-00-08 | Top | 3 | 24 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1234 ft-lbs | 22426 ft-lbs | 5.5% | 13 | 04-06-12 |
| End Shear | 500 lbs | 14464 lbs | 3.5% | 13 | 01-02-10 |
| Total Load Deflection | L/999 (0.012") | n\a | n\a | 35 | 04-06-12 |
| Live Load Deflection | L/999 (0.009") | n\a | n\a | 51 | 04-06-12 |
| Max Defl. | 0.012" | n\a | n\a | 35 | 04-06-12 |
| Span / Depth | 8.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 2-3/4" x 3-1/2" | 553 lbs | 9.3% | 4.7% | Spruce-Pine-Fir |
| B2 | Hanger | 2-1/2" x 3-1/2" | 581 lbs | n\a | 5.4% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.

Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity. OK

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.

Design meets Code minimum (L/360) Live load deflection criteria.

CONFORMS TO OBC 2012 AMENDED 2020

Hanger Manufacturer: Unassigned

Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

Calculations assume unbraced length of Top: 08-10-08, Bottom: 08-10-08.

LICENSED PROFESSIONAL ENGINEER
2021
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6/6

DWG NO. TAM14635-21
STRUCTURAL
COMPONENT ONLY

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B39 E(I12413) (Flush Beam)

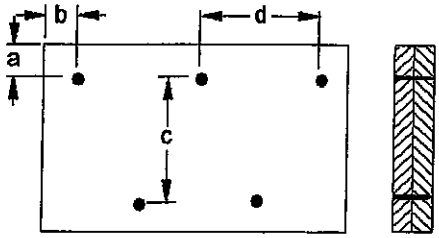
Dry | 1 span | No cant.

June 15, 2021 14:22:38

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B39 E(I12413)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = 8"

Connectors are: 1 .. Nails
3½" ARDOX SPIRAL


DWG NO. YAM/4635-21
STRUCTURAL
COMPONENT ONLY

## Disclosure

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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

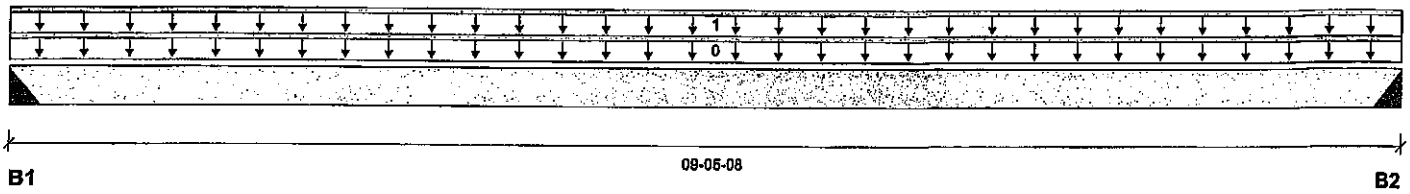
## 2ND FLR FRAMING\Dropped Beams\B40 E(I12411) (Dropped Beam)

Dry | 1 span | No cant.

June 15, 2021 14:22:38

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B40 E(I12411)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 09-05-08**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 2-1/2" | | 128 / 0 | 298 / 0 | |
| B2, 2-1/2" | | 128 / 0 | 298 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-05-08 | Top | | 12 | | | 00-00-00 |
| 1 | DRIFT | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-05-08 | Top | | 15 | 63 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1348 ft-lbs | 21043 ft-lbs | 6.4% | 1 | 04-08-12 |
| End Shear | 453 lbs | 14464 lbs | 3.1% | 1 | 01-02-06 |
| Total Load Deflection | L/999 (0.015") | n\a | n\a | 12 | 04-08-12 |
| Live Load Deflection | L/999 (0.01") | n\a | n\a | 17 | 04-08-12 |
| Max Defl. | 0.015" | n\a | n\a | 12 | 04-08-12 |
| Span / Depth | 9.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 2-1/2" x 3-1/2" | 607 lbs | n\a | 5.7% | HGUS410 |
| B2 | Hanger | 2-1/2" x 3-1/2" | 607 lbs | n\a | 5.7% | HGUS410 |

## Cautions

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL Beam.
Hanger model HGUS410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 09-05-08, Bottom: 09-05-08.

CONFORMS TO OBC 2012
AMENDED 2020

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM/4636-21
STRUCTURAL
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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

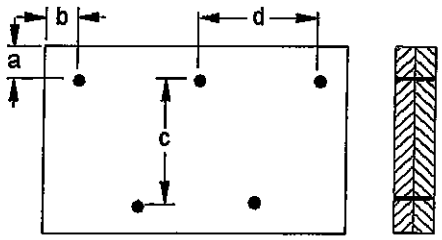
## 2ND FLR FRAMING\Dropped Beams\B40 E(I12411) (Dropped Beam)

BC CALC® Member Report — Dry | 1 span | No cant. — June 15, 2021 14:22:38

Build 7773

| | | | |
|---|---|---|---|
| Job name: | | File name: | GRANDVILLE 12 - EL 3.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Dropped Beams\B40 E(I12411) |
| City, Province, Postal Code: | HAMILTON | Specifier: | |
| Customer: | | Designer: | L.D. |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2" c = 7-7/8"
b minimum = 3" d = [redacted]"

Connectors are: [redacted] Nails
3½" ARDOX SPIRAL

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S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 14636-21
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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

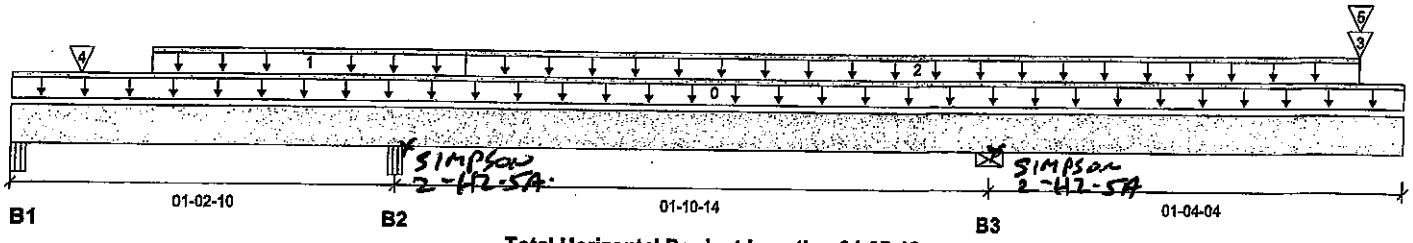
## 2ND FLR FRAMING\Flush Beams\B37 E(I12113) (Flush Beam)

Dry | 3 spans | R cant.

June 15, 2021 14:22:38

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B37 E(I12113)
Specifier:
Designer: L.D.
Company:




**Total Horizontal Product Length = 04-05-12**

## Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/4" | 5 / 0 | 176 / 0 | 330 / 0 | |
| B2, 5-1/4" | 6 / 0 | 0 / 320 | 0 / 817 | |
| B3, 5-1/2" | 0 / 0 | 539 / 0 | 1265 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-05-12 | Top | | 12 | | | 00-00-00 |
| 1 | FC3 Floor Decking (Plan View Fill) | Unf. Lin. (lb/ft) | L | 00-05-04 | 01-05-04 | Top | 8 | 4 | | | n\a |
| 2 | DRIFT | Unf. Lin. (lb/ft) | L | 01-05-04 | 04-04-00 | Top | | 15 | 63 | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 04-04-00 | 04-04-00 | Top | | 248 | 579 | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 00-02-09 | 00-02-09 | Top | 2 | 40 | 37 | | n\a |
| 5 | DRIFT | Conc. Pt. (lbs) | L | 04-04-00 | 04-04-00 | Top | | 4 | 18 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 515 ft-lbs | 34125 ft-lbs | 1.5% | 120 | 01-02-10 |
| Neg. Moment | -1559 ft-lbs | -35392 ft-lbs | 4.4% | 61 | 03-01-08 |
| End Shear | 620 lbs | 14464 lbs | 4.3% | 76 | 00-05-04 |
| Cont. Shear | 1312 lbs | 14464 lbs | 9.1% | 61 | 04-04-02 |
| Total Load Deflection | 2xL/1998 (0.002") | n\a | n\a | 153 | 04-05-12 |
| Live Load Deflection | 2xL/1998 (0.002") | n\a | n\a | 219 | 04-05-12 |
| Total Neg. Defl. | L/999 (0") | n\a | n\a | 153 | 02-05-02 |
| Max Defl. | 0" | n\a | n\a | 153 | 02-05-02 |
| Span / Depth | 1.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 5-1/4" x 3-1/2" | 719 lbs | 7.3% | 3.2% | Unspecified |
| B2 | Beam | 5-1/4" x 3-1/2" | 0 lbs | n\a | n\a | Unspecified |
| B2 | Uplift | | 1626 lbs | | | |
| B3 | Wall/Plate | 5-1/2" x 3-1/2" | 2570 lbs | 21.7% | 10.9% | Spruce-Pine-Fir |

## Cautions

Uplift of 1626 lbs found at bearing B2. ) - (SIMPSON 3-H2.5A @ B.B2)

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S. KATSOULADOS
PROVINCE OF ONTARIO

pg 1/2

DWG NO. TAM/4631-21
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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

## 2ND FLR FRAMING\Flush Beams\B37 E(i12113) (Flush Beam)

Dry | 3 spans | R cant.

June 15, 2021 14:22:38

BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

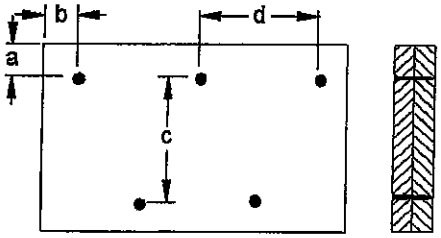
File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B37 E(I12113)
Specifier:
Designer: L.D.
Company:

## Notes

Design meets User specified (2xL/240) Total load deflection criteria.
Design meets User specified (2xL/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
Calculations assume unbraced length of Top: 02-09-00, Bottom: 01-05-08.

CONFORMS TO OBC 2012
AMENDED 2020

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [illegible] 8 "

Calculated Side Load = 303.5 lb/ft
Connectors are: 16d [illegible] 1 Nails

3½" ARDOX SPIRAL


DWG NO. TAM/4631-21
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BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS® ,

# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

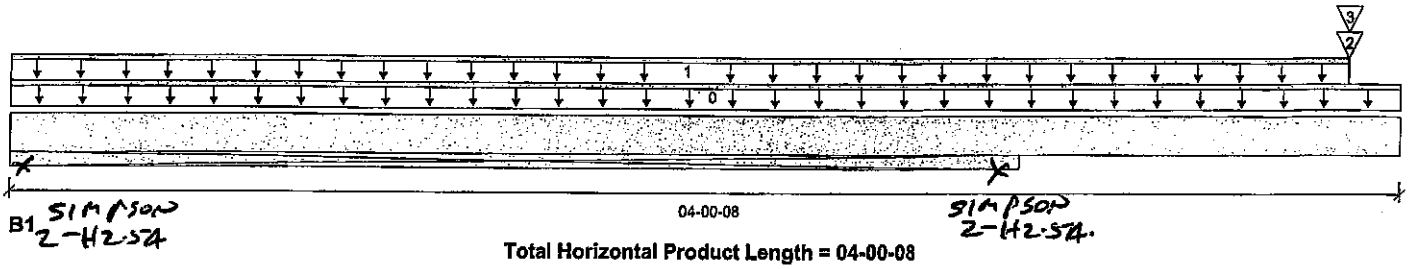
## 2ND FLR FRAMING\Flush Beams\B38 E(i12410) (Flush Beam)

BC CALC® Member Report — Dry | 1 span | R cant. — June 15, 2021 14:22:38

Build 7773

Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B38 E(i12410)
Specifier:
Designer: L.D.
Company:




Total Horizontal Product Length = 04-00-08

### Reaction Summary (Down / Uplift) (lbs)

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 35" | | 237 / 0 | 553 / 0 | |

### Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Loc. | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-00-08 | Top | | 12 | | | 00-00-00 |
| 1 | DRIFT | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-10-12 | Top | | 15 | 63 | | n\a |
| 2 | B40 E(i12411) | Conc. Pt. (lbs) | L | 03-10-12 | 03-10-12 | Top | | 128 | 298 | | n\a |
| 3 | DRIFT | Conc. Pt. (lbs) | L | 03-10-12 | 03-10-12 | Top | | 2 | 9 | | n\a |

### Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 0 ft-lbs | 33036 ft-lbs | n\a | 1 | 04-00-08 |
| Neg. Moment | -673 ft-lbs | -34125 ft-lbs | 2.0% | 1 | 02-11-00 |
| End Shear | 730 lbs | 14464 lbs | 5.0% | 1 | 03-10-14 |
| Total Load Deflection | 2xL/1998 (0") | n\a | n\a | 12 | 04-00-08 |
| Live Load Deflection | 2xL/1998 (0") | n\a | n\a | 17 | 04-00-08 |
| Span / Depth | 1.1 | | | | |
| Dist. Load (B1) | 113.25 lb/ft | 57645.1 lb/ft | 0.2% | | |

### Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 35" x 3-1/2" | 1125 lbs | 1.5% | 0.8% | Spruce-Pine-Fir |

### Notes

Design meets User specified (2xL/240) Total load deflection criteria.
Design meets User specified (2xL/360) Live load deflection criteria.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
Calculations assume unbraced length of Top: 03-09-00, Bottom: 02-09-00.

CONFORMS TO OBC 2012
AMENDED 2020


DWG NO. TAM/4634-2L
STRUCTURAL
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# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

## 2ND FLR FRAMING\Flush Beams\B38 E(I12410) (Flush Beam)

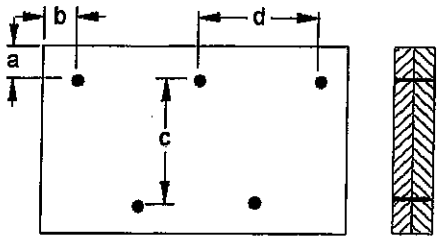
BC CALC® Member Report
Build 7773
Job name:
Address:
City, Province, Postal Code: HAMILTON
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | R cant.

June 15, 2021 14:22:38

File name: GRANDVILLE 12 - EL 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B38 E(i12410)
Specifier:
Designer: L.D.
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-7/8"
d = [redacted] 8"

Calculated Side Load = 303.5 lb/ft
Connectors are: 16d [redacted]: Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 14634-21
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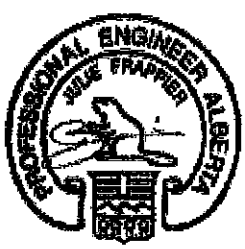
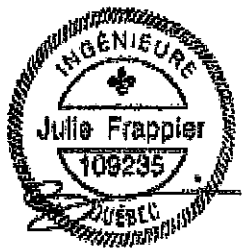







## Maximum Floor Spans

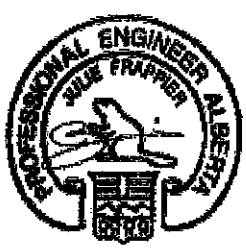
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

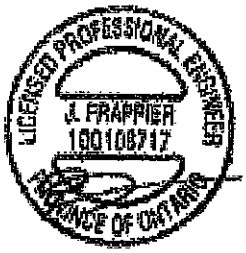
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-1" | 14'-2" | 13'-9" | N/A | 15'-7" | 14'-8" | 14'-2" | N/A |
| | NI-40x | 16'-1" | 15'-2" | 14'-8" | N/A | 16'-7" | 15'-7" | 15'-1" | N/A |
| | NI-60 | 16'-3" | 15'-4" | 14'-10" | N/A | 16'-8" | 15'-9" | 15'-3" | N/A |
| | NI-70 | 17'-1" | 16'-1" | 15'-6" | N/A | 17'-5" | 16'-5" | 15'-10" | N/A |
| | NI-80 | 17'-3" | 16'-3" | 15'-8" | N/A | 17'-8" | 16'-7" | 16'-0" | N/A |
| 11-7/8" | NI-20 | 16'-11" | 16'-0" | 15'-5" | N/A | 17'-6" | 16'-6" | 16'-0" | N/A |
| | NI-40x | 18'-1" | 17'-0" | 16'-5" | N/A | 18'-9" | 17'-6" | 16'-11" | N/A |
| | NI-60 | 18'-4" | 17'-3" | 16'-7" | N/A | 19'-0" | 17'-8" | 17'-1" | N/A |
| | NI-70 | 19'-6" | 18'-0" | 17'-4" | N/A | 20'-1" | 18'-7" | 17'-9" | N/A |
| | NI-80 | 19'-9" | 18'-3" | 17'-6" | N/A | 20'-4" | 18'-10" | 17'-11" | N/A |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | N/A | 20'-10" | 19'-3" | 18'-5" | N/A |
| 14" | NI-40x | 20'-1" | 18'-7" | 17'-10" | N/A | 20'-10" | 19'-4" | 18'-6" | N/A |
| | NI-60 | 20'-5" | 18'-11" | 18'-1" | N/A | 21'-2" | 19'-7" | 18'-9" | N/A |
| | NI-70 | 21'-7" | 20'-0" | 19'-1" | N/A | 22'-3" | 20'-7" | 19'-8" | N/A |
| | NI-80 | 21'-11" | 20'-3" | 19'-4" | N/A | 22'-7" | 20'-11" | 20'-0" | N/A |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | N/A | 23'-3" | 21'-6" | 20'-6" | N/A |
| 16" | NI-60 | 22'-3" | 20'-8" | 19'-9" | N/A | 23'-1" | 21'-5" | 20'-6" | N/A |
| | NI-70 | 23'-6" | 21'-9" | 20'-9" | N/A | 24'-3" | 22'-5" | 21'-5" | N/A |
| | NI-80 | 23'-11" | 22'-1" | 21'-1" | N/A | 24'-8" | 22'-10" | 21'-9" | N/A |
| | NI-90x | 24'-8" | 22'-9" | 21'-9" | N/A | 25'-4" | 23'-5" | 22'-4" | N/A |

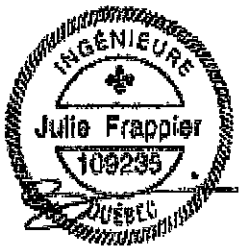
| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 16'-8" | 15'-3" | 14'-5" | N/A | 16'-8" | 15'-3" | 14'-5" | N/A |
| | NI-40x | 17'-11" | 16'-11" | 16'-1" | N/A | 18'-5" | 17'-1" | 16'-1" | N/A |
| | NI-60 | 18'-2" | 17'-1" | 16'-4" | N/A | 18'-7" | 17'-4" | 16'-4" | N/A |
| | NI-70 | 19'-2" | 17'-10" | 17'-2" | N/A | 19'-7" | 18'-3" | 17'-7" | N/A |
| | NI-80 | 19'-5" | 18'-0" | 17'-4" | N/A | 19'-10" | 18'-5" | 17'-8" | N/A |
| 11-7/8" | NI-20 | 19'-6" | 18'-1" | 17'-3" | N/A | 19'-11" | 18'-3" | 17'-3" | N/A |
| | NI-40x | 21'-0" | 19'-6" | 18'-8" | N/A | 21'-7" | 20'-2" | 19'-2" | N/A |
| | NI-60 | 21'-4" | 19'-9" | 18'-11" | N/A | 21'-11" | 20'-4" | 19'-6" | N/A |
| | NI-70 | 22'-6" | 20'-10" | 19'-11" | N/A | 23'-0" | 21'-5" | 20'-5" | N/A |
| | NI-80 | 22'-9" | 21'-1" | 20'-1" | N/A | 23'-3" | 21'-7" | 20'-8" | N/A |
| | NI-90x | 23'-4" | 21'-8" | 20'-8" | N/A | 23'-10" | 22'-2" | 21'-2" | N/A |
| 14" | NI-40x | 23'-7" | 21'-11" | 20'-11" | N/A | 24'-3" | 22'-7" | 21'-7" | N/A |
| | NI-60 | 24'-0" | 22'-3" | 21'-3" | N/A | 24'-8" | 22'-11" | 21'-11" | N/A |
| | NI-70 | 25'-3" | 23'-4" | 22'-3" | N/A | 25'-10" | 24'-0" | 22'-11" | N/A |
| | NI-80 | 25'-7" | 23'-8" | 22'-7" | N/A | 26'-2" | 24'-4" | 23'-2" | N/A |
| | NI-90x | 26'-4" | 24'-4" | 23'-3" | N/A | 26'-10" | 24'-11" | 23'-9" | N/A |
| 16" | NI-60 | 26'-5" | 24'-6" | 23'-4" | N/A | 27'-2" | 25'-3" | 24'-2" | N/A |
| | NI-70 | 27'-9" | 25'-8" | 24'-6" | N/A | 28'-5" | 26'-5" | 25'-2" | N/A |
| | NI-80 | 28'-2" | 26'-1" | 24'-10" | N/A | 28'-10" | 26'-9" | 25'-6" | N/A |
| | NI-90x | 29'-0" | 26'-10" | 25'-7" | N/A | 29'-7" | 27'-5" | 26'-2" | N/A |

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

NORDIC ENGINEERED WOOD




## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-10" | 15'-0" | 14'-5" | 13'-5" | 16'-4" | 15'-5" | 14'-6" | 13'-5" |
| | NI-40x | 17'-0" | 16'-0" | 15'-5" | 14'-9" | 17'-5" | 16'-5" | 15'-10" | 15'-2" |
| | NI-60 | 17'-2" | 16'-2" | 15'-7" | 14'-11" | 17'-6" | 16'-7" | 15'-11" | 15'-3" |
| | NI-70 | 18'-0" | 16'-11" | 16'-3" | 15'-7" | 18'-5" | 17'-3" | 16'-7" | 15'-11" |
| | NI-80 | 18'-3" | 17'-1" | 16'-5" | 15'-9" | 18'-8" | 17'-5" | 16'-9" | 16'-1" |
| 11-7/8" | NI-20 | 17'-10" | 16'-10" | 16'-2" | 15'-6" | 18'-6" | 17'-4" | 16'-9" | 16'-1" |
| | NI-40x | 19'-4" | 17'-11" | 17'-3" | 16'-6" | 19'-11" | 18'-6" | 17'-9" | 17'-0" |
| | NI-60 | 19'-7" | 18'-2" | 17'-5" | 16'-9" | 20'-2" | 18'-9" | 17'-11" | 17'-2" |
| | NI-70 | 20'-9" | 19'-2" | 18'-3" | 17'-5" | 21'-4" | 19'-9" | 18'-10" | 17'-10" |
| | NI-80 | 21'-1" | 19'-5" | 18'-6" | 17'-7" | 21'-7" | 20'-0" | 19'-0" | 18'-0" |
| | NI-90x | 21'-8" | 20'-0" | 19'-1" | 18'-0" | 22'-2" | 20'-6" | 19'-6" | 18'-6" |
| 14" | NI-40x | 21'-5" | 19'-10" | 18'-11" | 17'-11" | 22'-1" | 20'-6" | 19'-7" | 18'-7" |
| | NI-60 | 21'-10" | 20'-2" | 19'-3" | 18'-2" | 22'-5" | 20'-10" | 19'-11" | 18'-10" |
| | NI-70 | 23'-0" | 21'-3" | 20'-3" | 19'-2" | 23'-8" | 21'-11" | 20'-10" | 19'-9" |
| | NI-80 | 23'-5" | 21'-7" | 20'-7" | 19'-5" | 24'-0" | 22'-3" | 21'-2" | 20'-0" |
| | NI-90x | 24'-1" | 22'-3" | 21'-2" | 20'-0" | 24'-8" | 22'-10" | 21'-9" | 20'-7" |
| 16" | NI-60 | 23'-9" | 22'-0" | 20'-11" | 19'-10" | 24'-6" | 22'-9" | 21'-8" | 20'-6" |
| | NI-70 | 25'-1" | 23'-2" | 22'-0" | 20'-10" | 25'-9" | 23'-10" | 22'-9" | 21'-6" |
| | NI-80 | 25'-6" | 23'-6" | 22'-4" | 21'-2" | 26'-1" | 24'-2" | 23'-1" | 21'-10" |
| | NI-90x | 26'-4" | 24'-3" | 23'-1" | 21'-10" | 26'-11" | 24'-11" | 23'-8" | 22'-5" |

| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 16'-10" | 15'-5" | 14'-6" | 13'-5" | 16'-10" | 15'-5" | 14'-6" | 13'-5" |
| | NI-40x | 18'-8" | 17'-2" | 16'-3" | 15'-2" | 18'-10" | 17'-2" | 16'-3" | 15'-2" |
| | NI-60 | 18'-11" | 17'-6" | 16'-6" | 15'-5" | 19'-2" | 17'-6" | 16'-6" | 15'-5" |
| | NI-70 | 20'-0" | 18'-7" | 17'-9" | 16'-7" | 20'-5" | 18'-11" | 17'-10" | 16'-7" |
| | NI-80 | 20'-3" | 18'-10" | 17'-11" | 16'-10" | 20'-8" | 19'-3" | 18'-2" | 16'-10" |
| 11-7/8" | NI-20 | 20'-1" | 18'-5" | 17'-5" | 16'-2" | 20'-1" | 18'-5" | 17'-5" | 16'-2" |
| | NI-40x | 21'-10" | 20'-4" | 19'-4" | 17'-8" | 22'-5" | 20'-6" | 19'-4" | 17'-8" |
| | NI-60 | 22'-1" | 20'-7" | 19'-7" | 18'-4" | 22'-8" | 20'-10" | 19'-8" | 18'-4" |
| | NI-70 | 23'-4" | 21'-8" | 20'-8" | 19'-7" | 23'-10" | 22'-3" | 21'-2" | 19'-9" |
| | NI-80 | 23'-7" | 21'-11" | 20'-11" | 19'-9" | 24'-1" | 22'-6" | 21'-5" | 20'-0" |
| | NI-90x | 24'-3" | 22'-6" | 21'-6" | 20'-4" | 24'-8" | 23'-0" | 22'-0" | 20'-9" |
| 14" | NI-40x | 24'-5" | 22'-9" | 21'-8" | 19'-5" | 25'-1" | 23'-2" | 21'-9" | 19'-5" |
| | NI-60 | 24'-10" | 23'-1" | 22'-0" | 20'-10" | 25'-6" | 23'-8" | 22'-4" | 20'-10" |
| | NI-70 | 26'-1" | 24'-3" | 23'-2" | 21'-10" | 26'-8" | 24'-11" | 23'-9" | 22'-4" |
| | NI-80 | 26'-6" | 24'-7" | 23'-5" | 22'-2" | 27'-1" | 25'-3" | 24'-1" | 22'-9" |
| | NI-90x | 27'-3" | 25'-4" | 24'-1" | 22'-9" | 27'-9" | 25'-11" | 24'-8" | 23'-4" |
| 16" | NI-60 | 27'-3" | 25'-5" | 24'-2" | 22'-10" | 28'-0" | 26'-2" | 24'-9" | 23'-1" |
| | NI-70 | 28'-8" | 26'-8" | 25'-4" | 23'-11" | 29'-3" | 27'-4" | 26'-1" | 24'-8" |
| | NI-80 | 29'-1" | 27'-0" | 25'-9" | 24'-4" | 29'-8" | 27'-9" | 26'-5" | 25'-0" |
| | NI-90x | 29'-11" | 27'-10" | 26'-6" | 25'-0" | 30'-6" | 28'-5" | 27'-2" | 25'-8" |

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

NORDIC ENGINEERED WOOD



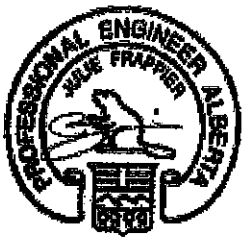

## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

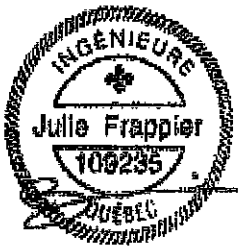
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-1" | 14'-1" | 13'-3" | N/A | 15'-7" | 14'-1" | 13'-3" | N/A |
| | NI-40x | 16'-1" | 15'-2" | 14'-8" | N/A | 16'-7" | 15'-7" | 15'-1" | N/A |
| | NI-60 | 16'-3" | 15'-4" | 14'-10" | N/A | 16'-8" | 15'-9" | 15'-3" | N/A |
| | NI-70 | 17'-1" | 16'-1" | 15'-6" | N/A | 17'-5" | 16'-5" | 15'-10" | N/A |
| | NI-80 | 17'-3" | 16'-3" | 15'-8" | N/A | 17'-8" | 16'-7" | 16'-0" | N/A |
| 11-7/8" | NI-20 | 16'-11" | 16'-0" | 15'-5" | N/A | 17'-6" | 16'-6" | 16'-0" | N/A |
| | NI-40x | 18'-1" | 17'-0" | 16'-5" | N/A | 18'-9" | 17'-6" | 16'-11" | N/A |
| | NI-60 | 18'-4" | 17'-3" | 16'-7" | N/A | 19'-0" | 17'-8" | 17'-1" | N/A |
| | NI-70 | 19'-6" | 18'-0" | 17'-4" | N/A | 20'-1" | 18'-7" | 17'-9" | N/A |
| | NI-80 | 19'-9" | 18'-3" | 17'-6" | N/A | 20'-4" | 18'-10" | 17'-11" | N/A |
| | NI-90x | 20'-4" | 18'-9" | 17'-11" | N/A | 20'-10" | 19'-3" | 18'-5" | N/A |
| 14" | NI-40x | 20'-1" | 18'-7" | 17'-10" | N/A | 20'-10" | 19'-4" | 18'-6" | N/A |
| | NI-60 | 20'-5" | 18'-11" | 18'-1" | N/A | 21'-2" | 19'-7" | 18'-9" | N/A |
| | NI-70 | 21'-7" | 20'-0" | 19'-1" | N/A | 22'-3" | 20'-7" | 19'-8" | N/A |
| | NI-80 | 21'-11" | 20'-3" | 19'-4" | N/A | 22'-7" | 20'-11" | 20'-0" | N/A |
| | NI-90x | 22'-7" | 20'-11" | 19'-11" | N/A | 23'-3" | 21'-6" | 20'-6" | N/A |
| 16" | NI-60 | 22'-3" | 20'-8" | 19'-9" | N/A | 23'-1" | 21'-5" | 20'-6" | N/A |
| | NI-70 | 23'-6" | 21'-9" | 20'-9" | N/A | 24'-3" | 22'-5" | 21'-5" | N/A |
| | NI-80 | 23'-11" | 22'-1" | 21'-1" | N/A | 24'-8" | 22'-10" | 21'-9" | N/A |
| | NI-90x | 24'-8" | 22'-9" | 21'-9" | N/A | 25'-4" | 23'-5" | 22'-4" | N/A |

| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-1" | 13'-3" | N/A | 15'-7" | 14'-1" | 13'-3" | N/A |
| | NI-40x | 17'-9" | 16'-1" | 15'-1" | N/A | 17'-9" | 16'-1" | 15'-1" | N/A |
| | NI-60 | 18'-1" | 16'-4" | 15'-4" | N/A | 18'-1" | 16'-4" | 15'-4" | N/A |
| | NI-70 | 19'-2" | 17'-10" | 16'-9" | N/A | 19'-7" | 17'-10" | 16'-9" | N/A |
| | NI-80 | 19'-5" | 18'-0" | 17'-1" | N/A | 19'-10" | 18'-3" | 17'-1" | N/A |
| 11-7/8" | NI-20 | 18'-9" | 17'-0" | 16'-0" | N/A | 18'-9" | 17'-0" | 16'-0" | N/A |
| | NI-40x | 21'-0" | 19'-3" | 17'-9" | N/A | 21'-3" | 19'-3" | 17'-9" | N/A |
| | NI-60 | 21'-4" | 19'-8" | 18'-5" | N/A | 21'-8" | 19'-8" | 18'-5" | N/A |
| | NI-70 | 22'-6" | 20'-10" | 19'-11" | N/A | 23'-0" | 21'-4" | 20'-0" | N/A |
| | NI-80 | 22'-9" | 21'-1" | 20'-1" | N/A | 23'-3" | 21'-7" | 20'-5" | N/A |
| | NI-90x | 23'-4" | 21'-8" | 20'-8" | N/A | 23'-10" | 22'-2" | 21'-2" | N/A |
| 14" | NI-40x | 23'-7" | 21'-5" | 19'-6" | N/A | 24'-1" | 21'-5" | 19'-6" | N/A |
| | NI-60 | 24'-0" | 22'-3" | 21'-0" | N/A | 24'-8" | 22'-5" | 21'-0" | N/A |
| | NI-70 | 25'-3" | 23'-4" | 22'-3" | N/A | 25'-10" | 24'-0" | 22'-9" | N/A |
| | NI-80 | 25'-7" | 23'-8" | 22'-7" | N/A | 26'-2" | 24'-4" | 23'-2" | N/A |
| | NI-90x | 26'-4" | 24'-4" | 23'-3" | N/A | 26'-10" | 24'-11" | 23'-9" | N/A |
| 16" | NI-60 | 26'-5" | 24'-6" | 23'-4" | N/A | 27'-2" | 24'-10" | 23'-4" | N/A |
| | NI-70 | 27'-9" | 25'-8" | 24'-6" | N/A | 28'-5" | 26'-5" | 25'-2" | N/A |
| | NI-80 | 28'-2" | 26'-1" | 24'-10" | N/A | 28'-10" | 26'-9" | 25'-6" | N/A |
| | NI-90x | 29'-0" | 26'-10" | 25'-7" | N/A | 29'-7" | 27'-5" | 26'-2" | N/A |

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 30 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.








## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-2" | 13'-4" | 12'-4" | 15'-7" | 14'-2" | 13'-4" | 12'-4" |
| | NI-40x | 17'-0" | 16'-0" | 15'-1" | 13'-11" | 17'-5" | 16'-1" | 15'-1" | 13'-11" |
| | NI-60 | 17'-2" | 16'-2" | 15'-5" | 14'-3" | 17'-6" | 16'-5" | 15'-5" | 14'-3" |
| | NI-70 | 18'-0" | 16'-11" | 16'-3" | 15'-6" | 18'-5" | 17'-3" | 16'-7" | 15'-6" |
| | NI-80 | 18'-3" | 17'-1" | 16'-5" | 15'-9" | 18'-8" | 17'-5" | 16'-9" | 15'-10" |
| 11-7/8" | NI-20 | 17'-10" | 16'-10" | 16'-0" | 14'-10" | 18'-6" | 17'-1" | 16'-0" | 14'-10" |
| | NI-40x | 19'-4" | 17'-11" | 17'-3" | 15'-10" | 19'-11" | 18'-6" | 17'-9" | 15'-10" |
| | NI-60 | 19'-7" | 18'-2" | 17'-5" | 16'-9" | 20'-2" | 18'-9" | 17'-11" | 17'-1" |
| | NI-70 | 20'-9" | 19'-2" | 18'-3" | 17'-5" | 21'-4" | 19'-9" | 18'-10" | 17'-10" |
| | NI-80 | 21'-1" | 19'-5" | 18'-6" | 17'-7" | 21'-7" | 20'-0" | 19'-0" | 18'-0" |
| | NI-90x | 21'-8" | 20'-0" | 19'-1" | 18'-0" | 22'-2" | 20'-6" | 19'-6" | 18'-6" |
| 14" | NI-40x | 21'-5" | 19'-10" | 18'-11" | 17'-5" | 22'-1" | 20'-6" | 19'-6" | 17'-5" |
| | NI-60 | 21'-10" | 20'-2" | 19'-3" | 18'-2" | 22'-5" | 20'-10" | 19'-11" | 18'-10" |
| | NI-70 | 23'-0" | 21'-3" | 20'-3" | 19'-2" | 23'-8" | 21'-11" | 20'-10" | 19'-9" |
| | NI-80 | 23'-5" | 21'-7" | 20'-7" | 19'-5" | 24'-0" | 22'-3" | 21'-2" | 20'-0" |
| | NI-90x | 24'-1" | 22'-3" | 21'-2" | 20'-0" | 24'-8" | 22'-10" | 21'-9" | 20'-7" |
| 16" | NI-60 | 23'-9" | 22'-0" | 20'-11" | 19'-10" | 24'-6" | 22'-9" | 21'-8" | 20'-6" |
| | NI-70 | 25'-1" | 23'-2" | 22'-0" | 20'-10" | 25'-9" | 23'-10" | 22'-9" | 21'-6" |
| | NI-80 | 25'-6" | 23'-6" | 22'-4" | 21'-2" | 26'-1" | 24'-2" | 23'-1" | 21'-10" |
| | NI-90x | 26'-4" | 24'-3" | 23'-1" | 21'-10" | 26'-11" | 24'-11" | 23'-8" | 22'-5" |

| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-2" | 13'-4" | 12'-4" | 15'-7" | 14'-2" | 13'-4" | 12'-4" |
| | NI-40x | 17'-9" | 16'-1" | 15'-1" | 13'-11" | 17'-9" | 16'-1" | 15'-1" | 13'-11" |
| | NI-60 | 18'-1" | 16'-5" | 15'-5" | 14'-3" | 18'-1" | 16'-5" | 15'-5" | 14'-3" |
| | NI-70 | 19'-10" | 17'-11" | 16'-9" | 15'-6" | 19'-10" | 17'-11" | 16'-9" | 15'-6" |
| | NI-80 | 20'-2" | 18'-3" | 17'-1" | 15'-10" | 20'-2" | 18'-3" | 17'-1" | 15'-10" |
| 11-7/8" | NI-20 | 18'-10" | 17'-1" | 16'-0" | 14'-10" | 18'-10" | 17'-1" | 16'-0" | 14'-10" |
| | NI-40x | 21'-3" | 19'-3" | 17'-9" | 15'-10" | 21'-3" | 19'-3" | 17'-9" | 15'-10" |
| | NI-60 | 21'-9" | 19'-8" | 18'-5" | 17'-1" | 21'-9" | 19'-8" | 18'-5" | 17'-1" |
| | NI-70 | 23'-4" | 21'-5" | 20'-1" | 18'-6" | 23'-8" | 21'-5" | 20'-1" | 18'-6" |
| | NI-80 | 23'-7" | 21'-10" | 20'-5" | 18'-11" | 24'-1" | 21'-10" | 20'-5" | 18'-11" |
| | NI-90x | 24'-3" | 22'-6" | 21'-3" | 19'-7" | 24'-8" | 22'-7" | 21'-3" | 19'-7" |
| 14" | NI-40x | 24'-2" | 21'-5" | 19'-6" | 17'-5" | 24'-2" | 21'-5" | 19'-6" | 17'-5" |
| | NI-60 | 24'-9" | 22'-5" | 21'-0" | 19'-6" | 24'-9" | 22'-5" | 21'-0" | 19'-6" |
| | NI-70 | 26'-1" | 24'-3" | 22'-9" | 21'-0" | 26'-8" | 24'-3" | 22'-9" | 21'-0" |
| | NI-80 | 26'-6" | 24'-7" | 23'-3" | 21'-6" | 27'-1" | 24'-10" | 23'-3" | 21'-6" |
| | NI-90x | 27'-3" | 25'-4" | 24'-1" | 22'-4" | 27'-9" | 25'-10" | 24'-3" | 22'-4" |
| 16" | NI-60 | 27'-3" | 24'-11" | 23'-5" | 21'-7" | 27'-6" | 24'-11" | 23'-5" | 21'-7" |
| | NI-70 | 28'-8" | 26'-8" | 25'-3" | 23'-4" | 29'-3" | 26'-11" | 25'-3" | 23'-4" |
| | NI-80 | 29'-1" | 27'-0" | 25'-9" | 23'-10" | 29'-8" | 27'-6" | 25'-10" | 23'-10" |
| | NI-90x | 29'-11" | 27'-10" | 26'-6" | 24'-10" | 30'-6" | 28'-5" | 26'-11" | 24'-10" |

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 30 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

**Construction Detail**
Limit States Design

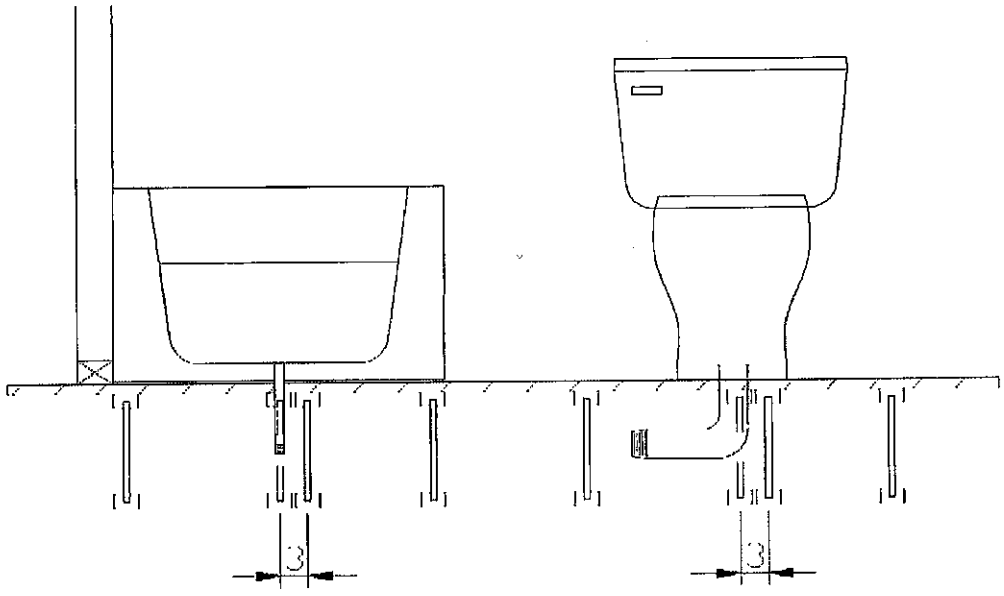
# Allowance for Piping (Installation Notes)

The floor layouts have usually not been checked for heating and/or plumbing interference. On-site adjustment of joists of up to 3 inches is permitted to avoid interferences. When moving a joist, the subfloor thickness shall be checked with code requirements when the joist spacing exceeds 19.2 inches. Except for cutting to length, I-joist flanges should never be cut, drilled, or notched.

Installation of Nordic I-joists shall be as per *Nordic Joist Installation Guide for Residential Floors*. Refer to Tables 1 and 2 for maximum web hole and duct chase openings, respectively. These tables are based on the I-joists being used at their maximum spans. The minimum distance given may be reduced for shorter spans; contact your distributor for additional information.

The detail below shows the 3-inch allowance for piping. Every third joist may be shifted up to 3 inches to avoid heating/plumbing interference. For other applications, please contact your distributor.

**ALLOWANCE FOR PIPING**




Every third joist may be shifted up to 3 inches to avoid heating/plumbing interference.

Revised April 12, 2012

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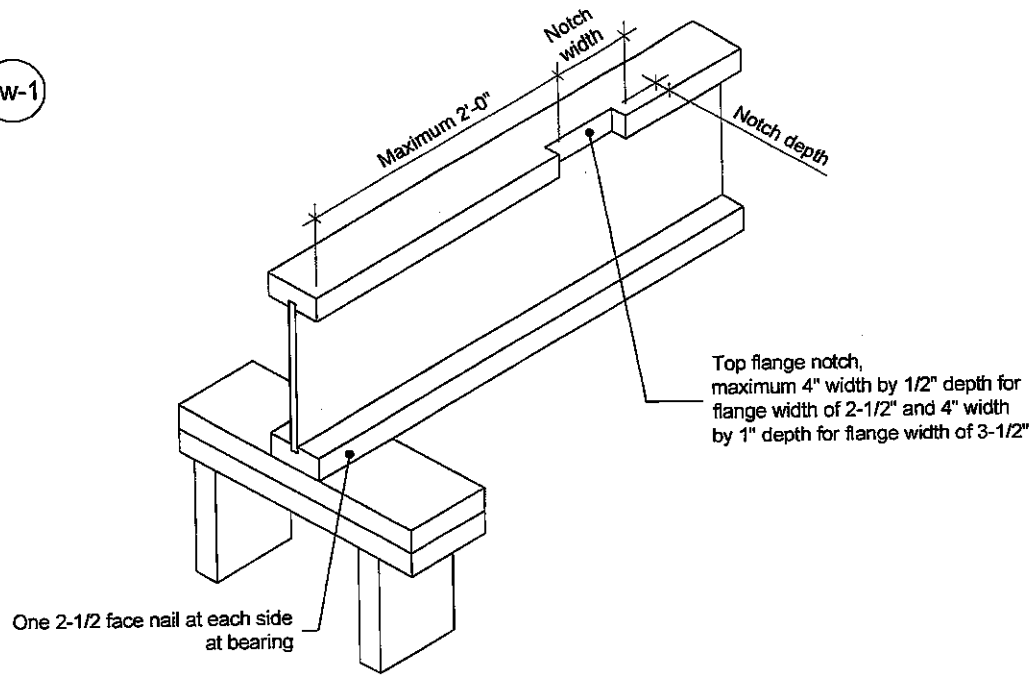


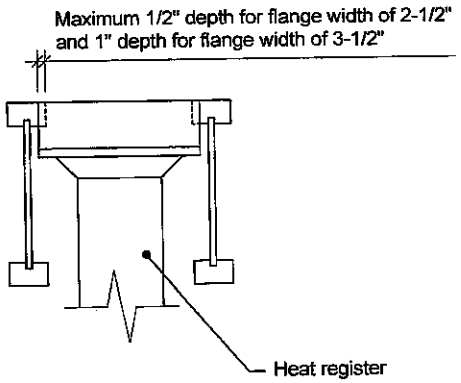


**Notes:**

1. Blocking required at bearing for lateral support, not shown for clarity.
2. The maximum dimensions for a notch on the side of the top flange are 4-inch width by 1/2-inch depth for flange width of 2-1/2 inches, and 4-inch width by 1-inch depth for flange width of 3-1/2 inches.
3. This detail applies to simple-span joists and multiple-span joists where the notch is located at the end half-span.
4. For other applications, contact Nordic Structures.



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TITLE
Notch in I-joist for Heat Register

DOCUMENT
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CATEGORY
I-joist - Typical Floor Framing and Construction Details

DATE
2018-04-10

NUMBER
1w-1