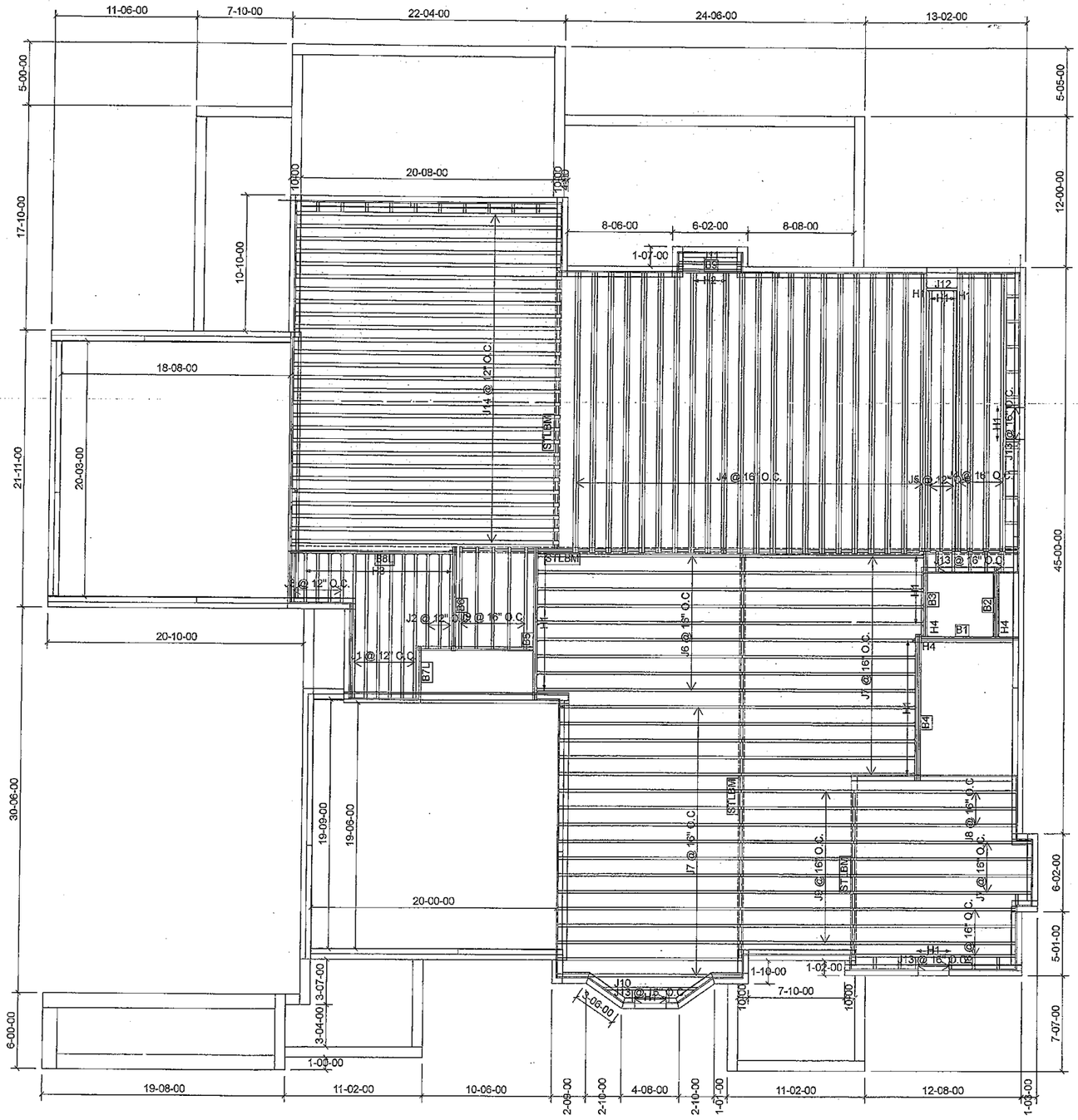



| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 12-00-00 | 9 1/2" NI-40x | 1 | 6 |
| J2 | 8-00-00 | 9 1/2" NI-40x | 1 | 3 |
| J3 | 4-00-00 | 9 1/2" NI-40x | 1 | 5 |
| J4 | 24-00-00 | 14" NI-40x | 2 | 52 |
| J5 | 22-00-00 | 14" NI-40x | 1 | 3 |
| J6 | 18-00-00 | 14" NI-40x | 1 | 9 |
| J7 | 16-00-00 | 14" NI-40x | 1 | 35 |
| J8 | 14-00-00 | 14" NI-40x | 1 | 7 |
| J9 | 10-00-00 | 14" NI-40x | 1 | 15 |
| J10 | 8-00-00 | 14" NI-40x | 1 | 1 |
| J11 | 6-00-00 | 14" NI-40x | 1 | 1 |
| J12 | 4-00-00 | 14" NI-40x | 1 | 1 |
| J13 | 2-00-00 | 14" NI-40x | 1 | 11 |
| J14 | 22-00-00 | 14" NI-80 | 1 | 27 |
| B8L | 14-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B7L | 6-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B5 | 14-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B4 | 12-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 3 | 3 |
| B6 | 10-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B1 | 8-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B3 | 8-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B2 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B9 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 14 | H1 | IUS2.56/11.88 |
| 4 | H1 | IUS2.56/11.88 |
| 9 | H1 | IUS2.56/11.88 |
| 7 | H1 | IUS2.56/11.88 |
| 3 | H2 | HU314-2 |
| 13 | H3 | IUS2.56/9.5 |
| 2 | H4 | HGUS410 |
| 1 | H4 | HGUS410 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED: JAN 2018**

**BUILDER:** GREENYORK HOMES

**SITE:** BALTINO

**MODEL:** AVIGNON 3

**ELEVATION:**

**LOT:**

**CITY:** KING

**SALESMAN:** RICK DICIANO
**DESIGNER:** LBV
**REVISION:**

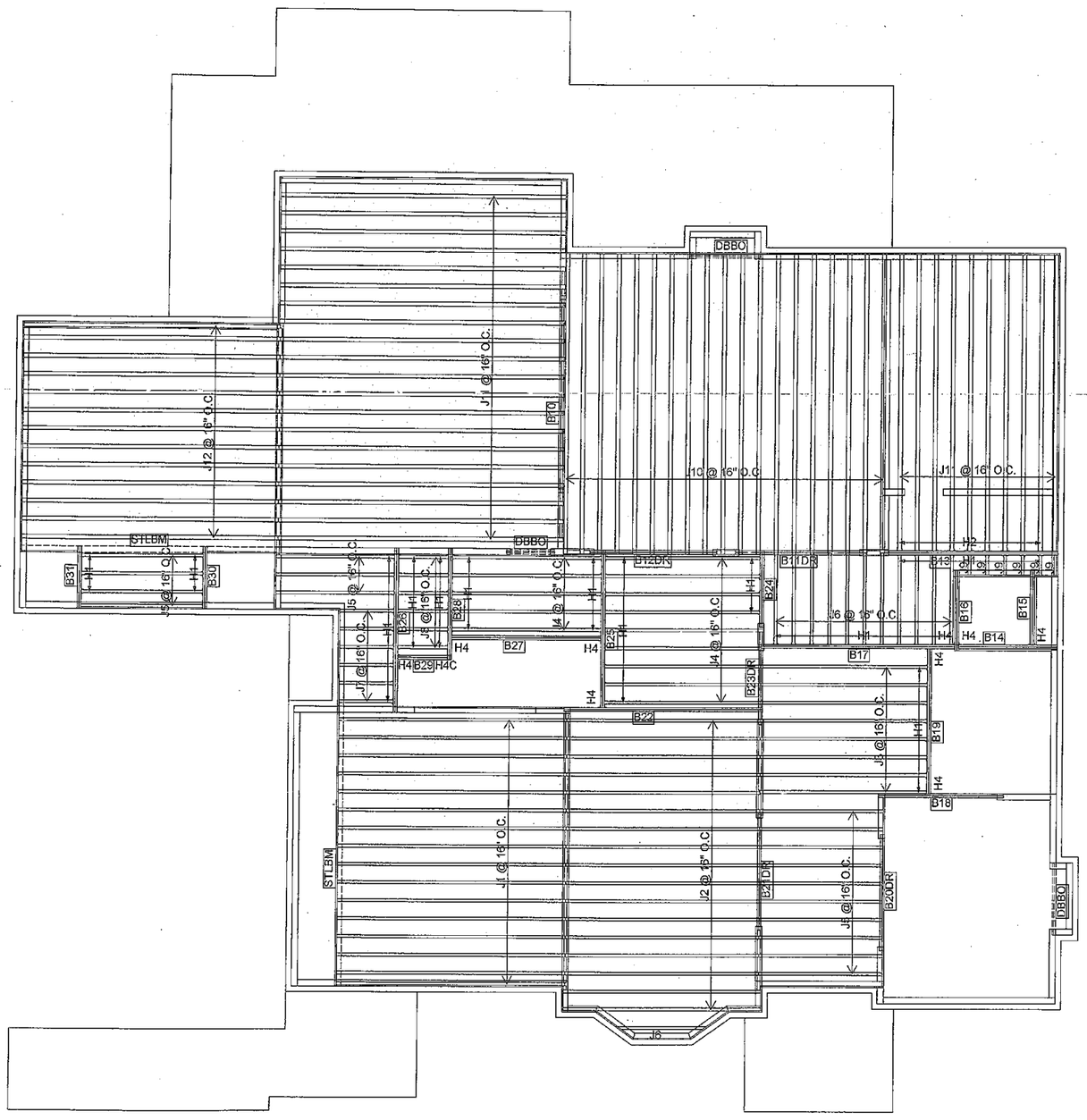
**NOTES:**
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK** REQ. 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 TILE** APPLICATION AS PER O.B.C 9.30.6.

**LOADING:**
DESIGN LOADS: L/720.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²
TILE LOAD: 25.0 lb/ft²

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

**DATE:** 2019-09-23

# 1st FLOOR




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 14" NI-40x | 1 | 16 |
| J2 | 16-00-00 | 14" NI-40x | 1 | 17 |
| J3 | 14-00-00 | 14" NI-40x | 1 | 8 |
| J4 | 12-00-00 | 14" NI-40x | 1 | 14 |
| J5 | 10-00-00 | 14" NI-40x | 1 | 17 |
| J6 | 8-00-00 | 14" NI-40x | 1 | 12 |
| J7 | 6-00-00 | 14" NI-40x | 1 | 6 |
| J8 | 4-00-00 | 14" NI-40x | 1 | 6 |
| J9 | 2-00-00 | 14" NI-40x | 1 | 6 |
| J10 | 24-00-00 | 14" NI-80 | 1 | 19 |
| J11 | 22-00-00 | 14" NI-80 | 1 | 30 |
| J12 | 20-00-00 | 14" NI-80 | 1 | 13 |
| B11DR | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B12DR | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B20DR | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B21DR | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B23DR | 6-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B10 | 16-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 3 | 3 |
| B17 | 16-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B22 | 16-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B13 | 14-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B26 | 14-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B19 | 12-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B25 | 12-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B27 | 12-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B18 | 10-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B28 | 10-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B14 | 8-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B15 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B16 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B24 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B30 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B31 | 6-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B29 | 4-00-00 | 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP | 2 | 2 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 78 | H1 | IUS2.56/11.88 |
| 9 | H2 | IUS3.56/11.88 |
| 1 | H4C | HUC410 |
| 9 | H4 | HGUS410 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

**FROM PLAN DATED:** JAN 2018

**BUILDER:** GREENYORK HOMES

**SITE:** BALTINO

**MODEL:** AVIGNON 3

**ELEVATION:**

**LOT:**

**CITY:** KING

**SALESMAN:** RICK DICIANO
**DESIGNER:** LBV
**REVISION:**

**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** REQ. I-JOIST BLOCKING ALONG BEARING AND RIMBOARD CLOSURE AT ENDS. SEE FIGURE 7 TABLES 4 & 5 FOR REINFORCEMENT REQUIREMENTS. FOR **HOLES** INCLUDING **DUCT CHASE** AND **FIELD CUT OPENINGS** SEE FIGURE 7 TABLES 1 & 2 OF THE INSTALLATION GUIDE. **CERAMIC TILE** APPLICATION AS PER O.B.C. 9.30.6

**LOADING:**
DESIGN LOADS: L/720.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 20.0 lb/ft²
TILE LOAD: 25.0 lb/ft²

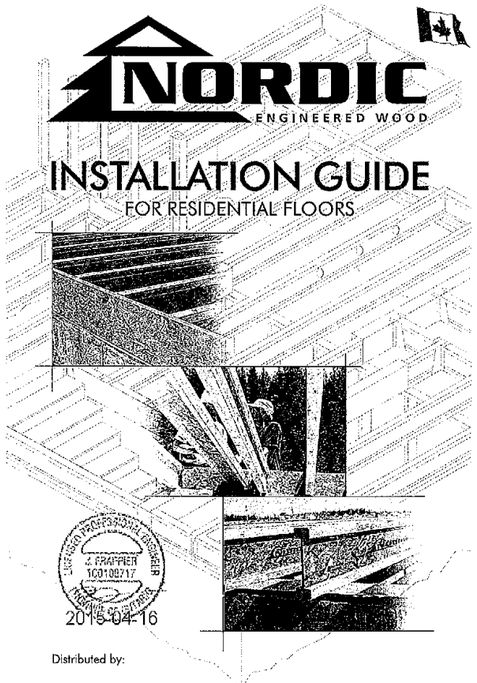
**SUBFLOOR:** 3/4" GLUED AND NAILED

**DATE:** 2019-09-23

# 2nd FLOOR

# NORDIC
ENGINEERED WOOD

# INSTALLATION GUIDE
## FOR RESIDENTIAL FLOORS



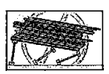


Distributed by:

N-C301 / 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. 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.

## 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 CSA-O 86-09 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

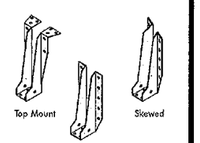
**MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS**
SIMPLE AND MULTIPLE SPANS

| 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'-5" | 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'-9" |
| | 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'-2" | 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'-9" | 23'-9 |
| | NI-90x | 24'-8" | 22'-9" | 21'-9" | 21'-10" | 27'-3" | 25'-2" | 24'-0" | 24'-1" |

CCMC EVALUATION REPORT 13022-R

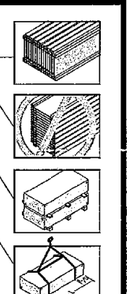
## I-JOIST HANGERS

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.




## 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.



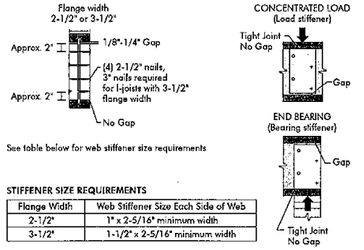
## WEB STIFFENERS

**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**

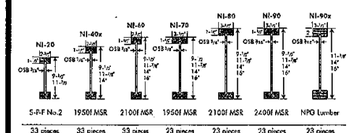



See table below for web stiffener size requirements

**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 manufacturing process. Every phase of the operation, from forest to the finished product, reflects our commitment to quality.

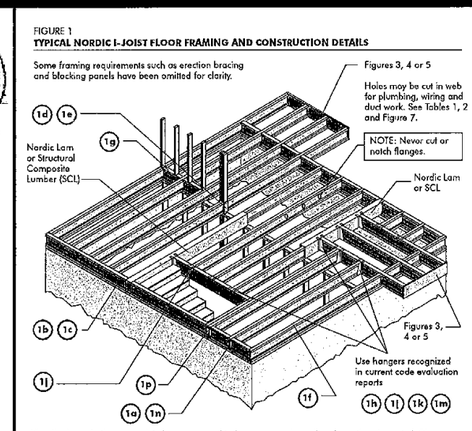
Nordic Engineered Wood I-joists use only finger-jointed black spruce lumber in their flanges, ensuring consistent quality, superior strength and longer span carrying capacity.



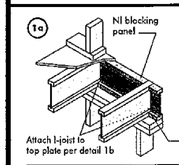
## INSTALLING NORDIC I-JOISTS

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 and end 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**

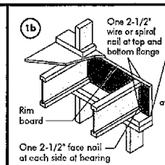



All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



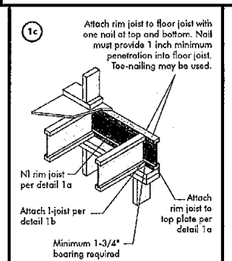

| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

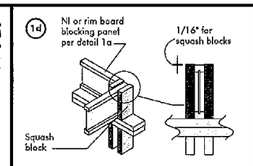
*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.




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

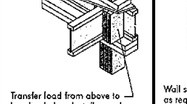
*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

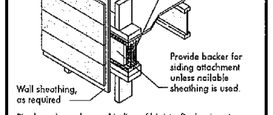


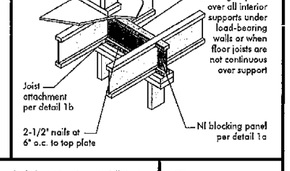



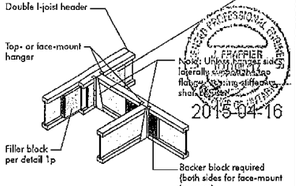

| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) | |
|---|---|---|
| | 3-1/2" wide | 5-1/2" wide |
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

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



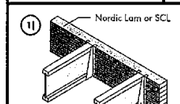

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

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" |

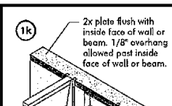
* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O437 Standard.

** 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".

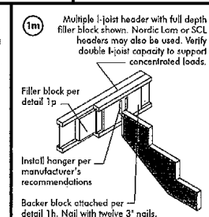


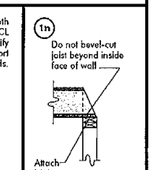

For nailing schedules for multiple beams, see the manufacturer's recommendations.

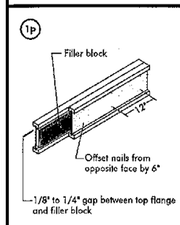
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.




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



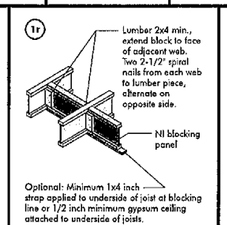



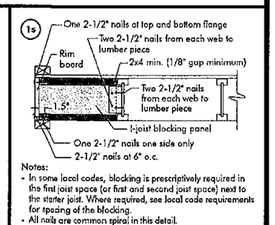




Notes:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 3" 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" |

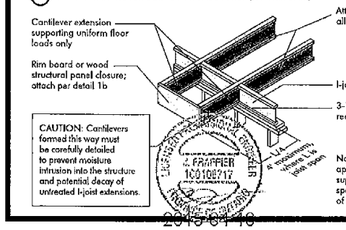


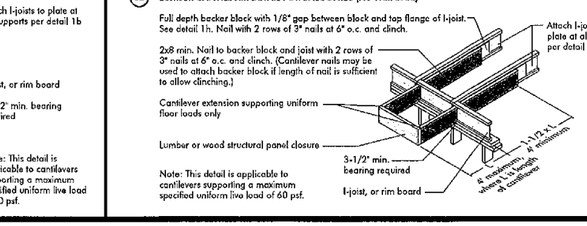

Notes:
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
- All nails are common spiral in this detail.

## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

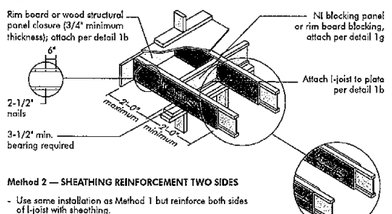



### 3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)




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

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

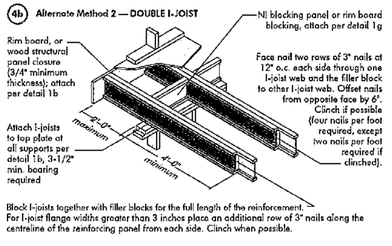



### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- 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".

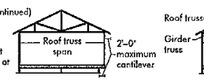
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

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

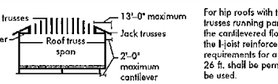



Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 3" nails along the centreline of the reinforcing panel from each side. Clinch when possible.

FIGURE 4 (continued)




See table below for NI reinforcement requirements at cantilever.



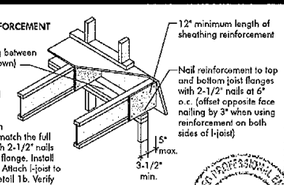

For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

### 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 | 1 | 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 | 1 | 1 | X | 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 | 1 | 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 | 1 | 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 | 1 | 1 |
| | 32 | N | N | N | N | N | N | N | 1 | N | N | 1 | 2 |
| | 34 | N | N | N | N | N | N | N | 1 | N | N | 1 | 2 |
| | 36 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 38 | N | N | N | 1 | N | N | N | 1 | N | N | 1 | 2 |
| | 40 | N | N | N | 1 | N | N | 1 | 2 | N | N | 1 | 2 |
| | 42 | N | N | N | 1 | N | N | 1 | 2 | N | 1 | 2 | X |

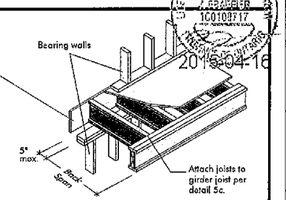
1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 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.

### 5a SHEATHING REINFORCEMENT



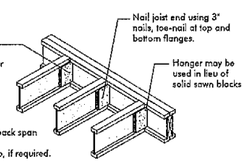

Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

### 5b SET-BACK DETAIL



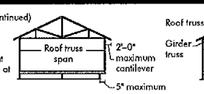

Notes:
- Provide full depth blocking between joists over support (not shown for clarity)
- Attach I-joist to plate at all supports per detail 1b.
- 3-1/2" minimum I-joist bearing required.

### 5c SET-BACK CONNECTION

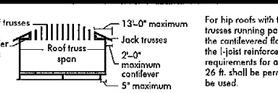



Notes:
- Verify girder joist capacity if the back span exceeds the joist spacing.
- Attach double I-joist per detail 1p, if required.

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 LOADINGS (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 | 2 | 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 | X | 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 | 2 | 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 | X | X | X | X |
| 16" | 25 | N | 1 | 2 | X | N | 1 | 2 | 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 | 2 | 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 *(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 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 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.) 3 | 4 | 5 | 6 | 6-1/4 | 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'-5" | 5'-8" | 6'-0" | --- | --- | --- | --- | --- | --- | --- | --- | 13'-6" |
| | NI-40x | 0'-7" | 1'-6" | 3'-0" | 4'-4" | 5'-0" | 5'-4" | --- | --- | --- | --- | --- | --- | --- | --- | 14'-9" |
| | NI-60 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 7'-0" | 7'-5" | --- | --- | --- | --- | --- | --- | --- | --- | 14'-11" |
| | NI-70 | 1'-3" | 2'-6" | 4'-4" | 6'-2" | 8'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | --- | --- | 15'-2" |
| | NI-80 | 1'-3" | 2'-6" | 5'-0" | 6'-2" | 8'-8" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15'-9" |
| 11-7/8" | NI-20 | 0'-7" | 0'-8" | 1'-3" | 2'-8" | 4'-0" | 5'-0" | 6'-0" | 7'-0" | --- | --- | --- | --- | --- | --- | 15'-6" |
| | NI-40x | 0'-7" | 0'-8" | 1'-3" | 2'-8" | 4'-0" | 5'-0" | 5'-5" | 8'-4" | --- | --- | --- | --- | --- | --- | 16'-6" |
| | NI-60 | 0'-7" | 1'-5" | 3'-0" | 4'-3" | 6'-0" | 6'-0" | 7'-3" | 8'-10" | 10'-0" | --- | --- | --- | --- | --- | 16'-9" |
| | NI-70 | 1'-3" | 2'-5" | 4'-0" | 5'-4" | 6'-9" | 7'-2" | 8'-6" | 10'-0" | 11'-3 | --- | --- | --- | --- | --- | 17'-5" |
| | NI-80 | 1'-6" | 2'-10" | 4'-2" | 5'-6" | 7'-0" | 7'-5" | 8'-6" | 10'-3" | 11'-4 | --- | --- | --- | --- | --- | 17'-7" |
| | NI-90 | 0'-7" | 0'-8" | 1'-5" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | 17'-11 |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 1'-5" | 3'-4" | 4'-9" | 6'-3" | --- | --- | --- | --- | --- | --- | --- | 18'-0" |
| 14" | NI-40x | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-2" | 3'-9" | 5'-2" | 6'-0" | 6'-6" | 8'-5" | 10'-2" | --- | --- | --- | 17'-11" |
| | NI-60 | 0'-7" | 0'-8" | 1'-8" | 3'-0" | 4'-3" | 4'-8" | 5'-8" | 7'-2" | 8'-0" | 10'-4" | 11'-5" | --- | --- | --- | 18'-2" |
| | NI-70 | 0'-8" | 1'-10" | 3'-0" | 4'-5" | 5'-10" | 6'-2" | 7'-3" | 8'-9" | 9'-8" | 12'-0" | 13'-0" | --- | --- | --- | 19'-5" |
| | NI-80 | 0'-10" | 2'-0" | 3'-4" | 4'-9" | 6'-2" | 6'-5" | 7'-6" | 9'-0" | 10'-0" | 12'-4" | 13'-5" | --- | --- | --- | 19'-5" |
| | 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'-1" | --- | --- | 19'-9 |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 1'-8" | 3'-6" | 4'-0" | 5'-5" | 7'-3" | 8'-6" | 9'-2" | --- | --- | --- | --- | 20'-0 |
| 16" | NI-60 | 0'-7" | 0'-8" | 0'-8" | 1'-5" | 2'-10" | 3'-2" | 4'-2" | 5'-6" | 6'-4" | 7'-9" | 8'-5" | 9'-8" | 10'-3" | 12'-5" | 19'-10" |
| | NI-70 | 0'-7" | 1'-0" | 2'-3" | 3'-6" | 4'-10" | 5'-3" | 6'-5" | 7'-8" | 8'-6" | 9'-5" | 10'-8" | 12'-0" | 12'-4" | 14'-0" | 20'-10" |
| | NI-80 | 0'-7" | 1'-3" | 2'-6" | 3'-10" | 5'-3" | 5'-7" | 6'-8" | 8'-0" | 9'-0" | 9'-5" | 11'-0" | 12'-3" | 12'-8" | 14'-5" | 21'-2 |
| | NI-90 | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-3" | 3'-8" | 4'-9" | 6'-5" | 7'-5" | 8'-9" | 9'-10" | 11'-3" | 11'-9" | 13'-9" | 15'-4" | 21'-6 |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 0'-9" | 2'-8" | 3'-0" | 4'-0" | 5'-9" | 6'-9" | 7'-9" | 8'-4" | 10'-2" | 11'-6" | 12'-9" | --- | 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.

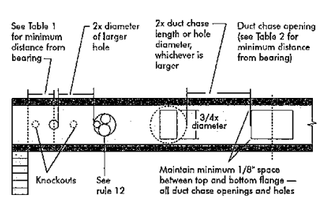
**OPTIONAL:**

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 Span Tables), the minimum distance from the centreline of the hole to the face of any support (D) as given above may be reduced as follows:

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

Where:
- $D_{reduced}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft-in.). This distance shall not be less than 6 inches from the face of the support to edge of the hole.
- $I_{actual}$ = 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 $\frac{I_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{I_{actual}}{SAF}$.

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 | 5'-3" | 5'-8" | 6'-0" | 6'-5" | 6'-10" | 7'-3" | 7'-8" | 8'-2" | 8'-6" |
| | NI-60 | 5'-4" | 5'-9" | 6'-2" | 6'-7" | 7'-1" | 7'-5" | 7'-9" | 8'-3" | 8'-10" |
| | NI-70 | 5'-1" | 5'-5" | 5'-10" | 6'-3" | 6'-7" | 7'-1" | 7'-6" | 8'-1" | 8'-4" |
| | NI-80 | 5'-0" | 5'-4" | 5'-8" | 6'-0" | 6'-10" | 7'-3" | 7'-8" | 8'-1" | 8'-4" |
| 11-7/8" | NI-20 | 5'-9" | 6'-2" | 6'-6" | 7'-1" | 7'-5" | 8'-3" | 8'-9" | 9'-4" | --- |
| | NI-40x | 5'-8" | 7'-2" | 7'-6" | 8'-1" | 8'-6" | 9'-1" | 9'-6" | 10'-1" | 10'-5" |
| | 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'-5" | 7'-9" | 8'-3" | 8'-7" | 9'-1" | 9'-6" | 10'-0" | 10'-4" |
| | NI-80 | 7'-0" | 7'-3" | 8'-0" | 8'-5" | 8'-10" | 9'-3" | 9'-8" | 10'-2" | 10'-8" |
| | NI-90 | 7'-0" | 7'-11" | 8'-4" | 8'-9" | 9'-2" | 9'-7" | 10'-1" | 10'-7" | 10'-11" |
| | NI-90x | 7'-0" | 8'-0" | 8'-4" | 8'-10" | 9'-3" | 9'-8" | 10'-2" | 10'-8" | 11'-2" |
| 14" | NI-40x | 8'-1" | 8'-7" | 9'-0" | 9'-7" | 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'-7" | 12'-3" | 13'-0" |
| | NI-70 | 8'-7" | 9'-1" | 9'-5" | 9'-10" | 10'-4" | 10'-8" | 11'-2" | 11'-7" | 12'-5" |
| | NI-80 | 8'-5" | 8'-9" | 9'-3" | 9'-8" | 10'-1" | 10'-6" | 11'-1" | 11'-6" | 12'-6" |
| | NI-90 | 9'-5" | 9'-8" | 10'-0" | 10'-6" | 10'-11" | 11'-5" | 11'-9" | 12'-4" | 13'-11" |
| | NI-90x | 9'-4" | 9'-8" | 10'-0" | 10'-5" | 10'-7" | 11'-1" | 11'-5" | 12'-1" | 13'-0" |
| 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'-8" | 12'-1" | 12'-7" | 13'-1" | 13'-8" | 14'-4" |
| | NI-90 | 10'-9" | 11'-1" | 11'-6" | 12'-0" | 12'-5" | 13'-0" | 13'-5" | 14'-0" | 14'-10" |
| | NI-90x | 11'-1" | 11'-5" | 11'-10" | 12'-4" | 12'-10" | 13'-2" | 13'-6" | 14'-2" | 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. 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 Fastenors: Edges | Interm. Supports |
|---|---|---|---|---|---|---|
| 16 | 5/8 | 2" | 1-3/4" | 2" | 6" | 12" |
| 20 | 5/8 | 2" | 1-3/4" | 2" | 6" | 12" |
| 24 | 3/4 | 2" | 1-3/4" | 2" | 6" | 12" |

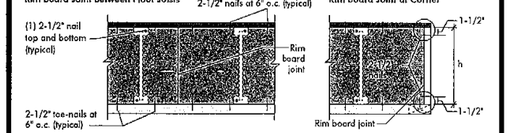
1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions 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.*

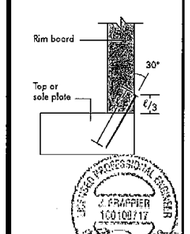
**IMPORTANT NOTE:**
**Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.**

## RIM BOARD INSTALLATION DETAILS

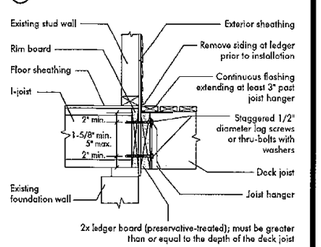
### 8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT



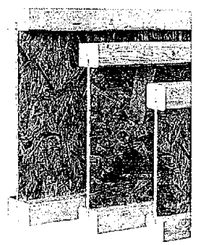

### 8b TOE-NAIL CONNECTION AT RIM BOARD




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





# CONSTRUCTION DETAILS FOR RESIDENTIAL FLOORS

N-C303 / April 2014

NORDIC ENGINEERED WOOD

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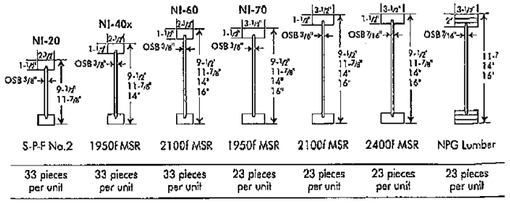
FSC mixed sources

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




## 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'-3" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-70 | 2'-0" | 3'-4" | 4'-9" | 6'-3" | 8'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | NI-80 | 2'-3" | 3'-6" | 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'-3" | 2'-8" | 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'-3" | 5'-8" | 7'-0" | 7'-5" | 8'-8" | 10'-3" | 11'-6" | --- | --- | --- | --- | --- | --- |
| | 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'-0" |
| | 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'-3" | 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

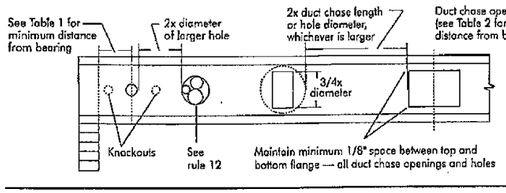
Simple Span Only

| 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'-2" | 5'-8" | 6'-0" | 6'-5" | 6'-10" | 7'-3" | 7'-8" | 8'-2" | 8'-6" |
| | 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'-8" |
| | 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" | 12'-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'-6" | 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 over-stress 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.

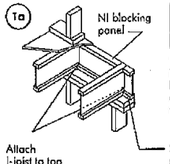
CHANTIERS CHIBOUGAMAU

## 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.*

**1a**

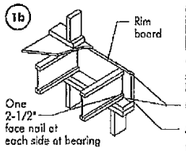



| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| NI Joists | 3,300 |

*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.

2-1/2" nails at 6" o.c. to top plate (when used for lateral shear transfer, nail to bearing plate with same nailing as required for decking)

**1b**




| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| 1-1/8" Rim Board Plus | 6,090 |

*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.

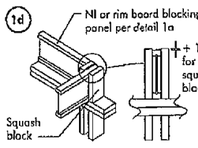
One 2-1/2" wire or spiral nail at top and bottom flange

Attach rim board to top plate using 2-1/2" wire or spiral toe-nails at 6" o.c.

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.

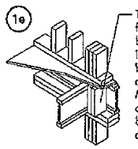
**1d**



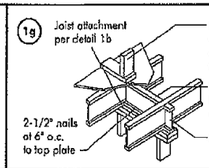

| Pair of Squash Blocks | Maximum Factored Vertical Load per Pair of Squash Blocks (lbs) | |
|---|---|---|
| | 3-1/2" wide | 5-1/2" wide |
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

Provide lateral bracing per detail 1a or 1b

**1e**




**1g**



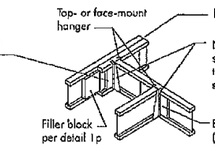

**1h**

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)

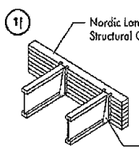
| Flange Width | Material Thickness Required* | Minimum Depth** |
|---|---|---|
| 2-1/2" | 1" | 5-1/2" |
| 3-1/2" | 1-1/2" | 7-1/4" |

* 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".



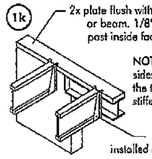

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

**1i**

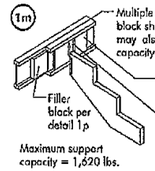



NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

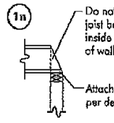
**1k**




**1m**

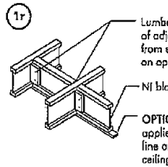



**1n**

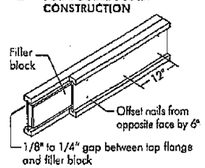



NOTE: Blocking required at bearing for lateral support, not shown for clarity.

**1r**



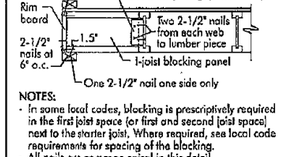

**1p** FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION




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" | 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" |

**1s**




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.**

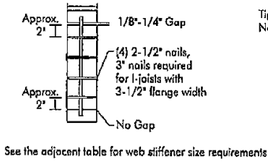
## WEB STIFFENERS

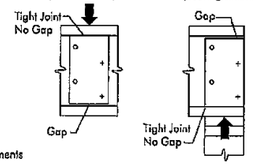
RECOMMENDATIONS:

- 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



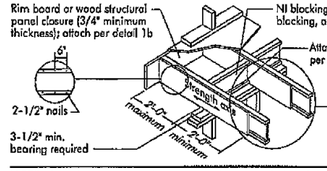

STIFFENER SIZE REQUIREMENTS

| 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 |

See the adjacent table for web stiffener size requirements

## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

**4a** Method 1 — SHEATHING REINFORCEMENT ONE SIDE




Method 2 — SHEATHING REINFORCEMENT TWO SIDES

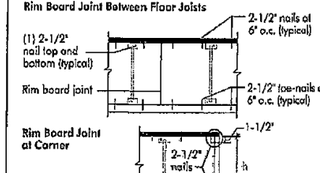
Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.


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.

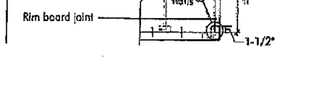
## RIM BOARD INSTALLATION DETAILS

**8a** ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

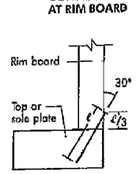
Rim Board Joint Between Floor Joists




Rim Board Joint at Corner




**8b** TOE-NAIL CONNECTION AT RIM BOARD



| NORDIC STRUCTURES | COMPANY<br>Sep. 20, 2019 14:20 | PROJECT<br>J14 GRD FLR |
|---|---|---|

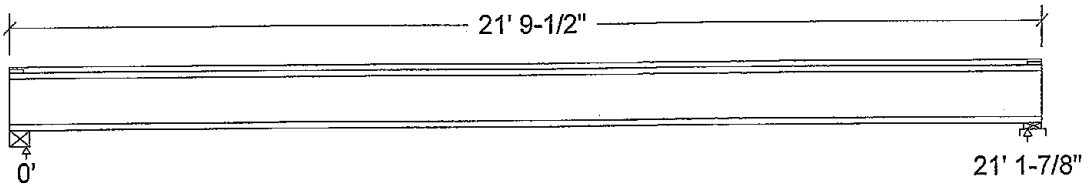
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

| Load | Type | Distribution | Pat-tern | Location [ft] Start | End | Magnitude Start | End | Unit |
|---|---|---|---|---|---|---|---|---|
| Load1 | Dead | Full Area | | | | 25.00 | | psf |
| Load2 | Live | Full Area | | | | 40.00 | | psf |

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




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 264 | | 264 |
| Live | 423 | | 423 |
| Factored: | | | |
| Total | 965 | | 965 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 2446 | | 2446 |
| Support | - | | 10829 |
| Des ratio | | | |
| Joist | 0.39 | | 0.39 |
| Support | - | | 0.09 |
| Load case | #2 | | #2 |
| Length | 5 | | 4-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | - | | 1.00 |
| fcp sup | - | | 769 |
| Kzcp sup | - | | 1.15 |

**Nordic Joist 14" NI-80 Floor joist @ 12" o.c.**

Supports: 1 - Steel Beam, W; 2 - Lumber Sill plate, No.1/No.2;

Total length: 21' 9-1/2"; Clear span: 21' 1/8"; 3/4" nailed and glued OSB sheathing with 1/2" gypsum ceiling

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

LICENSED PROFESSIONAL ENGINEER
9-25-19
S. KATSOULAKOS
PROVINCE OF ONTARIO

p6/12

DWG NO. TAM3052-19
STRUCTURAL
COMPONENT ONLY

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

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 965 | Vr = 2731 | lbs | Vf/Vr = 0.35 |
| Moment(+) | Mf = 5105 | Mr = 13980 | lbs-ft | Mf/Mr = 0.37 |
| Perm. Defl'n | 0.14 = < L/999 | 0.71 = L/360 | in | 0.20 |
| Live Defl'n | 0.23 = < L/999 | 0.35 = L/720 | in | 0.65 |
| Total Defl'n | 0.37 = L/685 | 1.06 = L/240 | in | 0.35 |
| Bare Defl'n | 0.25 = L/998 | 0.71 = L/360 | in | 0.36 |
| Vibration | Lmax = 21'-1.9 | Lv = 24'-1.9 | ft | 0.88 |
| Defl'n | = 0.022 | = 0.031 | in | 0.72 |

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2731 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 13980 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 802.1 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 = 909.19 lb-in^2  K=  7.28e06 lbs
"Live" deflection is due to all non-dead loads (live, wind, snow…)
```

## Design Notes:

CONFORMS TO OBC 2012

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.

LICENSED PROFESSIONAL ENGINEER
9252
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3052-19
STRUCTURAL
COMPONENT ONLY

| NORDIC STRUCTURES | COMPANY<br>Sep. 20, 2019 14:22 | PROJECT<br>J4 GRD FLR |
|---|---|---|

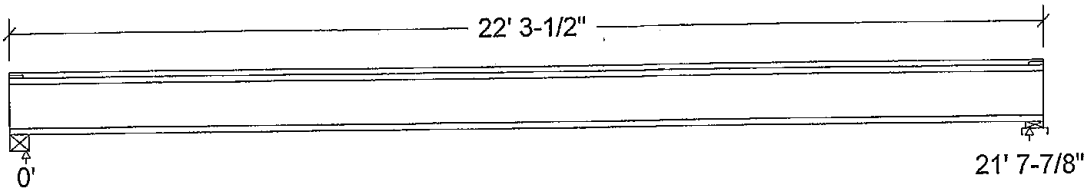
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

| Load | Type | Distribution | Pat-tern | Location [ft] Start | End | Magnitude Start | End | Unit |
|---|---|---|---|---|---|---|---|---|
| Load1 | Dead | Full Area | | | | 25.00 | | psf |
| Load2 | Live | Full Area | | | | 40.00 | | psf |

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




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 361 | | 361 |
| Live | 578 | | 578 |
| Factored: | | | |
| Total | 1317 | | 1317 |
| Bearing: | | | |
| Capacity | | | |
| Joist | 4892 | | 4892 |
| Support | - | | 15470 |
| Des ratio | | | |
| Joist | 0.27 | | 0.27 |
| Support | - | | 0.09 |
| Load case | #2 | | #2 |
| Length | 5 | | 4-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | - | | 1.00 |
| fcp sup | - | | 769 |
| Kzcp sup | - | | 1.15 |

**Nordic Joist 14" NI-40x 2-ply Floor joist @ 16" o.c.**

Supports: 1 - Steel Beam, W; 2 - Lumber Sill plate, No.1/No.2;

Total length: 22' 3-1/2"; Clear span: 21' 6-1/8"; 3/4" 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 = 1317 | Vr = 5463 | lbs | Vf/Vr = 0.24 |
| Moment(+) | Mf = 7133 | Mr = 15068 | lbs-ft | Mf/Mr = 0.47 |
| Perm. Defl'n | 0.15 = < L/999 | 0.72 = L/360 | in | 0.20 |
| Live Defl'n | 0.24 = < L/999 | 0.36 = L/720 | in | 0.65 |
| Total Defl'n | 0.38 = L/677 | 1.08 = L/240 | in | 0.35 |
| Bare Defl'n | 0.26 = L/980 | 0.72 = L/360 | in | 0.37 |
| Vibration | Lmax = 21'-7.9 | Lv = 24'-2.8 | ft | 0.89 |
| Defl'n | = 0.023 | = 0.031 | in | 0.76 |

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

p6/12

DWG NO. TAM 3053-19
STRUCTURAL
COMPONENT ONLY

## Additional Data:

| FACTORS: | f/E | KD | KH | KZ | KL | KT | KS | KN | LC# |
|---|---|---|---|---|---|---|---|---|---|
| Vr | 2731 | 1.00 | 1.00 | - | - | - | - | - | #2 |
| Mr+ | 7534 | 1.00 | 1.00 | - | 1.000 | - | - | - | #2 |
| EI | 540.1 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 = 612.45 lb-in^2/ply  K=  7.28e06 lbs/ply
 "Live" deflection is due to all non-dead loads (live, wind, snow…)
```

## Design Notes:

CONFORMS TO OBC 2012

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 3053-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

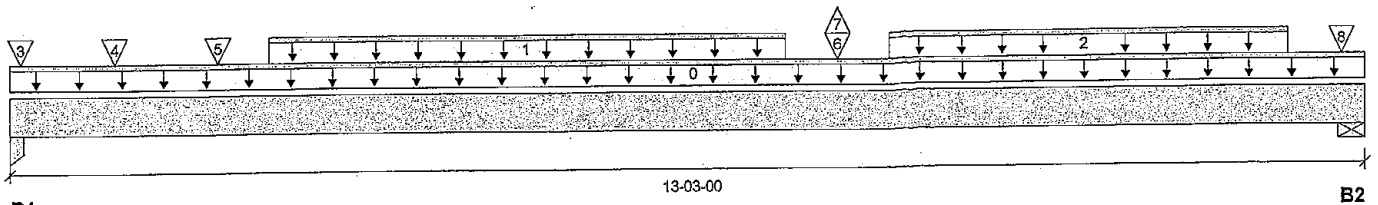
## 1ST FLR FRAMING\Flush Beams\B8L(i4121)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B8L(i4121)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 13-03-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 1,146 / 2 | 605 / 0 | | |
| B2, 5-1/2" | 802 / 2 | 464 / 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 | 13-03-00 | Top | | 5 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 02-06-00 | 07-06-00 | Top | 228 | 114 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 08-06-00 | 12-06-00 | Top | 78 | 39 | | | n\a |
| 3 | J2(i1871) | Conc. Pt. (lbs) | L | 00-01-04 | 00-01-04 | Top | 77 | 38 | | | n\a |
| 4 | J2(i1867) | Conc. Pt. (lbs) | L | 01-00-00 | 01-00-00 | Top | 154 | 77 | | | n\a |
| 5 | J2(i1854) | Conc. Pt. (lbs) | L | 02-00-00 | 02-00-00 | Top | 153 | 77 | | | n\a |
| 6 | J1(i3914) | Conc. Pt. (lbs) | L | 08-00-00 | 08-00-00 | Top | 70 | 34 | | | n\a |
| 7 | J1(i3914) | Conc. Pt. (lbs) | L | 08-00-00 | 08-00-00 | Top | -4 | | | | n\a |
| 8 | E42(i1058) | Conc. Pt. (lbs) | L | 13-00-04 | 13-00-04 | Top | 43 | 52 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 7,412 ft-lbs | 11,610 ft-lbs | 63.8% | 1 | 06-00-00 |
| End Shear | 2,271 lbs | 5,785 lbs | 39.2% | 1 | 01-01-00 |
| Total Load Deflection | L/263 (0.576") | n\a | 91.3% | 6 | 06-03-00 |
| Live Load Deflection | L/402 (0.377") | n\a | 89.5% | 8 | 06-03-00 |
| Max Defl. | 0.576" | n\a | n\a | 6 | 06-03-00 |
| Span / Depth | 15.9 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 3-1/2" x 1-3/4" | 2,475 lbs | 62.2% | 33.1% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 1-3/4" | 1,783 lbs | 30.1% | 15.2% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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

CONFORMS TO OBC 2012

DWG NO. TAW 3054-1
STRUCTURAL
COMPONENT ONLY

LICENSED PROFESSIONAL ENGINEER
92519
S. KATSOULAKOS
PROVINCE OF ONTARIO

## 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

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

**PASSED**

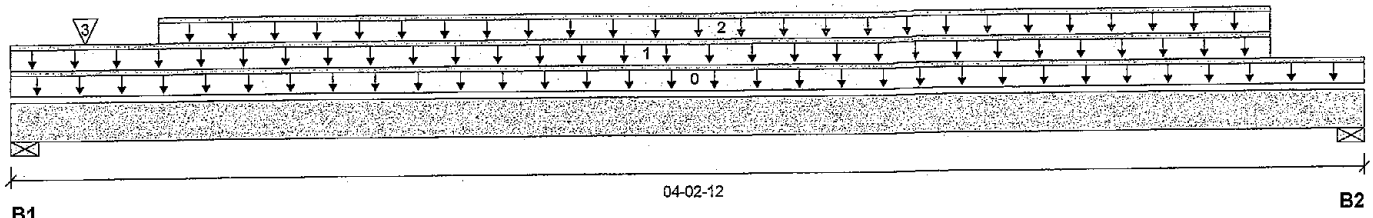
## 1ST FLR FRAMING\Flush Beams\B7L(i4215)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B7L(i4215)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 04-02-12**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 443 / 0 | 247 / 0 | | |
| B2, 3-1/2" | 437 / 0 | 228 / 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 | 04-02-12 | Top | | 5 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-11-04 | Top | 10 | 5 | | | n\a |
| 2 | STAIR | Unf. Lin. (lb/ft) | L | 00-05-08 | 03-11-04 | Top | 240 | 120 | | | n\a |
| 3 | E37(i1053) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | 17 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 871 ft-lbs | 11,610 ft-lbs | 7.5% | 1 | 02-02-06 |
| End Shear | 509 lbs | 5,785 lbs | 8.8% | 1 | 01-03-00 |
| Total Load Deflection | L/999 (0.006") | n\a | n\a | 4 | 02-02-06 |
| Live Load Deflection | L/999 (0.004") | n\a | n\a | 5 | 02-02-06 |
| Max Defl. | 0.006" | n\a | n\a | 4 | 02-02-06 |
| Span / Depth | 4.6 | | | | |

## Bearing Supports

| | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|
| B1 | Wall/Plate 5-1/2" x 1-3/4" | 973 lbs | 16.4% | 8.3% | Spruce-Pine-Fir |
| B2 | Wall/Plate 3-1/2" x 1-3/4" | 941 lbs | 25.0% | 12.6% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.
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

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9234
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3055-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

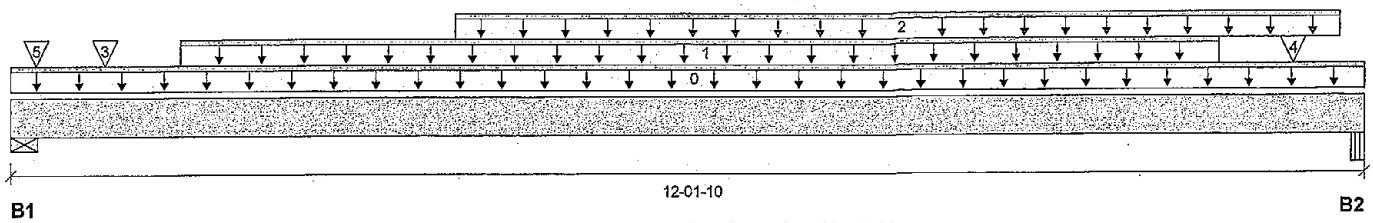
## 1ST FLR FRAMING\Flush Beams\B5(i4442)

Dry | 1 span | No cant.

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B5(i4442)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 12-01-10**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 2,026 / 0 | 1,126 / 0 | | |
| B2, 5-1/4" | 1,982 / 0 | 1,079 / 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 | 12-01-10 | Top | | 14 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-06-00 | 10-10-00 | Top | 336 | 168 | | | n\a |
| 2 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 03-11-04 | 11-11-00 | Top | 16 | 8 | | | n\a |
| 3 | J6(i2108) | Conc. Pt. (lbs) | L | 00-10-00 | 00-10-00 | Top | 435 | 218 | | | n\a |
| 4 | J6(i2116) | Conc. Pt. (lbs) | L | 11-06-00 | 11-06-00 | Top | 294 | 147 | | | n\a |
| 5 | E39(i1055) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | 27 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 12,351 ft-lbs | 48,300 ft-lbs | 25.6% | 1 | 06-02-00 |
| End Shear | 3,747 lbs | 17,052 lbs | 22.0% | 1 | 01-07-08 |
| Total Load Deflection | L/1,084 (0.126") | n\a | 22.1% | 4 | 06-00-00 |
| Live Load Deflection | L/999 (0.082") | n\a | n\a | 5 | 06-00-00 |
| Max Defl. | 0.126" | n\a | n\a | 4 | 06-00-00 |
| Span / Depth | 9.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 4,446 lbs | 37.5% | 18.9% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/4" x 3-1/2" | 4,321 lbs | 55.0% | 19.3% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
92519
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM 3056-10
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B5(i4442)

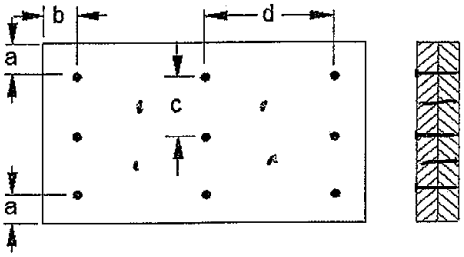
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B5(i4442)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




5 ROWS

a minimum = 2" c = 5"
b minimum = 3" d = 12"

Calculated Side Load = 678.1 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 Nails

3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
9259
S. KATSOULAKOS
PROVINCE OF ONTARIO

BWGNO. TAM3056-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Triple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

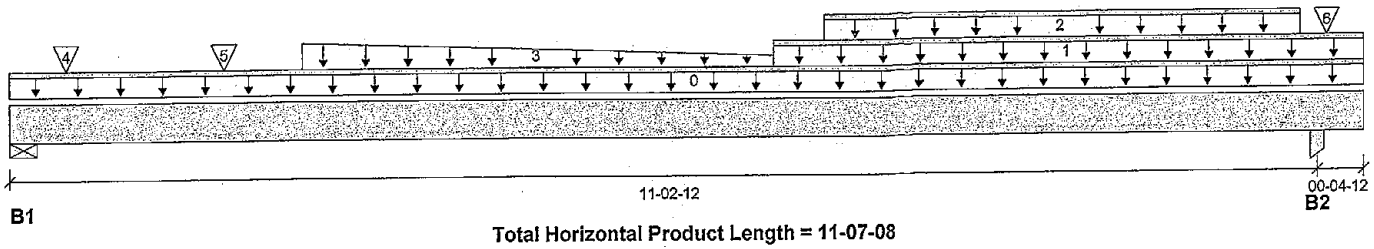
## 1ST FLR FRAMING\Flush Beams\B4(i4547)

Dry | 2 spans | R cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B4(i4547)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 11-07-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 3,324 / 0 | 4,432 / 0 | 4,861 / 0 | |
| B2, 5-1/2" | 6,258 / 0 | 4,162 / 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 | 11-07-08 | Top | | 21 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 06-05-12 | 11-07-08 | Top | 306 | 152 | | | n\a |
| 2 | STAIR | Unf. Lin. (lb/ft) | L | 06-11-00 | 11-01-00 | Top | 240 | 120 | | | n\a |
| 3 | Smoothed Load | Trapezoidal (lb/ft) | L | 02-05-12 | | Top | 567 | 283 | | | n\a |
| | | | | | 06-05-12 | | 241 | 120 | | | |
| 4 | J7(i4537) | Conc. Pt. (lbs) | L | 00-05-12 | 00-05-12 | Top | 1,176 | 3,235 | 4,861 | TOP EDGE LOADED ONLY | n\a |
| 5 | J7(i4526) | Conc. Pt. (lbs) | L | 01-09-12 | 01-09-12 | Top | 685 | 343 | | | n\a |
| 6 | B1(i4553) | Conc. Pt. (lbs) | L | 11-03-12 | 11-03-12 | Top | 3,524 | 2,673 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 13,843 ft-lbs | 75,349 ft-lbs | 18.4% | 2 | 05-09-12 |
| End Shear | 4,666 lbs | 25,578 lbs | 18.2% | 1 | 01-07-08 |
| Cont. Shear | 4,443 lbs | 25,578 lbs | 17.4% | 1 | 09-10-00 |
| Total Load Deflection | L/999 (0.088") | n\a | n\a | 79 | 05-09-12 |
| Live Load Deflection | L/999 (0.057") | n\a | n\a | 117 | 05-09-12 |
| Total Neg. Defl. | 2xL/1,998 (-0.01") | n\a | n\a | 79 | 11-07-08 |
| Max Defl. | 0.088" | n\a | n\a | 79 | 05-09-12 |
| Span / Depth | 9.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 5-1/4" | 16,156 lbs | 90.9% | 45.9% | Spruce-Pine-Fir |
| B2 | Column | 5-1/2" x 5-1/4" | 14,590 lbs | 77.8% | 41.4% | Unspecified |

LICENSED PROFESSIONAL ENGINEER
92519
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PROVINCE OF ONTARIO

P6 L4

DWG NO. TAM 3057-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Triple 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B4(i4547)

Dry | 2 spans | R cant.

September 20, 2019 14:07:55

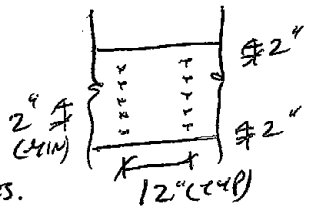
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

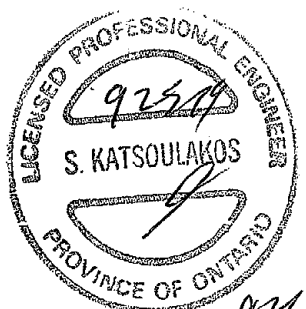
File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B4(i4547)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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.
Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection.

PROVIDE 5 ROWS OF 3½" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING, MAINTAIN A MIN. 2" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS STAGGER NAILS 6" BETWEEN PLIES.




DWG NO. TAM 3057-18
STRUCTURAL
COMPONENT ONLY

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

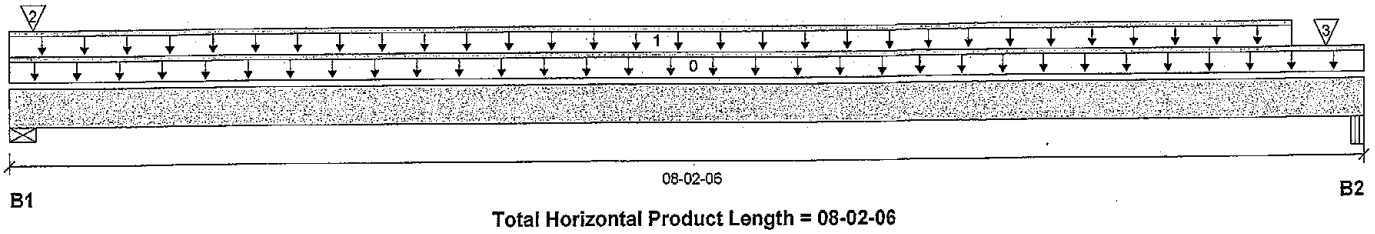
## 1ST FLR FRAMING\Flush Beams\B6(i4366)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B6(i4366)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 08-02-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 964 / 0 | 772 / 0 | | |
| B2, 5-1/4" | 467 / 0 | 351 / 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 | 08-02-06 | Top | | 14 | | | 00-00-00 |
| 1 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-09-02 | Top | 6 | 3 | | | n\a |
| 2 | PBO4(i1204) | Conc. Pt. (lbs) | L | 00-01-12 | 00-01-12 | Top | 941 | 703 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 07-11-09 | 07-11-09 | Top | 441 | 278 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 173 ft-lbs | 31,395 ft-lbs | 0.5% | 0 | 04-00-05 |
| End Shear | 61 lbs | 11,084 lbs | 0.6% | 0 | 01-05-08 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 4 | 04-00-05 |
| Live Load Deflection | L/999 (0") | n\a | n\a | 5 | 04-00-05 |
| Max Defl. | 0.001" | n\a | n\a | 4 | 04-00-05 |
| Span / Depth | 6.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 2,412 lbs | 32.0% | 16.1% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/4" x 3-1/2" | 1,140 lbs | 14.5% | 5.1% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

P6/6

DWG NO. TAM 3058 - 19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B6(i4366)

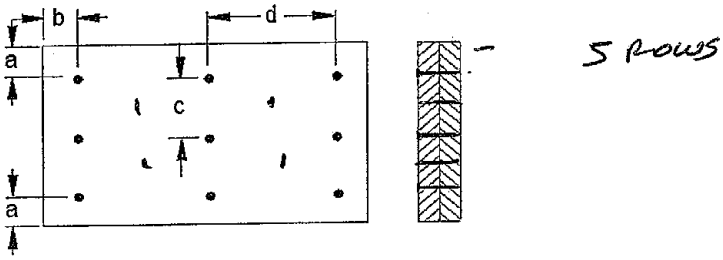
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B6(i4366)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 12"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d 1 Nails

3½" ARDOX SPIRAL


DWG NO. TAM3058-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

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

**PASSED**

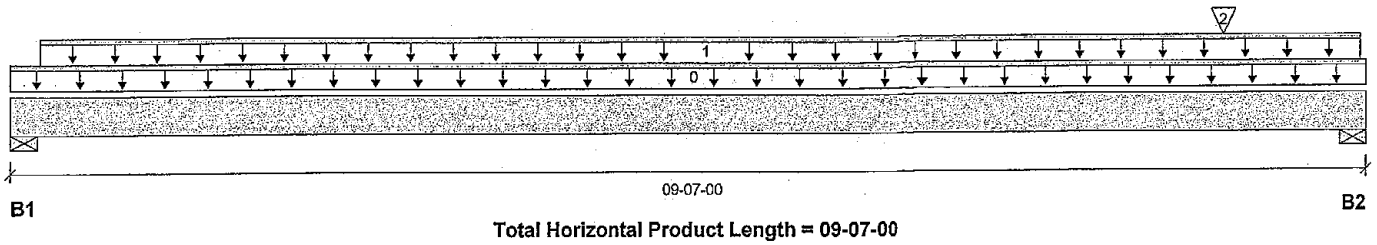
## 2ND FLR FRAMING\Dropped Beams\B12DR(i4424)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B12DR(i4424)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 09-07-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 2,217 / 0 | 1,167 / 0 | | |
| B2, 3-1/2" | 4,318 / 0 | 2,315 / 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 | 09-07-00 | Top | | 10 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-02-08 | 09-06-08 | Top | 436 | 218 | | | n\a |
| 2 | B25(i4425) | Conc. Pt. (lbs) | L | 08-06-12 | 08-06-12 | Top | 2,458 | 1,348 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 12,151 ft-lbs | 23,220 ft-lbs | 52.3% | 1 | 04-10-08 |
| End Shear | 8,348 lbs | 11,571 lbs | 72.1% | 1 | 08-06-00 |
| Total Load Deflection | L/416 (0.263") | n\a | 57.6% | 4 | 04-11-08 |
| Live Load Deflection | L/636 (0.172") | n\a | 56.6% | 5 | 04-11-08 |
| Max Defl. | 0.263" | n\a | n\a | 4 | 04-11-08 |
| Span / Depth | 11.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 4,784 lbs | 29.3% | 32.0% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 3-1/2" | 9,371 lbs | 57.3% | 62.7% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-00-04, Bottom: 00-00-04.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9/20/19
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PROVINCE OF ONTARIO

DWG NO. TAM 3064-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B12DR(i4424)

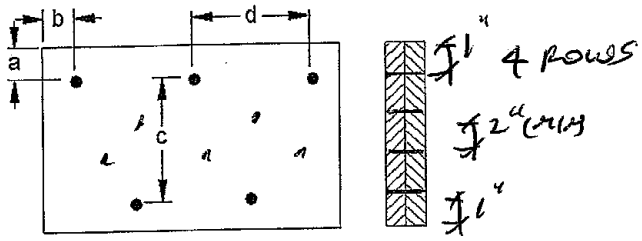
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B12DR(i4424)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 1"
b minimum = 3"
c = 7-1/2"
d = 6"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d Sinker Nails

3½" ARDOX SPIRAL


DWG NO. TAM3064-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

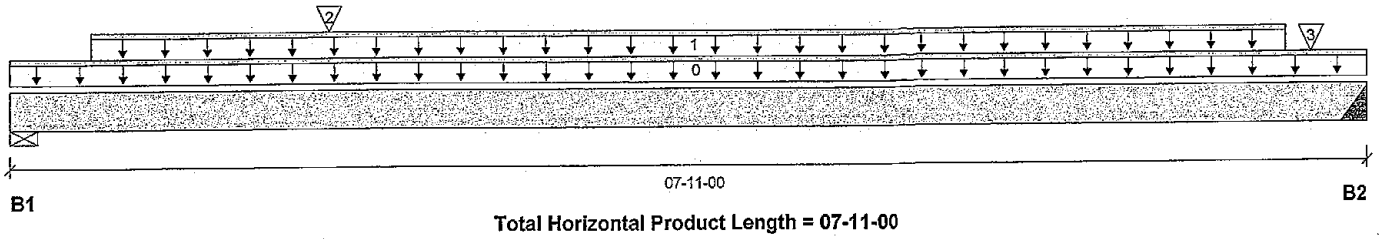
## 1ST FLR FRAMING\Flush Beams\B1(i4553)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B1(i4553)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 07-11-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5" | 0 / 0 | 538 / 0 | | |
| B2, 4" | 3,686 / 0 | 2,788 / 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 | 07-11-00 | Top | | 14 | | | 00-00-00 |
| 1 | 14(i1076) | Unf. Lin. (lb/ft) | L | 00-05-08 | 07-05-04 | Top | | 82 | | | n\a |
| 2 | B2(i4395) | Conc. Pt. (lbs) | L | 01-10-00 | 01-10-00 | Top | | 242 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 07-07-00 | 07-07-00 | Top | 3,677 | 2,398 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,158 ft-lbs | 31,395 ft-lbs | 3.7% | 0 | 03-05-12 |
| End Shear | 722 lbs | 11,084 lbs | 6.5% | 0 | 01-07-00 |
| Total Load Deflection | L/999 (0.005") | n\a | n\a | 4 | 03-10-15 |
| Max Defl. | 0.005" | n\a | n\a | 4 | 03-10-15 |
| Span / Depth | 6.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5" x 3-1/2" | 754 lbs | 10.8% | 5.4% | Spruce-Pine-Fir |
| B2 | Hanger | 4" x 3-1/2" | 9,013 lbs | n\a | 52.8% | HGUS414 |

## Cautions

Header for the hanger HGUS414 at B2 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 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.
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

LICENSED PROFESSIONAL ENGINEER
9/19
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PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM 3059-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B1(i4553)

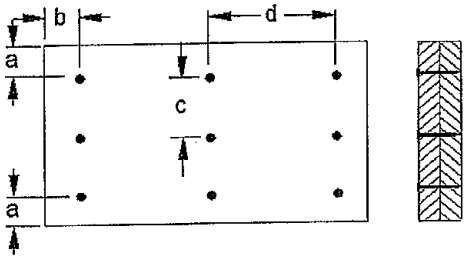
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B1(i4553)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2" c = 5"
b minimum = 3" d = 6"

Calculated Side Load = 257.6 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: Nails

3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
90519
S. KATSOULAKOS
PROVINCE OF ONTARIO

BWBHB, TAM 3059-19
STRUCTURAL
COMPONENT ONLY

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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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

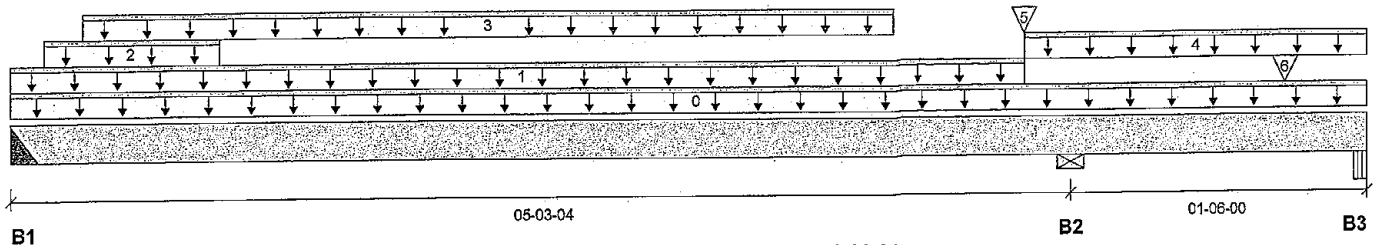
## 1ST FLR FRAMING\Flush Beams\B3(i4455)

Dry | 2 spans | No cant.

September 20, 2019 14:07:56

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B3(i4455)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 06-09-04**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 583 / 2 | 507 / 0 | | |
| B2, 5-1/2" | 1,684 / 0 | 1,351 / 0 | | |
| B3, 2-5/8" | 217 / 560 | 0 / 336 | | |

## 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 | 06-09-04 | Top | | 14 | | | 00-00-00 |
| 1 | 15(i1078) | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-00-08 | Top | | 81 | | | n\a |
| 2 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-02-00 | 01-00-04 | Top | 25 | | | | n\a |
| 3 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-04-04 | 04-04-04 | Top | 298 | 150 | | | n\a |
| 4 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 05-00-08 | 06-09-04 | Top | 18 | 9 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 05-00-07 | 05-00-07 | Top | 406 | 265 | | | n\a |
| 6 | J7(i2349) | Conc. Pt. (lbs) | L | 06-04-04 | 06-04-04 | Top | 257 | 129 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,640 ft-lbs | 48,300 ft-lbs | 3.4% | 2 | 02-04-04 |
| Neg. Moment | -1,913 ft-lbs | -48,300 ft-lbs | 4.0% | 1 | 05-03-04 |
| End Shear | 1,100 lbs | 17,052 lbs | 6.4% | 2 | 05-04-10 |
| Cont. Shear | 1,556 lbs | 17,052 lbs | 9.1% | 1 | 03-10-08 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 9 | 02-06-04 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 12 | 02-06-04 |
| Total Neg. Defl. | L/999 (-0") | n\a | n\a | 9 | 05-10-00 |
| Max Defl. | 0.003" | n\a | n\a | 9 | 02-06-04 |
| Span / Depth | 4.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 1,508 lbs | n\a | 8.8% | HGUS414 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 4,216 lbs | 35.6% | 18.0% | Spruce-Pine-Fir |
| B3 | Beam | 2-5/8" x 3-1/2" | 22 lbs | 0.6% | 0.2% | Unspecified |
| B3 | Uplift | | 1,261 lbs | | | |

## Cautions

Uplift of 1,261 lbs found at bearing B3. (SIMPSON 2-H2-SA2 ES. 33)
Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
91519
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM 3060-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B3(i4455)

Dry | 2 spans | No cant.

September 20, 2019 14:07:56

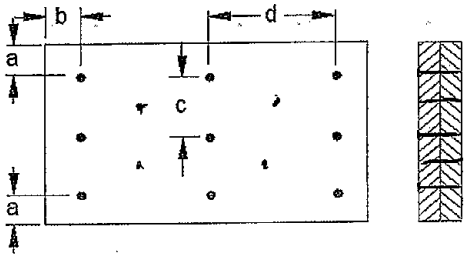
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B3(i4455)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86.
CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

## Connection Diagram: Full Length of Member




5 rows

a minimum = 2"
b minimum = 3"
c = 5"
d = 12"

Calculated Side Load = 587.2 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 16d 1 Nails
3½" ARDOX SPIRAL


DWG NO. TAM3060-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

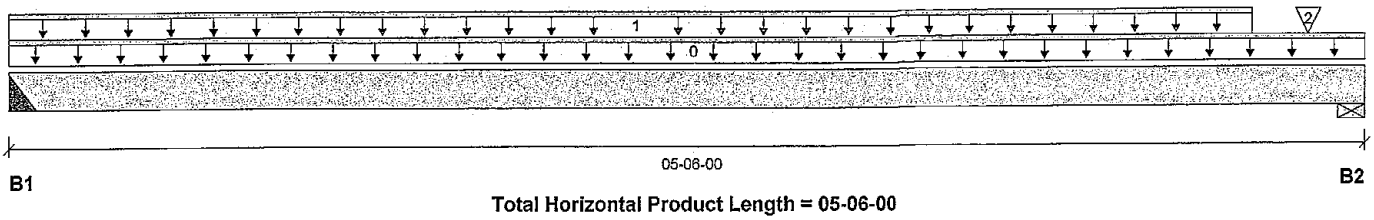
## 1ST FLR FRAMING\Flush Beams\B2(i4395)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B2(i4395)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 05-06-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | | 257 / 0 | | |
| B2, 5-1/2" | 12 / 0 | 270 / 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 | 05-06-00 | Top | | 14 | | | 00-00-00 |
| 1 | 17(i1079) | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-00-08 | Top | | 82 | | | n\a |
| 2 | 16(i1077) | Conc. Pt. (lbs) | L | 05-03-04 | 05-03-04 | Top | 12 | 38 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 391 ft-lbs | 31,395 ft-lbs | 1.2% | 0 | 02-08-04 |
| End Shear | 159 lbs | 11,084 lbs | 1.4% | 0 | 01-06-00 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 4 | 02-08-04 |
| Max Defl. | 0.001" | n\a | n\a | 4 | 02-08-04 |
| Span / Depth | 4.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 360 lbs | n\a | 3.2% | HGUS414 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 378 lbs | 4.9% | 2.5% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 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.
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAN 3061-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 1ST FLR FRAMING\Flush Beams\B2(i4395)

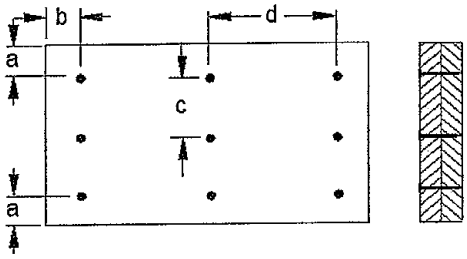
Dry | 1 span | No cant.

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B2(i4395)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 6"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d 1 : Nails
3½" ARDOX SPIRAL

## 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.

LICENSED PROFESSIONAL ENGINEER
9759
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3061-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

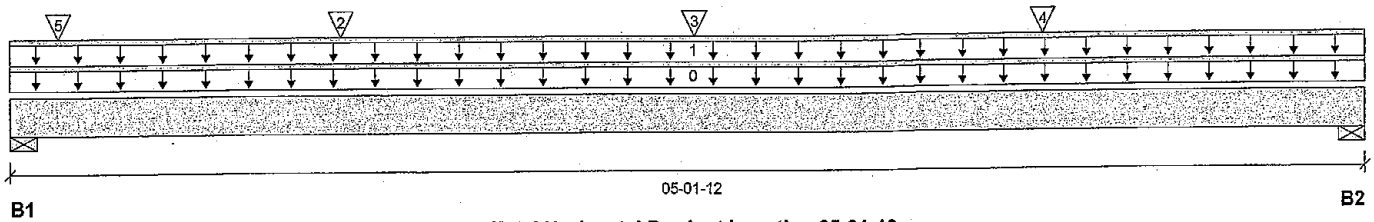
## 1ST FLR FRAMING\Flush Beams\B9(i4416)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 1ST FLR FRAMING\Flush Beams\B9(i4416)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 05-01-12**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-7/8" | 1,947 / 0 | 1,077 / 0 | | |
| B2, 3-7/8" | 916 / 0 | 494 / 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 | 05-01-12 | Top | | 14 | | | 00-00-00 |
| 1 | FC2 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-01-12 | Top | 13 | 6 | | | n\a |
| 2 | J4(i4427) | Conc. Pt. (lbs) | L | 01-02-14 | 01-02-14 | Top | 544 | 270 | | | n\a |
| 3 | J4(i4397) | Conc. Pt. (lbs) | L | 02-06-14 | 02-06-14 | Top | 593 | 296 | | | n\a |
| 4 | J4(i2410) | Conc. Pt. (lbs) | L | 03-10-14 | 03-10-14 | Top | 595 | 298 | | | n\a |
| 5 | E22(i731) | Conc. Pt. (lbs) | L | 00-02-03 | 00-02-03 | Top | 1,060 | 599 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2,763 ft-lbs | 48,300 ft-lbs | 5.7% | 1 | 02-06-14 |
| End Shear | 1,653 lbs | 17,052 lbs | 9.7% | 1 | 03-07-14 |
| Total Load Deflection | L/999 (0.004") | n\a | n\a | 4 | 02-06-14 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 02-06-14 |
| Max Defl. | 0.004" | n\a | n\a | 4 | 02-06-14 |
| Span / Depth | 4.0 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-7/8" x 3-1/2" | 4,268 lbs | 51.2% | 25.8% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-7/8" x 3-1/2" | 1,992 lbs | 23.9% | 12.0% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3062-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

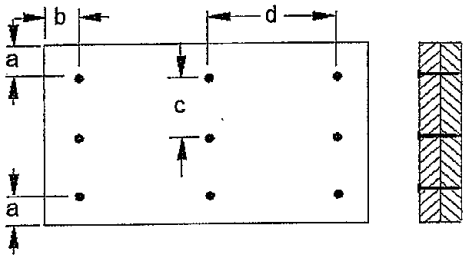
**PASSED**

## 1ST FLR FRAMING\Flush Beams\B9(i4416)

BC CALC® Member Report
Build 7118
Dry | 1 span | No cant.
September 20, 2019 14:07:55

| | | | |
|---|---|---|---|
| Job name: | | File name: | AVIGNON 3.mmdl |
| Address: | | Description: | 1ST FLR FRAMING\Flush Beams\B9(i4416) |
| City, Province, Postal Code: | KING | Specifier: | |
| Customer: | | Designer: | LBV |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 8"

Calculated Side Load = 714.8 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEERS
92519
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. TAM3062-19
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

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

**PASSED**

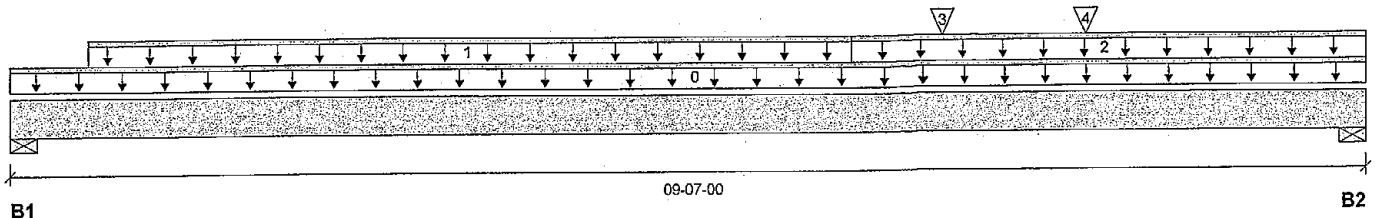
## 2ND FLR FRAMING\Dropped Beams\B11DR(i4475)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B11DR(i4475)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 09-07-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 2,531 / 0 | 1,318 / 0 | | |
| B2, 3-1/2" | 3,144 / 0 | 1,649 / 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 | 09-07-00 | Top | | 10 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-06-08 | 05-10-08 | Top | 574 | 286 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 05-10-08 | 09-07-00 | Top | 472 | 236 | | | n\a |
| 3 | J6(i4430) | Conc. Pt. (lbs) | L | 06-06-08 | 06-06-08 | Top | 165 | 82 | | | n\a |
| 4 | B24(i4447) | Conc. Pt. (lbs) | L | 07-07-00 | 07-07-00 | Top | 701 | 391 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 13,944 ft-lbs | 23,220 ft-lbs | 60.1% | 1 | 05-02-08 |
| End Shear | 5,655 lbs | 11,571 lbs | 48.9% | 1 | 08-06-00 |
| Total Load Deflection | L/371 (0.295") | n\a | 64.6% | 4 | 04-10-08 |
| Live Load Deflection | L/565 (0.194") | n\a | 63.7% | 5 | 04-10-08 |
| Max Defl. | 0.295" | n\a | n\a | 4 | 04-10-08 |
| Span / Depth | 11.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 5,445 lbs | 33.3% | 36.4% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 3-1/2" | 6,777 lbs | 41.5% | 45.3% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-00-14, Bottom: 00-00-14.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9259
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3063-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B11DR(i4475)

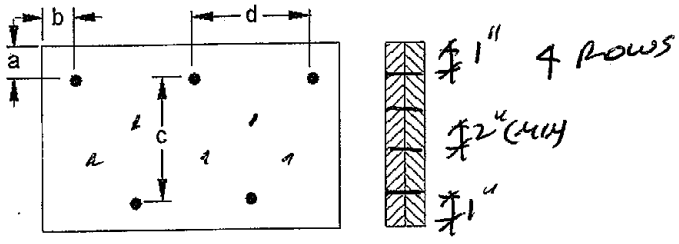
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B11DR(i4475)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 3-1/2"
d = 8"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL


DWG NO. TAM 3063-10
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

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

**PASSED**

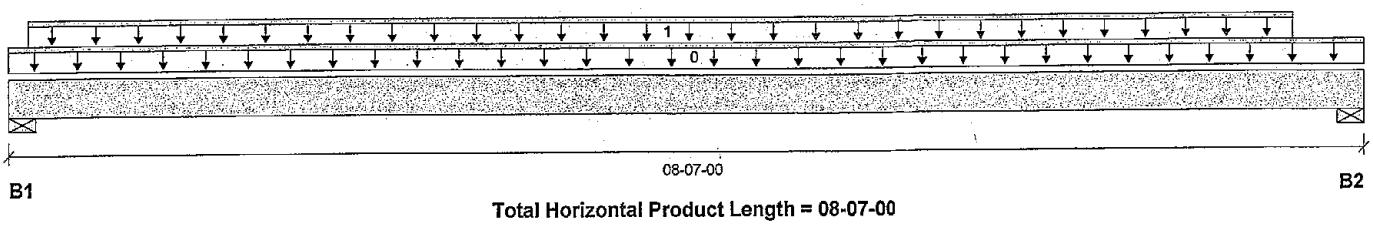
## 2ND FLR FRAMING\Dropped Beams\B21DR(i4561)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 23, 2019 15:45:23

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B21DR(i4561)
Specifier:
Designer: LBV
Company:




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

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 1,977 / 0 | 1,031 / 0 | | |
| B2, 3-1/2" | 1,817 / 0 | 951 / 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 | 08-07-00 | Top | | 10 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-01-08 | 08-01-08 | Top | 474 | 238 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 8,503 ft-lbs | 23,220 ft-lbs | 36.6% | 1 | 04-09-08 |
| End Shear | 3,902 lbs | 11,571 lbs | 33.7% | 1 | 07-06-00 |
| Total Load Deflection | L/683 (0.143") | n\a | 35.1% | 4 | 04-03-08 |
| Live Load Deflection | L/999 (0.094") | n\a | n\a | 5 | 04-03-08 |
| Max Defl. | 0.143" | n\a | n\a | 4 | 04-03-08 |
| Span / Depth | 10.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 4,254 lbs | 26.0% | 28.5% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 3-1/2" | 3,915 lbs | 24.0% | 26.2% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-04-02, Bottom: 00-04-02.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

LICENSED PROFESSIONAL ENGINEER
9254
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3066-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B21DR(i4561)

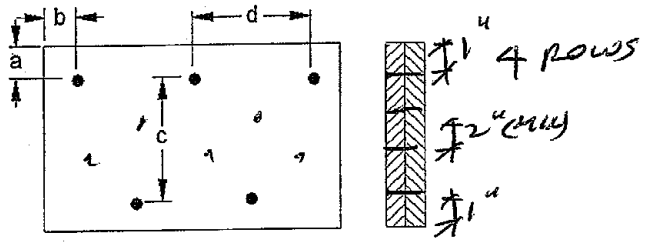
Dry | 1 span | No cant.

September 23, 2019 15:45:23

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B21DR(i4561)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 1"  c = 7-1/2"
b minimum = 3"  d = 12"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d [illegible] Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
9/23/19
S. KATSOULAKOS
PROVINCE OF ONTARIO
PEO
DWG NO. TAM 3066-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

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

**PASSED**

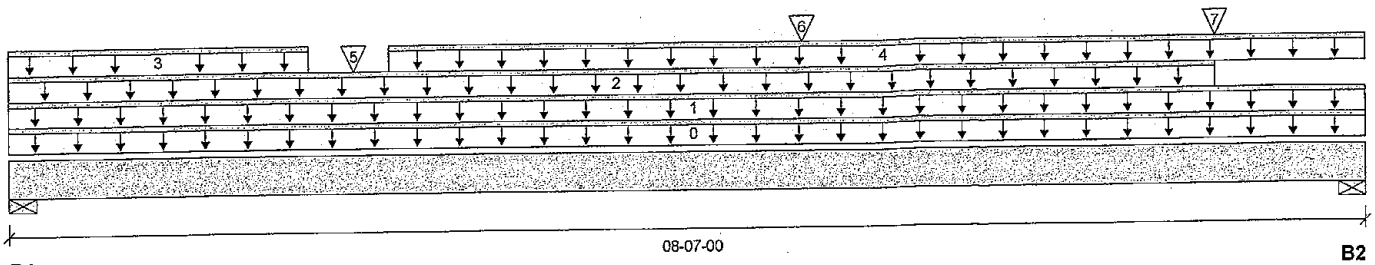
## 2ND FLR FRAMING\Dropped Beams\B20DR(i4117)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B20DR(i4117)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 08-07-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 759 / 0 | 1,703 / 0 | 2,389 / 0 | |
| B2, 3-1/2" | 761 / 0 | 1,618 / 0 | 2,172 / 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 | 08-07-00 | Top | | 10 | | | 00-00-00 |
| 1 | R1(i4068) | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-07-00 | Top | | 105 | 152 | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-07-08 | Top | 100 | 50 | | | n\a |
| 3 | R1(i4068) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-10-08 | Top | | 32 | 105 | | n\a |
| 4 | R1(i4068) | Unf. Lin. (lb/ft) | L | 02-04-08 | 08-07-00 | Top | | 151 | 308 | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 02-01-14 | 02-01-14 | Top | 252 | 707 | 1,147 | | n\a |
| 6 | J5(i4092) | Conc. Pt. (lbs) | L | 04-11-08 | 04-11-08 | Top | 254 | 127 | | | n\a |
| 7 | J5(i4021) | Conc. Pt. (lbs) | L | 07-07-08 | 07-07-08 | Top | 254 | 127 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 12,773 ft-lbs | 23,220 ft-lbs | 55.0% | 13 | 03-10-08 |
| End Shear | 5,790 lbs | 11,571 lbs | 50.0% | 13 | 01-01-00 |
| Total Load Deflection | L/423 (0.23") | n\a | 56.7% | 35 | 04-02-08 |
| Live Load Deflection | L/654 (0.149") | n\a | 55.0% | 51 | 04-02-08 |
| Max Defl. | 0.23" | n\a | n\a | 35 | 04-02-08 |
| Span / Depth | 10.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 6,471 lbs | 39.6% | 43.3% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 3-1/2" | 6,042 lbs | 37.0% | 40.4% | Spruce-Pine-Fir |

LICENSED PROFESSIONAL ENGINEER
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DWG NO. TAM3065-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B20DR(i4117)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

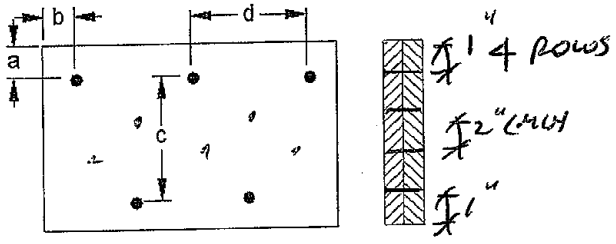
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B20DR(i4117)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

## Connection Diagram: Full Length of Member




a minimum = 1"
b minimum = 3"
c = 3-1/2"
d = 6"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d [illegible] Nails

3½" ARDOX SPIRAL


DWG NO. TAM3065-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

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

**PASSED**

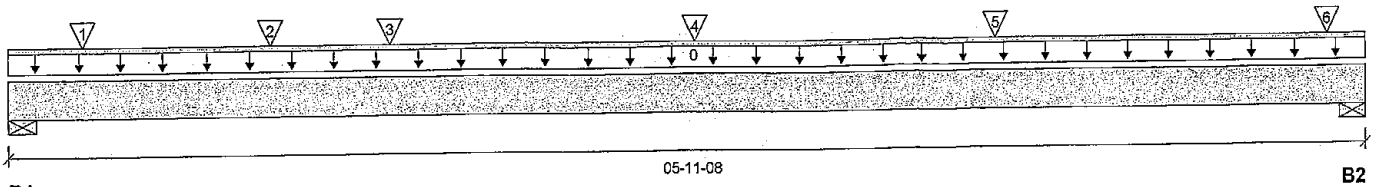
## 2ND FLR FRAMING\Dropped Beams\B23DR(i4406)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B23DR(i4406)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 05-11-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4-3/4" | 1,965 / 0 | 1,118 / 0 | | |
| B2, 5-1/2" | 2,818 / 0 | 1,569 / 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 | 05-11-08 | Top | | 10 | | | 00-00-00 |
| 1 | - | Conc. Pt. (lbs) | L | 00-03-12 | 00-03-12 | Top | 650 | 325 | | | n\a |
| 2 | B22(i4372) | Conc. Pt. (lbs) | L | 01-01-08 | 01-01-08 | Top | 486 | 369 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 01-07-12 | 01-07-12 | Top | 558 | 279 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 02-11-12 | 02-11-12 | Top | 654 | 327 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 04-03-12 | 04-03-12 | Top | 675 | 338 | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 05-09-06 | 05-09-06 | Top | 1,760 | 992 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3,998 ft-lbs | 23,220 ft-lbs | 17.2% | 1 | 02-11-12 |
| End Shear | 2,855 lbs | 11,571 lbs | 24.7% | 1 | 01-02-04 |
| Total Load Deflection | L/999 (0.027") | n\a | n\a | 4 | 02-10-12 |
| Live Load Deflection | L/999 (0.017") | n\a | n\a | 5 | 02-10-12 |
| Max Defl. | 0.027" | n\a | n\a | 4 | 02-10-12 |
| Span / Depth | 6.6 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 4-3/4" x 3-1/2" | 4,345 lbs | 19.6% | 21.4% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 6,189 lbs | 24.1% | 26.4% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-02-09, Bottom: 00-02-09.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

P6 12

DWG NO. TAM 3067-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B23DR(i4406)

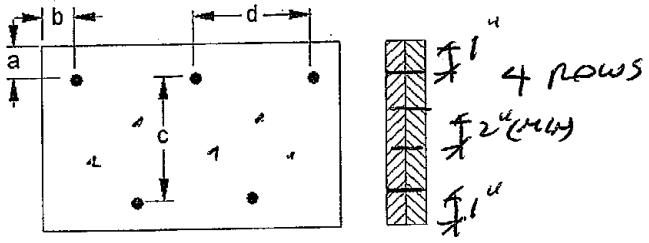
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B23DR(i4406)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 7-1/2"
d = 6"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.
Connectors are: 16d 3½" Nails

3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
9259
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. TAM 3067-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

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

**PASSED**

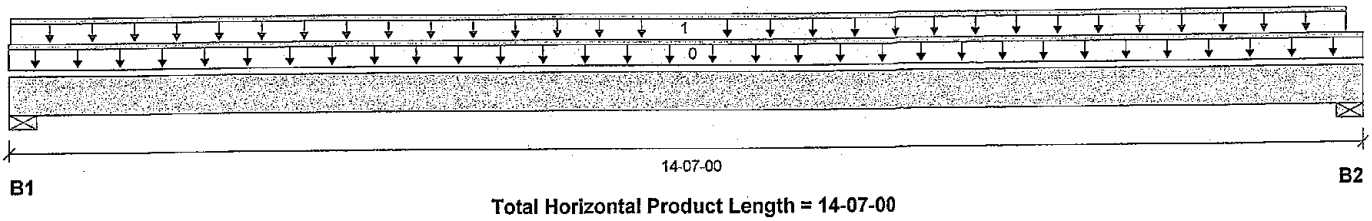
## 2ND FLR FRAMING\Dropped Beams\B10(i5736)

Dry | 1 span | No cant.

September 23, 2019 15:45:37

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B10(i5736)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 14-07-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 3,210 / 0 | 1,736 / 0 | | |
| B2, 3-1/2" | 3,131 / 0 | 1,698 / 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 | 14-07-00 | Top | | 18 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-00-04 | 14-04-12 | Top | 436 | 218 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 23,649 ft-lbs | 55,212 ft-lbs | 42.8% | 1 | 07-02-08 |
| End Shear | 6,046 lbs | 21,696 lbs | 27.9% | 1 | 01-03-06 |
| Total Load Deflection | L/415 (0.408") | n\a | 57.8% | 4 | 07-04-04 |
| Live Load Deflection | L/640 (0.265") | n\a | 56.2% | 5 | 07-04-04 |
| Max Defl. | 0.408" | n\a | n\a | 4 | 07-04-04 |
| Span / Depth | 14.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 5-1/4" | 6,985 lbs | 28.5% | 31.2% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 3-1/2" x 5-1/4" | 6,818 lbs | 27.8% | 30.4% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-03-09, Bottom: 00-03-09.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Nailing schedule applies to both sides of the member.
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9/25/19
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM3068-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

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

**PASSED**

## 2ND FLR FRAMING\Dropped Beams\B10(i5736)

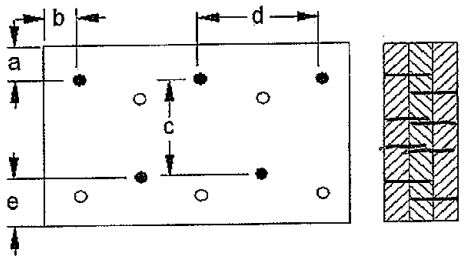
Dry | 1 span | No cant.

September 23, 2019 15:45:37

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Dropped Beams\B10(i5736)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




4 rows

a minimum = 1"
b minimum = 3"
c = 6-7/8"
d = 12"
e minimum = 2"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Nailing schedule applies to both sides of the member.
Member has no side loads.
Connectors are: 16d 1" Nails
3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. TAM 3066 19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

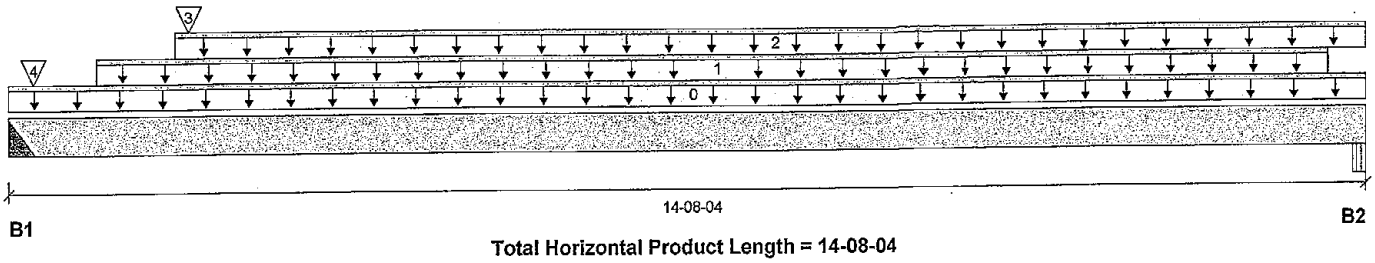
## 2ND FLR FRAMING\Flush Beams\B17(i4413)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B17(i4413)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 14-08-04

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 3,006 / 0 | 1,674 / 0 | | |
| B2, 1-3/4" | 1,407 / 0 | 813 / 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 | 14-08-04 | Top | | 14 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-11-04 | 14-03-04 | Top | 140 | 70 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 01-09-04 | 14-08-04 | Top | 30 | 15 | | | n\a |
| 3 | B19(i4314) | Conc. Pt. (lbs) | L | 01-11-00 | 01-11-00 | Top | 2,025 | 1,087 | | | n\a |
| 4 | J6(i4084) | Conc. Pt. (lbs) | L | 00-03-04 | 00-03-04 | Top | 134 | 67 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 13,566 ft-lbs | 48,300 ft-lbs | 28.1% | 1 | 05-07-04 |
| End Shear | 6,290 lbs | 17,052 lbs | 36.9% | 1 | 01-06-00 |
| Total Load Deflection | L/754 (0.228") | n\a | 31.8% | 4 | 07-03-04 |
| Live Load Deflection | L/1,183 (0.145") | n\a | 30.4% | 5 | 07-03-04 |
| Max Defl. | 0.228" | n\a | n\a | 4 | 07-03-04 |
| Span / Depth | 12.3 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 6,601 lbs | n\a | 38.6% | HGUS414 |
| B2 | Beam | 1-3/4" x 3-1/2" | 3,127 lbs | 41.8% | 41.8% | VL 2.0 3100 SP |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
92519
S. KATSOULAKOS
PROVINCE OF ONTARIO

OWNO. TAM3069-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B17(i4413)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

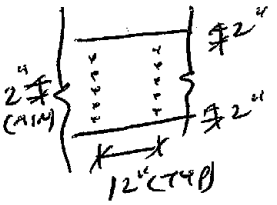
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B17(i4413)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection.

PROVIDE 5 ROWS OF 3½" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING, MAINTAIN A MIN. 2" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS




LICENSED PROFESSIONAL ENGINEERS
9254
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3069-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

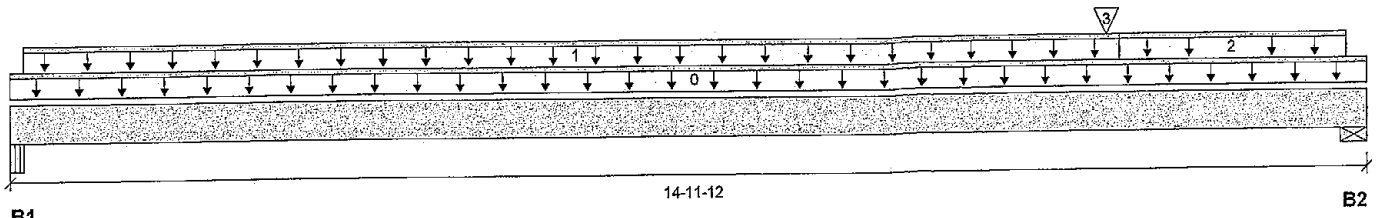
## 2ND FLR FRAMING\Flush Beams\B22(i4372)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B22(i4372)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 14-11-12

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 503 / 0 | 379 / 0 | | |
| B2, 5-1/2" | 1,652 / 0 | 1,037 / 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 | 14-11-12 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-01-12 | 12-02-12 | Top | 27 | 13 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 12-02-12 | 14-09-00 | Top | 19 | 10 | | | n\a |
| 3 | B25(i4425) | Conc. Pt. (lbs) | L | 12-01-00 | 12-01-00 | Top | 1,784 | 1,018 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 9,219 ft-lbs | 48,300 ft-lbs | 19.1% | 1 | 12-01-00 |
| End Shear | 3,688 lbs | 17,052 lbs | 21.6% | 1 | 13-04-04 |
| Total Load Deflection | L/1,358 (0.127") | n\a | 17.7% | 4 | 08-01-03 |
| Live Load Deflection | L/999 (0.076") | n\a | n\a | 5 | 08-01-03 |
| Max Defl. | 0.127" | n\a | n\a | 4 | 08-01-03 |
| Span / Depth | 12.3 | | | | |

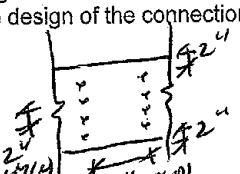
## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Beam | 3-1/2" x 3-1/2" | 1,228 lbs | 8.2% | 8.2% | VL 2.0 3100 SP |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 3,774 lbs | 31.9% | 16.1% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
CONFORMS TO OBC 2012
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
Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection.

PROVIDE 4 ROWS OF 3½" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING, MAINTAIN A MIN. 2" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS




DWG NO. TAM3070 - 19
STRUCTURAL
COMPONENT ONLY

LICENSED PROFESSIONAL ENGINEER
9/25/19
S. KATSOULAKOS
PROVINCE OF ONTARIO

## 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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

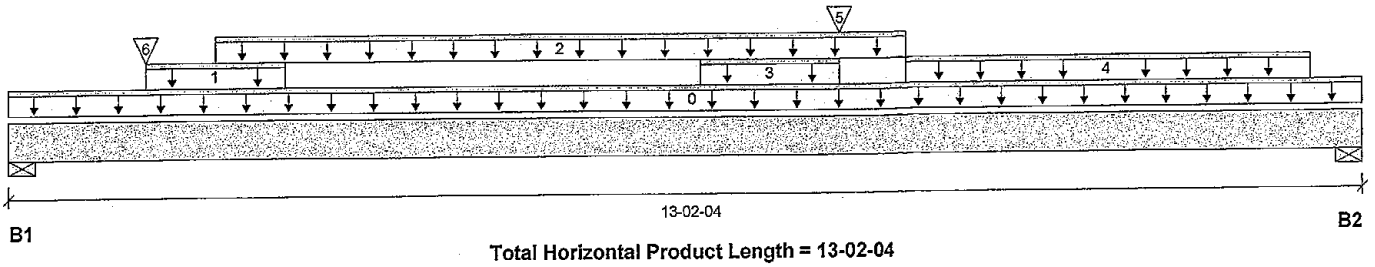
## 2ND FLR FRAMING\Flush Beams\B13(i4066)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B13(i4066)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 13-02-04**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 2,905 / 0 | 1,545 / 0 | | |
| B2, 4" | 3,245 / 0 | 1,713 / 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 | 13-02-04 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 01-04-00 | 02-08-00 | Top | 51 | 25 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 02-00-00 | 08-08-00 | Top | 439 | 219 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 06-08-00 | 08-00-00 | Top | 51 | 25 | | | n\a |
| 4 | Smoothed Load | Unf. Lin. (lb/ft) | L | 08-08-00 | 12-08-00 | Top | 577 | 288 | | | n\a |
| 5 | J6(i4084) | Conc. Pt. (lbs) | L | 08-00-00 | 08-00-00 | Top | 118 | 59 | | | n\a |
| 6 | J11(i4048) | Conc. Pt. (lbs) | L | 01-04-00 | 01-04-00 | Top | 532 | 266 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 21,730 ft-lbs | 48,300 ft-lbs | 45.0% | 1 | 06-08-00 |
| End Shear | 6,544 lbs | 17,052 lbs | 38.4% | 1 | 11-08-04 |
| Total Load Deflection | L/556 (0.27") | n\a | 43.1% | 4 | 06-08-00 |
| Live Load Deflection | L/849 (0.177") | n\a | 42.4% | 5 | 06-08-00 |
| Max Defl. | 0.27" | n\a | n\a | 4 | 06-08-00 |
| Span / Depth | 10.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 6,289 lbs | 53.1% | 26.8% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 4" x 3-1/2" | 7,008 lbs | 81.4% | 41.0% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM3071-18
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B13(i4066)

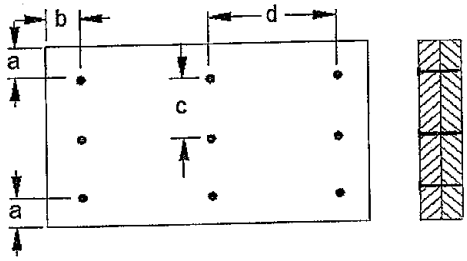
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B13(i4066)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 6"

Calculated Side Load = 839.5 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 16d 1" Nails

3½" ARDOX SPIRAL

## 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.



LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO
16/9/19

DWG NO. TAM3071-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

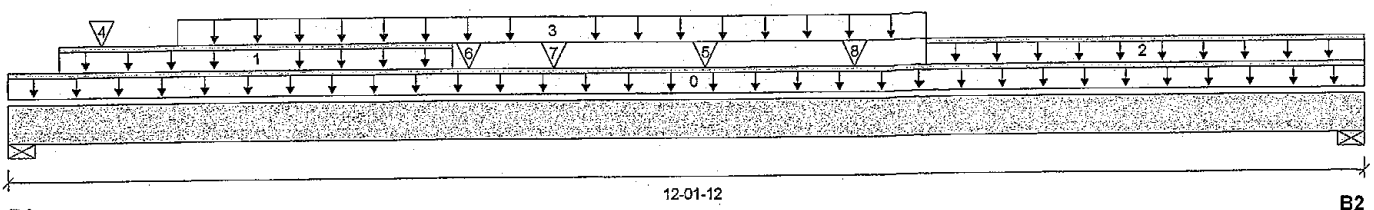
## 2ND FLR FRAMING\Flush Beams\B26(i3792)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B26(i3792)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 12-01-12**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 1,480 / 0 | 847 / 0 | | |
| B2, 5-1/2" | 1,430 / 0 | 810 / 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 | 12-01-12 | Top | | 14 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-05-08 | 03-11-04 | Top | 240 | 120 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 08-02-00 | 12-01-12 | Top | 264 | 132 | | | n\a |
| 3 | Smoothed Load | Trapezoidal (lb/ft) | L | 01-06-00 | | Top | 84 | 44 | | | n\a |
| | | | | | 08-02-00 | | 84 | 40 | | | |
| 4 | J7(i3759) | Conc. Pt. (lbs) | L | 00-10-00 | 00-10-00 | Top | 113 | 57 | | | n\a |
| 5 | J7(i3937) | Conc. Pt. (lbs) | L | 06-02-00 | 06-02-00 | Top | 109 | 55 | | | n\a |
| 6 | B29(i3808) | Conc. Pt. (lbs) | L | 04-01-00 | 04-01-00 | Top | 34 | 44 | | | n\a |
| 7 | J8(i3932) | Conc. Pt. (lbs) | L | 04-10-00 | 04-10-00 | Top | 89 | 45 | | | n\a |
| 8 | J8(i3991) | Conc. Pt. (lbs) | L | 07-06-00 | 07-06-00 | Top | 110 | 55 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 7,759 ft-lbs | 48,300 ft-lbs | 16.1% | 1 | 06-02-00 |
| End Shear | 2,503 lbs | 17,052 lbs | 14.7% | 1 | 10-06-04 |
| Total Load Deflection | L/999 (0.082") | n\a | n\a | 4 | 06-00-00 |
| Live Load Deflection | L/999 (0.052") | n\a | n\a | 5 | 06-00-00 |
| Max Defl. | 0.082" | n\a | n\a | 4 | 06-00-00 |
| Span / Depth | 9.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 3,279 lbs | 27.7% | 14.0% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 3,157 lbs | 26.7% | 13.4% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

LICENSED PROFESSIONAL ENGINEER
9151
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3072-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B26(i3792)

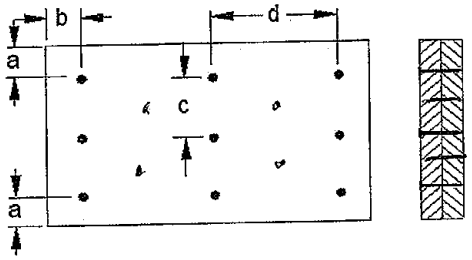
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B26(i3792)
Specifier:
Designer: LBV
Company:

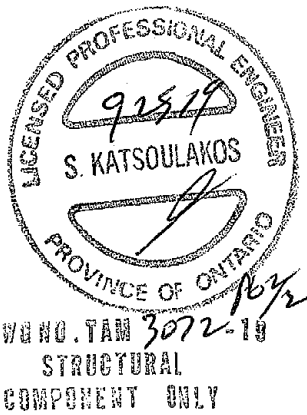
## Connection Diagram: Full Length of Member




5 ROWS

a minimum = 2"
b minimum = 3"
c = 5"
d = 12"

Calculated Side Load = 243.5 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 .. Nails
3½" ARDOX SPIRAL




DWG NO. TAM 3072-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

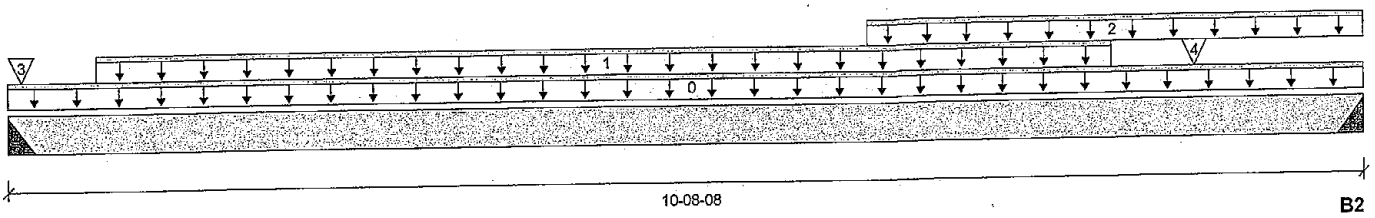
## 2ND FLR FRAMING\Flush Beams\B19(i4314)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B19(i4314)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 10-08-08

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1,655 / 0 | 904 / 0 | | |
| B2, 4" | 2,040 / 0 | 1,095 / 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 | 10-08-08 | Top | | 14 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-08-04 | 08-08-04 | Top | 260 | 130 | | | n\a |
| 2 | STAIR | Unf. Lin. (lb/ft) | L | 06-08-08 | 10-08-08 | Top | 240 | 120 | | | n\a |
| 3 | J3(i4316) | Conc. Pt. (lbs) | L | 00-01-04 | 00-01-04 | Top | 277 | 139 | | | n\a |
| 4 | J3(i4049) | Conc. Pt. (lbs) | L | 09-04-04 | 09-04-04 | Top | 372 | 186 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 9,291 ft-lbs | 48,300 ft-lbs | 19.2% | 1 | 05-04-04 |
| End Shear | 3,538 lbs | 17,052 lbs | 20.7% | 1 | 09-02-08 |
| Total Load Deflection | L/999 (0.077") | n\a | n\a | 4 | 05-06-04 |
| Live Load Deflection | L/999 (0.05") | n\a | n\a | 5 | 05-06-04 |
| Max Defl. | 0.077" | n\a | n\a | 4 | 05-06-04 |
| Span / Depth | 8.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 3,613 lbs | n\a | 21.2% | HGUS414 |
| B2 | Hanger | 4" x 3-1/2" | 4,429 lbs | n\a | 25.9% | HGUS414 |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.
Header for the hanger HGUS414 at B2 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.

LICENSED PROFESSIONAL ENGINEER
9259
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3073-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B19(i4314)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

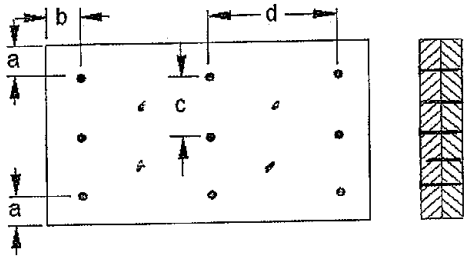
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B19(i4314)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

## Connection Diagram: Full Length of Member




5 ROWS

a minimum = 2"
b minimum = 3"
c = 5"
d = 12"

Calculated Side Load = 542.7 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 16d 1 Nails
3½" ARDOX SPIRAL

## Disclosure

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LICENSED PROFESSIONAL ENGINEER
9254
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3073-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

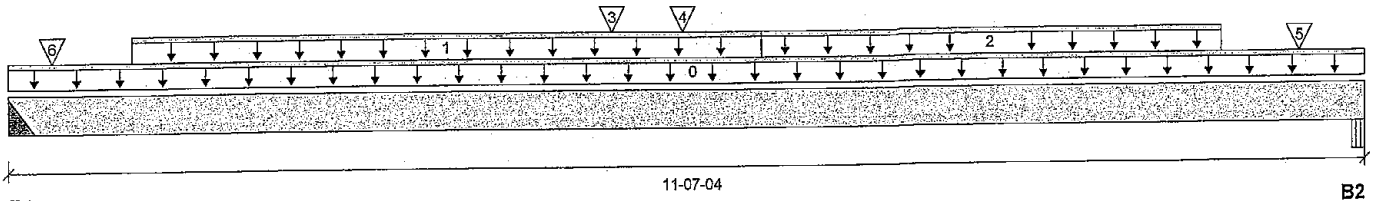
## 2ND FLR FRAMING\Flush Beams\B25(i4425)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B25(i4425)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 11-07-04**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 1,824 / 0 | 1,040 / 0 | | |
| B2, 3-1/2" | 2,418 / 0 | 1,327 / 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 | 11-07-04 | Top | | 14 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 01-00-08 | 06-04-08 | Top | 244 | 122 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 06-04-08 | 10-04-08 | Top | 470 | 235 | | | n\a |
| 3 | B27(i3928) | Conc. Pt. (lbs) | L | 05-01-04 | 05-01-04 | Top | 84 | 122 | | | n\a |
| 4 | J4(i4253) | Conc. Pt. (lbs) | L | 05-08-08 | 05-08-08 | Top | 237 | 119 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 11-00-08 | 11-00-08 | Top | 505 | 253 | | | n\a |
| 6 | J4(i4196) | Conc. Pt. (lbs) | L | 00-04-08 | 00-04-08 | Top | 228 | 114 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 13,273 ft-lbs | 48,300 ft-lbs | 27.5% | 1 | 05-08-08 |
| End Shear | 4,435 lbs | 17,052 lbs | 26.0% | 1 | 10-01-12 |
| Total Load Deflection | L/1,041 (0.128") | n\a | 23.1% | 4 | 05-10-08 |
| Live Load Deflection | L/999 (0.082") | n\a | n\a | 5 | 05-10-08 |
| Max Defl. | 0.128" | n\a | n\a | 4 | 05-10-08 |
| Span / Depth | 9.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 4,035 lbs | n\a | 23.6% | HGUS414 |
| B2 | Beam | 3-1/2" x 3-1/2" | 5,286 lbs | 35.4% | 35.4% | VL 2.0 3100 SP |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3074-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B25(i4425)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

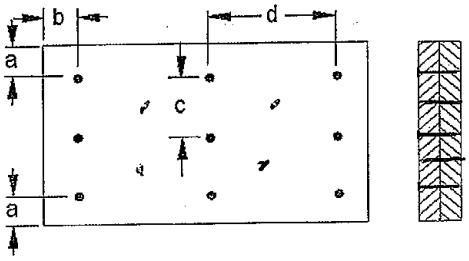
BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B25(i4425)
Specifier:
Designer: LBV
Company:

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Hanger Manufacturer: Unassigned
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

## Connection Diagram: Full Length of Member




5 ROWS

a minimum = 2"
b minimum = 3"
c = 5"
d = 12"

Calculated Side Load = 502.5 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 16d [illegible] Nails

3½" ARDOX SPIRAL


DWG NO. TAM3074-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

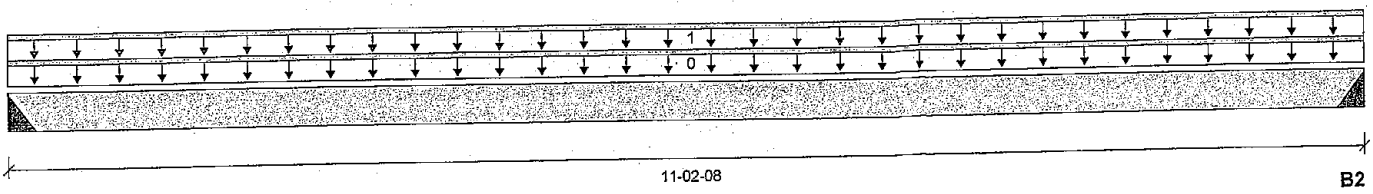
## 2ND FLR FRAMING\Flush Beams\B27(i3928)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B27(i3928)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 11-02-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 84 / 0 | 122 / 0 | | |
| B2, 4" | 84 / 0 | 122 / 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 | 11-02-08 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-02-08 | Top | 15 | 7 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 706 ft-lbs | 48,300 ft-lbs | 1.5% | 1 | 05-07-04 |
| End Shear | 204 lbs | 17,052 lbs | 1.2% | 1 | 01-06-00 |
| Total Load Deflection | L/999 (0.007") | n\a | n\a | 4 | 05-07-04 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 05-07-04 |
| Max Defl. | 0.007" | n\a | n\a | 4 | 05-07-04 |
| Span / Depth | 9.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 278 lbs | n\a | 1.6% | HGUS414 |
| B2 | Hanger | 4" x 3-1/2" | 278 lbs | n\a | 1.6% | HGUS414 |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.
Header for the hanger HGUS414 at B2 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
92519
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6/4

DWG NO. TAM3075-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B27(i3928)

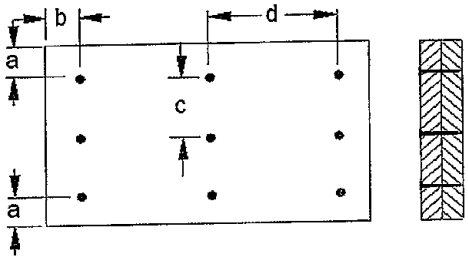
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B27(i3928)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"  c = 5"
b minimum = 3"  d = 12"

Member has no side loads.
Connectors are: 16d [illegible] Nails

3½" ARDOX SPIRAL



DWG NO. TAM 3075-18
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

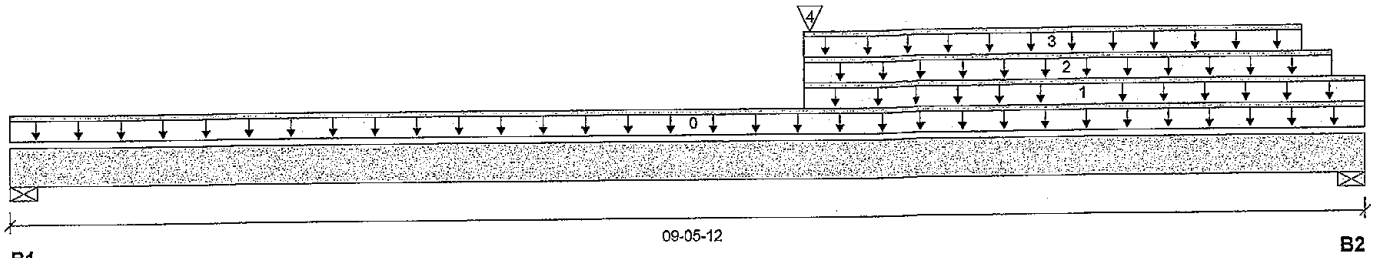
## 2ND FLR FRAMING\Flush Beams\B18(i4326)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B18(i4326)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 09-05-12**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 667 / 0 | 1,616 / 0 | 2,239 / 0 | |
| B2, 5-1/2" | 1,033 / 0 | 2,915 / 0 | 4,289 / 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 | 09-05-12 | Top | | 14 | | | 00-00-00 |
| 1 | 29(i3746) | Unf. Lin. (lb/ft) | L | 05-06-00 | 09-05-12 | Top | | 21 | | | n\a |
| 2 | 29(i3746) | Unf. Lin. (lb/ft) | L | 05-06-00 | 09-03-00 | Top | | 281 | 561 | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 05-06-00 | 09-00-07 | Top | 8 | | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 05-06-08 | 05-06-08 | Top | 1,670 | 3,245 | 4,425 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 30,597 ft-lbs | 40,224 ft-lbs | 76.1% | 13 | 05-06-00 |
| End Shear | 9,356 lbs | 17,052 lbs | 54.9% | 13 | 07-10-04 |
| Total Load Deflection | L/658 (0.158") | n\a | 36.5% | 35 | 05-00-03 |
| Live Load Deflection | L/999 (0.103") | n\a | n\a | 51 | 05-00-03 |
| Max Defl. | 0.158" | n\a | n\a | 35 | 05-00-03 |
| Span / Depth | 7.4 | | | | |

LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO

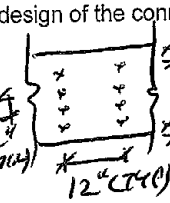
## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 6,046 lbs | 51.1% | 25.7% | Spruce-Pine-Fir |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 11,111 lbs | 93.8% | 47.3% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 05-00-08, Bottom: 05-00-08. CONFORMS TO OBC 2012
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
Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection.

PROVIDE 4 ROWS OF 3½" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING, MAINTAIN A MIN. 2" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS




DWG NO. TAM3076-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

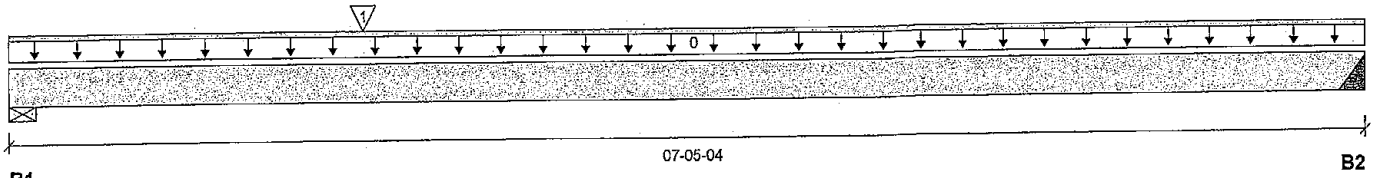
## 2ND FLR FRAMING\Flush Beams\B14(i4194)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B14(i4194)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 07-05-04

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | | 82 / 0 | | |
| B2, 4" | | 60 / 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 | 07-05-04 | Top | | 14 | | | 00-00-00 |
| 1 | B15(i3902) | Conc. Pt. (lbs) | L | 01-11-00 | 01-11-00 | Top | | 36 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 155 ft-lbs | 28,874 ft-lbs | 0.5% | 0 | 03-02-13 |
| End Shear | 82 lbs | 11,084 lbs | 0.7% | 0 | 01-07-08 |
| Total Load Deflection | L/999 (0.001") | n\a | n\a | 1 | 03-08-02 |
| Max Defl. | 0.001" | n\a | n\a | 1 | 03-08-02 |
| Span / Depth | 5.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 114 lbs | 1.5% | 0.7% | Spruce-Pine-Fir |
| B2 | Hanger | 4" x 3-1/2" | 84 lbs | n\a | 0.8% | HGUS414 |

## Cautions

Header for the hanger HGUS414 at B2 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 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.
Calculations assume unbraced length of Top: 05-04-08, Bottom: 05-04-08.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9159
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 307819
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B14(i4194)

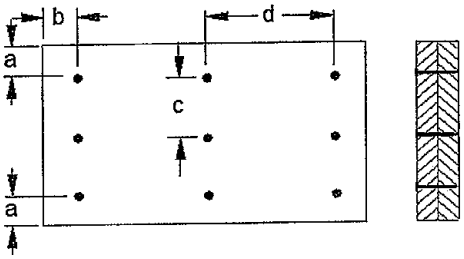
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B14(i4194)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 6"

Calculated Side Load = 6.8 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: Nails

3½" ARDOX SPIRAL


DWG NO. TAM3078-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

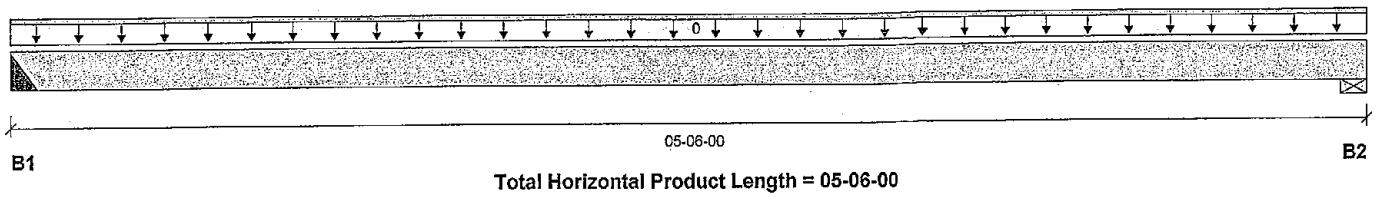
## 2ND FLR FRAMING\Flush Beams\B15(i3902)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B15(i3902)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 05-06-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | | 38 / 0 | | |
| B2, 5-1/2" | | 40 / 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 | 05-06-00 | Top | | 14 | | | 00-00-00 |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 58 ft-lbs | 29,177 ft-lbs | 0.2% | 0 | 02-08-04 |
| End Shear | 24 lbs | 11,084 lbs | 0.2% | 0 | 01-06-00 |
| Total Load Deflection | L/999 (0") | n\a | n\a | 1 | 02-08-04 |
| Max Defl. | 0" | n\a | n\a | 1 | 02-08-04 |
| Span / Depth | 4.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 53 lbs | n\a | 0.5% | HGUS414 |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 56 lbs | 0.7% | 0.4% | Spruce-Pine-Fir |

## Cautions

Header for the hanger HGUS414 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 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.
Calculations assume unbraced length of Top: 05-00-08, Bottom: 05-00-08.
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
Member has no side loads.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
92514
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3079-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B15(i3902)

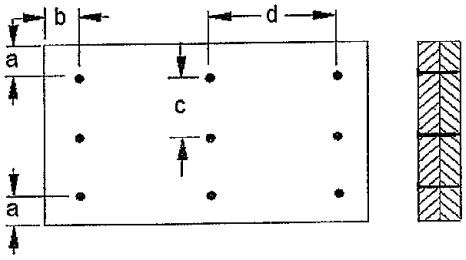
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B15(i3902)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 8"

Member has no side loads.
Connectors are: 16d 1 Nails
3½" ARDOX SPIRAL

## 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.



LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3079-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

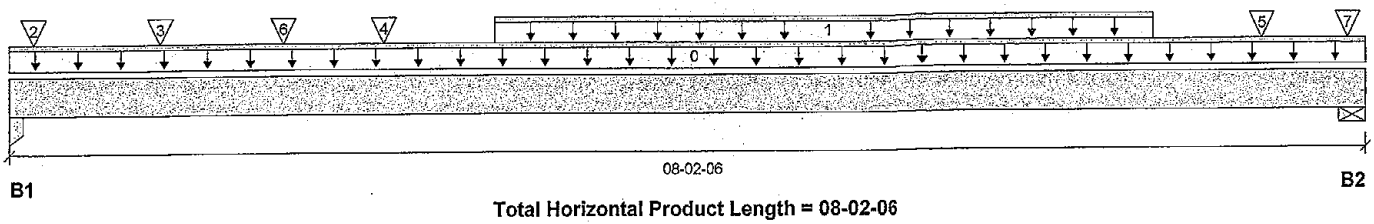
## 2ND FLR FRAMING\Flush Beams\B28(i4450)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B28(i4450)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 08-02-06**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 950 / 0 | 624 / 0 | | |
| B2, 5-3/8" | 1,271 / 0 | 709 / 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 | 08-02-06 | Top | | 14 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 02-10-12 | 06-10-12 | Top | 313 | 156 | | | n\a |
| 2 | B29(i3808) | Conc. Pt. (lbs) | L | 00-01-12 | 00-01-12 | Top | 40 | 47 | | | n\a |
| 3 | J8(i3932) | Conc. Pt. (lbs) | L | 00-10-12 | 00-10-12 | Top | 95 | 47 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 02-02-12 | 02-02-12 | Top | 347 | 174 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 07-06-12 | 07-06-12 | Top | 359 | 180 | | | n\a |
| 6 | B27(i3928) | Conc. Pt. (lbs) | L | 01-07-08 | 01-07-08 | Top | 84 | 122 | | | n\a |
| 7 | FC3 Floor Material | Conc. Pt. (lbs) | L | 08-01-01 | 08-01-01 | Top | 38 | 19 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4,749 ft-lbs | 48,300 ft-lbs | 9.8% | 1 | 03-06-12 |
| End Shear | 2,044 lbs | 17,052 lbs | 12.0% | 1 | 06-07-00 |
| Total Load Deflection | L/999 (0.022") | n\a | n\a | 4 | 04-00-12 |
| Live Load Deflection | L/999 (0.014") | n\a | n\a | 5 | 04-00-12 |
| Max Defl. | 0.022" | n\a | n\a | 4 | 04-00-12 |
| Span / Depth | 6.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 3-1/2" x 3-1/2" | 2,205 lbs | 27.7% | 14.8% | Unspecified |
| B2 | Wall/Plate | 5-3/8" x 3-1/2" | 2,794 lbs | 24.1% | 12.2% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9259
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3077-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B28(i4450)

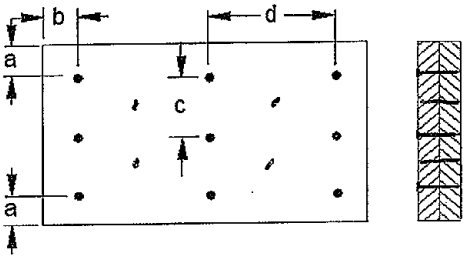
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B28(i4450)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member

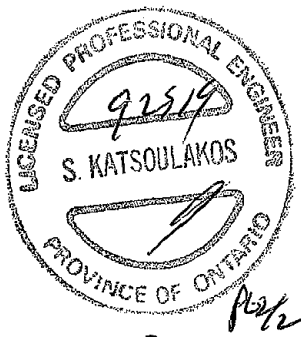



5 ROWS

a minimum = 2"
b minimum = 3"
c = 5"
d = 8"

Calculated Side Load = 398.6 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 .. Nails

3½" ARDOX SPIRAL




DWG NO. TAM3077-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

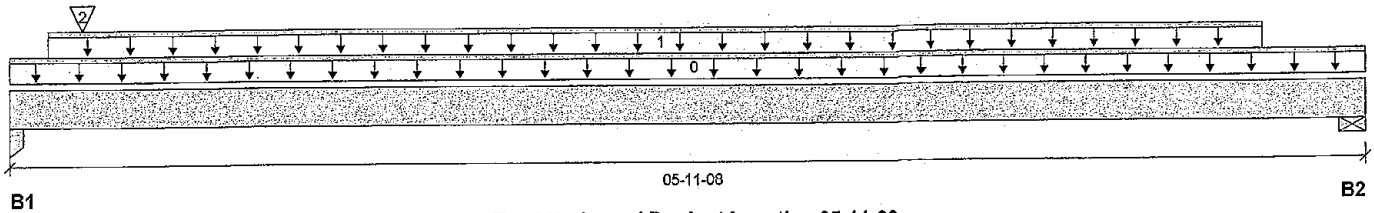
## 2ND FLR FRAMING\Flush Beams\B16(i4386)

Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B16(i4386)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 05-11-08**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 3,001 / 0 | 1,769 / 0 | | |
| B2, 5-1/2" | 32 / 0 | 58 / 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 | 05-11-08 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-02-00 | 05-06-00 | Top | 11 | 6 | | | n\a |
| 2 | - | Conc. Pt. (lbs) | L | 00-03-12 | 00-03-12 | Top | 2,969 | 1,711 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 93 ft-lbs | 31,395 ft-lbs | 0.3% | 0 | 02-11-12 |
| End Shear | 38 lbs | 11,084 lbs | 0.3% | 0 | 01-07-08 |
| Total Load Deflection | L/999 (0") | n\a | n\a | 4 | 02-11-12 |
| Live Load Deflection | L/999 (0") | n\a | n\a | 5 | 02-11-12 |
| Max Defl. | 0" | n\a | n\a | 4 | 02-11-12 |
| Span / Depth | 4.4 | | | | |

## Bearing Supports

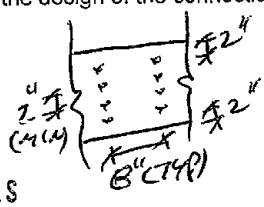
| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Column | 5-1/2" x 3-1/2" | 6,712 lbs | 53.7% | 28.6% | Unspecified |
| B2 | Wall/Plate | 5-1/2" x 3-1/2" | 82 lbs | 1.1% | 0.5% | Spruce-Pine-Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 00-02-00, Bottom: 00-02-00.
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
Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection.

CONFORMS TO OBC 2012

PROVIDE 4 ROWS OF 3½" ARDOX SPIRAL NAILS @ 8" O/C FOR MULTI-PLY NAILING, MAINTAIN A MIN. 2" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS




LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3080-18
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

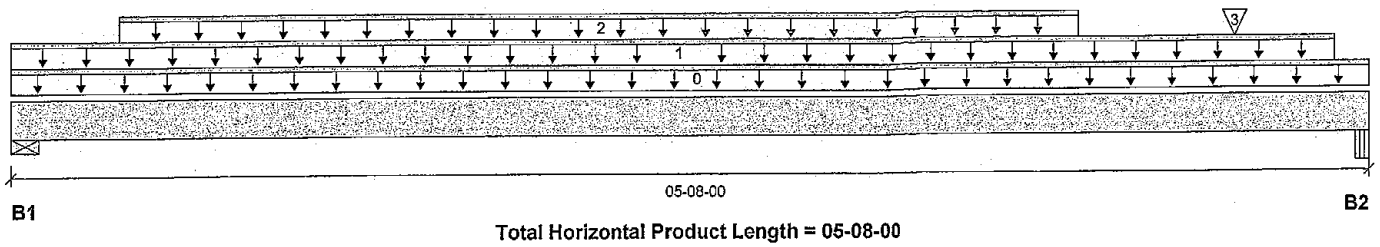
## 2ND FLR FRAMING\Flush Beams\B24(i4447)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B24(i4447)
Specifier:
Designer: LBV
Company:




Total Horizontal Product Length = 05-08-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 3-1/2" | 627 / 0 | 355 / 0 | | |
| B2, 3-1/2" | 702 / 0 | 392 / 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 | 05-08-00 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-06-04 | Top | 21 | 10 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-05-04 | 04-05-04 | Top | 239 | 120 | | | n\a |
| 3 | J4(i4385) | Conc. Pt. (lbs) | L | 05-01-04 | 05-01-04 | Top | 256 | 128 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,967 ft-lbs | 48,300 ft-lbs | 4.1% | 1 | 02-05-04 |
| End Shear | 1,087 lbs | 17,052 lbs | 6.4% | 1 | 01-05-08 |
| Total Load Deflection | L/999 (0.004") | n\a | n\a | 4 | 02-10-04 |
| Live Load Deflection | L/999 (0.003") | n\a | n\a | 5 | 02-10-04 |
| Max Defl. | 0.004" | n\a | n\a | 4 | 02-10-04 |
| Span / Depth | 4.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 1,384 lbs | 18.4% | 9.3% | Spruce-Pine-Fir |
| B2 | Beam | 3-1/2" x 3-1/2" | 1,542 lbs | 10.3% | 10.3% | VL 2.0 3100 SP |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
9/25/19
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 12

DWG NO. TAM3081-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B24(i4447)

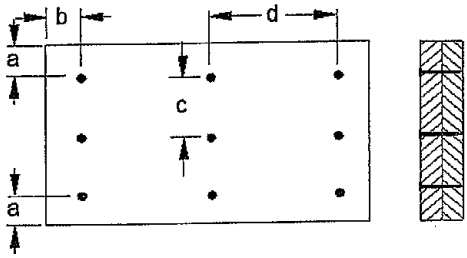
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B24(i4447)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = [redacted] 6"

Calculated Side Load = 455.2 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 16d [redacted] Nails

3½" ARDOX SPIRAL

## Disclosure

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

LICENSED PROFESSIONAL ENGINEER
9254
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 3081-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

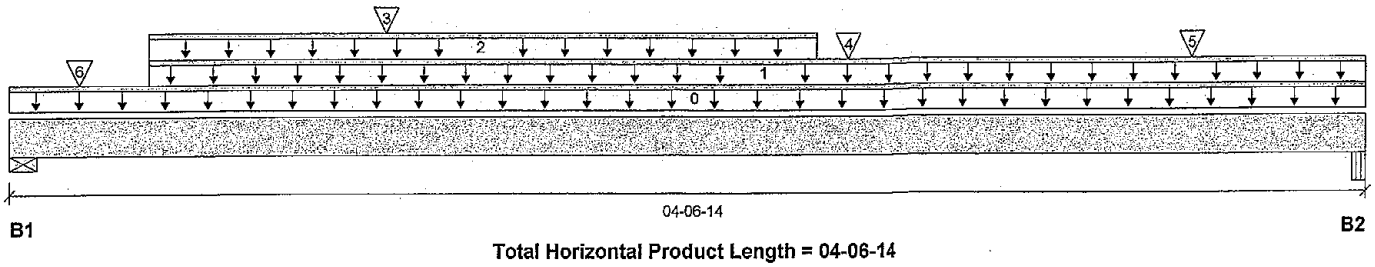
# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B30(i3990)

BC CALC® Member Report
Build 7118
Dry | 1 span | No cant.
September 20, 2019 14:07:55

| | | | |
|---|---|---|---|
| Job name: | | File name: | AVIGNON 3.mmdl |
| Address: | | Description: | 2ND FLR FRAMING\Flush Beams\B30(i3990) |
| City, Province, Postal Code: | KING | Specifier: | |
| Customer: | | Designer: | LBV |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 04-06-14**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 310 / 0 | 469 / 0 | 282 / 0 | |
| B2, 5-1/2" | 448 / 0 | 1,368 / 0 | 1,958 / 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 | 04-06-14 | Top | | 14 | | | 00-00-00 |
| 1 | E58(i1208) | Unf. Lin. (lb/ft) | L | 00-05-08 | 04-06-14 | Top | | 81 | | | n\a |
| 2 | E58(i1208) | Unf. Lin. (lb/ft) | L | 00-05-08 | 02-08-04 | Top | | 28 | 88 | | n\a |
| 3 | J5(i4071) | Conc. Pt. (lbs) | L | 01-03-00 | 01-03-00 | Top | 235 | 117 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 02-09-08 | 02-09-08 | Top | 262 | 316 | 389 | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 03-11-12 | 03-11-12 | Top | 258 | 912 | 1,635 | | n\a |
| 6 | E57(i1211) | Conc. Pt. (lbs) | L | 00-02-12 | 00-02-12 | Top | | 30 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,567 ft-lbs | 48,300 ft-lbs | 3.2% | 13 | 02-07-00 |
| End Shear | 1,119 lbs | 17,052 lbs | 6.6% | 13 | 02-11-06 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 35 | 02-04-02 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 51 | 02-04-02 |
| Max Defl. | 0.002" | n\a | n\a | 35 | 02-04-02 |
| Span / Depth | 3.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 1,334 lbs | 11.3% | 5.7% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/2" x 3-1/2" | 5,095 lbs | 62.0% | 21.7% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

CONFORMS TO OBC 2012

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM3082719
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B30(i3990)

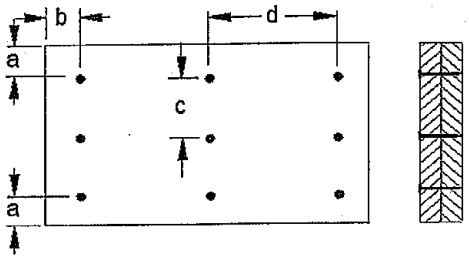
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B30(i3990)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 6"

Calculated Side Load = 350.7 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 Nails

3½" ARDOX SPIRAL

LICENSED PROFESSIONAL ENGINEER
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM 30824-19
STRUCTURAL
COMPONENT ONLY

## Disclosure

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Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

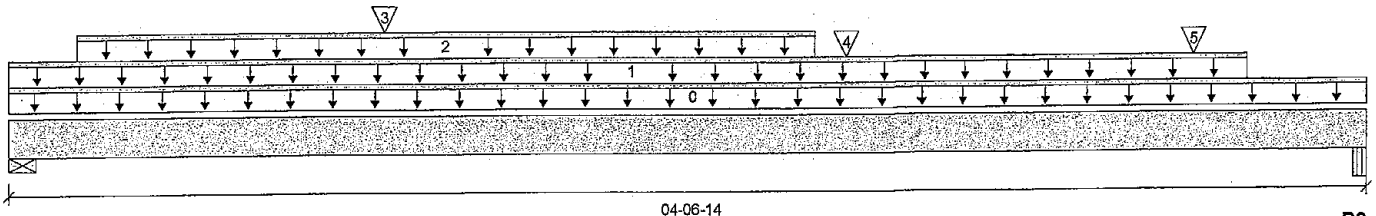
## 2ND FLR FRAMING\Flush Beams\B31(i4016)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B31(i4016)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 04-06-14**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 5-1/2" | 310 / 0 | 483 / 0 | 283 / 0 | |
| B2, 5-1/2" | 448 / 0 | 1,368 / 0 | 1,958 / 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 | 04-06-14 | Top | | 14 | | | 00-00-00 |
| 1 | E56(i1215) | Unf. Lin. (lb/ft) | L | 00-00-00 | 04-02-00 | Top | | 81 | | | n\a |
| 2 | E56(i1215) | Unf. Lin. (lb/ft) | L | 00-02-12 | 02-08-04 | Top | | 28 | 88 | | n\a |
| 3 | J5(i4071) | Conc. Pt. (lbs) | L | 01-03-00 | 01-03-00 | Top | 235 | 117 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 02-09-08 | 02-09-08 | Top | 262 | 316 | 389 | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 03-11-13 | 03-11-13 | Top | 258 | 945 | 1,635 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,569 ft-lbs | 48,300 ft-lbs | 3.2% | 13 | 02-07-00 |
| End Shear | 1,120 lbs | 17,052 lbs | 6.6% | 13 | 02-11-06 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 35 | 02-04-02 |
| Live Load Deflection | L/999 (0.001") | n\a | n\a | 51 | 02-04-02 |
| Max Defl. | 0.002" | n\a | n\a | 35 | 02-04-02 |
| Span / Depth | 3.2 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Wall/Plate | 5-1/2" x 3-1/2" | 1,351 lbs | 11.4% | 5.8% | Spruce-Pine-Fir |
| B2 | Beam | 5-1/2" x 3-1/2" | 5,094 lbs | 61.9% | 21.7% | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86. CONFORMS TO OBC 2012
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
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

LICENSED PROFESSIONAL ENGINEER
9251
S. KATSOULAKOS
PROVINCE OF ONTARIO

DWG NO. TAM30083-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B31(i4016)

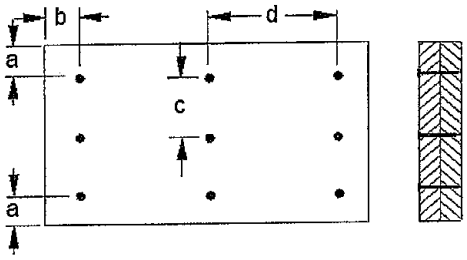
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B31(i4016)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2" c = 5"
b minimum = 3" d = 6"

Calculated Side Load = 353.2 lb/ft
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Connectors are: 1 Nails
3½" ARDUX SPIRAL

LICENSED PROFESSIONAL ENGINEERS
S. KATSOULAKOS
PROVINCE OF ONTARIO
DWG NO. TAM3083-19
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

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

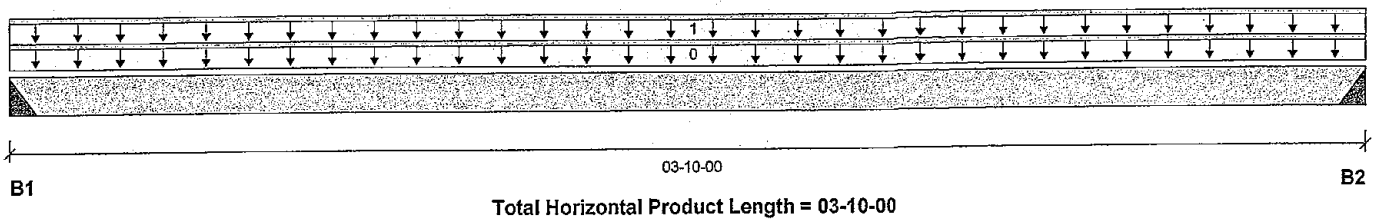
## 2ND FLR FRAMING\Flush Beams\B29(i3808)

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

September 20, 2019 14:07:55

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B29(i3808)
Specifier:
Designer: LBV
Company:




**Total Horizontal Product Length = 03-10-00**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B1, 4" | 34 / 0 | 44 / 0 | | |
| B2, 4" | 34 / 0 | 44 / 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 | 03-10-00 | Top | | 14 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-10-00 | Top | 18 | 9 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 76 ft-lbs | 48,300 ft-lbs | 0.2% | 1 | 01-11-00 |
| End Shear | 23 lbs | 17,052 lbs | 0.1% | 1 | 01-06-00 |
| Total Load Deflection | L/999 (0") | n\a | n\a | 4 | 01-11-00 |
| Max Defl. | 0" | n\a | n\a | 4 | 01-11-00 |
| Span / Depth | 2.8 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B1 | Hanger | 4" x 3-1/2" | 107 lbs | n\a | 0.6% | HUC416 |
| B2 | Hanger | 4" x 3-1/2" | 107 lbs | n\a | 0.6% | HGUS414 |

## Cautions

Header for the hanger HUC416 at B1 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HUC416 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.
Header for the hanger HGUS414 at B2 is a Double 1-3/4" x 14" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS414 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.
Calculations assume member is fully braced.
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
Member has no side loads.

CONFORMS TO OBC 20

LICENSED PROFESSIONAL ENGINEER
9519
S. KATSOULAKOS
PROVINCE OF ONTARIO

P6 1/2

DWG NO. TAM 3064-19
STRUCTURAL
COMPONENT ONLY

Boise Cascade

# Double 1-3/4" x 14" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLR FRAMING\Flush Beams\B29(i3808)

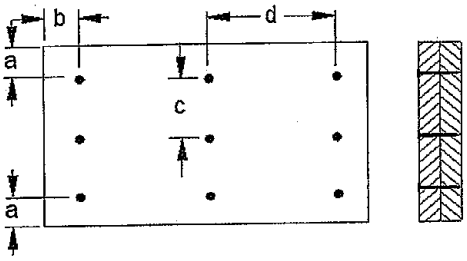
Dry | 1 span | No cant.

September 20, 2019 14:07:55

BC CALC® Member Report
Build 7118
Job name:
Address:
City, Province, Postal Code: KING
Customer:
Code reports: CCMC 12472-R

File name: AVIGNON 3.mmdl
Description: 2ND FLR FRAMING\Flush Beams\B29(i3808)
Specifier:
Designer: LBV
Company:

## Connection Diagram: Full Length of Member




a minimum = 2"
b minimum = 3"
c = 5"
d = 8"

Member has no side loads.
Connectors are: 16d Nails

3½" ARDUX SPIRAL


BVO NO. FAM308419
STRUCTURAL
COMPONENT ONLY

## Disclosure

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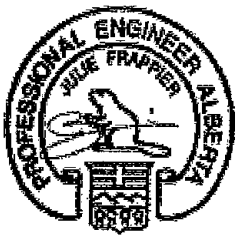
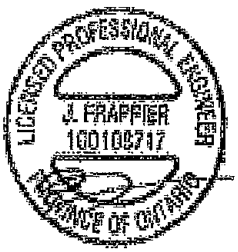
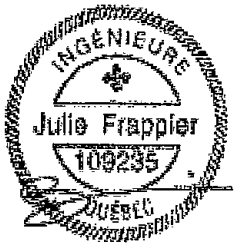


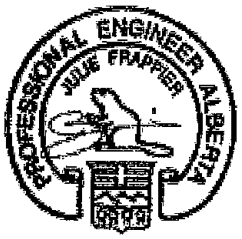

## Maximum Floor Spans

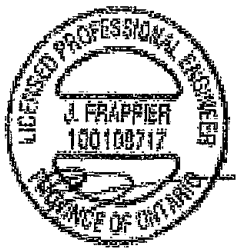
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

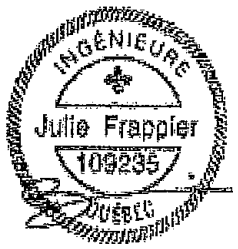
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-2" | 13'-4" | 12'-4" | 15'-7" | 14'-2" | 13'-4" | 12'-4" |
| | 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.




## Maximum Floor Spans

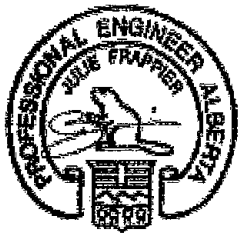
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

| 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 |

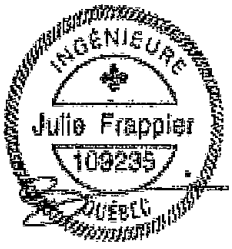
| Depth | Series | Mid-Span Blocking | | | | Mid-Span Blocking and 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 16'-8" | 15'-3" | 14'-5" | N/A | 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







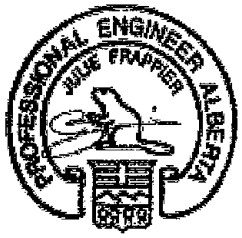

## Maximum Floor Spans

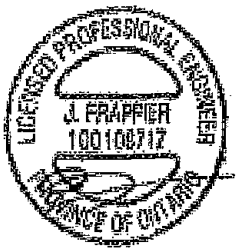
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing

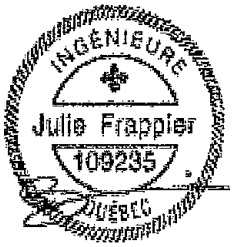
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-10" | 15'-0" | 14'-5" | 13'-5" | 16'-4" | 15'-5" | 14'-6" | 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.




## Maximum Floor Spans

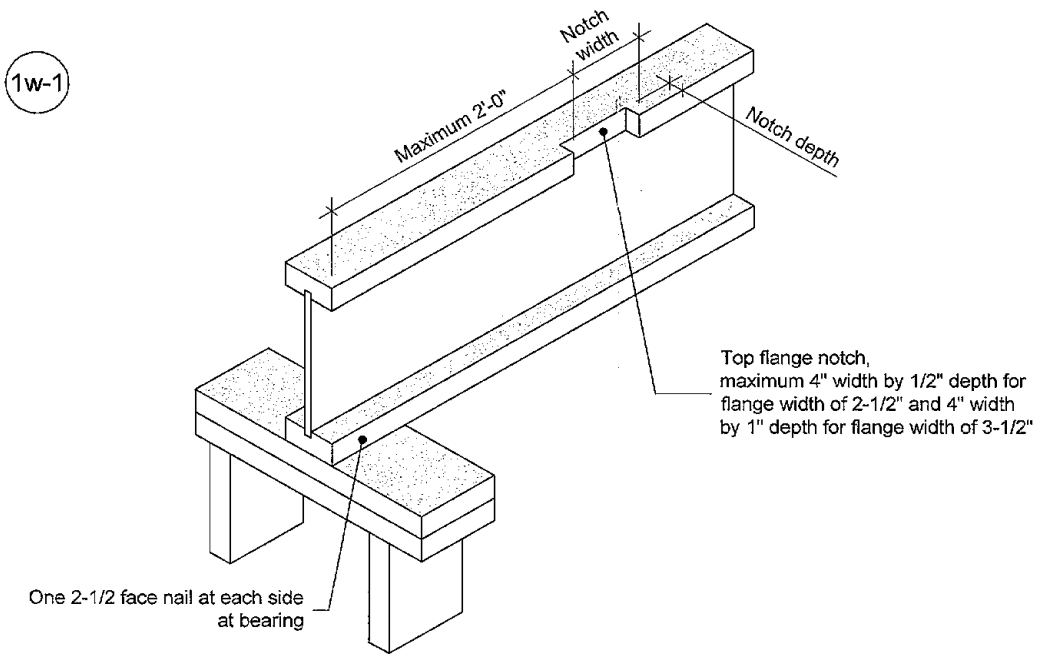
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

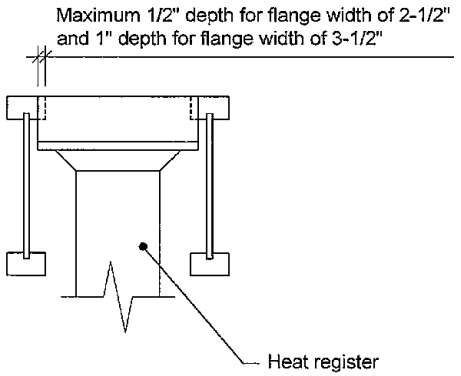
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-1" | 14'-1" | 13'-3" | N/A | 15'-7" | 14'-1" | 13'-3" | N/A |
| | 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.

1w-1




**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.



NORDIC STRUCTURES

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| TITLE | DOCUMENT | |
|---|---|---|
| Notch in I-joist for Heat Register | - | |
| CATEGORY | DATE | NUMBER |
| I-joist - Typical Floor Framing and Construction Details | 2018-04-10 | 1w-1 |

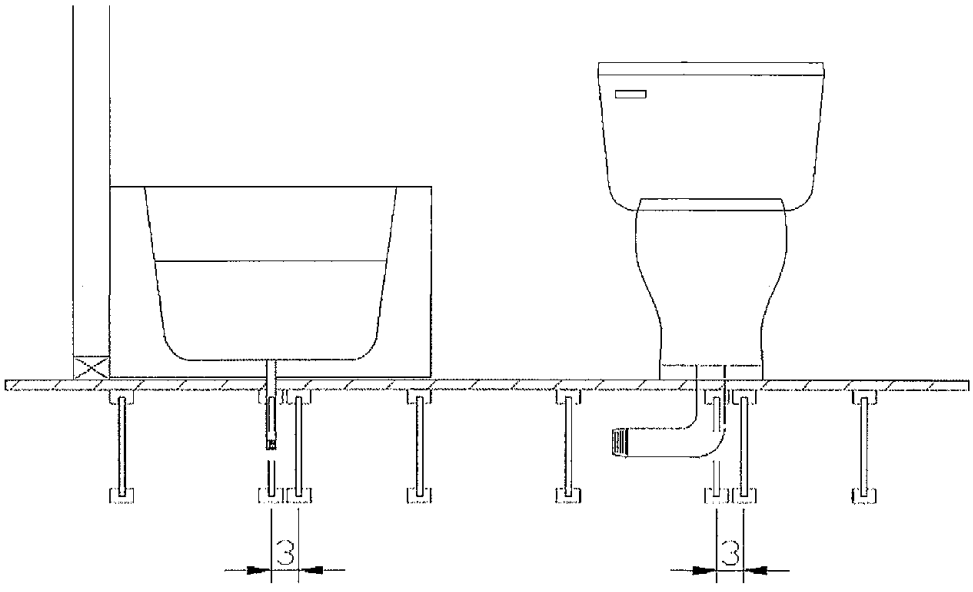
# Allowance for Piping (Installation Notes)

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