

FROM PLAN DATED: JULY 25 2019

BUILDER: GREENPARK HOMES

SITE: LAMBERTS LANE

MODEL: MILLWOOD 4A

ELEVATION: 1

LOT: 58

CITY: CALEDON

SALESMAN: M D

DESIGNER: PL

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/480.000

LIVE LOAD: 40.0 lb/ft²

DEAD LOAD: 15.0 lb/ft²

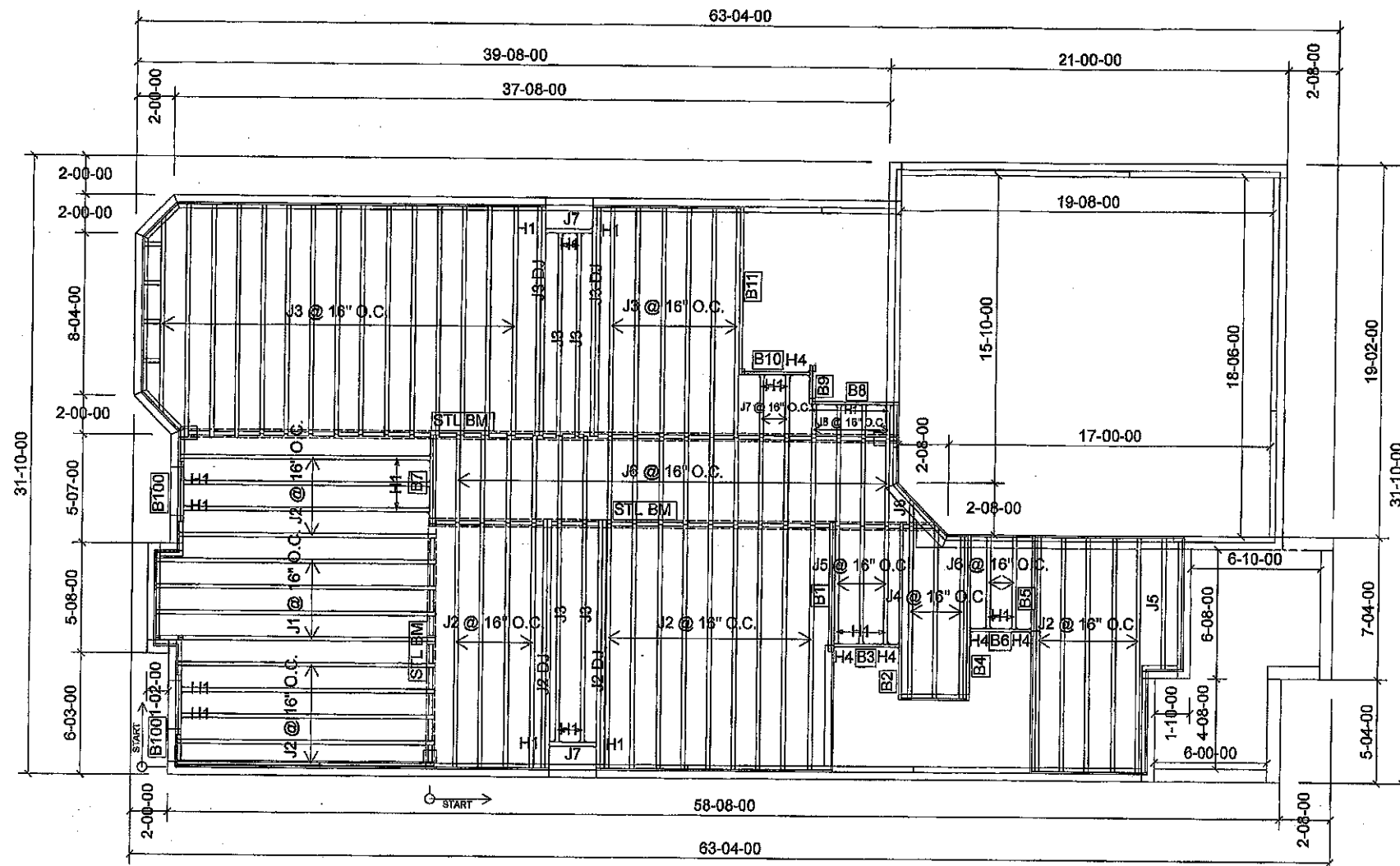
TILED AREAS: 20 lb/ft²

SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 2019-08-01

1st FLOOR

OPTIONAL DECK CONDITION



THIS STRUCTURE MUST BE
CONSTRUCTED TO MEET OR
EXCEED THE PROVISIONS OF
THE CURRENT BUILDING CODE

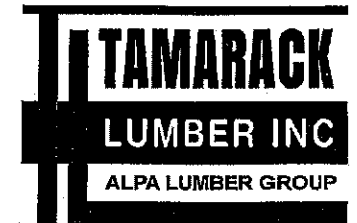
Products				
PlotID	Length	Product	Piles	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	4
J2	14-00-00	9 1/2" NI-40x	1	27
J2 DJ	14-00-00	9 1/2" NI-40x	2	4
J3	12-00-00	9 1/2" NI-40x	1	25
J3 DJ	12-00-00	9 1/2" NI-40x	2	4
J4	10-00-00	9 1/2" NI-40x	1	3
J5	8-00-00	9 1/2" NI-40x	1	4
J6	6-00-00	9 1/2" NI-40x	1	20
J7	4-00-00	9 1/2" NI-40x	1	4
J8	2-00-00	9 1/2" NI-40x	1	5
B11	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B1	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B8	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B7	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B10	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B100	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	4
B9	2-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1

Connector Summary		
Qty	Manuf	Product
11	H1	IUS2.56/9.5
7	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
4	H4	HUS1.81/10
1	H4	HUS1.81/10

APPLICANT COPY

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AUG 23 2019

TOWN OF CALEDON
BUILDING SECTION
FILE NO



FROM PLAN DATED: AUG 26 2018

BUILDER: GREENPARK HOMES

SITE: LAMBERTS LANE

MODEL: MILLWOOD 4A

ELEVATION: 1

LOT: 58

CITY: CALEDON

SALESMAN: M D

DESIGNER: PL

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/480.000

LIVE LOAD: 40.0 lb/ft²

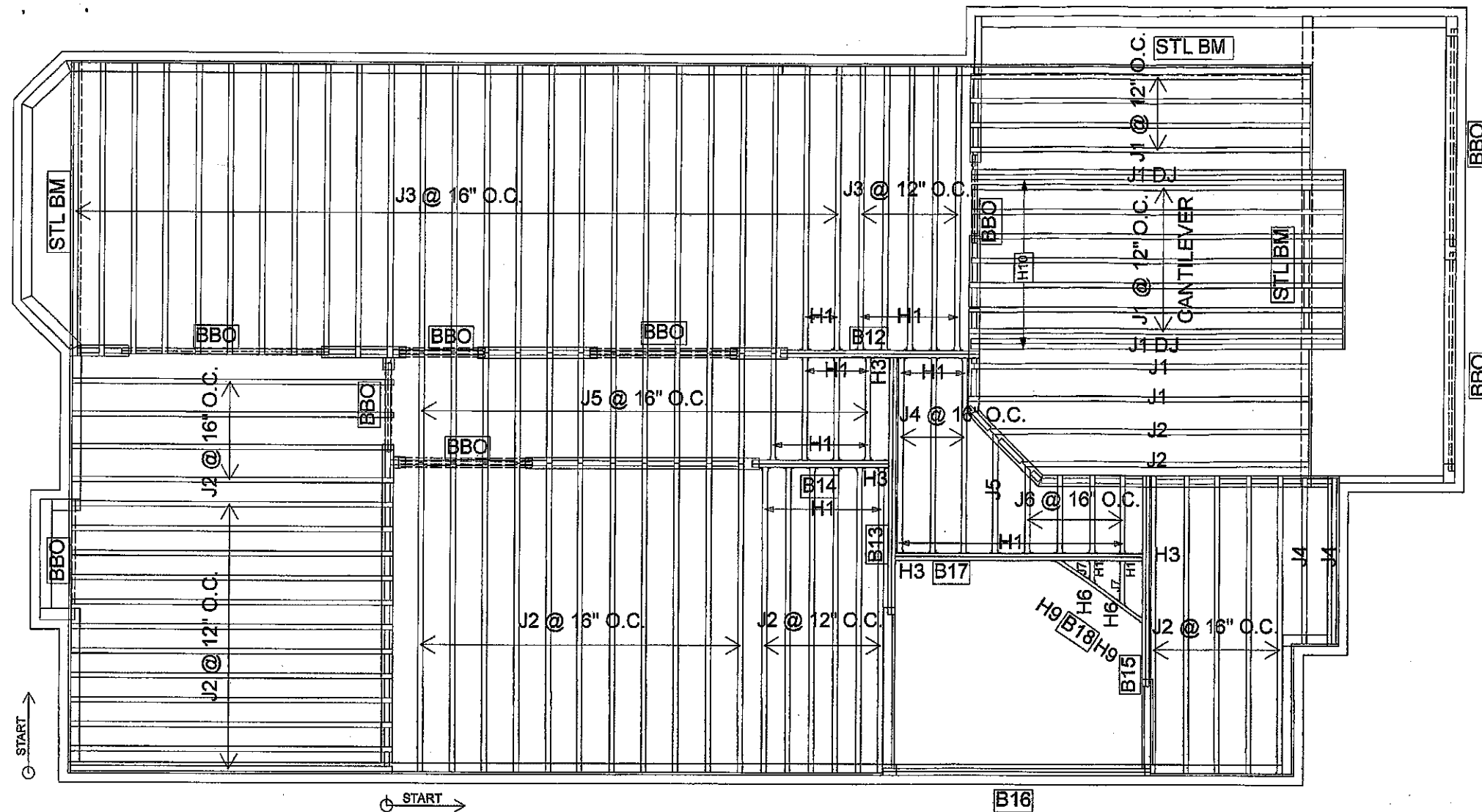
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft²

SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 2019-03-28

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	13
J1 DJ	16-00-00	9 1/2" NI-40x	2	4
J2	14-00-00	9 1/2" NI-40x	1	40
J3	12-00-00	9 1/2" NI-40x	1	30
J4	8-00-00	9 1/2" NI-40x	1	5
J5	6-00-00	9 1/2" NI-40x	1	16
J6	4-00-00	9 1/2" NI-40x	1	4
J7	2-00-00	9 1/2" NI-40x	1	2
B13	12-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2
B16	12-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2
B17	12-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2
B12	10-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2
B15	10-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2
B18	6-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	1	1
B14	6-00-00	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
33	H1	IUS2.56/9.5
4	H3	HGUS410
2	H6	LSSUH310
1	H9	LS90
1	H9	LS90
9	H10	H2.5A*



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:

- The distance between the inside edge of the support and the cantrelines of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
- I-joint top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centered on the middle of the web.
- The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joint web shall equal the clear distance between the flanges of the I-joint 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-joint flange.

- The sides of square holes or longest sides of rectangular holes shall not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
- 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 largest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
- 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.
- 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.

- 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.
- 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.
- Limit three maximum size holes per span, of which one may be a duct chase opening.
- 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
9-1/2"	NI-20	0-7"	1-6"	2-10"	4-3"	5-8"	6-0"	---	---	---	---	---	---
	NI-40x	0-7"	1-6"	3-0"	4-4"	6-0"	6-4"	---	---	---	---	---	---
	NI-60	1-3"	2-6"	4-0"	5-4"	7-0"	7-5"	---	---	---	---	---	---
	NI-80	2-0"	3-4"	4-9"	6-3"	8-0"	8-4"	---	---	---	---	---	---
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"	4-4"	6-0"	6-4"	7-5"	9-0"	10-4"	---	---	---
	NI-80	1-3"	2-6"	4-0"	5-4"	7-0"	7-5"	8-6"	10-0"	11-2"	---	---	---
14"	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"	4-4"	6-0"	6-4"	7-5"	9-0"	10-4"	---	---	---
	NI-80	1-3"	2-6"	4-0"	5-4"	7-0"	7-5"	8-6"	10-0"	11-2"	---	---	---
16"	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"	4-4"	6-0"	6-4"	7-5"	9-0"	10-4"	---	---	---
	NI-80	1-3"	2-6"	4-0"	5-4"	7-0"	7-5"	8-6"	10-0"	11-2"	---	---	---

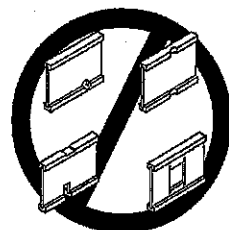
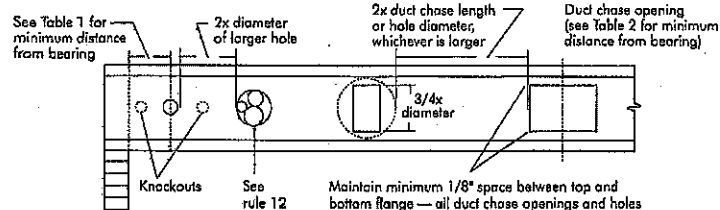
- Above table may be used for I-joint spacing of 24 inches on centre or less.
- Hole location distance is measured from inside face of supports to centre of hole.
- Distances in this chart are based on uniformly loaded joists.
- The above table is based on the I-joint being used at their maximum spans. 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"	6-8"	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"	8-0"	8-3"	8-9"			
	NI-80	5-1"	5-5"	5-10"	6-3"	6-7"	7-1"	7-6"	8-1"	8-4"			
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"	8-5"	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-80	7-1"	7-4"	7-9"	8-3"	8-7"	9-1"	9-8"	10-1"	10-4"			
14"	NI-20	7-1"	7-7"	8-0"	8-5"	8-10"	9-3"	9-8"	10-2"	10-8"			
	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"	11-1"	11-6"	12-1"	13-0"	13-9"			
	NI-80	8-7"	9-1"	9-5"	10-0"	10-4"	10-8"	11-3"	12-1"	12-6"			
16"	NI-20	9-0"	9-3"	9-5"	10-1"	10-7"	11-1"	11-6"	12-1"	12-6"			
	NI-40x	9-2"	9-8"	10-0"	10-6"	11-1"	11-5"	12-0"	12-4"	12-11"			
	NI-60	9-4"	9-9"	10-3"	10-7"	11-1"	11-5"	12-1"	12-7"	13-2"			
	NI-80	10-3"	10-8"	11-2"	11-6"	12-1"	12-6"	13-2"	14-1"	14-10"			

- Above table may be used for I-joint spacing of 24 inches on centre or less.
- Duct chase opening location distance is measured from inside face of supports to centre of opening.
- The above table is based on simple-span joists only. For other applications, contact your local distributor.
- 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.
- The above table is based on the I-joints 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 pre-scored 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-joint. Where possible, it is preferable to use knockouts instead of field-cut holes.

Never drill, cut or notch the flanges, 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-joint.

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 unshathed I-joists. Once shathed, 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 shathed.

AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

- Brace and nail each I-joint as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joint 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.
- 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-joint 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-joint. Nail the bracing to a lateral restraint at the end of each bay. Lay 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.
- For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
- Install and fully nail permanent sheathing to each I-joint before placing loads on the floor system. Then, stack building materials over beams or walls only.
- Never install a damaged I-joint.

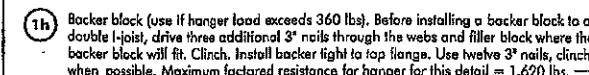
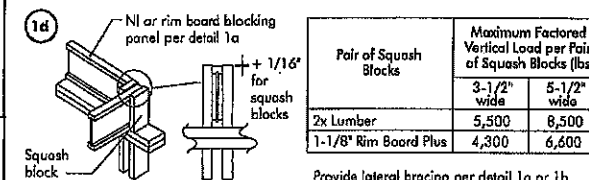
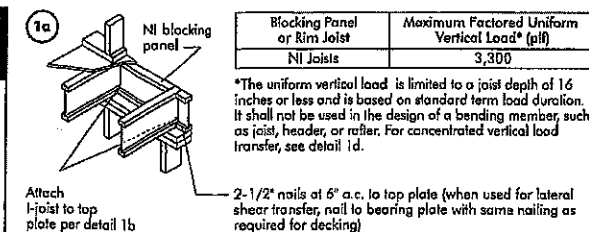
Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines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



PRODUCT WARRANTY

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

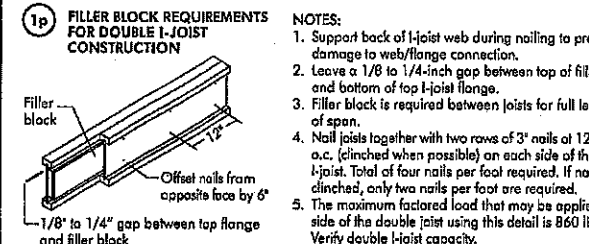
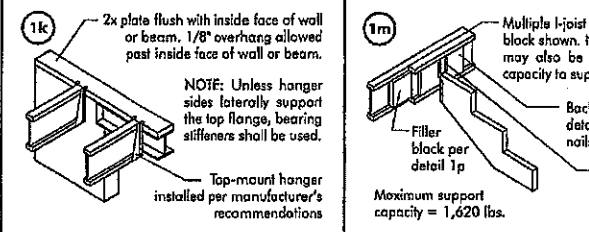
Furthermore, Chantiers Chibougamau warrants that our products, when utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.



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-C325 or CAN/CSA-C437 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".

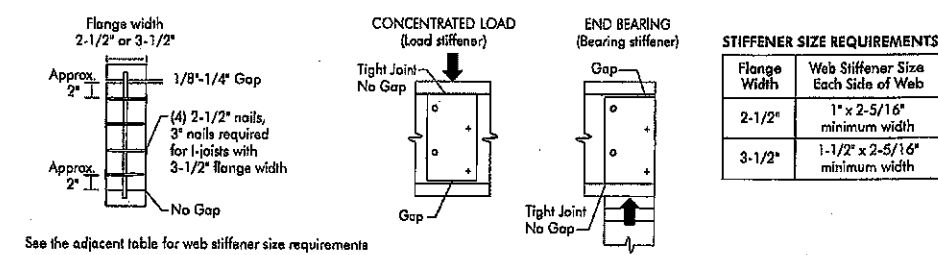


WEB STIFFENERS

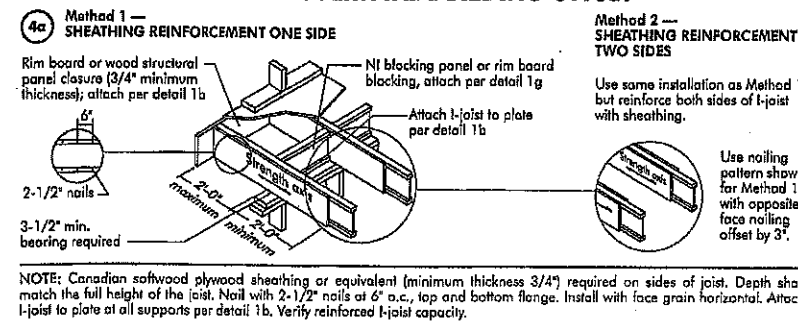
RECOMMENDATIONS:

- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joint properties table found in the I-joint Construction Guide (C101). The gap between the stiffener and the flange is at the top.
- A bearing stiffener is required when the I-joint 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.

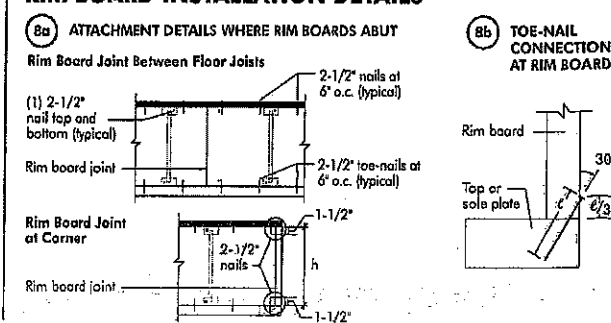
FIGURE 2
WEB STIFFENER INSTALLATION DETAILS



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

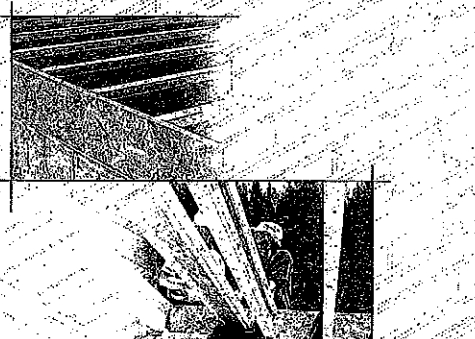


RIM BOARD INSTALLATION DETAILS





INSTALLATION GUIDE FOR RESIDENTIAL FLOORS



2015-04-16

Distributed by:

NC301 / November 2014

SAFETY AND CONSTRUCTION PRECAUTIONS



WARNING

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

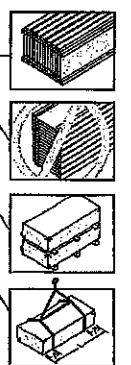
Avoid Accidents by Following these Important Guidelines:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-briding at joist ends. When I-joists are applied continuously 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 center, 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.
 - On 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 end bottom flanges, and brace ends with closure panels, rim board, or cross-briding.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. Never install a damaged I-joist.

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

STORAGE AND HANDLING GUIDELINES

1. Bundles 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 snow.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. When handling I-joists with a crane on the job site, take a few simple precautions to prevent damage to the I-joists and injury to your work crew.
 - Pick I-joists in bundles as shipped by the supplier.
 - Orient the bundles so that the webs of the I-joists are vertical.
 - Pick the bundles at the 5th points, using a spreader bar if necessary.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.



MAXIMUM FLOOR SPANS

1. Maximum clear spans applicable to single-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate live load is 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-nail 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 CBCS-71.24 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use 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 U.S. Steel Design per CAN/CSA C84-09 Standard, and NBS 2010.
7. SI units conversion: 1 inch = 25.4 mm
1 foot = 0.305 m

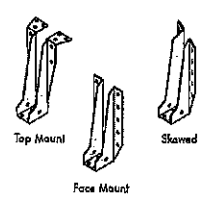
MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS SIMPLE AND MULTIPLE SPANS

Joist Depth	Joist Series	Simple spans On center spacing				Multiple spans On center spacing			
		16'	19.2'	24'	32'	16'	19.2'	24'	32'
9-1/2"	NL-20	15'1"	14'2"	13'9"	13'5"	16'3"	15'4"	14'10"	14'7"
	NL-40	16'1"	15'2"	14'9"	14'5"	17'3"	16'5"	15'10"	15'5"
	NL-60	16'3"	15'4"	14'10"	14'11"	17'7"	16'7"	15'11"	15'6"
	NL-70	17'1"	16'1"	15'6"	15'2"	18'7"	17'4"	16'9"	16'10"
11-7/8"	NL-20	17'3"	16'3"	15'8"	15'4"	18'10"	17'6"	16'11"	17'0"
	NL-40	18'1"	17'0"	16'5"	16'1"	19'4"	18'4"	17'9"	17'7"
	NL-60	18'4"	17'3"	16'7"	16'3"	20'3"	18'9"	18'5"	18'1"
	NL-70	19'5"	18'0"	17'4"	17'0"	21'6"	19'11"	18'9"	19'1"
14"	NL-20	19'9"	18'3"	17'8"	17'2"	21'9"	20'2"	19'3"	19'4"
	NL-40	20'2"	18'7"	17'10"	17'11"	22'3"	20'7"	19'8"	19'9"
	NL-60	20'4"	18'9"	17'11"	18'0"	22'5"	20'9"	19'10"	19'11"
	NL-70	20'1"	18'7"	17'10"	17'11"	22'2"	20'6"	19'7"	19'4"
16"	NL-20	20'5"	18'11"	18'1"	18'2"	22'7"	20'11"	20'0"	20'1"
	NL-40	21'7"	20'0"	19'1"	19'2"	23'10"	21'1"	21'1"	21'2"
	NL-60	21'11"	20'3"	19'4"	19'5"	24'3"	22'5"	21'5"	21'6"
	NL-70	22'5"	20'8"	19'9"	19'10"	24'9"	22'10"	21'10"	21'10"
18"	NL-20	22'7"	20'11"	20'11"	20'9"	25'0"	23'1"	22'0"	22'2"
	NL-40	22'3"	20'8"	19'9"	19'10"	24'7"	22'9"	21'9"	21'10"
	NL-60	22'11"	21'2"	20'3"	20'4"	25'0"	23'1"	22'1"	22'2"
	NL-70	24'5"	22'6"	21'5"	21'6"	26'11"	24'10"	23'9"	23'9"
20"	NL-20	24'8"	22'9"	21'9"	21'10"	27'3"	25'2"	24'0"	24'1"
	NL-40	24'8"	22'9"	21'9"	21'10"	27'3"	25'2"	24'0"	24'1"
	NL-60	24'8"	22'9"	21'9"	21'10"	27'3"	25'2"	24'0"	24'1"
	NL-70	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 fully brace the top flange of the I-joist.



WEB STIFFENERS

RECOMMENDATIONS:

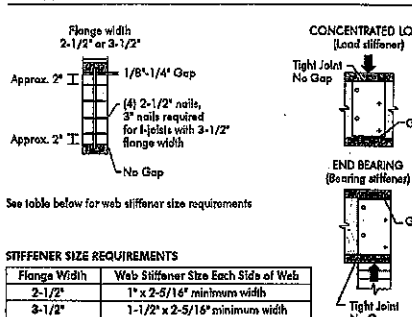
- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found in the I-joist Construction Guide (C101). The gap between the stiffener and the flange is at the top.

- 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 the flange is at the top.

- A load stiffener is required at locations where a factored concentrated load greater than 2,375 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

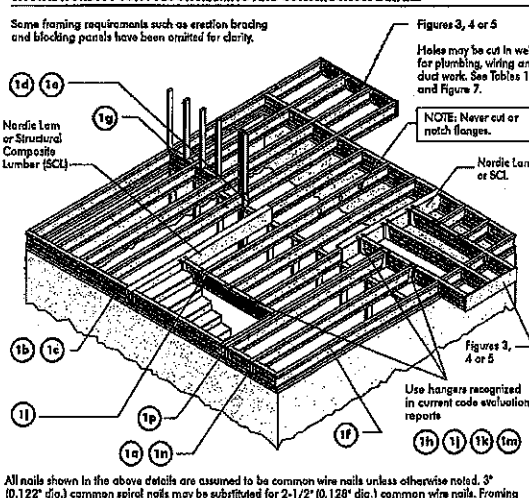
STIFFENER SIZE REQUIREMENTS

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

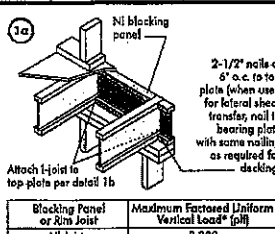
INSTALLING NORDIC I-JOISTS

1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, contact supplier.
2. Except for cutting to length, I-joist flanges should never be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. I-joists must be anchored securely to supports before floor sheathing is attached, and supports for multiple-span I-joists must be level.
5. Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
6. When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16-inch gap between the I-joist end and a header.
8. Concentrated loads greater than those that can normally be expected in residential construction should only be applied to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment and security cameras. Never suspend unusual or heavy loads from the I-joist's bottom flange. Whenver possible, spread 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 squish blocks (scrapie 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 on 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 and 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

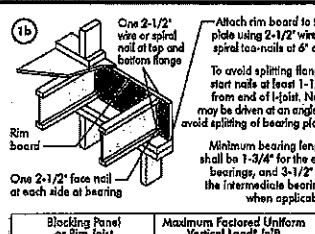


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



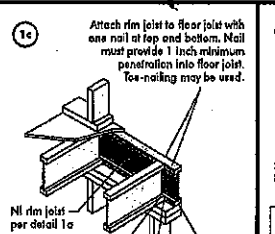
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (psf)
NL Joists	3,300

*The uniform vertical load is limited to a joist depth of 16 inches or less and is based on a 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.



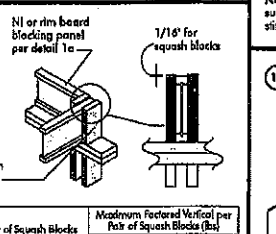
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (psf)
1-1/8" Rim Board Plus	8,090

*The uniform vertical load is limited to a rim board depth of 16 inches or less and is based on a 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.



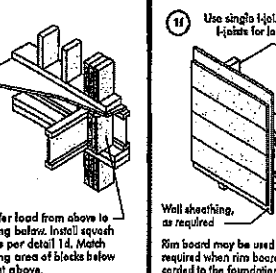
Pair of Squish Blocks	Maximum Factored Vertical Load* (psf)
2x Lumber	4,300
1-1/8" Rim Board Plus	4,300

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

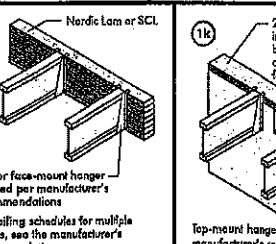


Pair of Squish Blocks	Maximum Factored Vertical Load* (psf)
2x Lumber	4,300
1-1/8" Rim Board Plus	4,300

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



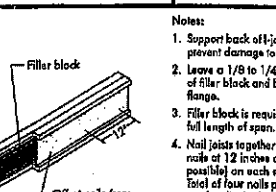
Transfer load from above to bearing below. Install squish blocks per detail 1d. Match bearing area of blocks below to part above.



Top- or face-mount hanger installed per manufacturer's recommendations

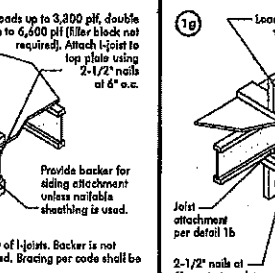
For nailing schedules for multiple beams, see the manufacturer's recommendations.

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

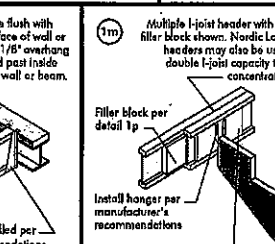


1/8" to 1/4" gap between top flange and filler block

Notes: 1. Support back of 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 lb/ft. Verify double I-joist capacity.



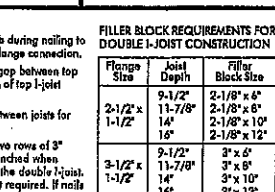
Well sheathing, as required. Rim board may be used in lieu of I-joists. Backer is not required when rim board is used. Bracing per code shall be added to the foundation.



Top-mount hanger installed per manufacturer's recommendations

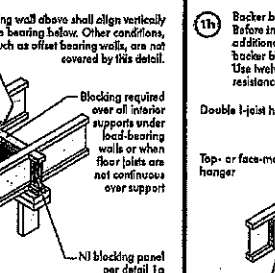
Notes: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

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

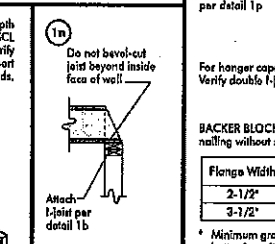


Top-mount hanger installed per manufacturer's recommendations

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



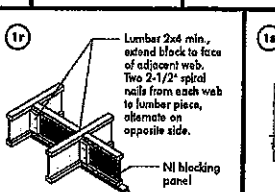
Load bearing wall above shall align vertically with the bearing below. Other conditions, such as offset bearing walls, are not covered by this detail.



Top-mount hanger installed per manufacturer's recommendations

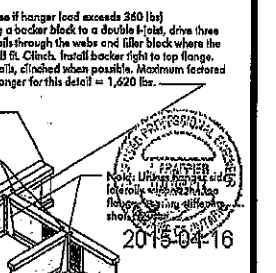
Notes: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

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

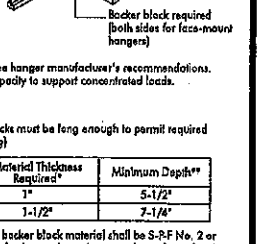


Top-mount hanger installed per manufacturer's recommendations

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



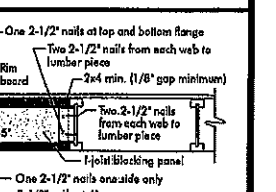
Backer block (one if hanger load exceeds 360 lbs) Before installing a backer block to a double I-joist, drive three additional 3" nails through the webs and filler block where the backer block will sit. Clinch. Install backer right to top flange. Use twelve 3" nails, clinched when possible. Maximum factored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



Top-mount hanger installed per manufacturer's recommendations

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

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



Top-mount hanger installed per manufacturer's recommendations

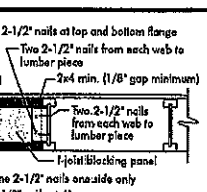
Notes: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

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

Flange Width	Minimum 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-C0325 or CAN/CSA-C0437 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".

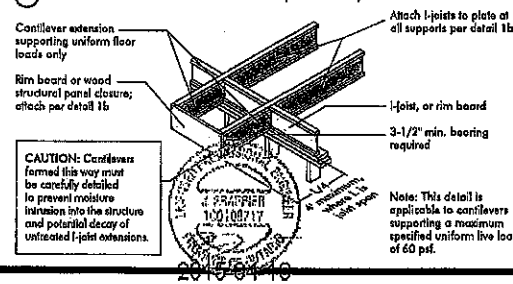


Top-mount hanger installed per manufacturer's recommendations

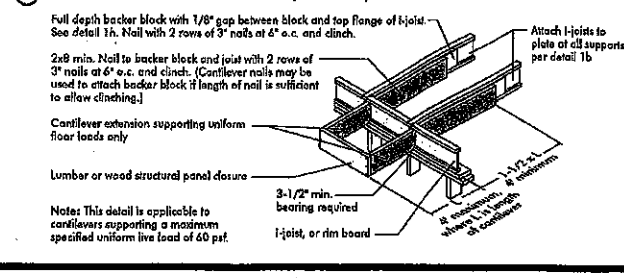
Notes: 1. In some local codes, blocking is prescriptively required in the first joint space (for first and second joint spaces) used to the exterior joist. Where required, see local code requirements for spacing of the blocking. 2. All nails are common joist to this detail.

CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

1a) I-JOIST CANTILEVER DETAIL FOR BALCONIES (No Wall Load)

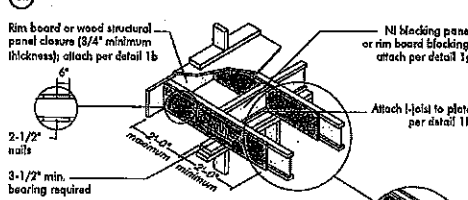


1b) LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)

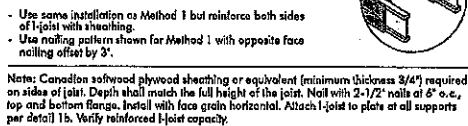


CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

4a) Method 1 — SHEATHING REINFORCEMENT ONE SIDE



Method 2 — SHEATHING REINFORCEMENT TWO SIDES



4b) Alternate Method 2 — DOUBLE I-JOIST

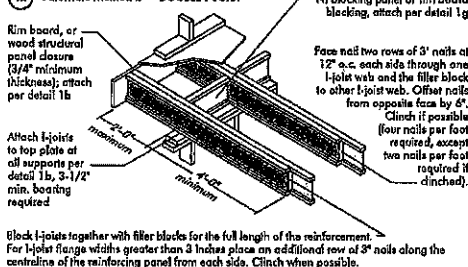


FIGURE 4 (continued)



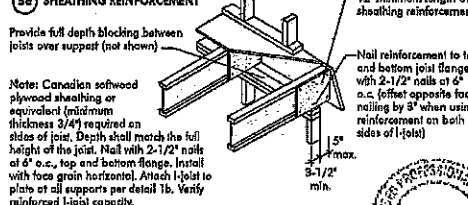
CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	JOIST SPACING (in.)	ROOF LOADING (UNIFORM)				ROOF LOADING (POINT)			
		12	16	19.2	24	12	16	19.2	24
9-1/2"	12	N	N	N	N	N	N	N	N
9-1/2"	16	N	N	N	N	N	N	N	N
9-1/2"	19.2	N	N	N	N	N	N	N	N
9-1/2"	24	N	N	N	N	N	N	N	N
11-7/8"	12	N	N	N	N	N	N	N	N
11-7/8"	16	N	N	N	N	N	N	N	N
11-7/8"	19.2	N	N	N	N	N	N	N	N
11-7/8"	24	N	N	N	N	N	N	N	N
14"	12	N	N	N	N	N	N	N	N
14"	16	N	N	N	N	N	N	N	N
14"	19.2	N	N	N	N	N	N	N	N
14"	24	N	N	N	N	N	N	N	N
16"	12	N	N	N	N	N	N	N	N
16"	16	N	N	N	N	N	N	N	N
16"	19.2	N	N	N	N	N	N	N	N
16"	24	N	N	N	N	N	N	N	N

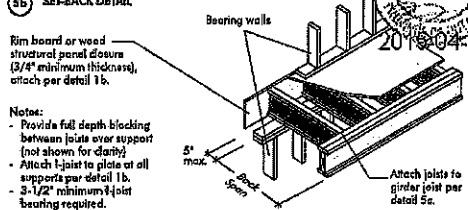
1. N = No reinforcement required.
2. N = Reinforced with 3/4" wood structural panel on one side only.
3. N = Reinforced with 3/4" wood structural panel on both sides, or double I-joist.
4. For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
5. 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.
6. 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 beam, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
7. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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

5a) SHEATHING REINFORCEMENT



5b) SET-BACK DETAIL



5c) SET-BACK CONNECTION

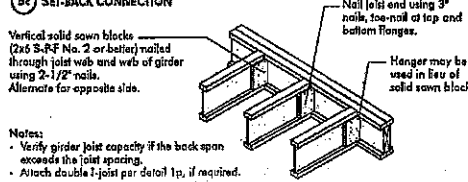


FIGURE 5 (continued)



BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	JOIST SPACING (in.)	ROOF LOADING (UNIFORM)				ROOF LOADING (POINT)			
		12	16	19.2	24	12	16	19.2	24
9-1/2"	12	N	N	N	N	N	N	N	N
9-1/2"	16	N	N	N	N	N	N	N	N
9-1/2"	19.2	N	N	N	N	N	N	N	N
9-1/2"	24	N	N	N	N	N	N	N	N
11-7/8"	12	N	N	N	N	N	N	N	N
11-7/8"	16	N	N	N	N	N	N	N	N
11-7/8"	19.2	N	N	N	N	N	N	N	N
11-7/8"	24	N	N	N	N	N	N	N	N
14"	12	N	N	N	N	N	N	N	N
14"	16	N	N	N	N	N	N	N	N
14"	19.2	N	N	N	N	N	N	N	N
14"	24	N	N	N	N	N	N	N	N
16"	12	N	N	N	N	N	N	N	N
16"	16	N	N	N	N	N	N	N	N
16"	19.2	N	N	N	N	N	N	N	N
16"	24	N	N	N	N	N	N	N	N

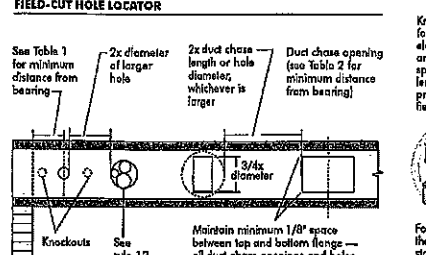
1. N = No reinforcement required.
2. N = Reinforced with 3/4" wood structural panel on one side only.
3. N = Reinforced with 3/4" wood structural panel on both sides, or double I-joist.
4. For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
5. 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.
6. 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 beam, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
7. 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 shall 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 largest sides of rectangular holes shall 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 hole per span, of which one may be a duct chase opening.
12. A group of round holes or approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

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.

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 Spacing	Minimum distance from inside face of any support to centre of hole (in.)												Span (feet)
		8	12	16	19.2	24	32	40	48	56	64	72	80	
		Round hole diameter (in.)												
		8	12	16	19.2	24	32	40	48	56	64	72	80	
9-1/2"	N-10	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-12	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-16	1.3	2.6	4.5	5.4	7.4	7.5	...	...	...	...	...	14.1	
	N-20	3.0	3.7	5.4	5.4	7.4	7.5	...	...	...	...	...	14.1	
	N-30	3.7	5.4	5.4	5.4	7.4	7.5	...	...	...	...	...	15.9	
11-7/8"	N-10	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-12	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-16	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-20	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-30	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
14"	N-10	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-12	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-16	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-20	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-30	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
16"	N-10	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-12	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-16	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-20	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	
	N-30	0.7	1.5	2.1	4.5	5.5	6.0	...	...	...	...	...	12.5	

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Field 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 in their maximum span. If the I-joists are placed at less than their full maximum span (see Manufacturer's literature), the actual measured span distance between the inside faces of supports (S) as given above may be reduced as follows:

Reduced = $\frac{S}{L} \times D$

Where:

Reduced =

Location =

SAF =

D =

SAF =

D =

SAF =

D =

SAF =

D =

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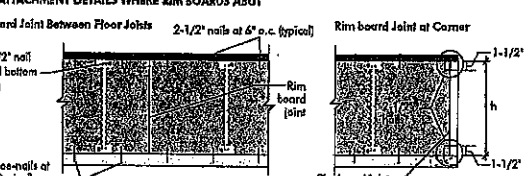
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SAF =

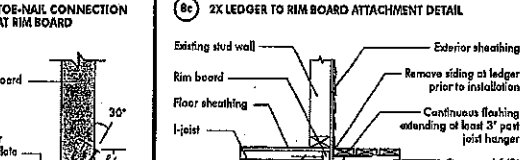
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RIM BOARD INSTALLATION DETAILS

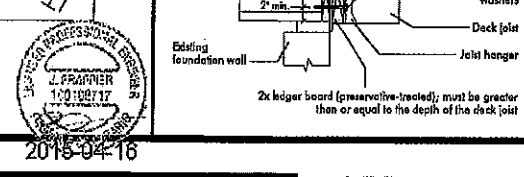
6a) ATTACHMENT DETAILS WHERE RIM BOARDS ABUT



6b) TOE-NAIL CONNECTION AT RIM BOARD



6c) 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL



FASTENERS FOR SHEATHING AND SUBFLOORING(1)

Maximum Joist Spacing (in.)	Minimum Panel Thickness (in.)	Nail Size and Type				Maximum Spacing of Fasteners	
		Common Wire or Spiral Nails	Ring Threaded Nails or Screws	Staples	Edges	End 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

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER INC.
3269 NORTH SERVICE ROAD
BURLINGTON ONTARIO
Oct. 31, 2018 16:02

PROJECT
J1 1ST FLOOR

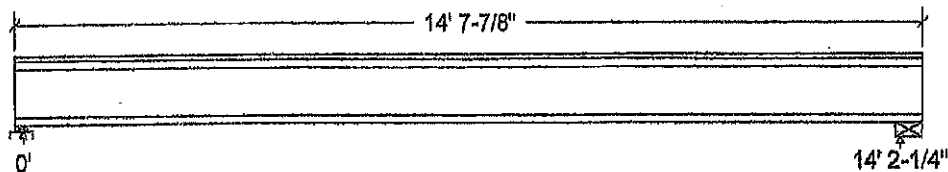
Design Check Calculation Sheet

Nordic Sizer - Canada 7.1

Loads:

Load	Type	Distribution	Fat- tern	Location (ft) Start End	Magnitude Start End	Unit
Load1	Dead	Full Area			20.00	psf
Load2	Live	Full Area			40.00	psf

Maximum Reactions (lbs), Bearing Resistances (lbs) and Bearing Lengths (in) :



Unfactored:			
Dead	189		189
Live	378		378
Factored:			
Total	804		804
Bearing:			
Resistance			
Joist	2101		2336
Support	3651		-
Des ratio			
Joist	0.38		0.34
Support	0.22		-
Load case	#2		#2
Length	2-3/8		5
Min req'd	1-3/4		1-3/4
Stiffener	No		No
KD	1.00		1.00
KB support	1.00		-
fop sup	769		-
Kzop sup	1.00		-



DESIGN CONFORMS TO OBC2012

Nordic Joist 11-7/8" NI-40x Floor Joist @ 16" o.c.

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

Total length: 14' 7-7/8"; Clear span: 14' 1/2"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

This section PASSES the design code check.

RECEIVED
AUG 23 2019

ET0000405

TOWN OF CALEDON
BUILDING SECTION
FILE NO

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	$V_f = 804$	$V_r = 2336$	lbs	$V_f/V_r = 0.34$
Moment (+)	$M_f = 2852$	$M_r = 6255$	lbs-ft	$M_f/M_r = 0.46$
Perm. Defl'n	$0.06 = < L/999$	$0.47 = L/360$	in	0.14
Live Defl'n	$0.13 = < L/999$	$0.35 = L/480$	in	0.37
Total Defl'n	$0.19 = L/876$	$0.71 = L/240$	in	0.27
Bare Defl'n	$0.15 = < L/999$	$0.47 = L/360$	in	0.32
Vibration	$L_{max} = 14'-2.3$	$L_v = 17'-8.1$	ft	0.80
Defl'n	$= 0.024$	$= 0.047$	in	0.50

Additional Data:

FACTORS:	F/E	KD	KH	KZ	KL	KT	KS	KN	LCF
Vr	2336	1.00	1.00	-	-	-	-	-	#2
Mr+	6255	1.00	1.00	-	1.000	-	-	-	#2
EI	371.1 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

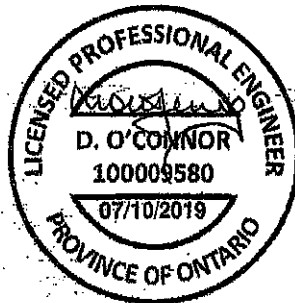
All Load Combinations (LCs) are listed in the Analysis output

CALCULATIONS:Deflection: $EI_{eff} = 448e06 \text{ lb-in}^2$ $K = 6.18e06 \text{ lbs}$

"Live" deflection = Deflection from all non-dead loads (live, wind, earthquake)

Design Notes:

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 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.



DESIGN CONFORMS TO OBC2012

ET0000406

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER INC.
3260 NORTH SERVICE ROAD
BURLINGTON ONTARIO
Nov. 12, 2018 17:28

PROJECT
J1 2ND FLOOR ABOVE
GARAGE

Design Check Calculation Sheet

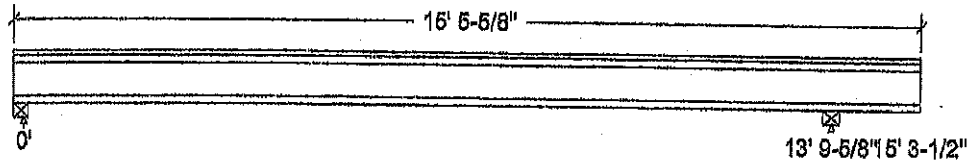
Nordic Sizer - Canada 7.1

Loads:

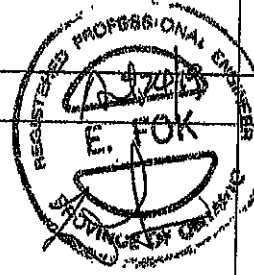
Load	Type	Distribution	Pat-tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area	No		20.00	psf
Load2	Live	Full Area	Yes		40.00	psf
J12 SN	Snow	Point	Yes	15.47	91	lbs
J12 D	Dead	Point	No	15.47	45	lbs
HIGH ROOF D	Dead	Point	No	15.47	30	lbs
HIGH ROOF L	Dead	Point	No	15.47	33	lbs
HIGH ROOF SN	Dead	Point	No	15.47	102	lbs

Load magnitude does not include Normal Importance factor from O86 Table 5.2.3.2, which is applied during analysis.

Maximum Reactions (lbs), Bearing Resistances (lbs) and Bearing Lengths (in) :



Unfactored:					
Dead	114			402	
Live	276			339	
Snow	-10			101	
Factored:					
Total	556			1112	
Bearing:					
Resistance					
Joist	1876			3804	
Support	4612			-	
Des ratio				0.29	
Joist	0.30			-	
Support	0.12			-	
Load case	#10			#4	
Length	3			3-1/2	
Min req'd	1-3/4			3-1/2	
Stiffener	No			No	
KD	1.00			1.00	
KB support	1.00			-	
fcp sup	769			-	
Kzcp sup	1.00			-	



DESIGN CONFORMS TO OBC2012

Maximum reaction on at least one support is from a different load combination than the critical one for bearing design, shown here, due to KD factor. See Analysis results for reaction from critical load combination.

Nordic Joist 9-1/2" NI-40x Floor Joist @ 12" o.c.

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

Total length: 15' 5-5/8"; Clear span: 13' 7", 1' 4-1/8", 5/8" nailed and glued OSB sheathing

This section PASSES the design code check.

ET0000407

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 632	Vr = 1895	lbs	Vf/Vr = 0.33
Moment (+)	Mf = 1820	Mr = 4824	lbs-ft	Mf/Mr = 0.38
Moment (-)	Mf = 621	Mr = 3677	lbs-ft	Mf/Mr = 0.17
Deflection:				
Interior Perm	0.04 = < L/999	0.46 = L/360	in	0.09
Live	0.14 = < L/999	0.35 = L/480	in	0.42
Total	0.19 = L/886	0.69 = L/240	in	0.27
Cantil. Perm	-0.00 = < L/999	0.10 = L/180	in	0.05
Live	-0.04 = L/409	0.07 = L/240	in	0.59
Total	-0.05 = L/368	0.15 = L/120	in	0.33
Bare Defl'n	-0.05 = L/345	0.10 = L/180	in	0.52
Vibration	Lmax = 13'-9.6	Lv = 16'-3.4	ft	0.85
Defl'n	= 0.029	= 0.049	in	0.59

Additional Data:

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#4
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#10
Mr-	4824	0.76	1.00	-	1.000	-	-	-	#4
EI	218.1 million	-	-	-	-	-	-	-	#10

CRITICAL LOAD COMBINATIONS:

Shear : LC #4 = 1.25D + 1.5L + (1.0)1.0S
 Moment (+) : LC #10 = 1.25D + 1.5L (pattern: L)
 Moment (-) : LC #4 = 1.25D + 1.5L + (1.0)1.0S
 Deflection: LC #1 = 1.0D (permanent)
 LC #10 = 1.0D + 1.0L (pattern: L) (live)
 LC #10 = 1.0D + 1.0L (pattern: L) (total)
 LC #10 = 1.0D + 1.0L (pattern: L) (bare joist)
 Bearing : Support 1 - LC #4 = 1.25D + 1.5L + (1.0)1.0S
 Support 2 - LC #0 = 1.4D

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:

Deflection: E_{ieff} = 258e06 lb-in² K= 4.94e06 lbs
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Design Notes:

1. WoodWorks analysis and design are in accordance with the 2016 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.



ET0000408

DESIGN CONFORMS TO OBC2012

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER INC.
3269 NORTH SERVICE ROAD
BURLINGTON ONTARIO
Nov. 12, 2018 17:18

PROJECT
J1 2ND FLOOR CANT UNDER
LINTAL

Design Check Calculation Sheet

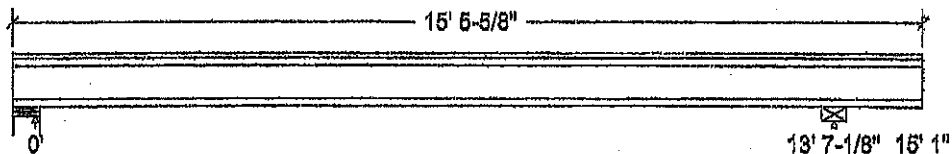
Nordic Sizer - Canada 7.1

Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area	No		20.00	psf
Load2	Live	Full Area	Yes		40.00	psf
WINDOW LINTALD	Dead	Point	No	15.47	167	lbs
WINDOW LINTALL	Live	Point	Yes	15.47	104	lbs
WINDOW LINTALS	Snow	Point	Yes	15.47	324	lbs

Load magnitude does not include Normal Importance factor from O86 Table 6.2.3.2, which is applied during analysis.

Maximum Reactions (lbs), Bearing Resistances (lbs) and Bearing Lengths (in) :



Unfactored:			
Dead	116		353
Live	272		450
Snow	-36		360
Factored:			
Total	553		1476
Bearing:			
Resistance			
Joist	1893		4063
Support	9724		-
Des ratio			
Joist	0.29		0.36
Support	0.06		-
Load case	#10		#4
Length	5-1/2		5
Min req'd	1-3/4		3-1/2
Stiffener	No		No
KD	1.00		1.00
KB support	1.00		-
fcy sup	769		-
Kzcy sup	1.15		-



DESIGN CONFORMS TO OBC2012

Maximum reaction on at least one support is from a different load combination than the critical one for bearing design, shown here, due to KD factor. See Analysis results for reaction from critical load combination. Bearing for wall supports is perpendicular-to-grain bearing on top plate. No stud design included.

Nordic 9-1/2" NI-40x Floor Joist @ 12" o.c.

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

Total length: 15' 5-5/8"; Clear span: 13' 3-3/4", 1' 3-3/8", 5/8" nailed and glued OSB sheathing

This section PASSES the design code check.

ET0000409

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 896	Vr = 1895	lbs	Vf/Vr = 0.47
Moment(+)	Mf = 1798	Mr = 4824	lbs-ft	Mf/Mr = 0.37
Moment(-)	Mf = 1262	Mr = 4824	lbs-ft	Mf/Mr = 0.26
Deflection:				
Interior Perm	0.04 = < L/999	0.45 = L/360	in	0.10
Live	0.14 = < L/999	0.34 = L/480	in	0.40
Total	0.18 = L/899	0.68 = L/240	in	0.27
Cantil. Perm	-0.01 = < L/999	0.10 = L/180	in	0.07
Live	-0.04 = L/428	0.07 = L/240	in	0.56
Total	-0.05 = L/364	0.15 = L/120	in	0.33
Bare Defl'n	-0.05 = L/361	0.10 = L/180	in	0.50
Vibration	Imax = 13'-7.1	Lv = 16'-3.4	ft	0.83
Defl'n	= 0.028	= 0.050	in	0.56

Additional Data:

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#5
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#10
Mr-	4824	1.00	1.00	-	1.000	-	-	-	#5
EI	218.1 million	-	-	-	-	-	-	-	#10

CRITICAL LOAD COMBINATIONS:

Shear : LC #5 = 1.25D + (1.0)1.5S + 1.0L
 Moment(+) : LC #10 = 1.25D + 1.5L (pattern: L)
 Moment(-) : LC #5 = 1.25D + (1.0)1.5S + 1.0L
 Deflection: LC #1 = 1.0D (permanent)
 LC #10 = 1.0D + 1.0L (pattern: L) (live)
 LC #10 = 1.0D + 1.0L (pattern: L) (total)
 LC #10 = 1.0D + 1.0L (pattern: L) (bare joist)
 Bearing : Support 1 - LC #4 = 1.25D + 1.5L + (1.0)1.0S
 Support 2 - LC #0 = 1.4D

Load Types: D=dead W=wind S=snow R=earth, groundwater E=earthquake
 L=live(use, occupancy) Ls=live(storage, equipment) f=live

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:

Deflection: E_{eff} = 258e06 lb-in² K= 4.94e06 lbs
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Design Notes:

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.



ET0000410

DESIGN CONFORMS TO OBC2012

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER INC.
3269 NORTH SERVICE ROAD
BURLINGTON ONTARIO
Nov. 12, 2018 17:01

PROJECT
J1 DJ 2ND FLOOR CANT

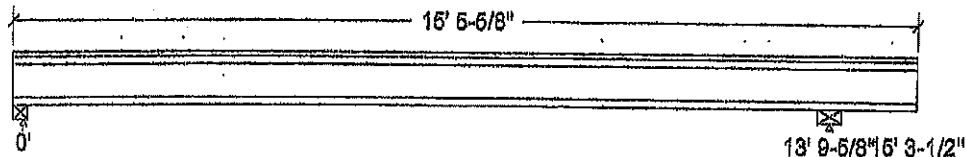
Design Check Calculation Sheet Nordic Sizer - Canada 7.1

Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start End	Magnitude Start End	Unit
Load1	Dead	Full Area	No		20.00	psf
Load2	Live	Full Area	Yes		40.00	psf
T12 D	Dead	Point	No	14.46	222	lbs
T12 L	Live	Point	Yes	14.46	143	lbs
T12 SN	Snow	Point	Yes	14.46	614	lbs
LOW ROOF D	Dead	Partial UDL	No	13.98 15.47	30.0 30.0	plf
LOW ROOF L	Dead	Partial UDL	No	13.98 15.47	33.0 33.0	plf
LOW ROOF SN	Dead	Partial UDL	No	13.98 15.47	102.0 102.0	plf
WALL	Dead	Partial UDL	No	13.98 15.47	100.0 100.0	plf
HIGH ROOF L	Live	Partial UDL	Yes	13.98 15.47	55.0 55.0	plf
HIGH ROOF SN	Snow	Partial UDL	Yes	13.98 15.47	170.0 170.0	plf
HIGH ROOF D	Dead	Partial UDL	No	13.98 15.47	50.0 50.0	plf

Load magnitude does not include Normal Importance factor from O86 Table 5.2.3.2, which is applied during analysis.

Maximum Reactions (lbs), Bearing Resistances (lbs) and Bearing Lengths (in) :



Unfactored:			
Dead	103		894
Live	276		573
Snow	-35		902
Factored:			
Total	543		3044
Bearing:			
Resistance			
Joist	3751		8127
Support	9224		-
Des ratio			
Joist	0.14		0.37
Support	0.06		-
Load case	#10		#5
Length	3		5
Min req'd	1-3/4		3-1/2
Stiffener	No		No
KD	1.00		1.00
KB support	1.00		-
fcp sup	769		-
Kzcp sup	1.00		-



DESIGN CONFORMS TO OBC2012

Maximum reaction on at least one support is from a different load combination than the critical one for bearing design, shown here, due to KD factor. See Analysis results for reaction from critical load combination.

ET0000411

Nordic Joist 9-1/2" NI-40x 2-ply Floor Joist @ 12" o.c.

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

Total length: 15' 5-5/8"; Clear span: 13' 6-1/4"; 1' 3-3/8"; 5/8" nailed and glued OSB sheathing

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 = 2487	Vr = 3790	lbs	Vf/Vr = 0.66
Moment (+)	Mf = 1736	Mr = 9647	lbs-ft	Mf/Mr = 0.18
Moment (-)	Mf = 1496	Mr = 9647	lbs-ft	Mf/Mr = 0.16
Deflection:				
Interior Perm	0.02 = < L/999	0.46 = L/360	in	0.03
Live	0.08 = < L/999	0.35 = L/480	in	0.22
Total	0.09 = < L/999	0.69 = L/240	in	0.13
Cantil. Perm	0.00 = < L/999	0.10 = L/180	in	0.01
Live	-0.02 = L/763	0.07 = L/240	in	0.31
Total	-0.02 = L/794	0.15 = L/120	in	0.15
Bare Defl'n	-0.03 = L/691	0.10 = L/180	in	0.26
Vibration	Lmax = 13'-9.6	Lv = 18'-9.4	ft	0.73
Defl'n	= 0.019	= 0.049	in	0.39

Additional Data:

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#5
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#10
Mr-	4824	1.00	1.00	-	1.000	-	-	-	#5
EI	218.1 million	-	-	-	-	-	-	-	#10

CRITICAL LOAD COMBINATIONS:

Shear : LC #5 = 1.25D + (1.0)1.5S + 1.0L

Moment (+) : LC #10 = 1.25D + 1.5L (pattern: L₁)

Moment (-) : LC #5 = 1.25D + (1.0)1.5S + 1.0L

Deflection: LC #1 = 1.0D (permanent)

LC #10 = 1.0D + 1.0L (pattern: L₁) (live)LC #10 = 1.0D + 1.0L (pattern: L₁) (total)LC #10 = 1.0D + 1.0L (pattern: L₁) (bare joist)

Bearing : Support 1 - LC #5 = 1.25D + (1.0)1.5S + 1.0L

Support 2 - LC #0 = 1.4D

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=8/2 L=L+Ls =no pattern load in this span

All Load Combinations (LCs) are listed in the Analysis output

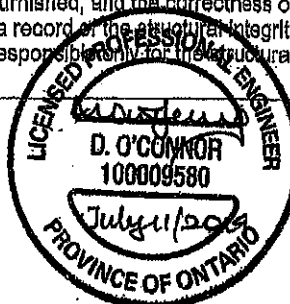
CALCULATIONS:Deflection: E_{eff} = 241e06 lb-in²/ply K= 4.94e06 lbs/ply

"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Design Notes:

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.

DESIGN CONFORMS TO OBC2012



ET0000412



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

PASSED

1ST FLOOR FRAMING\Flush Beams\B11\16308

Dry | 1 span | No cant.

March 28, 2019 17:27:24

BC CALCO® Member Report

Build 6766

Job name:

Address:

City, Province, Postal Code: CALEDON

Customer:

Code reports: CCMC 12472-R

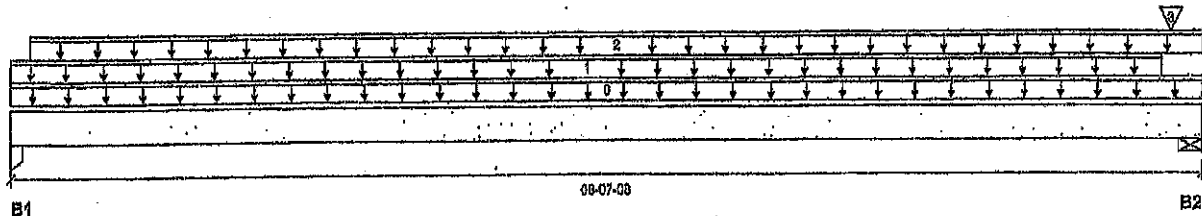
File name: MILLWOOD 4A.mmd\

Description: 1ST FLOOR FRAMING\Flush Beams\B11\16308

Specifier:

Designer: PL

Company:



Total Horizontal Product Length = 08-07-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	30 / 0	295 / 0		
B2, 3-1/2"	72 / 0	321 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-07-08	Top	1.00	0.68	1.00	1.15	00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	08-04-00	Top		60			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-01-12	08-07-08	Top	7	4			n/a
3	E2(1355)	Conc. Pt. (lbs)	L	08-04-12	08-04-12	Top	39	43			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	800 ft-lbs	7,646 ft-lbs	10.6%	0	04-03-12
End Shear	314 lbs	3,761 lbs	8.4%	0	07-08-08
Total Load Deflection	L/999 (0.08")	n/a	n/a	4	04-03-12
Live Load Deflection	L/999 (0.003")	n/a	n/a	5	04-03-12
Max Defl.	0.03"	n/a	n/a	4	04-03-12
Span / Depth	10.3				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 3-1/2" x 1-3/4"	413 lbs	16.0%	8.6%	Unspecified
B2	Wall/Plate 3-1/2" x 1-3/4"	450 lbs	26.4%	9.3%	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 CALCO® analysis is based on Canadian Limit States Design, as per NBCC 2016 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9



DESIGN CONFORMS TO OBC2012

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 CALCO®, BC FRAMER®, AJIS™, ALLJOIST®, BC RIM BOARD™, BOISE®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®



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

PASSED

BC CALC® Member Report

Build 6766

Job name:

Address:

City, Province, Postal Code: CALEDON

Customer:

Code reports: CCMC 12472-R

Dry | 1 span | No cant.

March 28, 2019 17:27:24

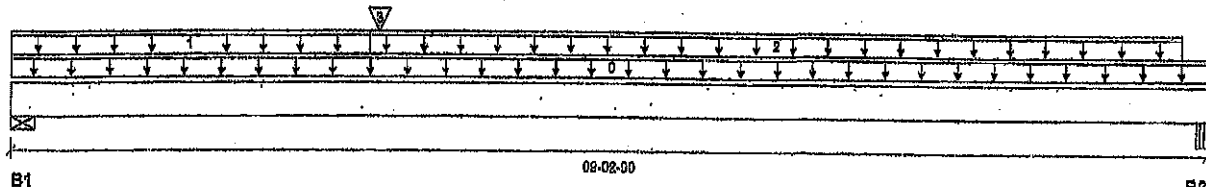
File name: MILLWOOD 4A.mmdl

Description: 1ST FLOOR FRAMING\Flush Beams\B2(16292)

Specifier:

Designer: PL

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	506 / 0	280 / 0		
B2, 5"	292 / 0	171 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	09-02-00	Top	1.00	0.85	1.00	1.15	
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	02-08-10	Top	12	6			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	02-08-10	08-11-08	Top	27	13			n/a
3	B3(16244)	Cono. Pt. (lbs)	L	02-09-08	02-09-08	Top	600	308			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2,724 ft-lbs	11,810 ft-lbs	23.5%	1	02-08-08
End Shear	1,076 lbs	5,785 lbs	18.6%	1	01-01-00
Total Load Deflection	L/999 (0.086")	n/a	n/a	4	04-02-00
Live Load Deflection	L/999 (0.086")	n/a	n/a	5	04-02-00
Max Defl.	0.086"	n/a	n/a	4	04-02-00
Span / Depth	10.8				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 1-3/4"	1,110 lbs	42.4%	14.6%	Unspecified
B2	Beam 5" x 1-3/4"	662 lbs	17.4%	6.1%	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.

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



DESIGN CONFORMS TO OBC2012

Disclosure

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



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

PASSED

1ST FLOOR FRAMING/Flush Beams/B4(16325)

Dry | 1 span | No cant.

March 28, 2019 17:27:24

BC CALC® Member Report

Build 6766

Job name:

Address:

City, Province, Postal Code: CALEDON

Customer:

Code reports: CCMC 12472-R

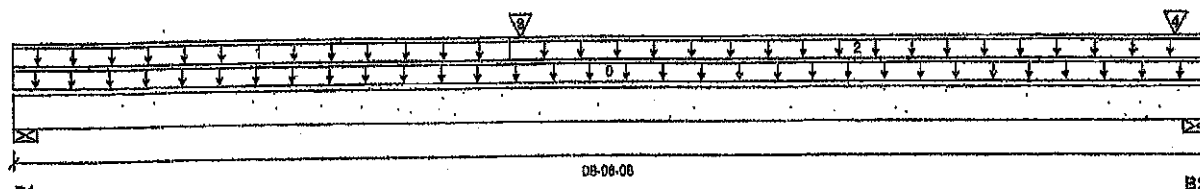
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Description: 1ST FLOOR FRAMING/Flush Beams/B4(16325)

Specifier:

Designer: PL

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	362 / 0	201 / 0		
B2, 3-1/2"	321 / 0	196 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-08-08	Top	1.00	0.86	1.00	1.16	00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	03-06-10	Top	8	4			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	03-06-10	08-08-08	Top	27	13			n/a
3	B6(16309)	Conc. Pt. (lbs)	L	03-07-08	03-07-08	Top	601	268			n/a
4	4(1576)	Conc. Pt. (lbs)	L	08-03-12	08-03-12	Top	9	16			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2,489 ft-lbs	11,810 ft-lbs	21.4%	1	03-07-08
End Shear	763 lbs	6,785 lbs	13.0%	1	01-01-00
Total Load Deflection	L/999 (0.069")	n/a	n/a	4	04-01-04
Live Load Deflection	L/999 (0.044")	n/a	n/a	5	04-01-04
Max Defl.	0.069"	n/a	n/a	4	04-01-04
Span / Depth	10.2				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 1-3/4"	779 lbs	29.8%	10.4%	Unspecified
B2	Wall/Plate 3-1/2" x 1-3/4"	726 lbs	27.7%	9.7%	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 NBC 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor: Normal Part code: Part 9



DESIGN CONFORMS TO OBC2012

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



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

PASSED

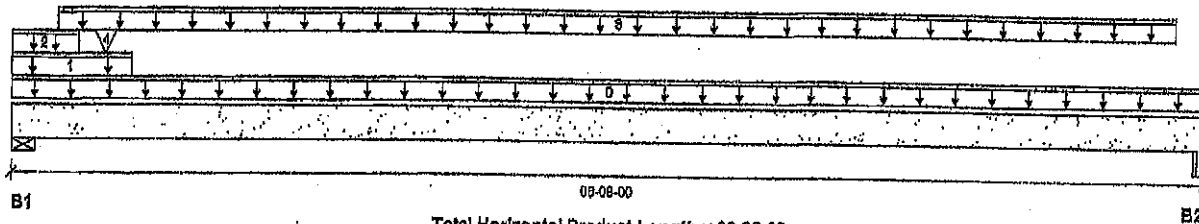
BC CALC® Member Report
Build 6766

1ST FLOOR FRAMING\Flush Beams\B1(16269)
Dry | 1 span | No cant.

March 28, 2019 17:27:24

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

File name: MILLWOOD 4A.mmdl
Description: 1ST FLOOR FRAMING\Flush Beams\B1(16269)
Specifier:
Designer: PL
Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4"	2,266 / 0	1,656 / 0		
B2, 4-1/2"	167 / 0	134 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-08-00	Top	1.00	0.65	1.00	1.18	
1	11(I718)	Unf. Lin. (lb/ft)	L	00-00-00	00-08-00	Top		10			00-00-00
2	11(I718)	Unf. Lin. (lb/ft)	L	00-00-00	00-04-08	Top		82			n/a
3	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-03-02	08-08-00	Top		51			n/a
4	-	Conc. Pt. (lbs)	L	00-06-03	00-06-03	Top	27	13			n/a
							2,262	1,4			

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1,188 ft-lbs	23,220 ft-lbs	5.2%	1	00-07-00
End Shear	1,195 lbs	11,671 lbs	10.3%	1	01-01-08
Total Load Deflection	L/999 (0.01")	n/a	n/a	4	02-11-10
Live Load Deflection	L/999 (0.008")	n/a	n/a	6	02-11-10
Max Defl.	0.01"	n/a	n/a	4	02-11-10
Span / Depth	7.7				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 4" x 3-1/2"	5,827 lbs	89.2%	31.2%	Unspecified
B2	Beam 4-1/2" x 3-1/2"	418 lbs	6.2%	2.2%	Unspecified

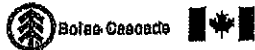
Notes

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 NBC 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.

Nail one ply to another with
3 1/2" spiral nails @ 4"
o.c. staggered in 2 rows



DESIGN CONFORMS TO OBC2012



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

PASSED

BC CALCO® Member Report

1ST FLOOR FRAMING\Flush Beams\B5\16229

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 6766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B5\16229

City, Province, Postal Code: CALEDON

Specifier:

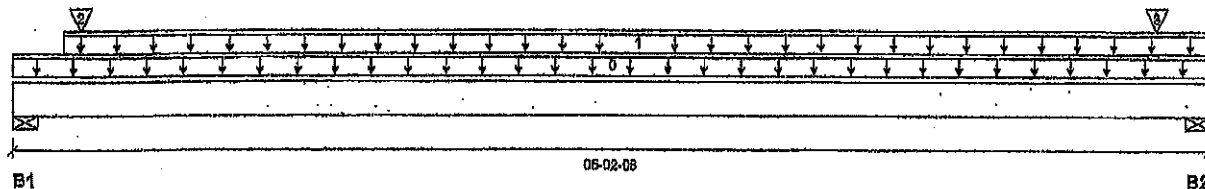
Customer:

Designer: PL

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 06-02-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	563 / 0	301 / 0		
B2, 3-1/2"	139 / 0	102 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	06-02-08	Top	1.00	0.65	1.00	1.15	00-00-00
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-10	06-02-08	Top	27	13			n/a
2	B6\16309	Conc. Pt. (lbs)	L	00-03-08	00-03-08	Top	498	267			n/a
3	4\1675	Conc. Pt. (lbs)	L	04-11-12	04-11-12	Top	70	55			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	177 ft-lbs	11,610 ft-lbs	1.6%	1	02-07-04
End Shear	95 lbs	5,785 lbs	1.6%	1	01-01-00
Total Load Deflection	L/999 (0.002")	n/a	n/a	4	02-07-04
Live Load Deflection	L/999 (0.001")	n/a	n/a	5	02-07-04
Max Defl.	0.002"	n/a	n/a	4	02-07-04
Span / Depth	6.0				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 1-3/4"	1,221 lbs	46.6%	10.3%	Unspecified
B2	Wall/Plate 3-1/2" x 1-3/4"	337 lbs	12.9%	4.5%	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 CALCO® 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



DESIGN CONFORMS TO OBC2012

Disclosure

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

RECEIVED
AUG 23 2019

**Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP****PASSED****1ST FLOOR FRAMING\Flush Beams\B8(16277)**

Dry / 1 span / No cant.

March 28, 2019 17:27:24

BC CALC® Member Report

Build 6766

Job name:

Address:

City, Province, Postal Code: CALEDON

Customer:

Code reports: CCMC 12472-R

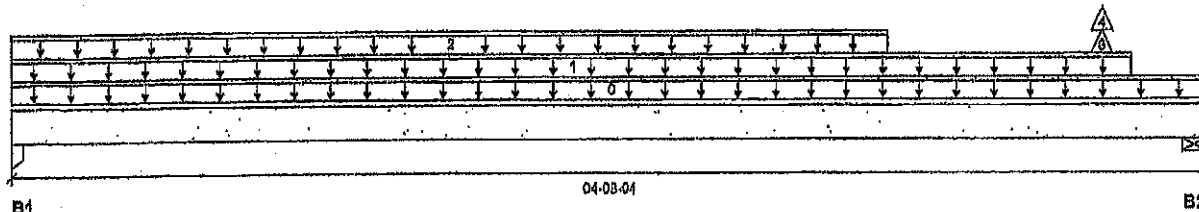
File name: MILLWOOD 4A.mmdl

Description: 1ST FLOOR FRAMING\Flush Beams\B8(16277)

Specifier:

Designer: PL

Company:

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

Bearing	Live	Dead	Snow	Wind
B1, 1-3/4"	111 / 0	208 / 0		
B2, 3-1/2"	120 / 2	210 / 0	0 / 6	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	04-08-04	Top	1.00	0.66	1.00	1.15	00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	04-04-12	Top		60			n/a
2	Smoothed Load	Unf. Lin. (lb/ft)	L	00-00-00	03-05-04	Top	45	23			n/a
3	-	Conc. Pt. (lbs)	L	04-03-07	04-03-07	Top	75	48	-6		n/a
4	-	Conc. Pt. (lbs)	L	04-03-07	04-03-07	Top	-2				

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	277 ft-lbs	7,548 ft-lbs	3.7%	0	02-03-12
End Shear	182 lbs	3,781 lbs	4.3%	0	00-11-04
Total Load Deflection	L/999 (0.004")	n/a	n/a	56	02-03-04
Live Load Deflection	L/999 (0.001")	n/a	n/a	83	02-03-04
Max Defl.	0.004"	n/a	n/a	56	02-03-04
Span / Depth	6.5				

Bearing Supports

	Dm. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 1-3/4" x 1-3/4"	284 lbs	21.9%	11.7%	Unspecified
B2	Wall/Plate 3-1/2" x 1-3/4"	293 lbs	17.2%	6.0%	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

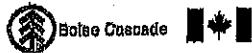


DESIGN CONFORMS TO OBC2012

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



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

PASSED

BC CALC® Member Report

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 6766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B7\I6318

City, Province, Postal Code: CALEDON

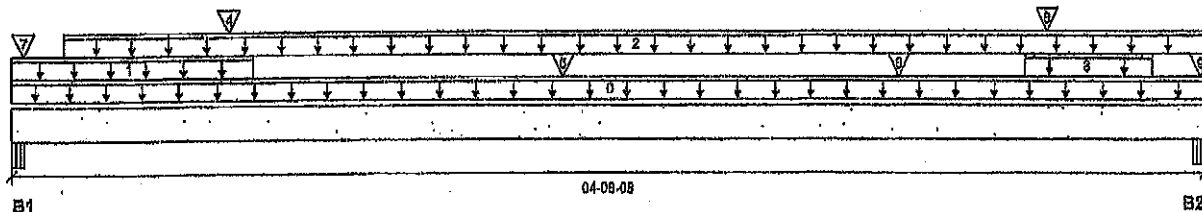
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 6"	1,374 / 0	830 / 0		
B2, 2-1/2"	1,068 / 0	647 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	04-08-08	Top		10			00-00-00
1	10(I676)	Unf. Lin. (lb/ft)	L	00-00-00	00-11-08	Top		83			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-08	04-08-08	Top	27	13			n/a
3	21(I613)	Unf. Lin. (lb/ft)	L	04-00-00	04-08-00	Top		81			n/a
4	"	Conc. Pt. (lbs)	L	00-10-05	00-10-05	Top	1,009	530			n/a
5	J2(I6357)	Conc. Pt. (lbs)	L	02-02-00	02-02-00	Top	355	177			n/a
6	J2(I6421)	Conc. Pt. (lbs)	L	03-06-00	03-06-00	Top	333	167			n/a
7	"	Conc. Pt. (lbs)	L	00-00-09	00-00-09	Top	84	58			n/a
8	21(I613)	Conc. Pt. (lbs)	L	04-01-00	04-01-00	Top	461	256			n/a
9	14(I798)	Conc. Pt. (lbs)	L	04-08-04	04-08-04	Top	70	59			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2,106 ft-lbs	23,220 ft-lbs	9.1%	1	02-02-00
End Shear	1,824 lbs	11,671 lbs	15.6%	1	01-02-08
Total Load Deflection	L/999 (0.01")	n/a	n/a	4	02-06-00
Live Load Deflection	L/999 (0.008")	n/a	n/a	5	02-06-00
Max Defl.	0.01"	n/a	n/a	4	02-06-00
Span / Depth	6.3				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 6" x 3-1/2"	3,099 lbs	41.6%	14.6%	Unspecified
B2	Beam 2-1/2" x 3-1/2"	2,410 lbs	64.6%	22.6%	Unspecified

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

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.

Nail one ply to another with
3 1/2" spiral nails @ 4"
o.c., staggered in 2 rows



DESIGN CONFORMS TO OBC2012

ET0000419



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

PASSED

BC CALC® Member Report

1ST FLOOR FRAMING\Flush Beams\B10\6285

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 8768

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B10\6285

City, Province, Postal Code: CALEDON

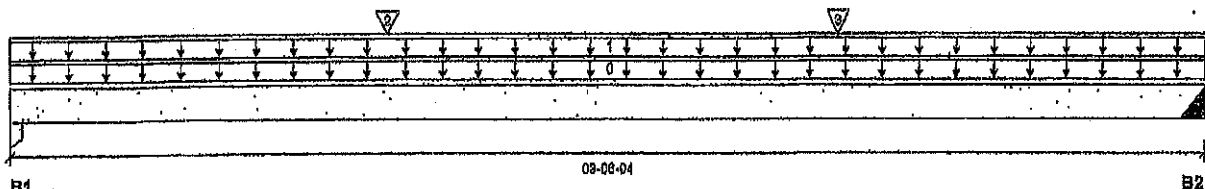
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 03-06-04

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 1-3/4"	293 / 0	154 / 0		
B2, 3"	310 / 0	164 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-06-04	Top	120	60			00-00-00
1	STAIRS	Unf. Lin. (lb/ft)	L	00-00-00	03-06-04	Top					n/a
2	J7(6388)	Conc. Pt. (lbs)	L	01-01-04	01-01-04	Top	93	46	n/a		n/a
3	J7(6301)	Conc. Pt. (lbs)	L	02-06-04	02-06-04	Top	88	44			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	629 ft-lbs	11,810 ft-lbs	4.8%	1	01-08-04
End Shear	399 lbs	5,786 lbs	6.9%	1	02-06-12
Total Load Deflection	L/999 (0.003")	n/a	n/a	4	01-08-04
Live Load Deflection	L/999 (0.002")	n/a	n/a	6	01-08-04
Max Defl.	0.003"	n/a	n/a	4	01-08-04
Span / Depth	4.1				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Column	1-3/4" x 1-3/4"	633 lbs	31.8%	16.9%	Unspecified
B2 Hanger	3" x 1-3/4"	670 lbs	n/a	10.6%	HUS1.81/10

Cautions

Header for the hanger HUS1.81/10 at B2 is a Single 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model HUS1.81/10 and seat length were input by the user. I

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



DESIGN CONFORMS TO OBC2012

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



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

PASSED

BC CALC® Member Report

1ST FLOOR FRAMING\Flush Beams\B3\16244)

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 9766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B3\16244)

City, Province, Postal Code: CALEDON

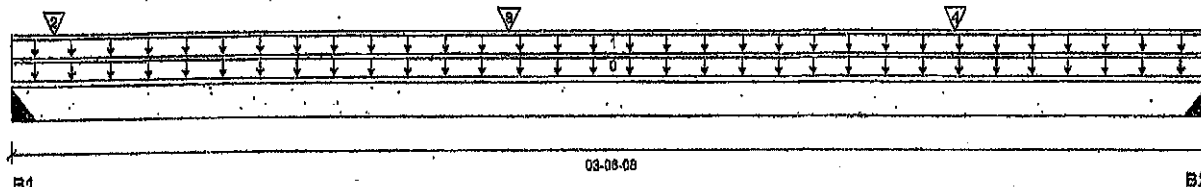
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3"	649 / 0	333 / 0		
B2, 3"	603 / 0	309 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-06-06	Top	1.00	0.68	1.00	1.16	00-00-00
1	STAIRS	Unf. Lin. (lb/ft)	L	00-00-00	03-06-06	Top	240	120			n/a
2	J6\16416)	Conc. Pt. (lbs)	L	00-01-08	00-01-08	Top	100	50			n/a
3	J6\16271)	Conc. Pt. (lbs)	L	01-05-08	01-05-08	Top	167	83			n/a
4	J6\16405)	Conc. Pt. (lbs)	L	02-09-08	02-09-08	Top	135	67			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	960 ft-lbs	11,810 ft-lbs	8.3%	1	01-07-01
End Shear	648 lbs	5,785 lbs	11.2%	1	02-06-00
Total Load Deflection	L/999 (0.005")	n/a	n/a	4	01-09-07
Live Load Deflection	L/999 (0.003")	n/a	n/a	5	01-09-07
Max Defl.	0.005"	n/a	n/a	4	01-09-07
Span / Depth	4.0				

Bearing Supports

	D/m. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 3" x 1-3/4"	1,389 lbs	n/a	21.7%	HUS1.81/10
B2	Hanger 3" x 1-3/4"	1,291 lbs	n/a	20.2%	HUS1.81/10

Cautions

Header for the hanger HUS1.81/10 at B1 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model HUS1.81/10 and seat length were input by the user.

Header for the hanger HUS1.81/10 at B2 is a Single 1-3/4" x 9-1/2" 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 G86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA G86.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9



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



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

PASSED

BC CALC® Member Report

1ST FLOOR FRAMING\Flush Beams\B6\16309

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Bulld 6766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B6\16309

City, Province, Postal Code: CALEDON

Specifier:

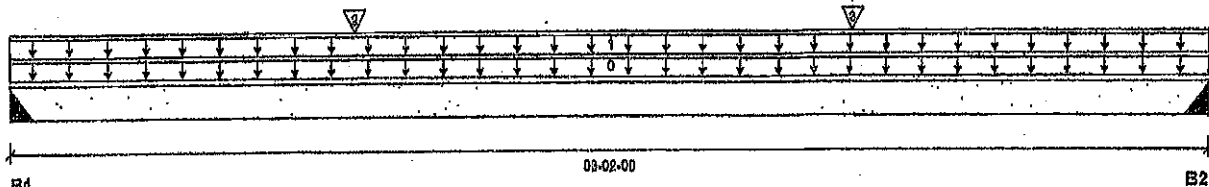
Customer:

Designer: PL

Code reports:

CCMC 12472-R

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3"	501 / 0	258 / 0		
B2, 3"	499 / 0	257 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-02-08	Top	1.00	0.86	1.00	1.15	00-00-00
1	STAIRS	Unf. Lin. (lb/ft)	L	00-00-00	03-02-08	Top	240	120			n/a
2	J6\16406	Conc. Pt. (lbs)	L	00-11-00	00-11-00	Top	114	57			n/a
3	J6\16326	Conc. Pt. (lbs)	L	02-03-00	02-03-00	Top	116	58			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	701 ft-lbs	11,810 ft-lbs	8.0%	1	01-07-04
End Shear	508 lbs	5,785 lbs	8.7%	1	02-02-00
Total Load Deflection	L/999 (0.003")	n/a	n/a	4	01-07-04
Live Load Deflection	L/999 (0.002")	n/a	n/a	5	01-07-04
Max Defl.	0.003"	n/a	n/a	4	01-07-04
Span / Depth	3.6				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Hanger	3" x 1-3/4"	1,075 lbs	n/a	16.8%	HUS1.81/10
B2 Hanger	3" x 1-3/4"	1,070 lbs	n/a	16.7%	HUS1.81/10

Cautions

Header for the hanger HUS1.81/10 at B1 is a Single 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model HUS1.81/10 and seat length were input by the user.)

Header for the hanger HUS1.81/10 at B2 is a Single 1-3/4" x 9-1/2" 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

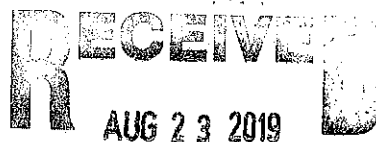


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BC CALC®, BC FRAMER®, AJL8™, ALLJOIST®, BC RIM BOARD™, BCIM®, BOISE GLULAM™, BC FloorValue®, VERSA-LAM®, VERSA-RIM PLUS®,





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

PASSED

BC CALC® Member Report

1ST FLOOR FRAMING\Flush Beams\B9\16401

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 6786

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 1ST FLOOR FRAMING\Flush Beams\B9\16401

City, Province, Postal Code: CALEDON

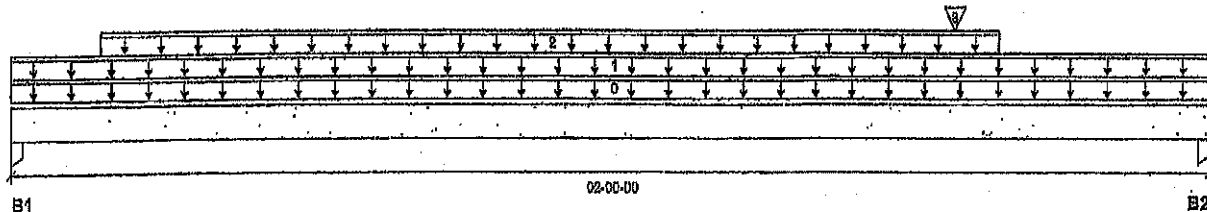
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



B1

Total Horizontal Product Length = 02-00-00

B2

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	89 / 0	95 / 0		
B2, 3-1/2"	278 / 0	211 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.85	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	02-00-00	Top		5			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	02-00-00	Top		60			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-01-12	01-07-12	Top	25	12			n/a
3	B10\16285	Cono. Pl. (lbs)	L	01-06-14	01-06-14	Top	300	158			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	128 ft-lbs	11,610 ft-lbs	1.1%	1	01-06-14
End Shear	71 lbs	5,785 lbs	1.2%	1	01-01-00
Total Load Deflection	L/999 (0")	n/a	n/a	4	01-00-12
Live Load Deflection	L/999 (0")	n/a	n/a	5	01-01-03
Max Defl.	0"	n/a	n/a	4	01-00-12
Span / Depth	1.9				

Bearing Supports

	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1	Column 3-1/2" x 1-3/4"	208 lbs	5.2%	2.8%	Unspecified
B2	Column 3-1/2" x 1-3/4"	680 lbs	17.1%	9.1%	Unspecified

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 Calculations assume unbraced length of Top: 00-04-04, Bottom: 00-04-04.
 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



DESIGN CONFORMS TO OBC2012

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 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™, BC®,
 BOISE GLULAM™, BC FloorValue®,
 VERSA-LAM®, VERSA-RIM PLUS®



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

PASSED

BC CALC® Member Report
Build 6766

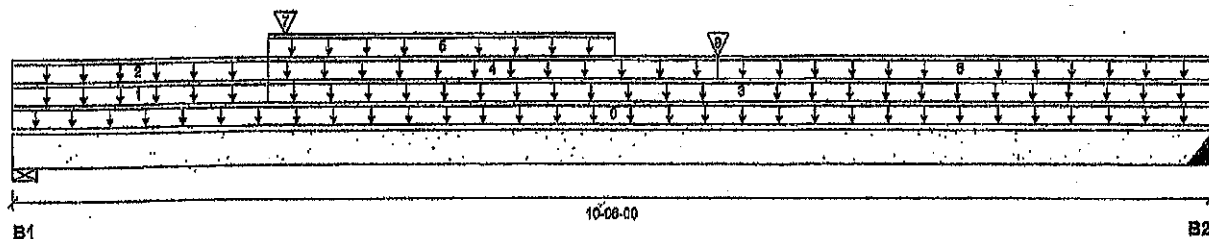
2ND FLOOR FRAMING Flush Beams B13(16024)

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Job name:
Address:
City, Province, Postal Code: CALEDON
Customer:
Code reports: OCMC 12472-R

File name: MILLWOOD 4A.mmdl
Description: 2ND FLOOR FRAMING Flush Beams B13(16024)
Specifier:
Designer: PL
Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	1,559 / 0	1,109 / 0		
B2, 4"	962 / 0	667 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	10-06-00	Top		10			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	02-02-12	Top		46			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	02-02-12	Top	12				n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	02-02-12	10-06-00	Top	8	3			n/a
4	FC2 Floor Material	Unf. Lin. (lb/ft)	L	02-02-12	08-01-12	Top	9				n/a
5	WALL	Unf. Lin. (lb/ft)	L	02-02-12	06-03-00	Top		68			n/a
6	FC2 Floor Material	Unf. Lin. (lb/ft)	L	06-01-12	10-06-00	Top	20	10			n/a
7	B17(16193)	Conc. Pt. (lbs)	L	02-04-08	02-04-08	Top	1,406	758			
8	B14(15835)	Conc. Pt. (lbs)	L	06-01-12	06-01-12	Top	916	530			

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	8,603 ft-lbs	23,220 ft-lbs	37.1%	1	06-01-12
End Shear	3,623 lbs	11,571 lbs	31.3%	1	01-01-00
Total Load Deflection	L/538 (0.223")	n/a	44.6%	4	06-00-13
Live Load Deflection	L/906 (0.132")	n/a	39.7%	5	06-00-13
Max Defl.	0.223"	n/a	n/a	4	06-00-13
Span / Depth	12.6				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	3,724 lbs	71.2%	24.9%	Unspecified
B2	Hanger 4" x 3-1/2"	2,265 lbs	n/a	13.3%	HGUS410

Cautions

Header for the hanger HGUS410 at B2 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model HGUS410 and seat length were input by the user. Nail one ply to another with 3 1/2" spiral nails @ 6" o.c. staggered in 2 rows



DESIGN CONFORMS TO OBC2012



Boise Cascade



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

PASSED

2ND FLOOR FRAMING\Flush Beams\B17\16193

Dry | 1 span | No cant.

March 28, 2019 17:27:24

BC CALC® Member Report

Build 6766

Job name:

Address:

City, Province, Postal Code: CALEDON

Customer:

Code reports: OCMC 12472-R

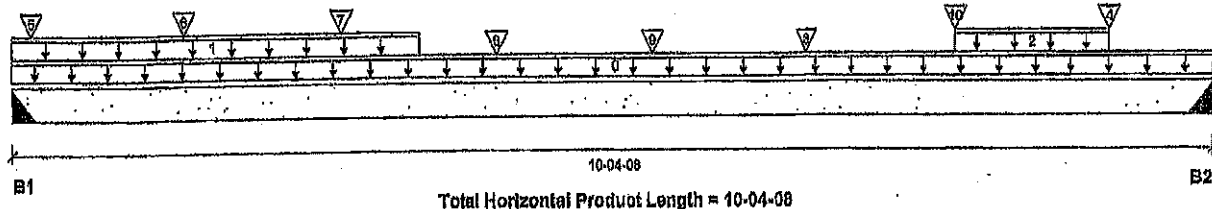
File name: MILLWOOD 4A.mxd

Description: 2ND FLOOR FRAMING\Flush Beams\B17\16193

Specifier:

Designer: PL

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 4"	1,419 / 0	765 / 0		
B2, 4"	634 / 0	373 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	10-04-08	Top	10				00-00-00
1	STAIRS	Unf. Lin. (lb/ft)	L	00-00-00	08-08-00	Top	240	120			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	08-02-00	08-08-00	Top	47	24			n/a
3	-	Conc. Pt. (lbs)	L	06-10-02	06-10-02	Top	118	69			n/a
4	-	Conc. Pt. (lbs)	L	09-08-00	09-08-00	Top	98	49			n/a
5	J4(15806)	Conc. Pt. (lbs)	L	00-02-00	00-02-00	Top	141	73			n/a
6	J4(15882)	Conc. Pt. (lbs)	L	01-08-00	01-08-00	Top	228	114			n/a
7	J4(15827)	Conc. Pt. (lbs)	L	02-10-00	02-10-00	Top	218	109			n/a
8	J5(15947)	Conc. Pt. (lbs)	L	04-02-00	04-02-00	Top	196	68			n/a
9	J6(15993)	Conc. Pt. (lbs)	L	05-06-00	05-06-00	Top	94	47			n/a
10	J6(16221)	Conc. Pt. (lbs)	L	08-02-00	08-02-00	Top	87	43			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	4,533 ft-lbs	23,220 ft-lbs	19.5%	1	04-02-00
End Shear	2,196 lbs	11,871 lbs	19.0%	1	01-01-08
Total Load Deflection	L/999 (0.11")	n/a	n/a	4	05-00-00
Live Load Deflection	L/999 (0.07")	n/a	n/a	5	05-00-00
Max Defl.	0.11"	n/a	n/a	4	05-00-00
Span / Depth	12.4				

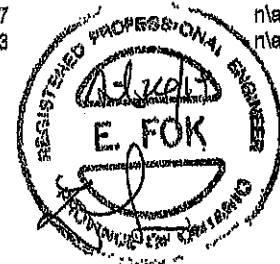
Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Hanger	4" x 3-1/2"	3,066 lbs	n/a	18.1%	HGUS410
B2 Hanger	4" x 3-1/2"	1,416 lbs	n/a	8.3%	HGUS410

Cautions

Header for the hanger HGUS410 at B1 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF.
Hanger model HGUS410 and seat length were input by the user.

Header for the hanger HGUS410 at B2 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF.

Nail one ply to another with
3 1/2" spiral nails @ 10"
o.c. staggered in 2 rows



DESIGN CONFORMS TO OBC2012



Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP****PASSED****2ND FLOOR FRAMING\Flush Beams\B12\15881**

BC CALC® Member Report

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 8768

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 2ND FLOOR FRAMING\Flush Beams\B12\15881

City, Province, Postal Code: CALEDON

Specifier:

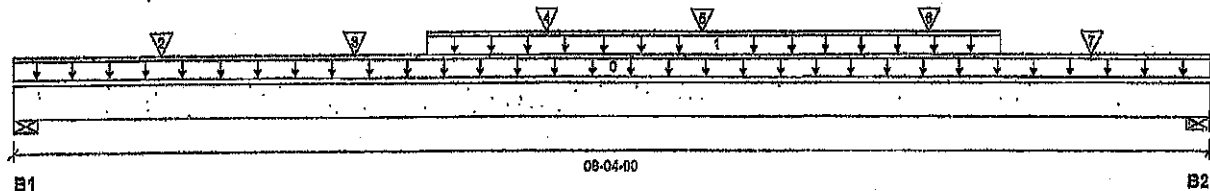
Customer:

Designer: PL

Code reports:

CCMC 12472-R

Company:

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

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	1,591 / 0	907 / 0		
B2, 6-1/2"	1,972 / 0	1,128 / 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	08-04-00	Top		10			00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	02-10-08	08-10-08	Top	230	116			n/a
2	-	Conc. Pt. (lbs)	L	01-00-08	01-00-08	Top	430	215			n/a
3	-	Conc. Pt. (lbs)	L	02-04-08	02-04-08	Top	391	196			n/a
4	J8(16073)	Conc. Pt. (lbs)	L	03-08-08	03-08-08	Top	106	53			n/a
5	-	Conc. Pt. (lbs)	L	04-09-03	04-09-03	Top	1,060	703			n/a
6	-	Conc. Pt. (lbs)	L	06-04-08	06-04-08	Top	232	110			n/a
7	-	Conc. Pt. (lbs)	L	07-06-03	07-06-03	Top	406	203			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	9,310 ft-lbs	23,220 ft-lbs	40.1%	1	04-08-12
End Shear	3,757 lbs	11,571 lbs	32.5%	1	07-01-00
Total Load Deflection	L/707 (0.131")	n/a	33.9%	4	04-02-08
Live Load Deflection	L/999 (0.083")	n/a	n/a	6	04-02-08
Max Defl.	0.131"	n/a	n/a	4	04-02-08
Span / Depth	9.7				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	3,520 lbs	67.3%	23.6%	Unspecified
B2	Wall/Plate 6-1/2" x 3-1/2"	4,368 lbs	53.1%	18.6%	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.

Nail one ply to another with
3 1/2" spiral nails @ 6" v)
o.c., staggered in 2 rows



DESIGN CONFORMS TO OBC2012



Boise Cascade



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

PASSED

2ND FLOOR FRAMING Flush Beams B15(16206)

BC CALCO® Member Report

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 6766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 2ND FLOOR FRAMING Flush Beams B15(16206)

City, Province, Postal Code: CALEDON

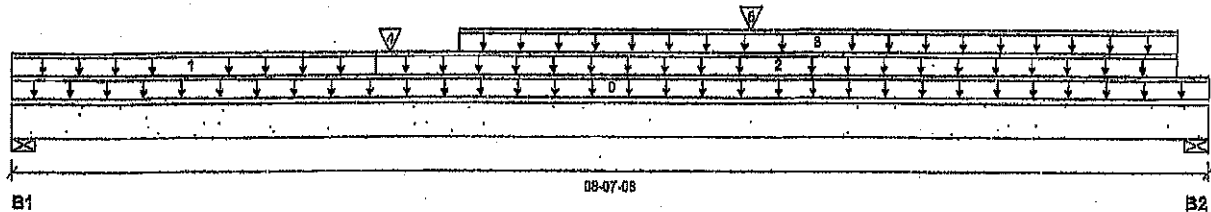
Specifier:

Customer:

Designer: PL

Code reports: COMC 12472-R

Company:



Total Horizontal Product Length = 08-07-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	836 / 0	237 / 0		
B2, 5-1/2"	527 / 0	344 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.85	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-07-08	Top		10			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	02-07-04	Top	9	5			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	02-07-04	08-04-12	Top	6	3			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	03-02-07	08-04-12	Top	20	10			n/a
4	B18(15873)	Conc. Pt. (lbs)	L	02-08-07	02-08-07	Top	48	34			n/a
5	B17(15193)	Conc. Pt. (lbs)	L	05-03-08	05-03-08	Top	648	380			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	3,246 ft-lbs	23,220 ft-lbs	14.0%	1	05-03-08
End Shear	1,147 lbs	11,671 lbs	9.9%	1	07-04-08
Total Load Deflection	L/999 (0.045")	n/a	n/a	4	04-05-05
Live Load Deflection	L/999 (0.027")	n/a	n/a	6	04-05-05
Max Defl.	0.045"	n/a	n/a	4	04-05-05
Span / Depth	10.1				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	803 lbs	15.3%	5.4%	Unspecified
B2	Wall/Plate 5-1/2" x 3-1/2"	1,220 lbs	14.8%	5.2%	Unspecified

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 CALCO® 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.

Nail one ply to another with
 3 1/2" spiral nails @ 6" o.c. staggered in 2 rows



DESIGN CONFORMS TO OBC2012

RECEIVED
 AUG 23 2019

TOWN OF CALEDON
 BUILDING SECTION
 FILE NO.

ET0000427



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

PASSED

2ND FLOOR FRAMING\Flush Beams\B18\15873

Dry | 1 span | No cant.

March 28, 2019 17:27:24

BC CALC® Member Report

Build 6766

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 2ND FLOOR FRAMING\Flush Beams\B18\15873

City, Province, Postal Code: CALEDON

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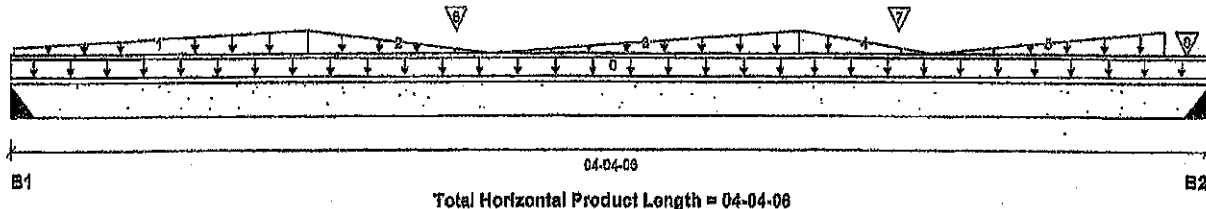
Customer:

Designer: PL

Code reports:

CCMC 12472-R

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2"	30 / 0	26 / 0		
B2, 2"	46 / 0	33 / 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	04-04-06	Top	5				00-00-00
1	FC2 Floor Material	Trapezoidal (lb/ft)	L	00-00-02	01-01-00	Top	4	2			n/a
2	FC2 Floor Material	Trapezoidal (lb/ft)	L	01-01-00	01-08-15	Top	8	3			n/a
3	FC2 Floor Material	Trapezoidal (lb/ft)	L	01-08-15	02-10-03	Top	0	0			n/a
4	FC2 Floor Material	Trapezoidal (lb/ft)	L	02-10-03	03-04-04	Top	0	0			n/a
5	FC2 Floor Material	Trapezoidal (lb/ft)	L	03-04-04	04-02-07	Top	0	0			n/a
6	J7(15899)	Conc. Pt. (lbs)	L	01-07-06	01-07-06	Top	23	11			n/a
7	J7(16041)	Conc. Pt. (lbs)	L	03-02-11	03-02-11	Top	9	4			n/a
8	FC2 Floor Material	Conc. Pt. (lbs)	L	04-03-06	04-03-06	Top	25	12			n/a
							1	1			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	104 ft-lbs	11,610 ft-lbs	0.9%	1	02-06-14
End Shear	102 lbs	5,785 lbs	1.8%	1	03-04-14
Total Load Deflection	L/999 (0.001")	n/a	n/a	4	02-02-12
Live Load Deflection	L/999 (0.001")	n/a	n/a	5	02-03-09
Max Defl.	0.001"	n/a	n/a	4	02-02-12
Span / Depth	5.3				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Hanger	2" x 1-3/4"	77 lbs	n/a	1.8%	LS90
B2 Hanger	2" x 1-3/4"	111 lbs	n/a	2.6%	LS90

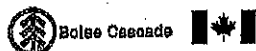
Cautions

Header for the hanger LS90 at B1 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model LS90 and seat length were input by the user. I

Header for the hanger LS90 at B2 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF.



DESIGN CONFORMS TO OBC2012

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP****PASSED****2ND FLOOR FRAMING\Flush Beams\B14\15835**

BC CALC® Member Report

Dry | 1 span | No cant.

March 28, 2019 17:27:24

Build 8788

Job name:

File name: MILLWOOD 4A.mmdl

Address:

Description: 2ND FLOOR FRAMING\Flush Beams\B14\15835

City, Province, Postal Code: CALEDON

Specifier:

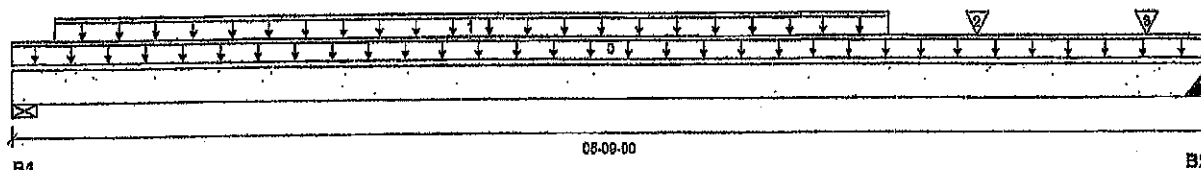
Customer:

Designer: PL

Code reports:

OCMC 12472-R

Company:

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

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	934 / 0	496 / 0		
B2, 4"	949 / 0	548 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	05-09-00	Top	10				00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	00-02-08	04-02-08	Top	340	170			n/a
2	-	Conc. Pt. (lbs)	L	04-07-12	04-07-12	Top	345	173			n/a
3	J2(16082)	Conc. Pt. (lbs)	L	05-05-08	05-05-08	Top	178	134			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2,528 ft-lbs	23,220 ft-lbs	10.9%	1	02-08-08
End Shear	1,589 lbs	11,571 lbs	13.7%	1	04-07-08
Total Load Deflection	L/999 (0.018")	n/a	n/a	4	02-10-04
Live Load Deflection	L/999 (0.012")	n/a	n/a	5	02-10-04
Max Defl.	0.018"	n/a	n/a	4	02-10-04
Span / Depth	6.6				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	2,019 lbs	38.6%	13.5%	Unspecified
B2	Hanger 4" x 3-1/2"	2,108 lbs	n/a	12.3%	HGUS410

Cautions

Header for the hanger HGUS410 at B2 is a Double 1-3/4" x 9-1/2" VERSA-LAM® 1.7 2400 DF. Hanger model HGUS410 and seat length were input by the user.

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
 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.

Nail one ply to another with
 3 1/2" spiral nails @ 6"
 o.c. staggered in 2 rows



DESIGN CONFORMS TO OBC2012



Boles Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP****PASSED****2ND FLOOR FRAMING\Flush Beams\B19(16800)**

BC CALC® Member Report

Dry | 1 span | No cant.

November 13, 2018 08:47:24

Build 6475

Job name:

File name: MILLWOOD 4A ELEV 2.mxd

Address:

Description: 2ND FLOOR FRAMING\Flush Beams\B19(16800)

City, Province, Postal Code: CALEDON

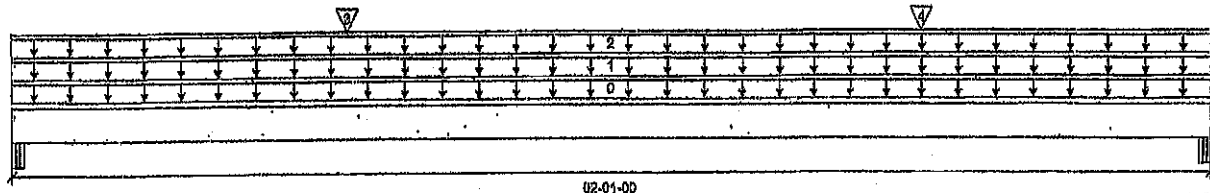
Specifier:

Customer:

Designer: PL

Code reports: COMC 12472-R

Company:



B1

Total Horizontal Product Length = 02-01-00

B2

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 6"	242 / 0	269 / 0	336 / 0	
B2, 6"	270 / 0	274 / 0	336 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.05	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	02-01-00	Top		10			00-00-00
1	E34(12343)	Unf. Lin. (lb/ft)	L	00-00-00	02-01-00	Top	72	146	221		n/a
2	LOW ROOF	Unf. Lin. (lb/ft)	L	00-00-00	02-01-00	Top	33	30	102		n/a
3	J4(16811)	Conc. Pt. (lbs)	L	00-07-00	00-07-00	Top	137	68			n/a
4	J4(16812)	Conc. Pt. (lbs)	L	01-07-00	01-07-00	Top	154	77			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	238 ft-lbs	23,220 ft-lbs	1.0%	13	01-00-08
End Shear	106 lbs	11,571 lbs	0.9%	23	01-02-08
Total Load Deflection	L/999 (0")	n/a	n/a	35	01-00-08
Live Load Deflection	L/999 (0")	n/a	n/a	51	01-00-08
Max Defl.	0"	n/a	n/a	35	01-00-08
Span / Depth	1.7				

Bearing Supports	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1 Beam	6" x 3-1/2"	1,070 lbs	11.4%	5.0%	Unspecified
B2 Beam	6" x 3-1/2"	1,117 lbs	11.9%	5.2%	Unspecified

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.

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.

Nail one ply to another with
3 1/2" spiral nails @ 4"
o.c., staggered in 2 rows



DESIGN CONFORMS TO OBC2012

ET0000430



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

PASSED

2ND FLOOR FRAMING\Flush Beams\B20\6809

BCALCO Member Report

Dry | 1 span | No cant.

November 13, 2018 08:47:24

Build 6475

Job name:

File name: MILLWOOD 4A ELEV 2.mmdl

Address:

Description: 2ND FLOOR FRAMING\Flush Beams\B20\6809

City, Province, Postal Code: CALEDON

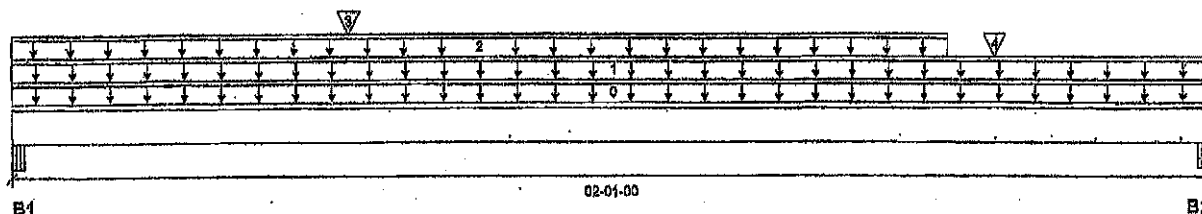
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 02-01-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 6"	239 / 0	257 / 0	336 / 0	
B2, 6"	270 / 0	260 / 0	337 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	02-01-00	Top	1.00	0.65	1.00	1.15	00-00-00
1	LOW ROOF	Unf. Lin. (lb/ft)	L	00-00-00	02-01-00	Top	33	30	102		n/a
2	E46(6792)	Unf. Lin. (lb/ft)	L	00-00-00	01-07-08	Top	72	146	221		n/a
3	J4(6811)	Conc. Pt. (lbs)	L	00-07-00	00-07-00	Top	137	68			n/a
4	"	Conc. Pt. (lbs)	L	01-08-07	01-08-07	Top	167	130	101		n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	236 ft-lbs	23,220 ft-lbs	1.0%	13	01-00-04
End Shear	341 lbs	11,571 lbs	2.9%	13	00-10-08
Total Load Deflection	L/999 (0")	n/a	n/a	35	01-00-08
Live Load Deflection	L/999 (0")	n/a	n/a	51	01-00-08
Max Defl.	0"	n/a	n/a	35	01-00-08
Span / Depth	1.7				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1 Beam	6" x 3-1/2"	1,064 lbs	11.4%	5.0%	Unspecified
B2 Beam	6" x 3-1/2"	1,101 lbs	11.8%	5.2%	Unspecified

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.

BCALCO 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.

Nail one ply to another with
3 1/2" spiral nails @ 4"
o.c, staggered in 2 rows



DESIGN CONFORMS TO OBC2012

ET0000431



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

PASSED

1ST FLOOR FRAMING Flush Beams B100(16511)

Dry | 1 span | No cant.

March 28, 2019 17:23:56

BC CALCO® Member Report

Build 6766

Job name:

File name: MILLWOOD 4A OPT DECK.mmdl

Address:

Description: 1ST FLOOR FRAMING Flush Beams B100(16511)

City, Province, Postal Code: CALEDON

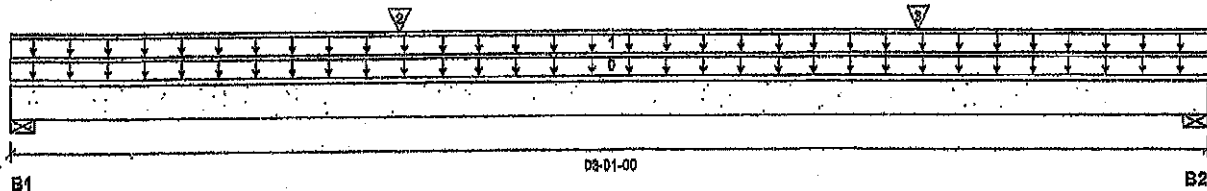
Specifier:

Customer:

Designer: PL

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 03-01-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	852 / 0	688 / 0	162 / 0	
B2, 3-1/2"	921 / 0	721 / 0	162 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-01-00	Top	100	10			00-00-00
1	E11(1580)	Unf. Lin. (lb/ft)	L	00-00-00	03-01-00	Top	339	329	105		n/a
2	J2(16435)	Conc. Pt. (lbs)	L	01-00-00	01-00-00	Top	364	182			n/a
3	J2(16433)	Conc. Pt. (lbs)	L	02-04-00	02-04-00	Top	364	182			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1,395 ft-lbs	23,220 ft-lbs	6.0%	1	01-06-13
End Shear	1,094 lbs	11,571 lbs	9.5%	1	01-01-00
Total Load Deflection	L/999 (0.003")	n/a	n/a	35	01-08-08
Live Load Deflection	L/999 (0.002")	n/a	n/a	51	01-08-08
Max Defl.	0.003"	n/a	n/a	35	01-08-08
Span / Depth	3.3				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	2,298 lbs	43.9%	16.4%	Unspecified
B2	Wall/Plate 3-1/2" x 3-1/2"	2,445 lbs	46.7%	16.4%	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 CALCO® 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.
 Nail one ply to another with 3 1/2" spiral nails @ 4" o.c., staggered in 2 rows



DESIGN CONFORMS TO OBC2012

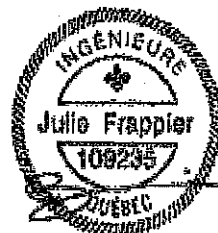
RECEIVED
AUG 23 2019

TOWN OF CALEDON
BUILDING SECTION
FILE NO

ET0000432

Maximum Floor Spans

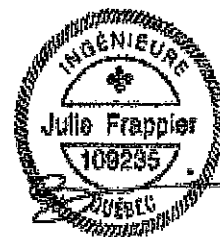
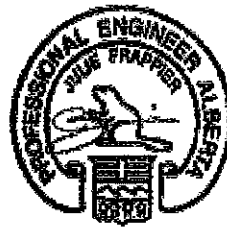
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
3/4" OSB G&N Sheathing



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"
14"	NI-90x	21'-8"	20'-0"	19'-1"	18'-0"	22'-2"	20'-6"	19'-6"	18'-6"
	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"
16"	NI-90x	24'-1"	22'-3"	21'-2"	20'-0"	24'-8"	22'-10"	21'-9"	20'-7"
	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"
14"	NI-90x	24'-3"	22'-6"	21'-3"	19'-7"	24'-8"	22'-7"	21'-3"	19'-7"
	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"
16"	NI-90x	27'-3"	25'-4"	24'-1"	22'-4"	27'-9"	25'-10"	24'-3"	22'-4"
	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"

- 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.
- 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.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- 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.
- 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.



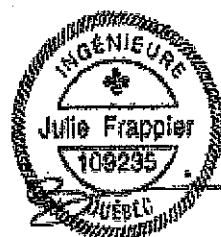
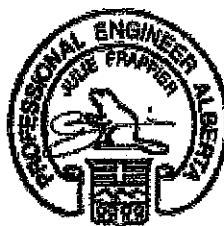
Maximum Floor Spans

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'-1"	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
14"	NI-90x	20'-4"	18'-9"	17'-11"	N/A	20'-10"	19'-3"	18'-5"	N/A
	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
16"	NI-90x	22'-7"	20'-11"	19'-11"	N/A	23'-3"	21'-6"	20'-6"	N/A
	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
14"	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
	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
16"	NI-90x	26'-4"	24'-4"	23'-3"	N/A	26'-10"	24'-11"	23'-9"	N/A
	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

- 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.
- 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.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- 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.
- 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, 1/480 Deflection Limit
3/4" OSB G&N Sheathing

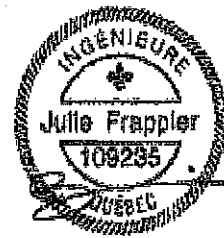
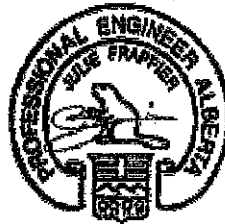
Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-10"	15'-0"	14'-5"	13'-5"	16'-4"	15'-5"	14'-6"	13'-5"
	NI-40x	17'-0"	16'-0"	15'-5"	14'-9"	17'-5"	16'-5"	15'-10"	15'-2"
	NI-60	17'-2"	16'-2"	15'-7"	14'-11"	17'-6"	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"
14"	NI-90x	21'-8"	20'-0"	19'-1"	18'-0"	22'-2"	20'-6"	19'-6"	18'-6"
	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"
16"	NI-90x	24'-1"	22'-3"	21'-2"	20'-0"	24'-8"	22'-10"	21'-9"	20'-7"
	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'-6"	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"
14"	NI-90x	24'-3"	22'-6"	21'-6"	20'-4"	24'-8"	23'-0"	22'-0"	20'-9"
	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"
16"	NI-90x	27'-3"	25'-4"	24'-1"	22'-9"	27'-9"	25'-11"	24'-8"	23'-4"
	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 1/480 and a total load deflection limit of 1/240.
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
14"	NI-90x	20'-4"	18'-9"	17'-11"	N/A	20'-10"	19'-3"	18'-5"	N/A
	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
16"	NI-90x	22'-7"	20'-11"	19'-11"	N/A	23'-3"	21'-6"	20'-6"	N/A
	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'-5"	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
14"	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
	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
16"	NI-90x	26'-4"	24'-4"	23'-3"	N/A	26'-10"	24'-11"	23'-9"	N/A
	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

- 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.
- 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.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- 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.
- Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.



Construction Detail

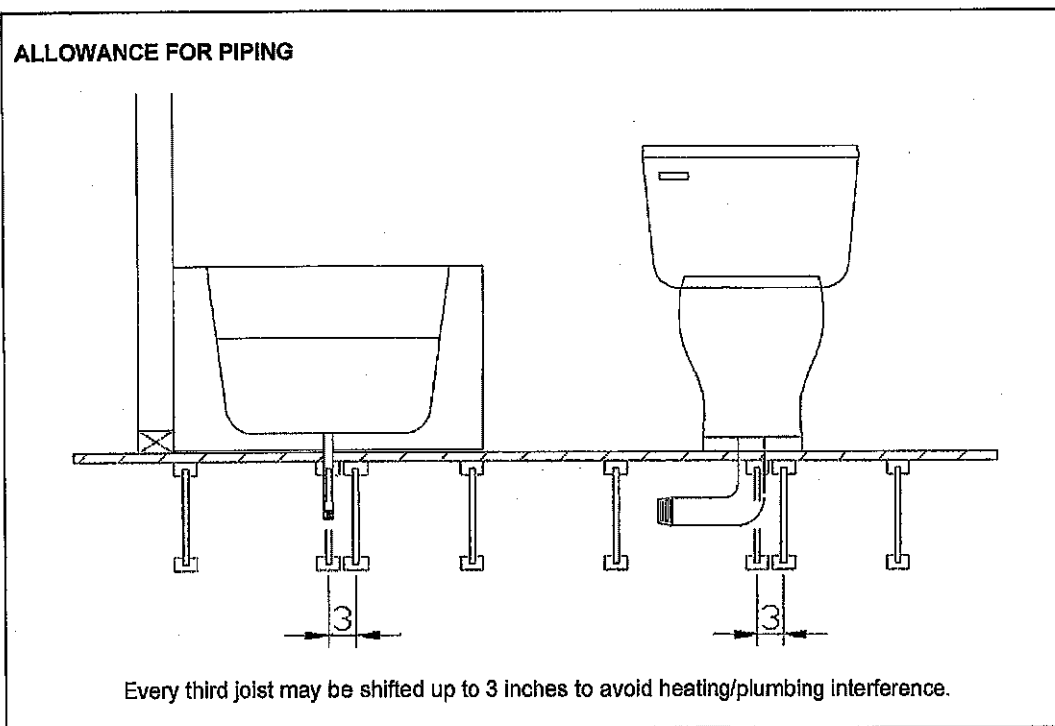
Limit States Design

Allowance for Piping (Installation Notes)

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

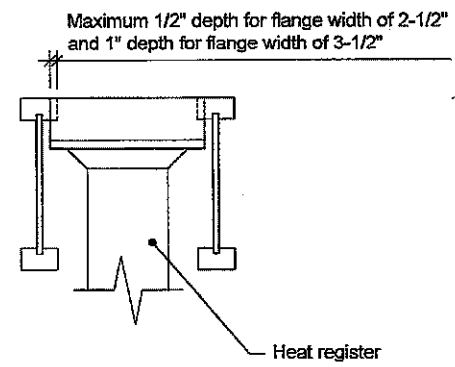
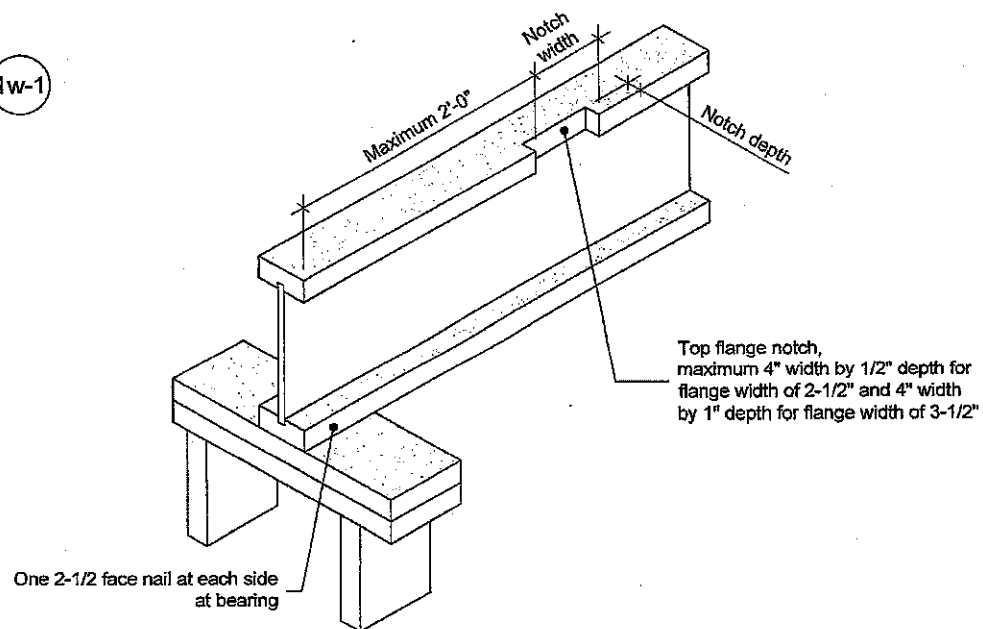
Installation of Nordic I-joists shall be as per *Nordic Joist Installation Guide for Residential Floors*. Refer to Tables 1 and 2 for maximum web hole and duct chase openings, respectively. These tables are based on the I-joists being used at their maximum spans. The minimum distance given may be reduced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

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



Revised April 12, 2012

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.

This document supersedes all previous versions. If the document has been in effect for more than one year, consult nordic.ca or contact Nordic Structures.

All nails shown in the details are assumed to be common nails unless otherwise noted. Nails shall have a diameter not less than 0.128 inch for 2-1/2-inch nails, or 0.144 inch for 3-inch nails. Individual components not shown to scale for clarity.

**NORDIC
STRUCTURES**

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1 866 817-3418
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TITLE
Notch in I-joist for Heat Register

CATEGORY
I-joist - Typical Floor Framing and Construction Details

DOCUMENT	
DATE	NUMBER
2018-04-10	1w-1