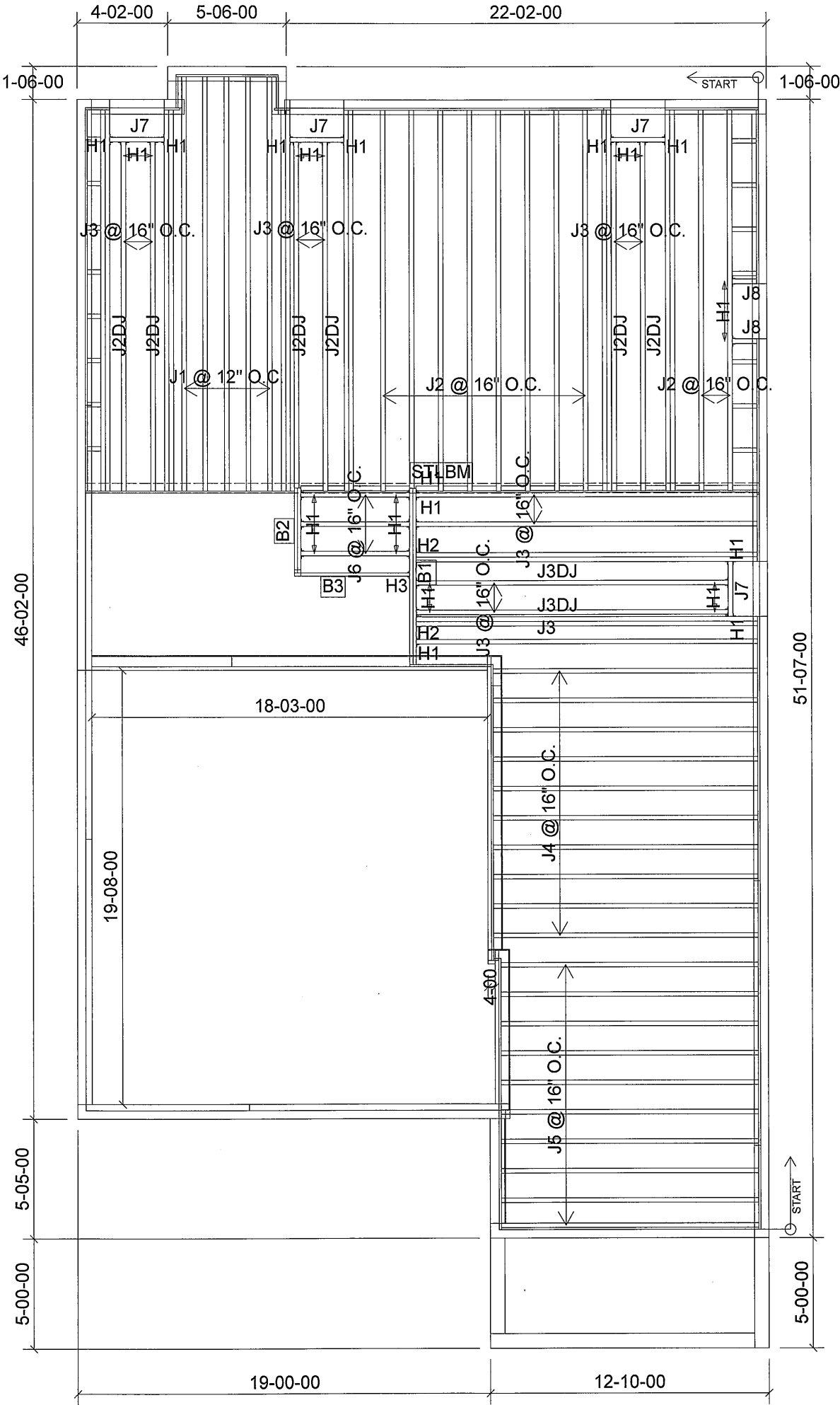
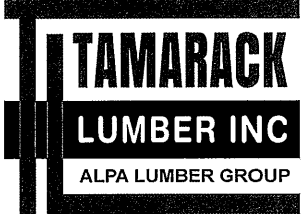




| Products |          |                                         |       |         |
|----------|----------|-----------------------------------------|-------|---------|
| PlotID   | Length   | Product                                 | Plies | Net Qty |
| J1       | 20-00-00 | 11 7/8" NI-40x                          | 1     | 5       |
| J2       | 18-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J2DJ     | 18-00-00 | 11 7/8" NI-40x                          | 2     | 12      |
| J3       | 16-00-00 | 11 7/8" NI-40x                          | 1     | 11      |
| J3DJ     | 16-00-00 | 11 7/8" NI-40x                          | 2     | 4       |
| J4       | 14-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J5       | 12-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J6       | 6-00-00  | 11 7/8" NI-40x                          | 1     | 3       |
| J7       | 4-00-00  | 11 7/8" NI-40x                          | 1     | 4       |
| J8       | 2-00-00  | 11 7/8" NI-40x                          | 1     | 2       |
| B1       | 8-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B3       | 6-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1     | 1       |
| B2       | 4-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |

| Connector Summary |       |               |
|-------------------|-------|---------------|
| Qty               | Manuf | Product       |
| 11                | H1    | IUS2.56/11.88 |
| 8                 | H1    | IUS2.56/11.88 |
| 10                | H1    | IUS2.56/11.88 |
| 2                 | H2    | HU312-2       |
| 1                 | H3    | IUS1.81/10    |



FROM PLAN DATED: MAR 2021

BUILDER: ROYAL PINE HOMES

SITE: CENTREFIELD

MODEL: 38-11 Belvedere

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: lbv

NOTES:

REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.

**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK** 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/ft<sup>2</sup>

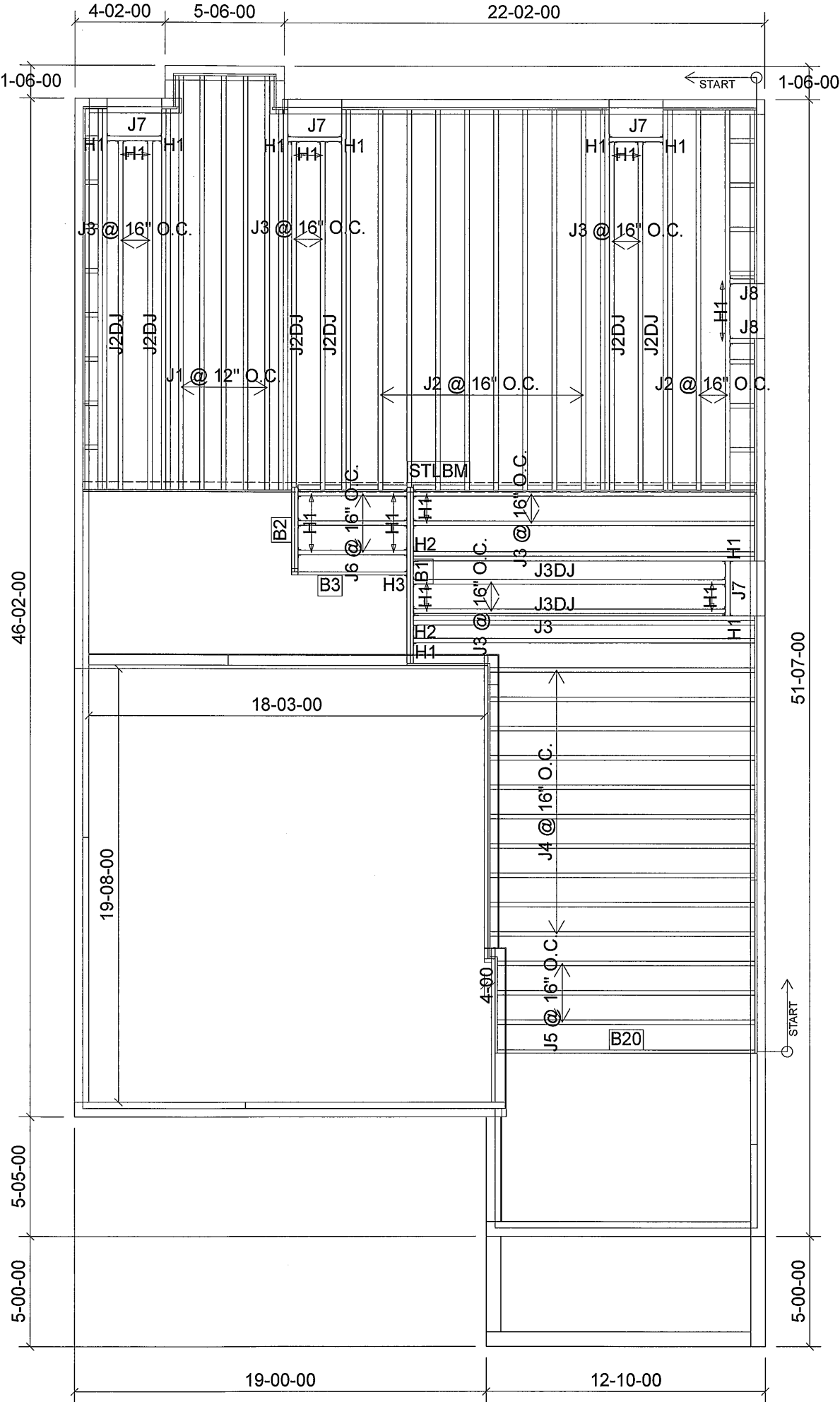
DEAD LOAD: 15.0 lb/ft<sup>2</sup>

TILE LOAD: 20.0 lb/ft<sup>2</sup>

SUBFLOOR: 3/4" GLUED AND NAILED

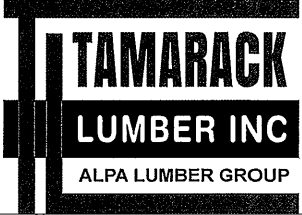
DATE: 2021-05-20

1st FLOOR



| Products |          |                                         |       |         |
|----------|----------|-----------------------------------------|-------|---------|
| PlotID   | Length   | Product                                 | Plies | Net Qty |
| J1       | 20-00-00 | 11 7/8" NI-40x                          | 1     | 5       |
| J2       | 18-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J2DJ     | 18-00-00 | 11 7/8" NI-40x                          | 2     | 12      |
| J3       | 16-00-00 | 11 7/8" NI-40x                          | 1     | 11      |
| J3DJ     | 16-00-00 | 11 7/8" NI-40x                          | 2     | 4       |
| J4       | 14-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J5       | 12-00-00 | 11 7/8" NI-40x                          | 1     | 3       |
| J6       | 6-00-00  | 11 7/8" NI-40x                          | 1     | 3       |
| J7       | 4-00-00  | 11 7/8" NI-40x                          | 1     | 4       |
| J8       | 2-00-00  | 11 7/8" NI-40x                          | 1     | 2       |
| B20      | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1     | 1       |
| B1       | 8-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B3       | 6-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1     | 1       |
| B2       | 4-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |

| Connector Summary |       |               |
|-------------------|-------|---------------|
| Qty               | Manuf | Product       |
| 11                | H1    | IUS2.56/11.88 |
| 8                 | H1    | IUS2.56/11.88 |
| 10                | H1    | IUS2.56/11.88 |
| 2                 | H2    | HU312-2       |
| 1                 | H3    | IUS1.81/10    |



FROM PLAN DATED: MAR 2021

BUILDER: ROYAL PINE HOMES

SITE: CENTREFIELD

MODEL: 38-11 Belvedere

ELEVATION: A, B, C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: lbv

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

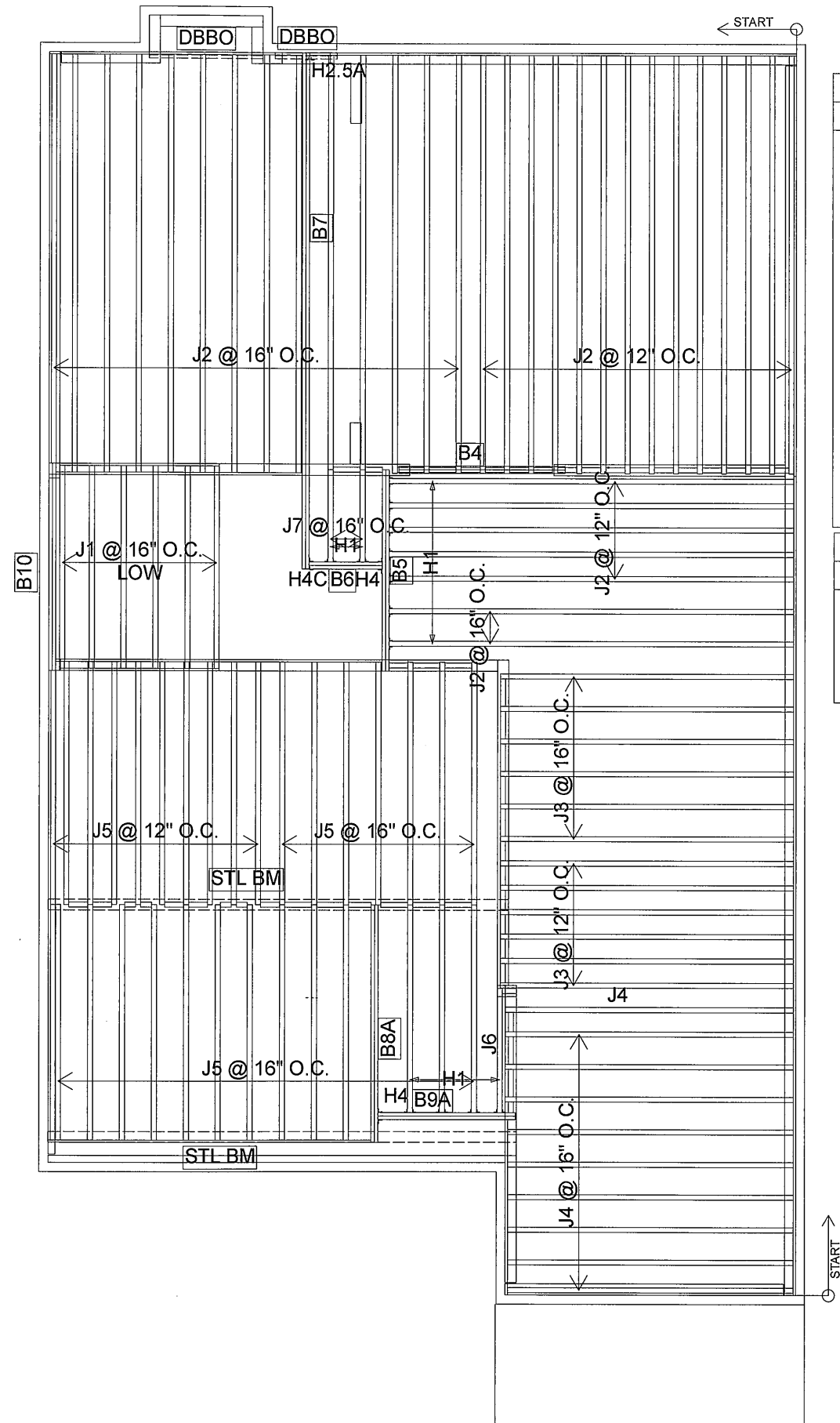
**LOADING:**  
DESIGN LOADS: L/480.000  
LIVE LOAD: 40.0 lb/ft²  
DEAD LOAD: 15.0 lb/ft²  
TILE LOAD: 20.0 lb/ft²

DATE: 2021-05-20

1st FLOOR

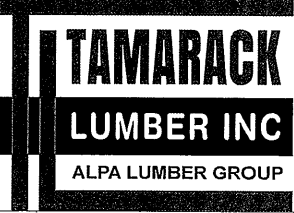
SUNKEN OPTION

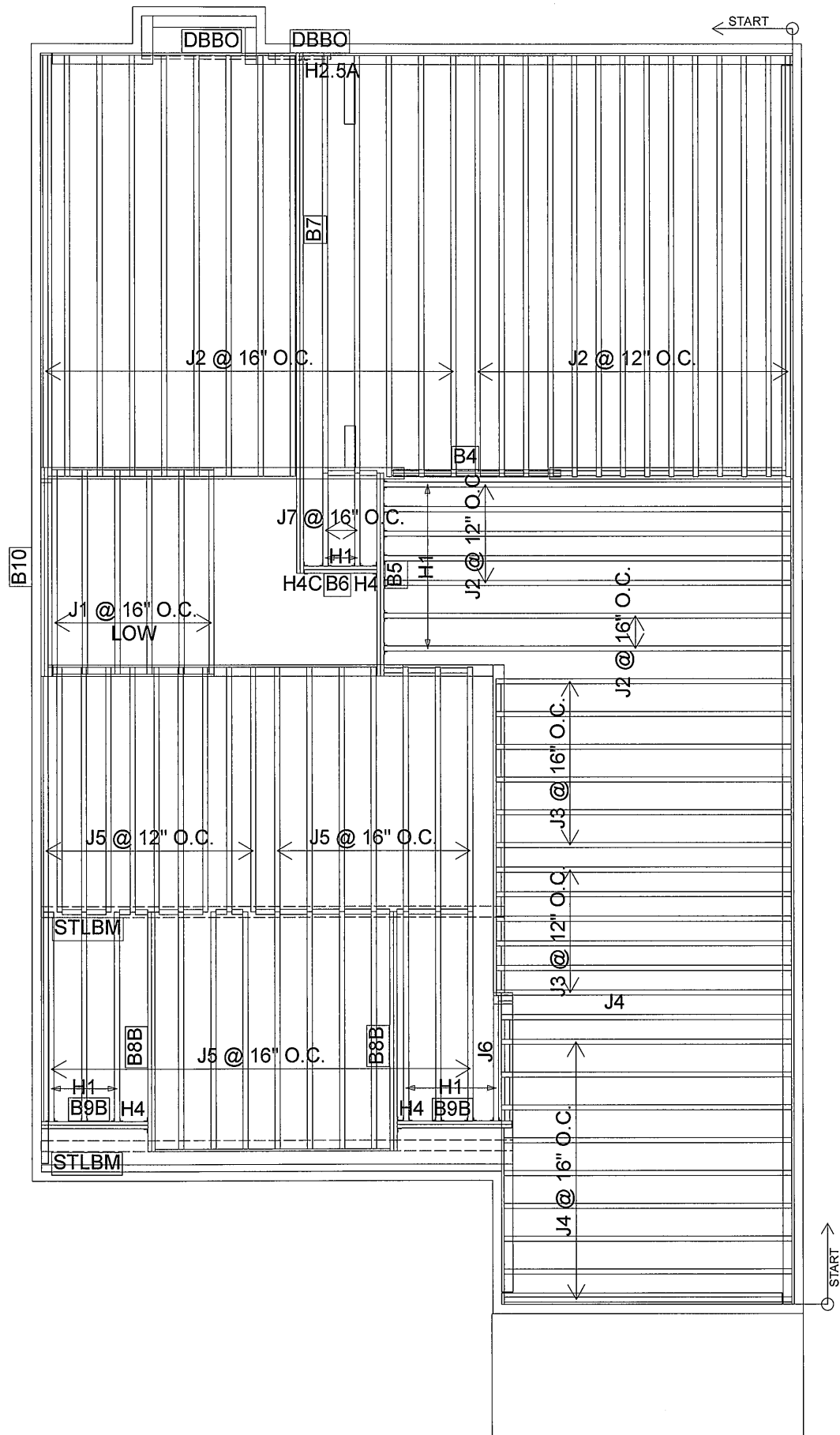
SUBFLOOR: 3/4" GLUED AND NAILED



| Products |          |                                         |       |         |
|----------|----------|-----------------------------------------|-------|---------|
| Plot/D   | Length   | Product                                 | Plies | Net Qty |
| J1       | 10-00-00 | 9 1/2" NI-40x                           | 1     | 6       |
| J2       | 18-00-00 | 11 7/8" NI-40x                          | 1     | 35      |
| J3       | 14-00-00 | 11 7/8" NI-40x                          | 1     | 12      |
| J4       | 12-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J5       | 10-00-00 | 11 7/8" NI-40x                          | 1     | 30      |
| J6       | 6-00-00  | 11 7/8" NI-40x                          | 1     | 1       |
| J7       | 4-00-00  | 11 7/8" NI-40x                          | 1     | 2       |
| B10      | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B4       | 8-00-00  | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B7       | 22-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B5       | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B8A      | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B9A      | 6-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B6       | 4-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |

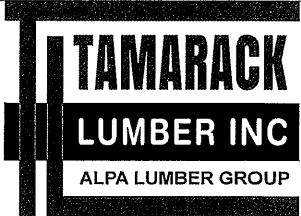
| Connector Summary |       |               |
|-------------------|-------|---------------|
| Qty               | Manuf | Product       |
| 13                | H1    | IUS2.56/11.88 |
| 1                 | N/A   | H2.5A         |
| 1                 | H4C   | HUC410        |
| 2                 | H4    | HGUS410       |





| Products |          |                                         |       |         |
|----------|----------|-----------------------------------------|-------|---------|
| PlotID   | Length   | Product                                 | Plies | Net Qty |
| J1       | 10-00-00 | 9 1/2" NI-40x                           | 1     | 6       |
| J2       | 18-00-00 | 11 7/8" NI-40x                          | 1     | 35      |
| J3       | 14-00-00 | 11 7/8" NI-40x                          | 1     | 12      |
| J4       | 12-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J5       | 10-00-00 | 11 7/8" NI-40x                          | 1     | 30      |
| J6       | 6-00-00  | 11 7/8" NI-40x                          | 1     | 1       |
| J7       | 4-00-00  | 11 7/8" NI-40x                          | 1     | 2       |
| B10      | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B4       | 8-00-00  | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B7       | 22-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B5       | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B8B      | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 4       |
| B9B      | 6-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 4       |
| B6       | 4-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |

| Connector Summary |       |               |
|-------------------|-------|---------------|
| Qty               | Manuf | Product       |
| 16                | H1    | IUS2.56/11.88 |
| 1                 | N/A   | H2.5A         |
| 1                 | H4C   | HUC410        |
| 3                 | H4    | HGUS410       |



FROM PLAN DATED: MAR 2021

BUILDER: ROYAL PINE HOMES

SITE: CENTREFIELD

MODEL: 38-11 Belvedere

ELEVATION: B

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: AJ

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/ft<sup>2</sup>

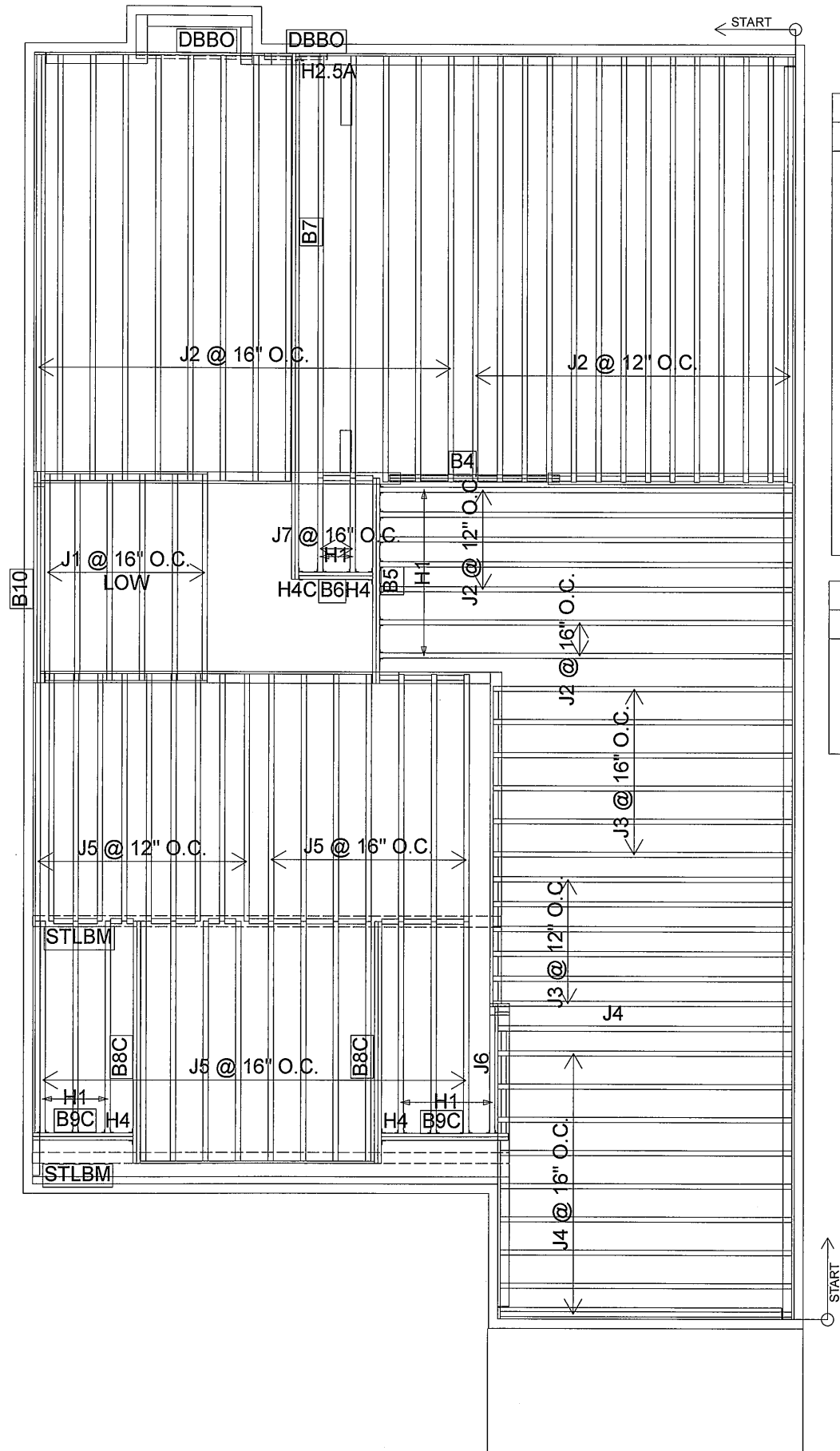
DEAD LOAD: 15.0 lb/ft<sup>2</sup>

TILE LOAD: 20.0 lb/ft<sup>2</sup>

SUBFLOOR: 5/8" GLUED AND NAILED

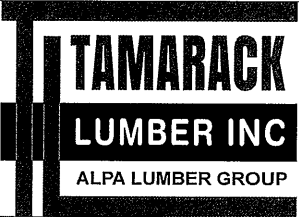
DATE: 2021-06-03

2ND FLOOR



| Products |          |                                         |       |         |
|----------|----------|-----------------------------------------|-------|---------|
| PlotID   | Length   | Product                                 | Plies | Net Qty |
| J1       | 10-00-00 | 9 1/2" NI-40x                           | 1     | 6       |
| J2       | 18-00-00 | 11 7/8" NI-40x                          | 1     | 35      |
| J3       | 14-00-00 | 11 7/8" NI-40x                          | 1     | 12      |
| J4       | 12-00-00 | 11 7/8" NI-40x                          | 1     | 10      |
| J5       | 10-00-00 | 11 7/8" NI-40x                          | 1     | 31      |
| J6       | 6-00-00  | 11 7/8" NI-40x                          | 1     | 1       |
| J7       | 4-00-00  | 11 7/8" NI-40x                          | 1     | 2       |
| B10      | 10-00-00 | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B4       | 8-00-00  | 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP  | 2     | 2       |
| B7       | 22-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B5       | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |
| B8C      | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 4       |
| B9C      | 6-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 4       |
| B6       | 4-00-00  | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2     | 2       |

| Connector Summary |       |               |
|-------------------|-------|---------------|
| Qty               | Manuf | Product       |
| 16                | H1    | IUS2.56/11.88 |
| 1                 | N/A   | H2.5A         |
| 1                 | H4C   | HUC410        |
| 3                 | H4    | HGUS410       |



FROM PLAN DATED: MAR 2021

BUILDER: ROYAL PINE HOMES

SITE: CENTREFIELD

MODEL: 38-11 Belvedere

ELEVATION: C

LOT:

CITY: RICHMOND HILL

SALESMAN: WILL GARCIA

DESIGNER: LBV

REVISION: AJ

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

TILE LOAD: 20.0 lb/ft²

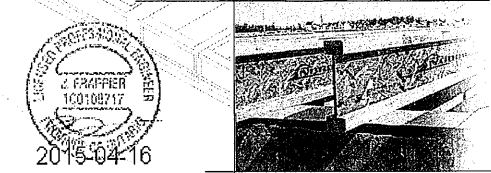
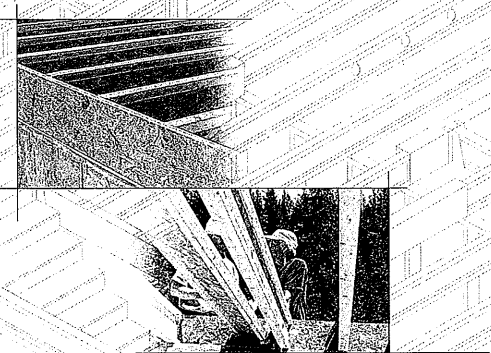
DATE: 2021-06-03

2ND FLOOR

SUBFLOOR: 5/8" GLUED AND NAILED

## INSTALLATION GUIDE

### FOR RESIDENTIAL FLOORS



Distributed by:

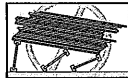


N-2301 / November 2014

#### SAFETY AND CONSTRUCTION PRECAUTIONS



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



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

#### WARNING

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

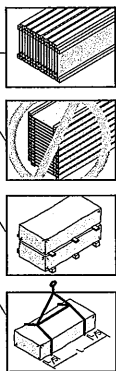
#### Avoid Accidents by Following these Important Guidelines:

- Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
- When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
  - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centre, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
  - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
- 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-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
- 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

- Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
- Store, stack, and handle I-joists vertically and level only.
- Always stack and handle I-joists in the upright position only.
- Do not store I-joists in direct contact with the ground and/or flatwise.
- Protect I-joists from weather, and use spacers to separate bundles.
- Bundled units should be kept intact until time of installation.
- 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.
- Do not handle I-joists in a horizontal orientation.
- NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.



#### MAXIMUM FLOOR SPANS

- Maximum clear spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS-71.26 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.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate 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 uniform loads, an engineering analysis may be required based on the use of the design properties.
- Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
- 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<br>On centre spacing |         |         |         | Multiple spans<br>On centre spacing |         |         |         |
|-------------|--------------|-----------------------------------|---------|---------|---------|-------------------------------------|---------|---------|---------|
|             |              | 12"                               | 16"     | 19.2"   | 24"     | 12"                                 | 16"     | 19.2"   | 24"     |
| 9-1/2"      | Ni-20        | 15'-1"                            | 14'-2"  | 13'-9"  | 13'-5"  | 16'-3"                              | 15'-4"  | 14'-10" | 14'-7"  |
|             | Ni-40x       | 16'-1"                            | 15'-2"  | 14'-8"  | 14'-9"  | 17'-5"                              | 16'-5"  | 15'-10" | 15'-5"  |
|             | Ni-60        | 16'-3"                            | 15'-4"  | 14'-10" | 14'-11" | 17'-7"                              | 16'-7"  | 16'-0"  | 16'-1"  |
|             | Ni-70        | 17'-1"                            | 16'-1"  | 15'-6"  | 15'-7"  | 18'-7"                              | 17'-4"  | 16'-9"  | 16'-10" |
|             | Ni-80        | 17'-3"                            | 16'-3"  | 15'-8"  | 15'-9"  | 18'-10"                             | 17'-6"  | 16'-11" | 17'-0"  |
| 11-7/8"     | Ni-20        | 16'-11"                           | 16'-0"  | 15'-5"  | 15'-6"  | 18'-4"                              | 17'-3"  | 16'-8"  | 16'-7"  |
|             | Ni-40x       | 18'-1"                            | 17'-0"  | 16'-5"  | 16'-6"  | 20'-0"                              | 18'-6"  | 17'-9"  | 17'-7"  |
|             | Ni-60        | 18'-4"                            | 17'-3"  | 16'-7"  | 16'-9"  | 20'-3"                              | 18'-9"  | 18'-0"  | 18'-1"  |
|             | Ni-70        | 19'-9"                            | 18'-0"  | 17'-4"  | 17'-5"  | 21'-6"                              | 19'-11" | 19'-0"  | 19'-1"  |
|             | Ni-80        | 19'-9"                            | 18'-3"  | 17'-6"  | 17'-7"  | 21'-9"                              | 20'-2"  | 19'-3"  | 19'-4"  |
| 14"         | Ni-20        | 20'-2"                            | 18'-7"  | 17'-10" | 17'-11" | 22'-3"                              | 20'-7"  | 19'-8"  | 19'-9"  |
|             | Ni-40x       | 20'-4"                            | 18'-9"  | 17'-11" | 18'-0"  | 22'-5"                              | 20'-9"  | 19'-10" | 19'-11" |
|             | Ni-60        | 20'-5"                            | 18'-11" | 18'-1"  | 18'-2"  | 22'-7"                              | 20'-11" | 20'-0"  | 20'-1"  |
|             | Ni-70        | 21'-7"                            | 20'-0"  | 19'-1"  | 19'-2"  | 23'-10"                             | 21'-1"  | 21'-1"  | 21'-2"  |
|             | Ni-80        | 21'-11"                           | 20'-3"  | 19'-4"  | 19'-5"  | 24'-3"                              | 22'-5"  | 21'-5"  | 21'-6"  |
| 16"         | Ni-20        | 22'-5"                            | 20'-8"  | 19'-9"  | 19'-10" | 24'-9"                              | 22'-10" | 21'-10" | 21'-10" |
|             | Ni-40x       | 22'-7"                            | 20'-11" | 19'-11" | 20'-0"  | 25'-0"                              | 23'-1"  | 22'-0"  | 22'-2"  |
|             | Ni-60        | 22'-3"                            | 20'-8"  | 19'-9"  | 19'-10" | 24'-7"                              | 22'-9"  | 21'-9"  | 21'-10" |
|             | Ni-70        | 23'-6"                            | 21'-2"  | 20'-9"  | 20'-10" | 26'-0"                              | 24'-0"  | 23'-0"  | 23'-0"  |
|             | Ni-80        | 23'-11"                           | 22'-1"  | 21'-1"  | 21'-2"  | 26'-5"                              | 24'-5"  | 23'-3"  | 23'-4"  |
| Ni-90x      | Ni-90        | 24'-5"                            | 22'-6"  | 21'-5"  | 21'-6"  | 26'-11"                             | 24'-10" | 23'-9"  | 23'-9"  |
|             | Ni-90x       | 24'-8"                            | 22'-9"  | 21'-9"  | 21'-10" | 27'-3"                              | 25'-2"  | 24'-0"  | 24'-1"  |

CCMC EVALUATION REPORT 13032-R

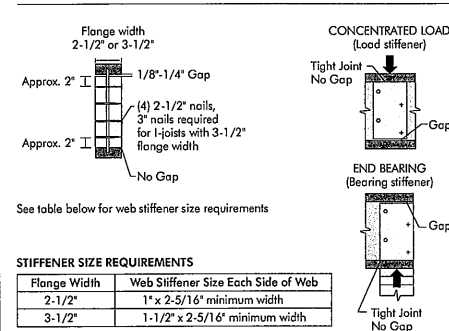
#### WEB STIFFENERS

##### 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 flange is at the top.
- A **load stiffener** is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

SI units conversion: 1 inch = 25.4 mm

FIGURE 2  
WEB STIFFENER INSTALLATION DETAILS



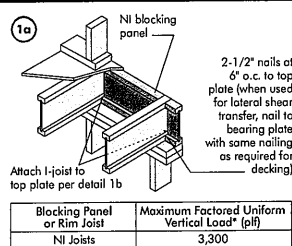
See table below for web stiffener size requirements

##### STIFFENER SIZE REQUIREMENTS

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

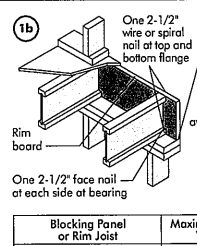
#### INSTALLING NORDIC I-JOISTS

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



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

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



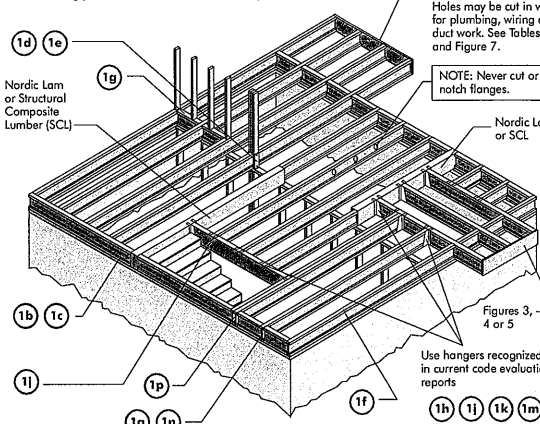
| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|-----------------------------|-----------------------------------------------|
| 1-1/8" Rim Board Plus       | 8,090                                         |

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

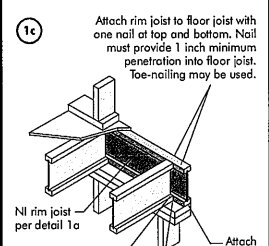


FIGURE 1  
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

Some framing requirements such as reaction bracing and blocking panels have been omitted for clarity.

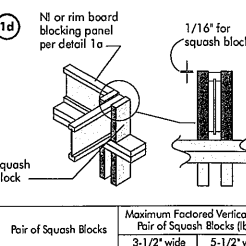


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



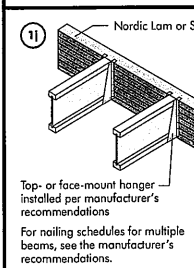
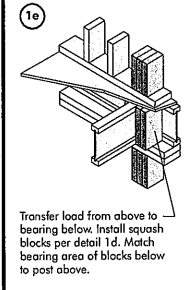
| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) |
|-----------------------|-----------------------------------------------------------|
| 2x Lumber             | 5,500                                                     |
| 1-1/8" Rim Board Plus | 4,300           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

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

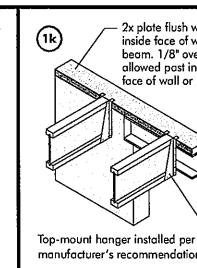
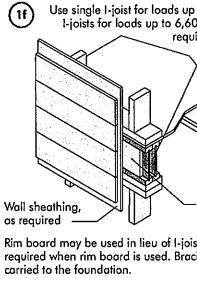


| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) |
|-----------------------|-----------------------------------------------------------|
| 2x Lumber             | 5,500                                                     |
| 1-1/8" Rim Board Plus | 4,300           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

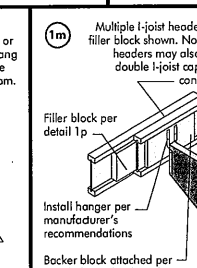
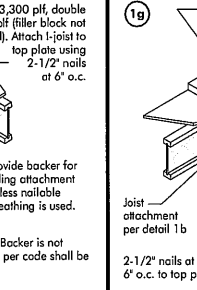
Provide lateral bracing per detail 1a, 1b, or 1c



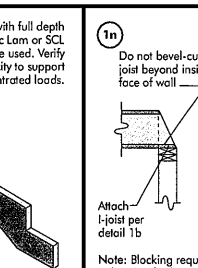
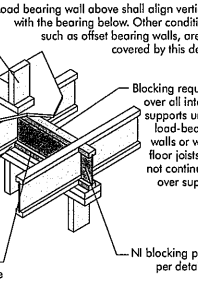
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



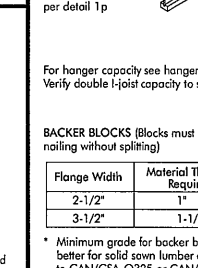
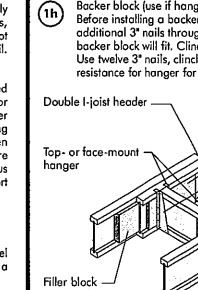
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



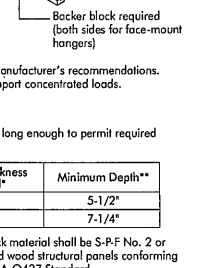
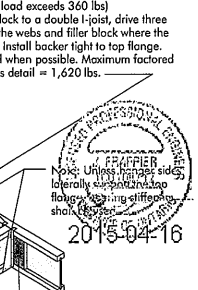
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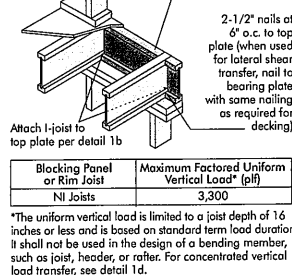
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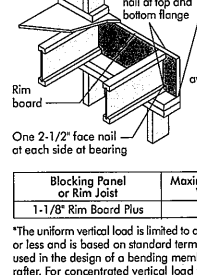
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



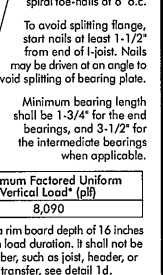
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



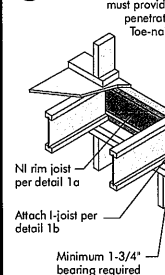
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



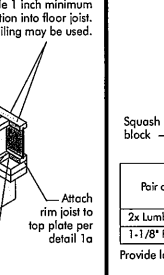
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



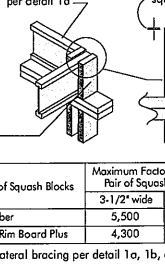
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



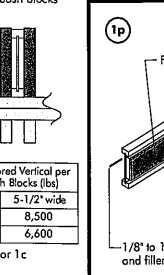
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



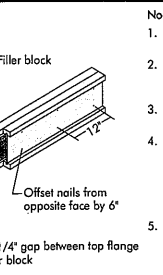
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



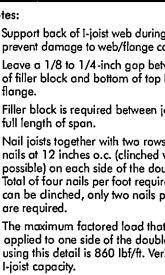
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



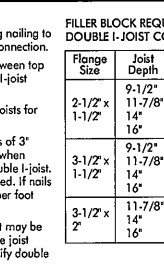
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



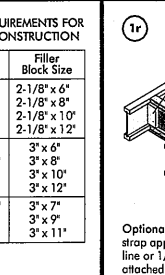
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



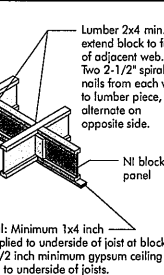
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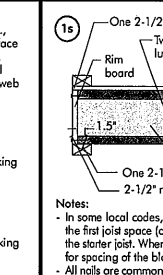
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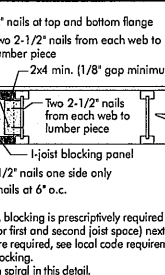
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



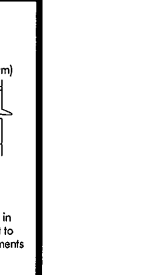
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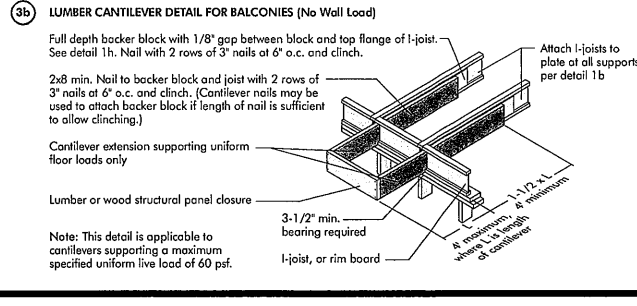
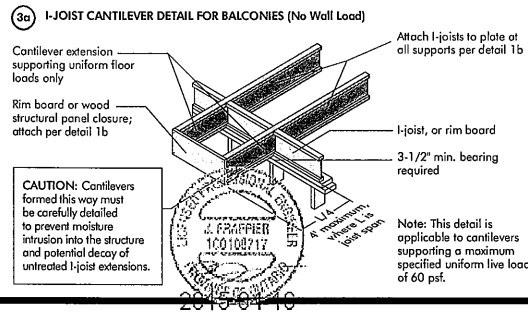


Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

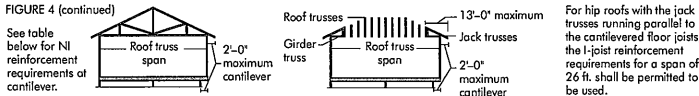
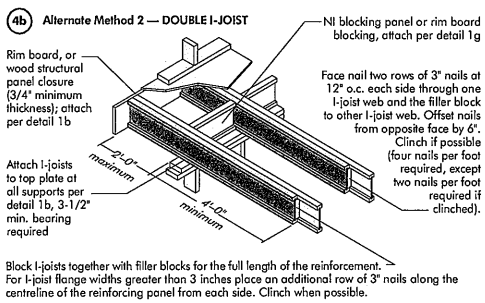
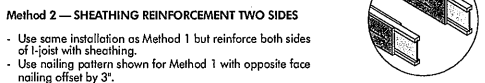
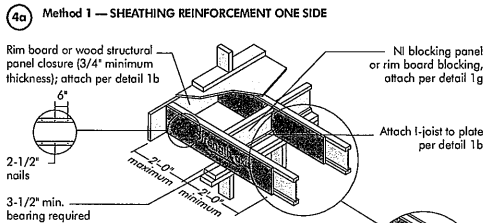


Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)



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



**CANTILEVER REINFORCEMENT METHODS ALLOWED**

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

1. N = No reinforcement required.  
 2. = NI reinforced with 3/4" wood structural panel on one side only.  
 3. = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.  
 4. = Try a deeper joist or closer spacing.  
 5. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 psf wall load. Wall load is based on 3'-0" o.c. requirements for lesser spacing.

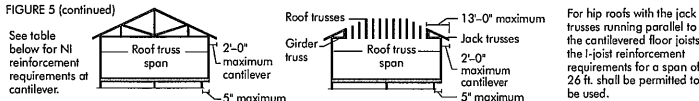
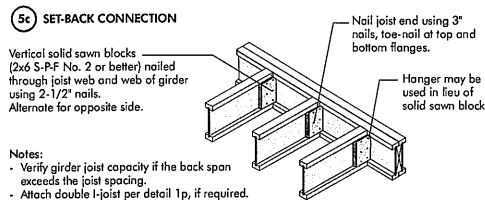
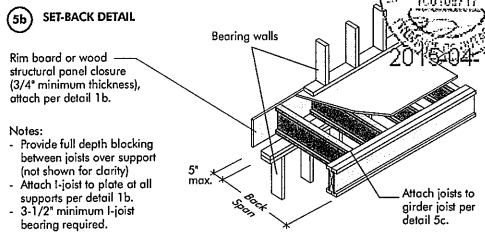
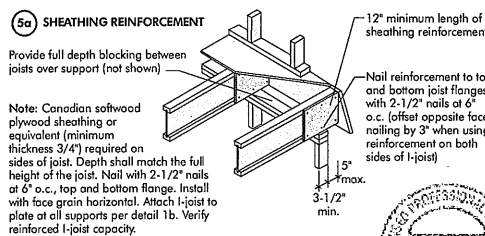
For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.

3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.

4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.

5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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



**BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED**

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

1. N = No reinforcement required.  
 2. = NI reinforced with 3/4" wood structural panel on one side only.  
 3. = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.  
 4. = Try a deeper joist or closer spacing.  
 5. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 psf wall load. Wall load is based on 3'-0" o.c. requirements for lesser spacing.

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.

3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.

4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.

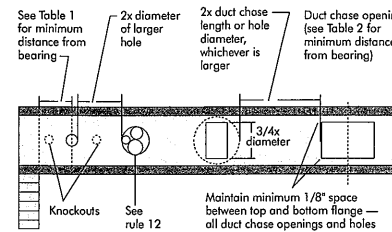
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## WEB HOLES

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

- 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.
- I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centred 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-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
- The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
- 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.
- 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 shall be 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 between them.

### FIGURE 7 FIELD-CUT HOLE LOCATOR



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

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

Holes in webs should be cut with a sharp saw.

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

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.) |     |     |     |     |       |      |      |       |      |      |        |      |      |        |      | Span adjustment Factor |
|-------------|--------------|-----------------------------------------------------------------------------|-----|-----|-----|-----|-------|------|------|-------|------|------|--------|------|------|--------|------|------------------------|
|             |              | Round hole diameter (in.)                                                   |     |     |     |     |       |      |      |       |      |      |        |      |      |        |      |                        |
|             |              | 2                                                                           | 3   | 4   | 5   | 6   | 6-1/4 | 7    | 8    | 8-5/8 | 9    | 10   | 10-3/4 | 11   | 12   | 12-3/4 |      |                        |
| 9-1/2"      | NI-20        | 0.7                                                                         | 1.0 | 1.3 | 1.6 | 1.9 | 2.1   | 2.3  | 2.5  | 2.8   | 3.0  | 3.2  | 3.4    | 3.6  | 3.8  | 4.0    | 13.6 |                        |
|             | NI-40x       | 0.7                                                                         | 1.0 | 1.3 | 1.6 | 1.9 | 2.1   | 2.3  | 2.5  | 2.8   | 3.0  | 3.2  | 3.4    | 3.6  | 3.8  | 4.0    | 14.1 |                        |
|             | NI-60        | 0.7                                                                         | 1.0 | 1.3 | 1.6 | 1.9 | 2.1   | 2.3  | 2.5  | 2.8   | 3.0  | 3.2  | 3.4    | 3.6  | 3.8  | 4.0    | 15.1 |                        |
|             | NI-70        | 2.0                                                                         | 3.4 | 4.9 | 6.3 | 7.7 | 9.1   | 10.5 | 11.9 | 13.3  | 14.7 | 16.1 | 17.5   | 18.9 | 20.3 | 21.7   | 18.7 |                        |
|             | NI-80        | 2.0                                                                         | 3.4 | 4.9 | 6.3 | 7.7 | 9.1   | 10.5 | 11.9 | 13.3  | 14.7 | 16.1 | 17.5   | 18.9 | 20.3 | 21.7   | 18.7 |                        |
| 11-7/8"     | NI-20        | 0.7                                                                         | 1.0 | 1.3 | 1.6 | 1.9 | 2.1   | 2.3  | 2.5  | 2.8   | 3.0  | 3.2  | 3.4    | 3.6  | 3.8  | 4.0    | 13.6 |                        |
|             | NI-40x       | 0.7                                                                         | 0.8 | 1.0 | 1.3 | 1.6 | 1.9   | 2.1  | 2.3  | 2.5   | 2.8  | 3.0  | 3.2    | 3.4  | 3.6  | 3.8    | 13.6 |                        |
|             | NI-60        | 0.7                                                                         | 0.8 | 1.0 | 1.3 | 1.6 | 1.9   | 2.1  | 2.3  | 2.5   | 2.8  | 3.0  | 3.2    | 3.4  | 3.6  | 3.8    | 13.6 |                        |
|             | NI-70        | 1.3                                                                         | 2.6 | 4.0 | 5.4 | 6.8 | 8.2   | 9.6  | 11.0 | 12.4  | 13.8 | 15.2 | 16.6   | 18.0 | 19.4 | 20.8   | 16.5 |                        |
|             | NI-80        | 1.6                                                                         | 2.1 | 3.6 | 5.1 | 6.6 | 8.1   | 9.6  | 11.1 | 12.6  | 14.1 | 15.6 | 17.1   | 18.6 | 20.1 | 21.6   | 17.0 |                        |
|             | NI-90        | 0.7                                                                         | 0.8 | 1.0 | 1.3 | 1.6 | 1.9   | 2.1  | 2.3  | 2.5   | 2.8  | 3.0  | 3.2    | 3.4  | 3.6  | 3.8    | 13.6 |                        |
|             | NI-90x       | 0.7                                                                         | 0.8 | 0.9 | 1.0 | 1.2 | 1.4   | 1.5  | 1.7  | 1.9   | 2.1  | 2.3  | 2.5    | 2.7  | 2.9  | 3.1    | 13.7 |                        |
|             | NI-90x       | 0.7                                                                         | 0.8 | 0.9 | 1.0 | 1.2 | 1.4   | 1.5  | 1.7  | 1.9   | 2.1  | 2.3  | 2.5    | 2.7  | 2.9  | 3.1    | 13.7 |                        |
|             | NI-90x       | 0.7                                                                         | 0.8 | 0.9 | 1.0 | 1.2 | 1.4   | 1.5  | 1.7  | 1.9   | 2.1  | 2.3  | 2.5    | 2.7  | 2.9  | 3.1    | 13.7 |                        |
| 14'         | NI-20        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 18.1 |                        |
|             | NI-40        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 18.1 |                        |
|             | NI-60        | 0.8                                                                         | 1.0 | 1.0 | 1.2 | 1.2 | 1.4   | 1.5  | 1.6  | 1.7   | 1.8  | 1.9  | 2.0    | 2.1  | 2.2  | 2.3    | 19.2 |                        |
|             | NI-70        | 0.10                                                                        | 2.0 | 3.4 | 4.9 | 6.3 | 7.7   | 9.1  | 10.5 | 11.9  | 13.3 | 14.7 | 16.1   | 17.5 | 18.9 | 20.3   | 19.2 |                        |
|             | NI-80        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 19.2 |                        |
| 16'         | NI-20        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 20.0 |                        |
|             | NI-40        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 20.0 |                        |
|             | NI-60        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 20.0 |                        |
|             | NI-70        | 1.3                                                                         | 2.6 | 4.0 | 5.4 | 6.8 | 8.2   | 9.6  | 11.0 | 12.4  | 13.8 | 15.2 | 16.6   | 18.0 | 19.4 | 20.8   | 21.2 |                        |
|             | NI-80        | 0.7                                                                         | 0.8 | 0.8 | 1.0 | 1.0 | 1.2   | 1.3  | 1.4  | 1.5   | 1.6  | 1.7  | 1.8    | 1.9  | 2.0  | 2.1    | 21.2 |                        |

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

### OPTIONAL:

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

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

Where:

- $D_{reduced}$  = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span application.
- $L_{actual}$  = The actual measured span distance between the inside faces of supports (ft).
- $L_{max}$  = Span Adjustment Factor given in this table.
- $D$  = The minimum distance from the inside face of any support to centre of hole from this table.
- If  $L_{actual}$  is greater than 1, use 1 in the above calculation for  $L_{actual}$ .

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

|         | Joist Depth | Joist Series | Minimum distance from inside face of any support to centre of opening (ft-in.) |     |     |     |     |     |     |     |                           |     |     |     |     |     |     |     |
|---------|-------------|--------------|--------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|
|         |             |              | Duct chase length (in.)                                                        |     |     |     |     |     |     |     | Duct chase diameter (in.) |     |     |     |     |     |     |     |
|         |             |              | 8                                                                              | 10  | 12  | 14  | 16  | 18  | 20  | 22  | 24                        | 8   | 10  | 12  | 14  | 16  | 18  |     |
| 9-1/2"  | NI-20       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-40       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-60       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-80       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
| 11-7/8" | NI-20       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-40       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-60       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-80       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
| 14"     | NI-20       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-40       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-60       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-80       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
| 16"     | NI-20       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-40       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-60       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |
|         | NI-80       | 4.1          | 4.5                                                                            | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 | 7.1 | 7.5 | 7.8                       | 4.1 | 4.5 | 4.9 | 5.4 | 5.8 | 6.1 | 6.4 |



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 centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
- I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centred 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-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.

- The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
- 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.
- 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 | 11    | 12-3/4 |
| 9-1/2"      | NI-20        | 0-7"                                                                          | 1-6"  | 2-10" | 4-3"  | 5-8"  | 6-0"  | ---  | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
|             | NI-40x       | 0-7"                                                                          | 1-6"  | 3-0"  | 4-4"  | 6-0"  | 6-4"  | ---  | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
|             | NI-60        | 1-3"                                                                          | 2-6"  | 4-0"  | 5-4"  | 7-0"  | 7-5"  | ---  | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
|             | NI-70        | 2-0"                                                                          | 3-4"  | 4-9"  | 6-3"  | 8-0"  | 8-4"  | ---  | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
|             | NI-80        | 2-3"                                                                          | 3-6"  | 5-0"  | 6-6"  | 8-2"  | 8-8"  | ---  | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
| 11-7/8"     | NI-20        | 0-7"                                                                          | 0-8"  | 1-0"  | 2-4"  | 3-8"  | 4-0"  | 5-0" | 6-6"  | 7-9"  | ---   | ---   | ---    | ---   | ---    |
|             | NI-40x       | 0-7"                                                                          | 0-8"  | 1-3"  | 2-8"  | 4-0"  | 4-4"  | 5-5" | 7-0"  | 8-4"  | ---   | ---   | ---    | ---   | ---    |
|             | NI-60        | 0-7"                                                                          | 1-8"  | 3-0"  | 4-3"  | 5-9"  | 6-0"  | 7-3" | 8-10" | 10-0" | ---   | ---   | ---    | ---   | ---    |
|             | NI-70        | 1-3"                                                                          | 2-6"  | 4-0"  | 5-4"  | 6-9"  | 7-2"  | 8-4" | 10-0" | 11-2" | ---   | ---   | ---    | ---   | ---    |
|             | NI-80        | 1-6"                                                                          | 2-10" | 4-2"  | 5-6"  | 7-0"  | 7-5"  | 8-6" | 10-3" | 11-4" | ---   | ---   | ---    | ---   | ---    |
| 14"         | NI-20        | 0-7"                                                                          | 0-8"  | 1-5"  | 2-2"  | 4-10" | 5-4"  | 6-9" | 8-9"  | 10-2" | ---   | ---   | ---    | ---   | ---    |
|             | NI-40x       | 0-7"                                                                          | 0-8"  | 0-9"  | 2-5"  | 4-4"  | 4-9"  | 6-3" | ---   | ---   | ---   | ---   | ---    | ---   | ---    |
|             | NI-60        | 0-7"                                                                          | 0-8"  | 1-0"  | 2-4"  | 3-9"  | 3-9"  | 5-2" | 6-0"  | 6-6"  | 8-3"  | 10-2" | ---    | ---   | ---    |
|             | NI-70        | 0-7"                                                                          | 0-8"  | 1-8"  | 3-0"  | 4-3"  | 4-8"  | 5-8" | 7-2"  | 8-0"  | 8-8"  | 10-4" | 11-9"  | ---   | ---    |
|             | NI-80        | 0-8"                                                                          | 1-10" | 3-0"  | 4-5"  | 5-10" | 6-2"  | 7-3" | 8-9"  | 9-9"  | 10-4" | 12-0" | 13-5"  | ---   | ---    |
| 16"         | NI-20        | 0-7"                                                                          | 0-8"  | 0-9"  | 2-0"  | 3-4"  | 4-9"  | 6-2" | 6-5"  | 7-6"  | 9-0"  | 10-0" | 10-8"  | 12-4" | 13-9"  |
|             | NI-40x       | 0-7"                                                                          | 0-8"  | 1-0"  | 2-4"  | 3-9"  | 4-2"  | 5-5" | 7-3"  | 8-5"  | 9-2"  | ---   | ---    | ---   | ---    |
|             | NI-60        | 0-7"                                                                          | 0-8"  | 0-8"  | 2-0"  | 3-6"  | 4-0"  | 5-0" | 6-9"  | 7-9"  | 8-4"  | 10-2" | 11-6"  | 12-0" | ---    |
|             | NI-70        | 0-7"                                                                          | 1-0"  | 2-3"  | 3-6"  | 4-10" | 5-3"  | 6-3" | 7-8"  | 8-6"  | 9-2"  | 10-8" | 12-0"  | 12-4" | 14-0"  |
|             | NI-80        | 0-7"                                                                          | 1-3"  | 2-6"  | 3-10" | 5-3"  | 5-6"  | 6-6" | 8-0"  | 9-0"  | 9-9"  | 11-0" | 12-3"  | 12-9" | 14-5"  |

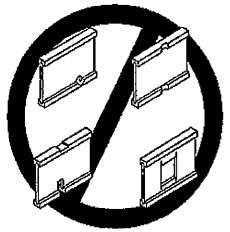
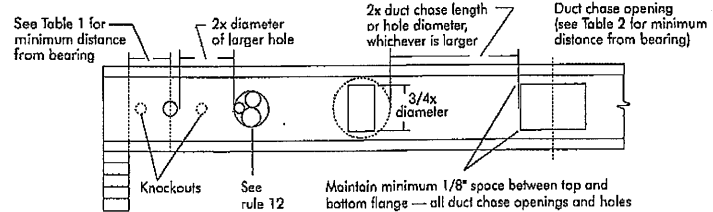
- Above table may be used for I-joist spacing of 24 inches on centre or less.
- Hole location distance is measured from inside face of supports to centre of hole.
- Distances in this chart are based on uniformly loaded joists.
- The above table is based on the I-joists being used at their maximum spans.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

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

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

- Above table may be used for I-joist 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-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

**FIGURE 7**  
**FIELD-CUT HOLE LOCATOR**



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

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

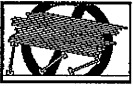
Holes in webs should be cut with a sharp saw.

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

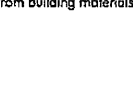
**SAFETY AND CONSTRUCTION PRECAUTIONS**



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



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



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

**AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:**

- Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
- When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
  - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centre, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Top 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-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
- 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.



**PRODUCT WARRANTY**

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

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

**1a**

Attach I-joist to top plate per detail 1b

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

Blocking Panel or Rim Joist  
NI Joists

Maximum Factored Uniform Vertical Load\* (psf)

3,300

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

**1b**

One 2-1/2" face nail at each side of bearing

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

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

Blocking Panel or Rim Joist  
1-1/8" Rim Board Plus

Maximum Factored Uniform Vertical Load\* (psf)

8,090

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

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

**1d**

Squash block

Pair of Squash Blocks

2x Lumber  
1-1/8" Rim Board Plus

Maximum Factored Vertical Load per Pair of Squash Blocks (lbs)

3-1/2" wide  
5,500

5-1/2" wide  
8,500

4,300

6,600

Provide lateral bracing per detail 1a or 1b

**1e**

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

**1g**

Joist attachment per detail 1b

2-1/2" nails at 6" o.c. to top plate

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

Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support

NI blocking panel per detail 1a

**1h**

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

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

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

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

**1i**

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

Double I-joist header

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

Backer block required (both sides for face-mount hangers)

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

**1j**

Nordic Lam or Structural Composite Lumber (SCL)

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

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

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

**1k**

2x plate flush with inside face of wall or beam. 1/8" overhang allowed past inside face of wall or beam.

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

Top-mount hanger installed per manufacturer's recommendations

**1m**

Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.

Backer block attached per detail 1h. Nail with twelve 3" nails, clinch when possible.

Filler block per detail 1p

Install hanger per manufacturer's recommendations

Maximum support capacity = 1,620 lbs.

**1n**

Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 1b

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

**1p**

Filler block

Offset nails from opposite face by 6"

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

**NOTES:**

- Support back of I-joist web during nailing to prevent damage to web/flange connection.
- Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
- Filler block is required between joists for full length of span.
- 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.
- 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.

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

**1s**

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

2x4 min. (1/8" gap minimum)

Two 2-1/2" nails from each web to lumber piece

One 2-1/2" nail one side only

NOTE: In some local codes, blocking is prescriptively required in the first joist space (for first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.

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

**WEB STIFFENERS**

**RECOMMENDATIONS:**

- A **bearing stiffener** is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found 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 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**

Flange width 2-1/2" x 3-1/2"

Approx. 2" I

1/8"-1/4" Gap

(4) 2-1/2" nails, 3" nails required for I-joists with 3-1/2" flange width

No Gap

See the adjacent table for web stiffener size requirements

CONCENTRATED LOAD (Load stiffener)

Tight Joint No Gap

Gap

END BEARING (Bearing stiffener)

Gap

Tight Joint No

# NORDIC STRUCTURES

COMPANY  
Oct. 14, 2020 08:52

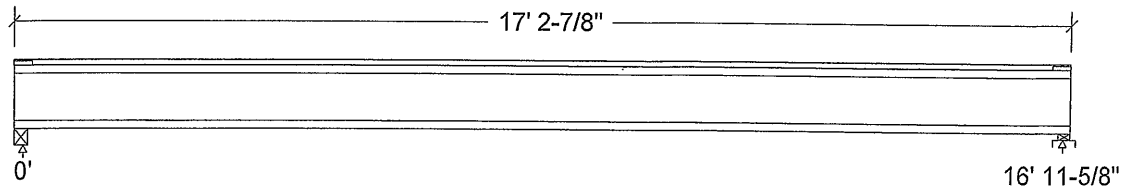
PROJECT  
J2 GRD FLR.wwb

## Design Check Calculation Sheet Nordic Sizer – Canada 7.2

### Loads:

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

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



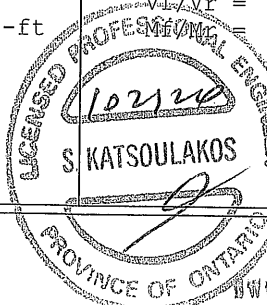
|             |       |  |       |
|-------------|-------|--|-------|
| Unfactored: |       |  |       |
| Dead        | 226   |  | 226   |
| Live        | 452   |  | 452   |
| Factored:   |       |  |       |
| Total       | 962   |  | 962   |
| Bearing:    |       |  |       |
| Capacity    |       |  |       |
| Joist       | 2137  |  | 2102  |
| Support     | -     |  | 3981  |
| Des ratio   |       |  |       |
| Joist       | 0.45  |  | 0.46  |
| Support     | -     |  | 0.24  |
| Load case   | #2    |  | #2    |
| Length      | 2-5/8 |  | 2-3/8 |
| Min req'd   | 1-3/4 |  | 1-3/4 |
| Stiffener   | No    |  | No    |
| KD          | 1.00  |  | 1.00  |
| KB support  | -     |  | 1.00  |
| fcp sup     | -     |  | 769   |
| Kzcp sup    | -     |  | 1.09  |

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

Supports: 1 - Steel Beam, W; 2 - Lumber Sill plate, No.1/No.2;  
Total length: 17' 2-7/8"; Clear span: 16' 9-7/8"; 3/4" 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 = 962        | Vr = 2336    | lbs    | Vf/Vr = 0.41    |
| Moment (+)   | Mf = 4079       | Mr = 6255    | lbs-ft | Mf/Mr = 0.65    |
| Perm. Defl'n | 0.12 = < L/999  | 0.57 = L/360 | in     | 0.22            |
| Live Defl'n  | 0.25 = L/827    | 0.42 = L/480 | in     | 0.58            |
| Total Defl'n | 0.37 = L/551    | 0.85 = L/240 | in     | 0.44            |
| Bare Defl'n  | 0.30 = L/683    | 0.57 = L/360 | in     | 0.53            |
| Vibration    | Lmax = 16'-11.6 | Lv = 18'-1.3 | ft     | 0.94            |
| Defl'n       | = 0.030         | = 0.037      | in     | 0.82            |



BWD NO. TAM/4497-20  
STRUCTURAL  
COMMENT ONLY

**Additional Data:**

| FACTORS: | f/E           | KD   | KH   | KZ | KL    | KT | KS | KN | LC# |
|----------|---------------|------|------|----|-------|----|----|----|-----|
| 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

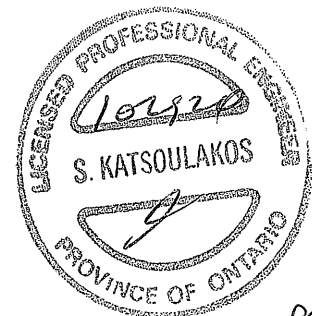
**CALCULATIONS:**E<sub>I</sub>eff = 459.76 lb-in<sup>2</sup> K= 6.18e06 lbs

"Live" deflection is due to all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

~~AMENDED 2020~~**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.



WWG NO. YAW/4497-20  
STRUCTURAL  
COMPONENT ONLY

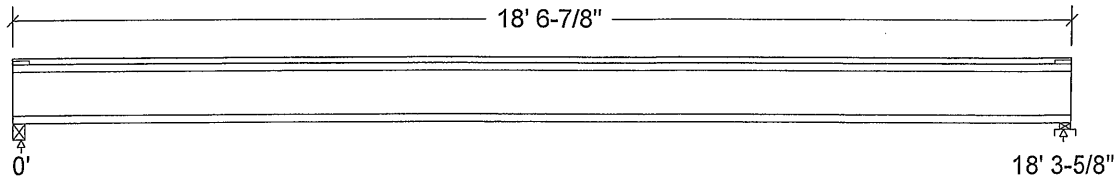
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

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

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



|             |       |  |       |
|-------------|-------|--|-------|
| Unfactored: |       |  |       |
| Dead        | 183   |  | 183   |
| Live        | 366   |  | 366   |
| Factored:   |       |  |       |
| Total       | 778   |  | 778   |
| Bearing:    |       |  |       |
| Capacity    |       |  |       |
| Joist       | 2137  |  | 2102  |
| Support     | -     |  | 3981  |
| Des ratio   |       |  |       |
| Joist       | 0.36  |  | 0.37  |
| Support     | -     |  | 0.20  |
| Load case   | #2    |  | #2    |
| Length      | 2-5/8 |  | 2-3/8 |
| Min req'd   | 1-3/4 |  | 1-3/4 |
| Stiffener   | No    |  | No    |
| KD          | 1.00  |  | 1.00  |
| KB support  | -     |  | 1.00  |
| fcp sup     | -     |  | 769   |
| Kzcp sup    | -     |  | 1.09  |

### Nordic Joist 11-7/8" NI-40x Floor joist @ 12" o.c.

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

Total length: 18' 6-7/8"; Clear span: 18' 1-7/8"; 3/4" 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 = 778       | Vr = 2336    | lbs    | Vf/Vr = 0.33    |
| Moment (+)   | Mf = 3559      | Mr = 6255    | lbs-ft | Mf/Mr = 0.57    |
| Perm. Defl'n | 0.13 = < L/999 | 0.61 = L/360 | in     | 0.21            |
| Live Defl'n  | 0.25 = L/865   | 0.46 = L/480 | in     | 0.55            |
| Total Defl'n | 0.38 = L/577   | 0.92 = L/240 | in     | 0.42            |
| Bare Defl'n  | 0.30 = L/736   | 0.61 = L/360 | in     | 0.49            |
| Vibration    | Lmax = 18'-3.6 | Lv = 19'-6.3 | ft     | 0.94            |
| Defl'n       | = 0.029        | = 0.034      | in     | 0.85            |



**Additional Data:**

| FACTORS: | f/E           | KD   | KH   | KZ | KL    | KT | KS | KN | LC# |
|----------|---------------|------|------|----|-------|----|----|----|-----|
| 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:**

EI<sub>eff</sub> = 443.45 lb-in<sup>2</sup> K= 6.18e06 lbs

"Live" deflection is due to all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

**Design Notes:**

AMENDED 2020

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



BWG NO. TAW 14498-20  
STRUCTURAL  
COMPONENT ONLY

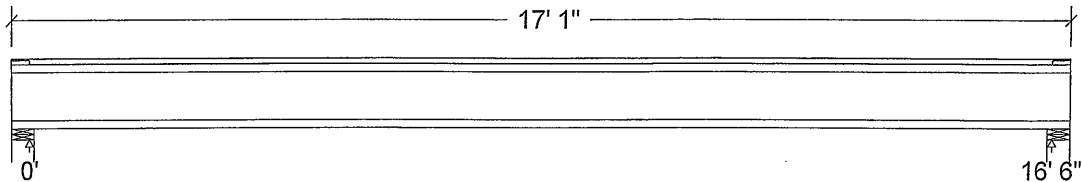
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.2

### Loads:

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

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



|             |       |  |       |
|-------------|-------|--|-------|
| Unfactored: |       |  |       |
| Dead        | 220   |  | 220   |
| Live        | 440   |  | 440   |
| Factored:   |       |  |       |
| Total       | 935   |  | 935   |
| Bearing:    |       |  |       |
| Capacity    |       |  |       |
| Joist       | 2336  |  | 2336  |
| Support     | 7744  |  | 7744  |
| Des ratio   |       |  |       |
| Joist       | 0.40  |  | 0.40  |
| Support     | 0.12  |  | 0.12  |
| Load case   | #2    |  | #2    |
| Length      | 4-3/8 |  | 4-3/8 |
| Min req'd   | 1-3/4 |  | 1-3/4 |
| Stiffener   | No    |  | No    |
| KD          | 1.00  |  | 1.00  |
| KB support  | -     |  | -     |
| fcp sup     | 769   |  | 769   |
| Kzcp sup    | -     |  | -     |

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

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

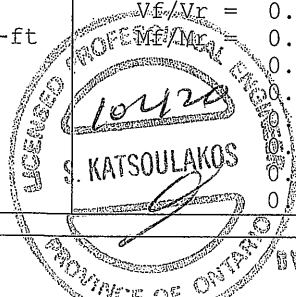
Supports: All - Lumber Wall, No.1/No.2

Total length: 17' 1"; Clear span: 16' 4-1/4"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

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

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

| Criterion    | Analysis Value | Design Value | Unit   | Analysis/Design |
|--------------|----------------|--------------|--------|-----------------|
| Shear        | Vf = 935       | Vr = 2336    | lbs    | Vf/Vr = 0.40    |
| Moment (+)   | Mf = 3857      | Mr = 6255    | lbs-ft | Mf/Mr = 0.62    |
| Perm. Defl'n | 0.11 = < L/999 | 0.55 = L/360 | in     | 0.21            |
| Live Defl'n  | 0.23 = L/872   | 0.41 = L/480 | in     | 0.55            |
| Total Defl'n | 0.34 = L/581   | 0.82 = L/240 | in     | 0.41            |
| Bare Defl'n  | 0.27 = L/739   | 0.55 = L/360 | in     | 0.49            |
| Vibration    | Lmax = 16'-6   | Lv = 17'-8.1 | ft     | 0.93            |
| Defl'n       | = 0.031        | = 0.039      | in     | 0.81            |



**Additional Data:**

| FACTORS: | f/E           | KD   | KH   | KZ | KL    | KT | KS | KN | LC# |
|----------|---------------|------|------|----|-------|----|----|----|-----|
| 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

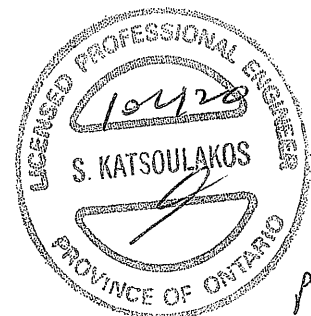
L=live(use,occupancy) Ls=live(storage,equipment) f=fire

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:**EI<sub>eff</sub> = 447.63 lb-in<sup>2</sup> K= 6.18e06 lbs"Live" deflection is due to all non-dead loads (live, wind, snow...) **CONFORMS TO OBC 2012****Design Notes:****AMENDED 2020**

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



DWG NO. YAM/4499-20  
STRUCTURAL  
COMPONENT ONLY

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B1(i1538)

City, Province, Postal Code:

Specifier:

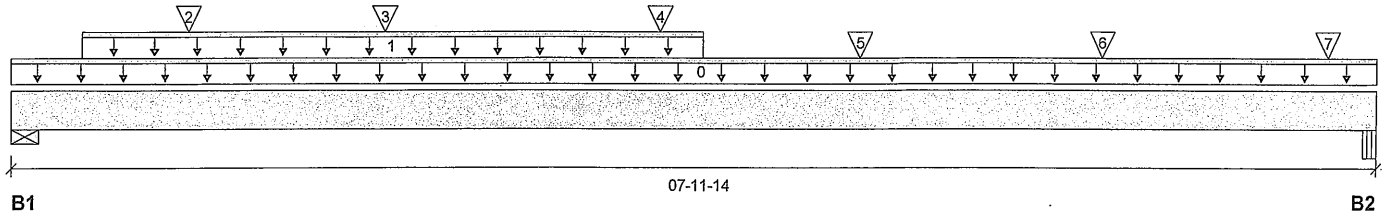
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 07-11-14

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

| Bearing    | Live     | Dead     | Snow | Wind |
|------------|----------|----------|------|------|
| B1, 4-3/8" | 1924 / 0 | 1019 / 0 |      |      |
| B2, 2-5/8" | 1728 / 0 | 919 / 0  |      |      |

### Load Summary

| Tag | Description | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|-------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight | Unf. Lin. (lb/ft) | L    | 00-00-00 | 07-11-14 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | STAIR       | Unf. Lin. (lb/ft) | L    | 00-04-14 | 04-00-00 | Top  | 240          | 120          |              |              | n/a       |
| 2   | J3(i1495)   | Conc. Pt. (lbs)   | L    | 01-00-06 | 01-00-06 | Top  | 344          | 172          |              |              | n/a       |
| 3   | -           | Conc. Pt. (lbs)   | L    | 02-01-15 | 02-01-15 | Top  | 502          | 251          |              |              | n/a       |
| 4   | -           | Conc. Pt. (lbs)   | L    | 03-09-01 | 03-09-01 | Top  | 420          | 225          |              |              | n/a       |
| 5   | -           | Conc. Pt. (lbs)   | L    | 04-10-13 | 04-10-13 | Top  | 567          | 284          |              |              | n/a       |
| 6   | -           | Conc. Pt. (lbs)   | L    | 06-04-06 | 06-04-06 | Top  | 592          | 296          |              |              | n/a       |
| 7   | -           | Conc. Pt. (lbs)   | L    | 07-08-06 | 07-08-06 | Top  | 336          | 168          |              |              | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 7590 ft-lbs     | 35392 ft-lbs        | 21.4%             | 1    | 03-08-06 |
| End Shear             | 3884 lbs        | 14464 lbs           | 26.9%             | 1    | 01-04-04 |
| Total Load Deflection | L/999 (0.055")  | n/a                 | n/a               | 4    | 04-00-00 |
| Live Load Deflection  | L/999 (0.036")  | n/a                 | n/a               | 5    | 04-00-00 |
| Max Defl.             | 0.055"          | n/a                 | n/a               | 4    | 04-00-00 |
| Span / Depth          | 7.6             |                     |                   |      |          |

### Bearing Supports

|    | Dim. (LxW)                 | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material        |
|----|----------------------------|----------|---------------------------|--------------------------|-----------------|
| B1 | Wall/Plate 4-3/8" x 3-1/2" | 4160 lbs | 44.2%                     | 22.3%                    | Spruce-Pine-Fir |
| B2 | Beam 2-5/8" x 3-1/2"       | 3742 lbs | 95.3%                     | 33.4%                    | 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 CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020



DWG NO. TAM 14500-20  
STRUCTURAL  
COMPONENT ONLY



Boise Cascade

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****1ST FLR FRAMING\Flush Beams\B1(i1538) (Flush Beam)**

Dry | 1 span | No cant.

**PASSED**

October 14, 2020 10:45:37

BC CALC® Member Report

Build 7493

Job name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

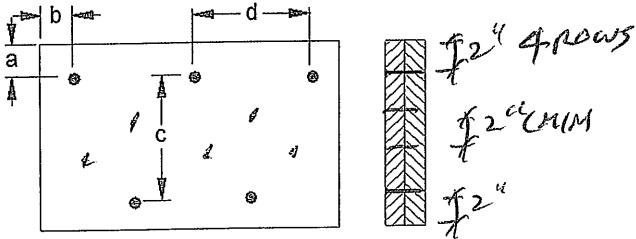
File name: 38-11.mmdl

Description: 1ST FLR FRAMING\Flush Beams\B1(i1538)

Specifier:

Designer:

Company:

**Connection Diagram: Full Length of Member**

a minimum = 2"

b minimum = 3"

c = 7-7/8"

d = 8"

Calculated Side Load = 949.9 lb/ft

Connectors are: 1 Nails

**3-1/2" ARDOX SPIRAL**

P642

NO. 14500-20  
STRUCTURAL  
COMPONENT ONLY

**Disclosure**

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

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



Boise Cascade

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****PASSED****1ST FLR FRAMING\Flush Beams\B2(i279) (Flush Beam)**

Dry | 1 span | No cant.

October 14, 2020 10:45:37

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B2(i279)

City, Province, Postal Code:

Specifier:

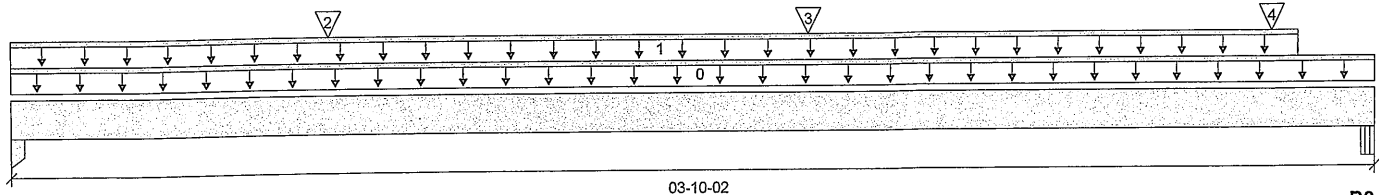
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



B1

B2

Total Horizontal Product Length = 03-10-02

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B1, 1-3/4" | 620 / 0 | 333 / 0 |      |      |
| B2, 2-5/8" | 616 / 0 | 332 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|-------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight | Unf. Lin. (lb/ft) | L    | 00-00-00 | 03-10-02 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | STAIR       | Unf. Lin. (lb/ft) | L    | 00-00-00 | 03-07-08 | Top  | 240          | 120          |              |              | n/a       |
| 2   | J6(i223)    | Conc. Pt. (lbs)   | L    | 00-10-10 | 00-10-10 | Top  | 133          | 67           |              |              | n/a       |
| 3   | J6(i266)    | Conc. Pt. (lbs)   | L    | 02-02-10 | 02-02-10 | Top  | 150          | 75           |              |              | n/a       |
| 4   | J6(i195)    | Conc. Pt. (lbs)   | L    | 03-06-10 | 03-06-10 | Top  | 83           | 42           |              |              | n/a       |

**Controls Summary**

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1217 ft-lbs     | 35392 ft-lbs        | 3.4%              | 1    | 02-00-03 |
| End Shear             | 679 lbs         | 14464 lbs           | 4.7%              | 1    | 01-01-10 |
| Total Load Deflection | L/999 (0.002")  | n/a                 | n/a               | 4    | 01-10-09 |
| Live Load Deflection  | L/999 (0.001")  | n/a                 | n/a               | 5    | 01-10-09 |
| Max Defl.             | 0.002"          | n/a                 | n/a               | 4    | 01-10-09 |
| Span / Depth          | 3.6             |                     |                   |      |          |

**Bearing Supports**

|         |          |                 |          | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member |             |
|---------|----------|-----------------|----------|----------------------------------|---------------------------------|-------------|
| Bearing | Supports | Dim. (LxW)      | Demand   |                                  |                                 | Material    |
| B1      | Column   | 1-3/4" x 3-1/2" | 1347 lbs | 33.8%                            | 18.0%                           | Unspecified |
| B2      | Beam     | 2-5/8" x 3-1/2" | 1340 lbs | 34.1%                            | 12.0%                           | 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.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020



HWB NO. TAM 14501-20  
STRUCTURAL  
COM. ONENT ONLY



Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP  
1ST FLR FRAMING\Flush Beams\B2(i279) (Flush Beam)

PASSED

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 14, 2020 10:45:37

Job name:

File name: 38-11.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B2(i279)

City, Province, Postal Code:

Specifier:

Customer:

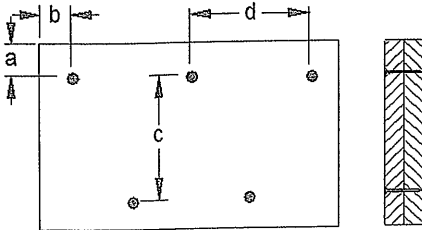
Designer:

Code reports:

CCMC 12472-R

Company:

Connection Diagram: Full Length of Member



a minimum = 2"

c = 7-7/8"

b minimum = 3"

d = 3"

Calculated Side Load = 159.4 lb/ft

Connectors are: 1 3-1/2" ARDOX SPIRAL Nails

3-1/2" ARDOX SPIRAL



HWG NO. TAM 14501-20  
STRUCTURAL  
COM. ONENT ONLY

Disclosure

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

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 1ST FLR FRAMING\Flush Beams\B3(i203)

City, Province, Postal Code:

Specifier:

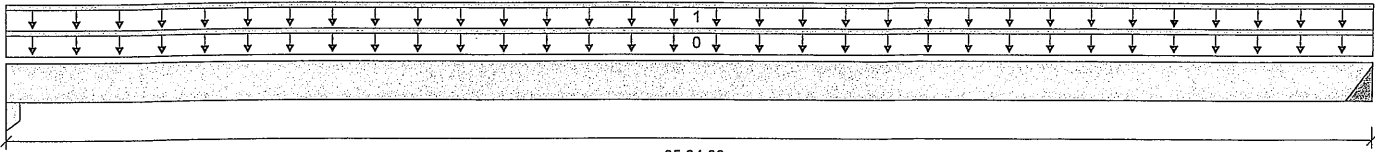
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



B1

Total Horizontal Product Length = 05-04-00

B2

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

| Bearing    | Live   | Dead   | Snow | Wind |
|------------|--------|--------|------|------|
| B1, 3-1/2" | 55 / 0 | 44 / 0 |      |      |
| B2, 3"     | 55 / 0 | 43 / 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 | 05-04-00 | Top  | 1.00 | 0.65 | 1.00 | 1.15 | 00-00-00  |
| 1   | FC1 Floor Material | Unf. Lin. (lb/ft) | L    | 00-00-00 | 05-04-00 | Top  | 21   | 10   |      |      | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 155 ft-lbs      | 17696 ft-lbs        | 0.9%              | 1    | 02-08-04 |
| End Shear             | 72 lbs          | 7232 lbs            | 1.0%              | 1    | 01-03-06 |
| Total Load Deflection | L/999 (0.001")  | n/a                 | n/a               | 4    | 02-08-04 |
| Live Load Deflection  | L/999 (0.001")  | n/a                 | n/a               | 5    | 02-08-04 |
| Max Defl.             | 0.001"          | n/a                 | n/a               | 4    | 02-08-04 |
| Span / Depth          | 5.0             |                     |                   |      |          |

### Bearing Supports

|                  |        |                 |         | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material    |
|------------------|--------|-----------------|---------|----------------------------------|---------------------------------|-------------|
| Bearing Supports |        | Dim. (LxW)      | Demand  |                                  |                                 |             |
| B1               | Column | 3-1/2" x 1-3/4" | 138 lbs | 3.5%                             | 1.8%                            | Unspecified |
| B2               | Hanger | 3" x 1-3/4"     | 136 lbs | n/a                              | 2.1%                            | IUS1.81/10  |

### Cautions

Header for the hanger IUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL Beam.

Hanger model IUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

### Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

Resistance Factor phi has been applied to all presented results per CSA O86. AMENDED 2020

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



DWG NO. TAM 14502-20  
STRUCTURAL  
COMPONENT ONLY

### Disclosure

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

CONFORMS TO DBC 2012

BC CALC® Member Report

Dry | 1 span | No cant.

October 14, 2020 10:45:37

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING/Dropped Beams\B4(i1466)

City, Province, Postal Code:

Specifier:

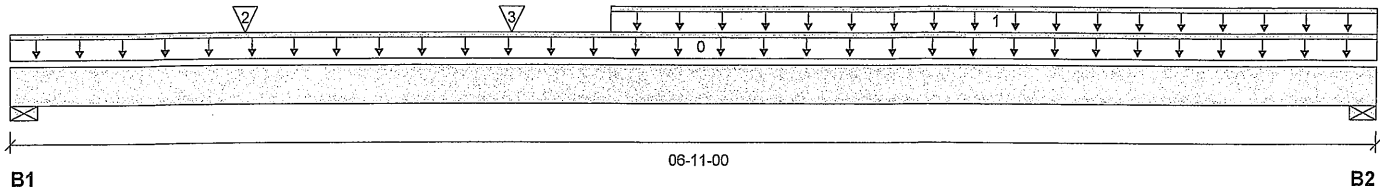
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 06-11-00

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

| Bearing    | Live     | Dead    | Snow | Wind |
|------------|----------|---------|------|------|
| B1, 5-1/2" | 973 / 0  | 520 / 0 |      |      |
| B2, 5-1/2" | 1192 / 0 | 631 / 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 | 06-11-00 | Top  | 1.00 | 0.65 | 1.00 | 1.15 | 00-00-00  |
| 1   | Smoothed Load | Unf. Lin. (lb/ft) | L    | 03-00-00 | 06-11-00 | Top  | 340  | 171  |      |      | n/a       |
| 2   | J1(i1364)     | Conc. Pt. (lbs)   | L    | 01-02-00 | 01-02-00 | Top  | 444  | 222  |      |      | n/a       |
| 3   | J1(i1552)     | Conc. Pt. (lbs)   | L    | 02-06-00 | 02-06-00 | Top  | 389  | 194  |      |      | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 3448 ft-lbs     | 23220 ft-lbs        | 14.8%             | 1    | 03-06-00 |
| End Shear             | 1995 lbs        | 11571 lbs           | 17.2%             | 1    | 01-03-00 |
| Total Load Deflection | L/999 (0.032")  | n/a                 | n/a               | 4    | 03-05-04 |
| Live Load Deflection  | L/999 (0.021")  | n/a                 | n/a               | 5    | 03-05-04 |
| Max Defl.             | 0.032"          | n/a                 | n/a               | 4    | 03-05-04 |
| Span / Depth          | 7.7             |                     |                   |      |          |

### Bearing Supports

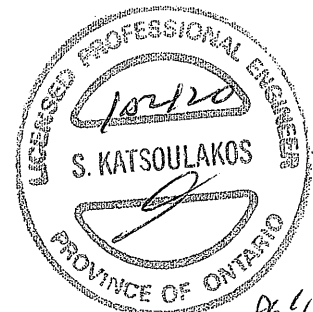
|    | Dim. (LxW)                 | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material        |
|----|----------------------------|----------|---------------------------|--------------------------|-----------------|
| B1 | Wall/Plate 5-1/2" x 3-1/2" | 2110 lbs | 8.2%                      | 9.0%                     | Spruce-Pine-Fir |
| B2 | Wall/Plate 5-1/2" x 3-1/2" | 2576 lbs | 10.0%                     | 11.0%                    | Spruce-Pine-Fir |

### Notes

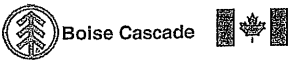
Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Calculations assume unbraced length of Top: 01-01-08, Bottom: 01-01-08.  
Resistance Factor phi has been applied to all presented results per CSA O86.  
BC CALC® analysis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

CONFORMS TO OBC 2012

AMENDED 2020



SW6 NO. TAM 14503-20  
STRUCTURAL  
COMPONENT ONLY



**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Dropped Beams\B4(i1466) (Dropped Beam)**

**PASSED**

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 14, 2020 10:45:37

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Dropped Beams\B4(i1466)

City, Province, Postal Code:

Specifier:

Customer:

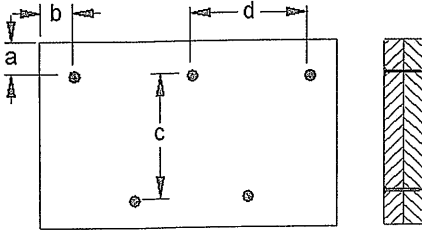
Designer:

Code reports:

CCMC 12472-R

Company:

**Connection Diagram: Full Length of Member**



a minimum = 2"

c = 5-1/2"

b minimum = 3"

d = 3"

Connectors are:



Nails

3-1/2" ARDOX SPIRAL



DWG NO. TAM 1450320  
STRUCTURAL  
COMMENT ONLY

**Disclosure**

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BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B5(i1461)

City, Province, Postal Code:

Specifier:

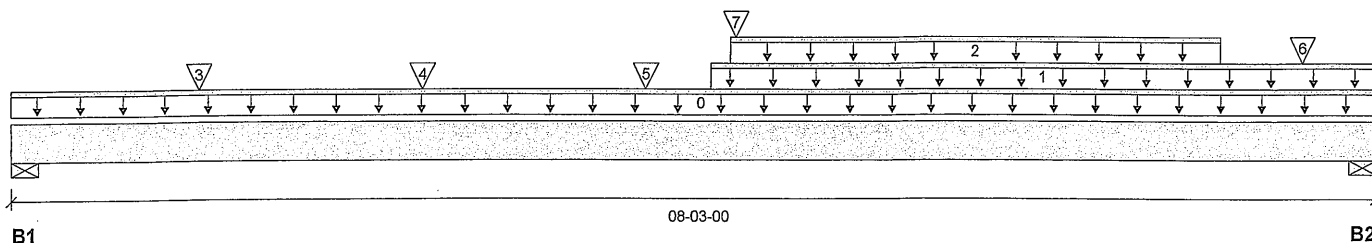
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 08-03-00

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

| Bearing    | Live     | Dead    | Snow | Wind |
|------------|----------|---------|------|------|
| B1, 5-1/2" | 1371 / 0 | 745 / 0 |      |      |
| B2, 2-3/4" | 1394 / 0 | 755 / 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 | 08-03-00 | Top  |      | 12   |      |      | 00-00-00  |
| 1   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 04-02-02 | 08-03-00 | Top  | 19   | 10   |      |      | n/a       |
| 2   | Smoothed Load      | Unf. Lin. (lb/ft) | L    | 04-03-08 | 07-03-08 | Top  | 336  | 168  |      |      | n/a       |
| 3   | J1(i1570)          | Conc. Pt. (lbs)   | L    | 01-01-08 | 01-01-08 | Top  | 456  | 228  |      |      | n/a       |
| 4   | J1(i1390)          | Conc. Pt. (lbs)   | L    | 02-05-08 | 02-05-08 | Top  | 456  | 228  |      |      | n/a       |
| 5   | J1(i1386)          | Conc. Pt. (lbs)   | L    | 03-09-08 | 03-09-08 | Top  | 396  | 198  |      |      | n/a       |
| 6   | J1(i1549)          | Conc. Pt. (lbs)   | L    | 07-09-08 | 07-09-08 | Top  | 245  | 123  |      |      | n/a       |
| 7   | B6(i1534)          | Conc. Pt. (lbs)   | L    | 04-03-14 | 04-03-14 | Top  | 99   | 67   |      |      | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 6031 ft-lbs     | 35392 ft-lbs        | 17.0%             | 1    | 04-03-14 |
| End Shear             | 2597 lbs        | 14464 lbs           | 18.0%             | 1    | 01-05-06 |
| Total Load Deflection | L/999 (0.046")  | n/a                 | n/a               | 4    | 04-02-02 |
| Live Load Deflection  | L/999 (0.03")   | n/a                 | n/a               | 5    | 04-02-02 |
| Max Defl.             | 0.046"          | n/a                 | n/a               | 4    | 04-02-02 |
| Span / Depth          | 7.8             |                     |                   |      |          |

| Bearing Supports | Dim. (LxW)                 | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material        |
|------------------|----------------------------|----------|---------------------------|--------------------------|-----------------|
| B1               | Wall/Plate 5-1/2" x 3-1/2" | 2988 lbs | 25.2%                     | 12.7%                    | Spruce-Pine-Fir |
| B2               | Wall/Plate 2-3/4" x 3-1/2" | 3035 lbs | 51.3%                     | 25.8%                    | Spruce-Pine-Fir |

### Notes

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

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

Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020



OWS NO. TAM/14504-20  
STRUCTURAL  
COMPONENT ONLY

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 14, 2020 10:45:37

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B5(i1461)

City, Province, Postal Code:

Specifier:

Customer:

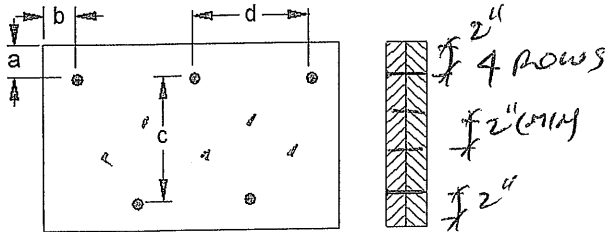
Designer:

Code reports:

CCMC 12472-R

Company:

## Connection Diagram: Full Length of Member



a minimum = 2"  
b minimum = 3"

c = 7-7/8"  
d = 8"

Calculated Side Load = 905.3 lb/ft

Connectors are: 1 Nail

3-1/2" ARDOX SPIRAL



BCU NO. YAM 14504-20  
STRUCTURAL  
COMPONENT ONLY

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BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B6(i1534)

City, Province, Postal Code:

Specifier:

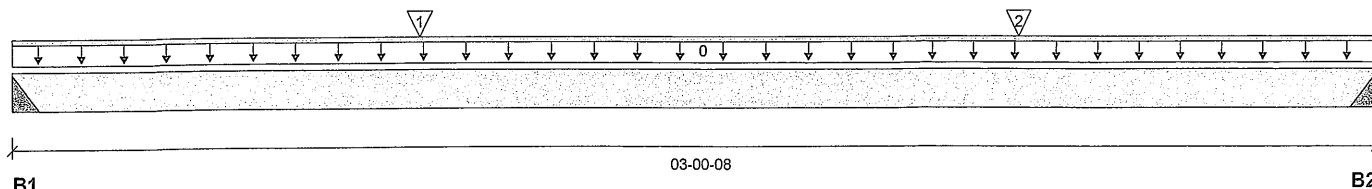
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:


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

| Bearing    | Live    | Dead   | Snow | Wind |
|------------|---------|--------|------|------|
| B1, 2-1/2" | 95 / 0  | 65 / 0 |      |      |
| B2, 4"     | 107 / 0 | 72 / 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 | 03-00-08 | Top  | 1.00 | 0.65 | 1.00 | 1.15 | 00-00-00  |
| 1   | J6(i1370)   | Conc. Pt. (lbs)   | L    | 00-10-12 | 00-10-12 | Top  | 105  | 53   |      |      | n/a       |
| 2   | J6(i1554)   | Conc. Pt. (lbs)   | L    | 02-02-12 | 02-02-12 | Top  | 97   | 48   |      |      | n/a       |

**Controls Summary**

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 162 ft-lbs      | 35392 ft-lbs        | 0.5%              | 1    | 00-10-12 |
| End Shear             | 138 lbs         | 14464 lbs           | 1.0%              | 1    | 01-02-06 |
| Total Load Deflection | L/999 (0")      | n/a                 | n/a               | 4    | 01-05-08 |
| Live Load Deflection  | L/999 (0")      | n/a                 | n/a               | 5    | 01-05-08 |
| Max Defl.             | 0"              | n/a                 | n/a               | 4    | 01-05-08 |
| Span / Depth          | 2.7             |                     |                   |      |          |

**Bearing Supports**

|    | Dim. (LxW)             | Demand  | Demand/Resistance Support | Demand/Resistance Member | Material |
|----|------------------------|---------|---------------------------|--------------------------|----------|
| B1 | Hanger 2-1/2" x 3-1/2" | 224 lbs | n/a                       | 2.1%                     | HUC410   |
| B2 | Hanger 4" x 3-1/2"     | 251 lbs | n/a                       | 1.5%                     | HGUS410  |

**Cautions**

Header for the hanger HUC410 is a Double 1-3/4" x 11-7/8" LVL Beam.

Hanger model HUC410 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

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

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

**Notes**

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

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

Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.

Hanger Manufacturer: Unassigned

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

AMENDED 2020


 BWM NO. TAM 14505-20  
 STRUCTURAL  
 COMMENT ONLY

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B6(i1534)

City, Province, Postal Code:

Specifier:

Customer:

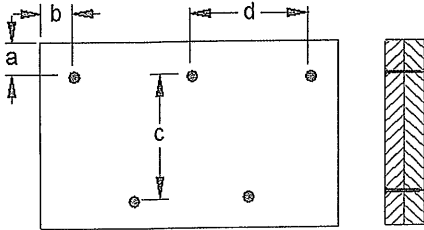
Designer:

Code reports:

CCMC 12472-R

Company:

## Connection Diagram: Full Length of Member



a minimum = 2"

c = 7-7/8"

b minimum = 3"

d = 8" B "

Calculated Side Load = 111.9 lb/ft

Connectors are: 1 Nails

3-1/2" ARDOX SPIRAL



OWB NO. TAM 14505-20  
STRUCTURAL  
COMPONENT ONLY

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BC CALC® Member Report

Dry | 2 spans | L cant.

October 14, 2020 10:45:37

Build 7493

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B7(i1571)

City, Province, Postal Code:

Specifier:

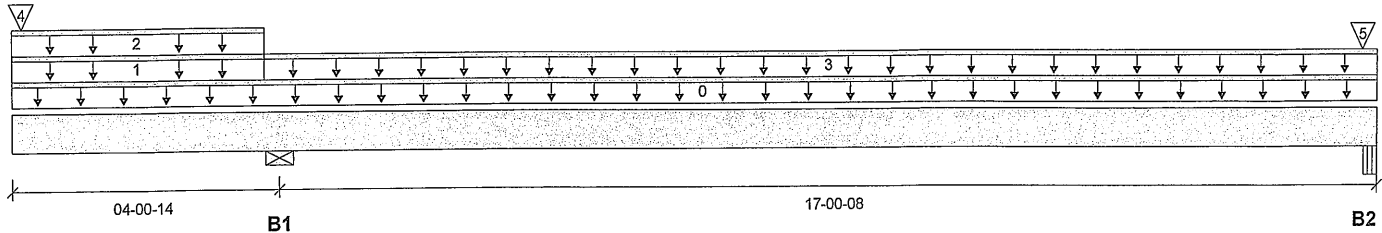
Customer:

Designer:

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 21-01-06

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

| Bearing    | Live      | Dead    | Snow | Wind |
|------------|-----------|---------|------|------|
| B1, 5-1/2" | 1501 / 0  | 930 / 0 |      |      |
| B2, 3"     | 230 / 153 | 156 / 0 |      |      |

**Load Summary**

| Tag | Description        | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|--------------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight        | Unf. Lin. (lb/ft) | L    | 00-00-00 | 21-01-06 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | STAIR              | Unf. Lin. (lb/ft) | L    | 00-00-00 | 03-10-02 | Top  | 240          | 120          |              |              | n/a       |
| 2   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 00-00-00 | 03-10-02 | Top  | 24           | 12           |              |              | n/a       |
| 3   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 03-10-02 | 21-01-06 | Top  | 27           | 13           |              |              | n/a       |
| 4   | B6(i1534)          | Conc. Pt. (lbs)   | L    | 00-01-12 | 00-01-12 | Top  | 103          | 70           |              |              | n/a       |
| 5   | E28(i339)          | Conc. Pt. (lbs)   | L    | 20-10-10 | 20-10-10 | Top  |              | 24           |              |              | n/a       |

**Controls Summary**

|                       | Factored Demand   | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-------------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1713 ft-lbs       | 35392 ft-lbs        | 4.8%              | 3    | 13-11-06 |
| Neg. Moment           | -5711 ft-lbs      | -35392 ft-lbs       | 16.1%             | 1    | 04-00-14 |
| End Shear             | 476 lbs           | 14464 lbs           | 3.3%              | 3    | 19-10-08 |
| Cont. Shear           | 1920 lbs          | 14464 lbs           | 13.3%             | 1    | 02-10-04 |
| Total Load Deflection | 2xL/615 (0.159")  | n/a                 | 39.0%             | 9    | 00-00-00 |
| Live Load Deflection  | 2xL/1998 (0.125") | n/a                 | n/a               | 12   | 00-00-00 |
| Total Neg. Defl.      | L/999 (-0.086")   | n/a                 | n/a               | 9    | 10-06-06 |
| Max Defl.             | -0.086"           | n/a                 | n/a               | 9    | 10-06-06 |
| Span / Depth          | 17.0              |                     |                   |      |          |

**Bearing Supports**

|    | Dim. (LxW)                 | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material        |
|----|----------------------------|----------|---------------------------|--------------------------|-----------------|
| B1 | Wall/Plate 5-1/2" x 3-1/2" | 3414 lbs | 28.8%                     | 14.5%                    | Spruce-Pine-Fir |
| B2 | Beam 3" x 3-1/2"           | 539 lbs  | 12.0%                     | 4.2%                     | Unspecified     |
| B2 | Uplift                     | 90 lbs   |                           |                          |                 |

**Cautions**

Uplift of 90 lbs found at bearing B2. (SIMPSON 2-HL-5A @ 5. B2)


OWG NO. TAM 14506-20  
**STRUCTURAL**  
**COMPONENT ONLY**

BC CALC® Member Report  
Build 7493

Dry | 2 spans | L cant.

October 14, 2020 10:45:37

Job name:

File name: 38-11.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B7(i1571)

City, Province, Postal Code:

Specifier:

Customer:

Designer:

Code reports:

CCMC 12472-R

Company:

## Notes

Design meets User specified (2xL/240) Total load deflection criteria.

Design meets User specified (2xL/360) Live load deflection criteria.

CONFORMS TO OBC 2012

Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-00-00.

AMENDED 2020

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

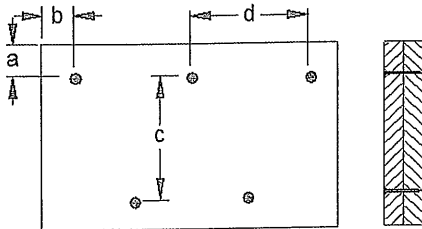
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.

## Connection Diagram: Full Length of Member



a minimum = 2"

c = 7-7/8"

b minimum = 3"

d = 8"

Calculated Side Load = 121.0 lb/ft

Connectors are:

1 Nails  
3-1/2" ARDOX SPIRAL



DWG NO. TAM/4506-20  
STRUCTURAL  
COMPONENT ONLY

## Disclosure

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

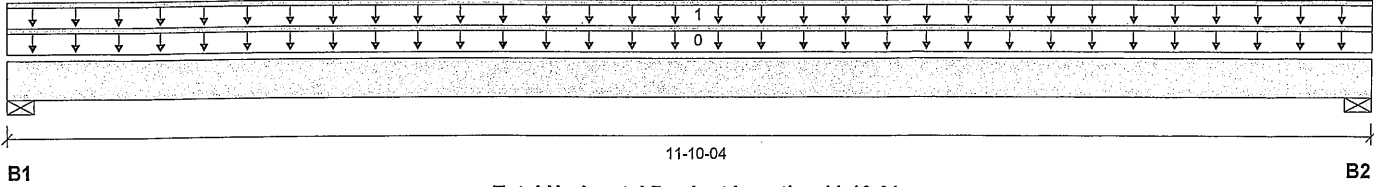
BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 14, 2020 11:00:16

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

File name: 38-11 SUNKEN OPTION.mmdl  
 Description: 1ST FLR FRAMING\Flush Beams\B20(i1591)  
 Specifier:  
 Designer: LBV  
 Company:



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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B1, 4-3/8" | 169 / 0 | 121 / 0 |      |      |
| B2, 2-3/8" | 164 / 0 | 117 / 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 | 11-10-04 | Top  | 1.00 | 0.65 | 1.00 | 1.15 | 00-00-00  |
| 1   | FC1 Floor Material | Unf. Lin. (lb/ft) | L    | 00-00-00 | 11-10-04 | Top  | 28   | 14   |      |      | n/a       |

**Controls Summary**

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1096 ft-lbs     | 17696 ft-lbs        | 6.2%              | 1    | 06-00-02 |
| End Shear             | 313 lbs         | 7232 lbs            | 4.3%              | 1    | 01-04-04 |
| Total Load Deflection | L/999 (0.038")  | n/a                 | n/a               | 4    | 06-00-02 |
| Live Load Deflection  | L/999 (0.022")  | n/a                 | n/a               | 5    | 06-00-02 |
| Max Defl.             | 0.038"          | n/a                 | n/a               | 4    | 06-00-02 |
| Span / Depth          | 11.5            |                     |                   |      |          |

| Bearing Supports | Dim. (LxW)                 | Demand  | Demand/Resistance Support | Demand/Resistance Member | Material        |
|------------------|----------------------------|---------|---------------------------|--------------------------|-----------------|
| B1               | Wall/Plate 4-3/8" x 1-3/4" | 404 lbs | 8.6%                      | 4.3%                     | Spruce-Pine-Fir |
| B2               | Wall/Plate 2-3/8" x 1-3/4" | 393 lbs | 15.4%                     | 7.8%                     | Spruce-Pine-Fir |

**Notes**

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

CONFORMS TO OBC 2012

AMENDED 2020



DWG NO. TAM/14507-20  
 STRUCTURAL  
 COMPONENT ONLY

**Disclosure**

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

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



Boise Cascade

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****2ND FLR FRAMING\Flush Beams\B8A(i1384) (Flush Beam)****PASSED**

BC CALC® Member Report

Dry | 1 span | No cant.

October 14, 2020 11:22:55

Build 7493

Job name:

File name: 38-11 EL A.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8A(i1384)

City, Province, Postal Code: RICHMOND HILL

Specifier:

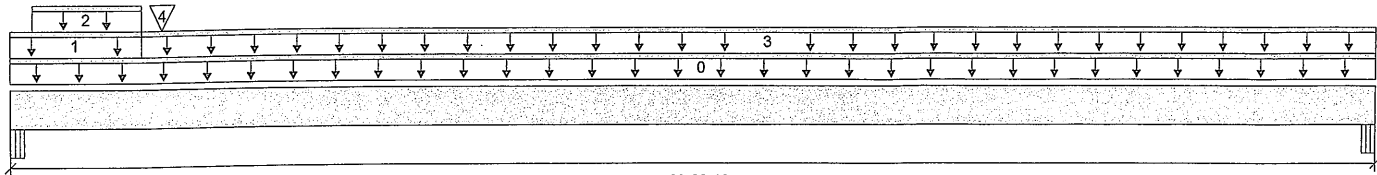
Customer:

Designer: LBV

Code reports:

CCMC 12472-R

Company:



B1

Total Horizontal Product Length = 09-08-10

B2

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

| Bearing    | Live    | Dead     | Snow     | Wind |
|------------|---------|----------|----------|------|
| B1, 5-1/4" | 557 / 0 | 1174 / 0 | 1040 / 0 |      |
| B2, 2-5/8" | 281 / 0 | 259 / 0  | 79 / 0   |      |

**Load Summary**

| Tag | Description        | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|--------------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight        | Unf. Lin. (lb/ft) | L    | 00-00-00 | 09-08-10 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | E25(i345)          | Unf. Lin. (lb/ft) | L    | 00-00-00 | 00-11-02 | Top  |              | 81           |              |              | n/a       |
| 2   | E25(i345)          | Unf. Lin. (lb/ft) | L    | 00-01-14 | 00-11-02 | Top  |              | 75           | 163          |              | n/a       |
| 3   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 00-11-02 | 09-08-10 | Top  | 53           | 27           |              |              | n/a       |
| 4   | -                  | Conc. Pt. (lbs)   | L    | 01-00-15 | 01-00-15 | Top  | 369          | 948          | 993          |              | n/a       |

**Controls Summary**

|                       | Factored Demand | Factored Resistance | Demand/<br>Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-----------------------|------|----------|
| Pos. Moment           | 2508 ft-lbs     | 35392 ft-lbs        | 7.1%                  | 1    | 03-03-11 |
| End Shear             | 2346 lbs        | 14464 lbs           | 16.2%                 | 13   | 01-05-02 |
| Total Load Deflection | L/999 (0.031")  | n/a                 | n/a                   | 35   | 04-07-10 |
| Live Load Deflection  | L/999 (0.018")  | n/a                 | n/a                   | 51   | 04-07-10 |
| Max Defl.             | 0.031"          | n/a                 | n/a                   | 35   | 04-07-10 |
| Span / Depth          | 9.3             |                     |                       |      |          |

| Bearing Supports | Dim. (LxW)      | Demand   | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material    |
|------------------|-----------------|----------|----------------------------------|---------------------------------|-------------|
| B1 Beam          | 5-1/4" x 3-1/2" | 3584 lbs | 45.7%                            | 16.0%                           | Unspecified |
| B2 Beam          | 2-5/8" x 3-1/2" | 823 lbs  | 21.0%                            | 7.3%                            | Unspecified |

**Cautions**

Concentrated side load(s) 8,9,10,11,12 are closer than 18" from end of member. Please consult a technical representative or Professional of Record.

**Notes**

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

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

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

CONFORMS TO OBC 2012

AMENDED 2020



DWG NO. TAM/14508-20  
STRUCTURAL  
COMPONENT ONLY



Boise Cascade

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****PASSED****2ND FLR FRAMING\Flush Beams\B8A(i1384) (Flush Beam)**

Dry | 1 span | No cant.

October 14, 2020 11:22:55

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11 EL A.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8A(i1384)

City, Province, Postal Code: RICHMOND HILL

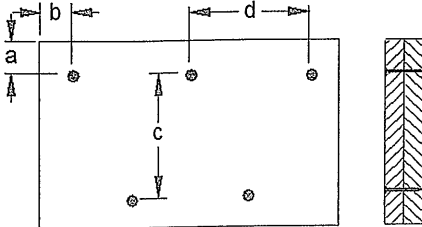
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:

**Connection Diagram: Full Length of Member**

a minimum = 2"

c = 7-7/8"

b minimum = 3"

d = 8"

Connectors are:

1

Nails

**3-1/2" ARDOX SPIRAL**

ENG. NO. 102420  
 STRUCTURAL  
 COMPONENT ONLY

**Disclosure**

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

BC CALC® Member Report

Build 7493

Job name:

File name: 38-11 EL A.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B9A(i1528)

City, Province, Postal Code: RICHMOND HILL

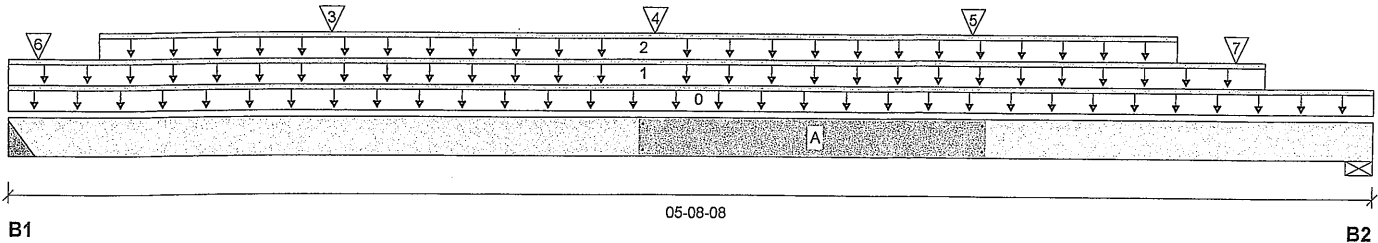
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 05-08-08

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

| Bearing | Live    | Dead    | Snow    | Wind |
|---------|---------|---------|---------|------|
| B1, 4"  | 387 / 0 | 917 / 0 | 963 / 0 |      |
| B2, 5"  | 398 / 0 | 882 / 0 | 902 / 0 |      |

### Load Summary

| Tag | Description | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|-------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight | Unf. Lin. (lb/ft) | L    | 00-00-00 | 05-08-08 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 00-00-00 | 05-03-00 | Top  |              | 81           |              |              | n/a       |
| 2   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 00-04-08 | 04-10-08 | Top  |              | 56           | 129          |              | n/a       |
| 3   | J4(i1443)   | Conc. Pt. (lbs)   | L    | 01-04-00 | 01-04-00 | Top  | 252          | 126          |              |              | n/a       |
| 4   | J4(i1417)   | Conc. Pt. (lbs)   | L    | 02-08-00 | 02-08-00 | Top  | 239          | 119          |              |              | n/a       |
| 5   | J4(i1467)   | Conc. Pt. (lbs)   | L    | 04-00-00 | 04-00-00 | Top  | 212          | 106          |              |              | n/a       |
| 6   | E24(i340)   | Conc. Pt. (lbs)   | L    | 00-01-08 | 00-01-08 | Top  |              | 313          | 622          |              | n/a       |
| 7   | -           | Conc. Pt. (lbs)   | L    | 05-01-08 | 05-01-08 | Top  | 82           | 390          | 663          |              | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/<br>Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-----------------------|------|----------|
| Pos. Moment           | 2372 ft-lbs     | 35392 ft-lbs        | 6.7%                  | 1    | 02-08-00 |
| End Shear             | 1535 lbs        | 14464 lbs           | 10.6%                 | 13   | 04-03-10 |
| Total Load Deflection | L/999 (0.009")  | n/a                 | n/a                   | 35   | 02-10-00 |
| Live Load Deflection  | L/999 (0.005")  | n/a                 | n/a                   | 51   | 02-10-00 |
| Max Defl.             | 0.009"          | n/a                 | n/a                   | 35   | 02-10-00 |
| Span / Depth          | 5.1             |                     |                       |      |          |

| Bearing Supports | Dim. (LxW)             | Demand   | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material        |
|------------------|------------------------|----------|----------------------------------|---------------------------------|-----------------|
| B1               | Hanger 4" x 3-1/2"     | 2978 lbs | n/a                              | 17.4%                           | HGUS410         |
| B2               | Wall/Plate 5" x 3-1/2" | 2854 lbs | 26.5%                            | 13.4%                           | Spruce-Pine-Fir |

### Cautions

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

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



HWQ NO. TAM 14509-20  
STRUCTURAL  
COMPONENT ONLY



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

## 2ND FLR FRAMING\Flush Beams\B9A(i1528) (Flush Beam)

PASSED

BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 14, 2020 11:22:55

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

File name: 38-11 EL A.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B9A(i1528)  
Specifier:  
Designer: LBV  
Company:

### Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

CONFORMS TO OBC 2012

AMENDED 2020

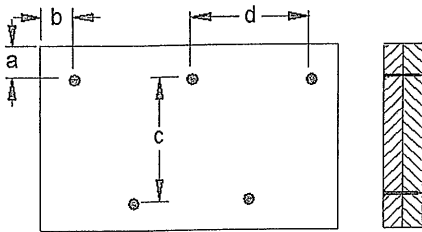
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2015 and CSA O86.

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 Diagram: Full Length of Member



a minimum = 2"  
b minimum = 3"

c = 7-7/8"  
d = 8"

Calculated Side Load = 267.8 lb/ft

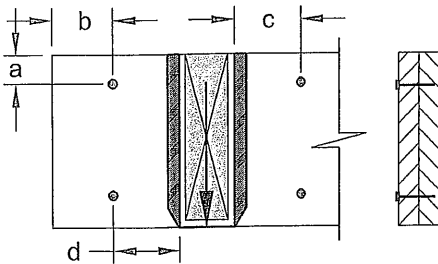
Connectors are: 3-1/2" ARDOX SPIRAL

3-1/2" ARDOX SPIRAL

### Connection Diagrams: Concentrated Side Loads

Connection Tag: A

Applies to load tag(s): 13+14



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

3-1/2" ARDOX SPIRAL



ENG NO. TAM/4509-20  
STRUCTURAL  
COMPONENT ONLY

### Disclosure

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

BC CALC® Member Report

Dry | 1 span | No cant.

October 14, 2020 11:27:17

Build 7493

Job name:

File name: 38-11 EL B.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8B(i1604)

City, Province, Postal Code: RICHMOND HILL

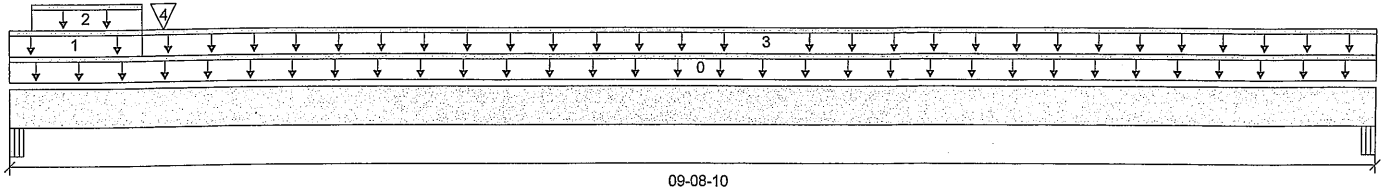
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 09-08-10

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

| Bearing    | Live    | Dead    | Snow    | Wind |
|------------|---------|---------|---------|------|
| B1, 5-1/4" | 438 / 0 | 797 / 0 | 490 / 0 |      |
| B2, 2-5/8" | 153 / 0 | 169 / 0 | 33 / 0  |      |

### Load Summary

| Tag | Description        | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|--------------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight        | Unf. Lin. (lb/ft) | L    | 00-00-00 | 09-08-10 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | E25(i345)          | Unf. Lin. (lb/ft) | L    | 00-00-00 | 00-11-02 | Top  |              | 81           |              |              | n/a       |
| 2   | E25(i345)          | Unf. Lin. (lb/ft) | L    | 00-01-14 | 00-11-02 | Top  |              | 75           | 163          |              | n/a       |
| 3   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 00-11-02 | 09-08-10 | Top  | 27           | 13           |              |              | n/a       |
| 4   | -                  | Conc. Pt. (lbs)   | L    | 01-00-15 | 01-00-15 | Top  | 357          | 599          | 398          |              | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1497 ft-lbs     | 35392 ft-lbs        | 4.2%              | 1    | 03-01-01 |
| End Shear             | 1413 lbs        | 14464 lbs           | 9.8%              | 1    | 01-05-02 |
| Total Load Deflection | L/999 (0.018")  | n/a                 | n/a               | 35   | 04-07-10 |
| Live Load Deflection  | L/999 (0.01")   | n/a                 | n/a               | 51   | 04-07-10 |
| Max Defl.             | 0.018"          | n/a                 | n/a               | 35   | 04-07-10 |
| Span / Depth          | 9.3             |                     |                   |      |          |

| Bearing Supports | Dim. (LxW)      | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material    |
|------------------|-----------------|----------|---------------------------|--------------------------|-------------|
| B1 Beam          | 5-1/4" x 3-1/2" | 2170 lbs | 22.1%                     | 9.7%                     | Unspecified |
| B2 Beam          | 2-5/8" x 3-1/2" | 474 lbs  | 9.7%                      | 4.2%                     | Unspecified |

### Cautions

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

### Notes

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

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

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.

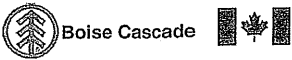
Importance Factor : Normal Part code : Part 9

CONFORMS TO QRC 2012

AMENDED 2020



QRC NO. TAM 14510-20  
**STRUCTURAL  
 COMPONENT ONLY**



**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B8B(i1604) (Flush Beam)**

**PASSED**

BC CALC® Member Report  
Build 7493

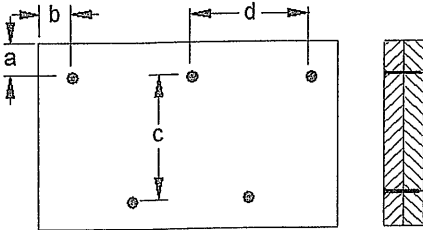
Dry | 1 span | No cant.

October 14, 2020 11:27:17

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

File name: 38-11 EL B.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8B(i1604)  
Specifier:  
Designer: LBV  
Company:

**Connection Diagram: Full Length of Member**



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

Calculated Side Load = 270.8 lb/ft

Connectors are:  Nails  
**3-1/2" ARDOX SPIRAL**



HWB NO. TAW 14510-20  
**STRUCTURAL**  
**COMPONENT ONLY**

**Disclosure**

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

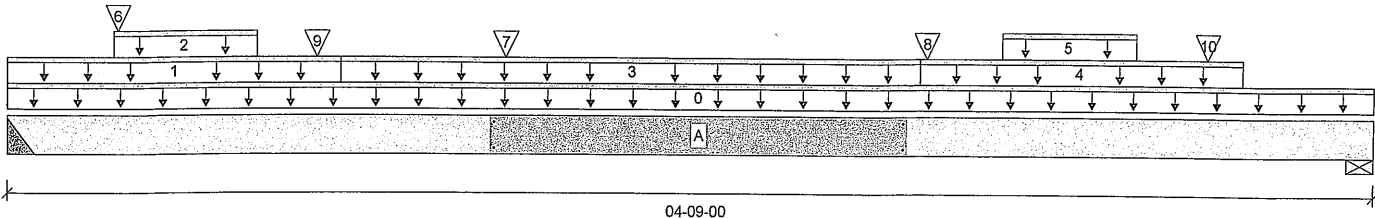
BC CALC® Member Report  
Build 7493

Dry | 1 span | No cant.

October 14, 2020 11:27:17

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

File name: 38-11 EL B.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B9B(i1606)  
Specifier:  
Designer: LBV  
Company:



B1

Total Horizontal Product Length = 04-09-00

B2

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

| Bearing | Live    | Dead    | Snow     | Wind |
|---------|---------|---------|----------|------|
| B1, 4"  | 397 / 0 | 581 / 0 | 368 / 0  |      |
| B2, 5"  | 302 / 0 | 849 / 0 | 1016 / 0 |      |

### Load Summary

| Tag | Description | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|-------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight | Unf. Lin. (lb/ft) | L    | 00-00-00 | 04-09-00 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | E32(i1977)  | Unf. Lin. (lb/ft) | L    | 00-00-00 | 01-01-12 | Top  |              | 81           |              |              | n/a       |
| 2   | E32(i1977)  | Unf. Lin. (lb/ft) | L    | 00-04-05 | 00-10-04 | Top  |              | 56           | 129          |              | n/a       |
| 3   | E33(i1978)  | Unf. Lin. (lb/ft) | L    | 01-01-12 | 03-01-12 | Top  |              | 61           |              |              | n/a       |
| 4   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 03-01-12 | 04-03-08 | Top  |              | 81           |              |              | n/a       |
| 5   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 03-05-04 | 03-11-00 | Top  |              | 56           | 129          |              | n/a       |
| 6   | J4(i1593)   | Conc. Pt. (lbs)   | L    | 00-04-08 | 00-04-08 | Top  | 166          | 83           |              |              | n/a       |
| 7   | J4(i1595)   | Conc. Pt. (lbs)   | L    | 01-08-08 | 01-08-08 | Top  | 239          | 119          |              |              | n/a       |
| 8   | -           | Conc. Pt. (lbs)   | L    | 03-02-00 | 03-02-00 | Top  | 212          | 325          | 426          |              | n/a       |
| 9   | E32(i1977)  | Conc. Pt. (lbs)   | L    | 01-00-12 | 01-00-12 | Top  |              | 93           | 170          |              | n/a       |
| 10  | -           | Conc. Pt. (lbs)   | L    | 04-02-00 | 04-02-00 | Top  | 82           | 390          | 663          |              | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/<br>Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-----------------------|------|----------|
| Pos. Moment           | 1836 ft-lbs     | 35392 ft-lbs        | 5.2%                  | 13   | 03-00-08 |
| End Shear             | 1569 lbs        | 14464 lbs           | 10.8%                 | 13   | 03-04-02 |
| Total Load Deflection | L/999 (0.004")  | n/a                 | n/a                   | 35   | 02-04-08 |
| Live Load Deflection  | L/999 (0.003")  | n/a                 | n/a                   | 51   | 02-05-08 |
| Max Defl.             | 0.004"          | n/a                 | n/a                   | 35   | 02-04-08 |
| Span / Depth          | 4.2             |                     |                       |      |          |

| Bearing Supports | Dim. (LxW)             | Demand   | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material        |
|------------------|------------------------|----------|----------------------------------|---------------------------------|-----------------|
| B1               | Hanger 4" x 3-1/2"     | 1690 lbs | n/a                              | 9.9%                            | HGUS410         |
| B2               | Wall/Plate 5" x 3-1/2" | 2887 lbs | 26.8%                            | 13.5%                           | Spruce-Pine-Fir |

### Cautions

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



ENG NO. 182420-20  
STRUCTURAL  
COMPONENT ONLY

BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 14, 2020 11:27:17

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

File name: 38-11 EL B.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B9B(i1606)  
 Specifier:  
 Designer: LBV  
 Company:

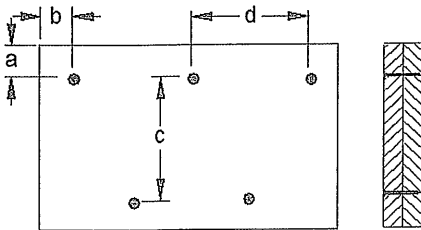
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume member is fully braced.  
 Hanger Manufacturer: Unassigned  
 Resistance Factor phi has been applied to all presented results per CSA O86.  
 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

CONFORMS TO OBC 2012

AMENDED 2020

## Connection Diagram: Full Length of Member

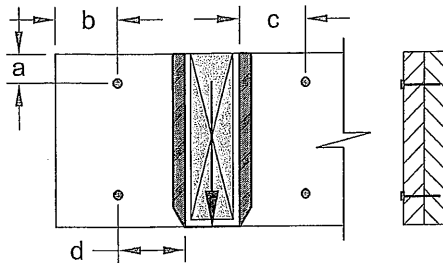


a minimum = 2"  
 b minimum = 3"  
 c = 7-7/8"  
 d = 8"

Calculated Side Load = 176.4 lb/ft  
 Connectors are: 3-1/2" ARDOX SPIRAL

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 14+15



a minimum = 2"  
 b minimum = 4"  
 c minimum = 4"  
 d maximum = 12"  
 Connectors are: 3-1/2" ARDOX SPIRAL



DWR NO. TAM 14511-20  
 STRUCTURAL  
 COMPONENT ONLY

## Disclosure

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

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

BC CALC® Member Report

Dry | 1 span | No cant.

October 14, 2020 11:45:16

Build 7493

Job name:

File name: 38-11 EL C.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B8C(i2009)

City, Province, Postal Code: RICHMOND HILL

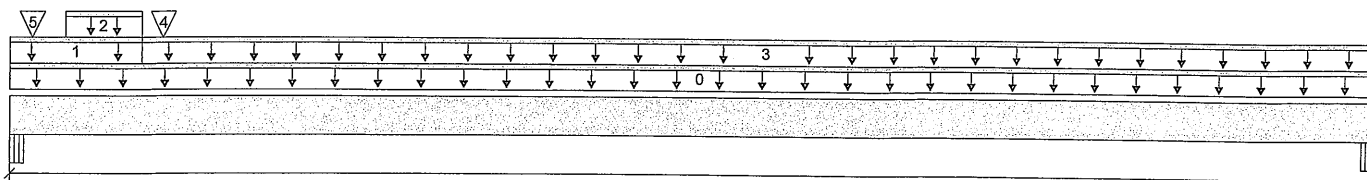
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



B1

09-08-10

B2

Total Horizontal Product Length = 09-08-10

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

| Bearing    | Live    | Dead    | Snow    | Wind |
|------------|---------|---------|---------|------|
| B1, 5-1/4" | 465 / 0 | 882 / 0 | 617 / 0 |      |
| B2, 2-5/8" | 155 / 0 | 176 / 0 | 44 / 0  |      |

### Load Summary

| Tag | Description        | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|--------------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight        | Unf. Lin. (lb/ft) | L    | 00-00-00 | 09-08-10 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 00-00-00 | 00-11-02 | Top  | 11           |              |              |              | n/a       |
| 2   | E34(i1982)         | Unf. Lin. (lb/ft) | L    | 00-04-10 | 00-11-02 | Top  |              | 156          | 163          |              | n/a       |
| 3   | FC2 Floor Material | Unf. Lin. (lb/ft) | L    | 00-11-02 | 09-08-10 | Top  | 27           | 13           |              |              | n/a       |
| 4   | -                  | Conc. Pt. (lbs)   | L    | 01-00-15 | 01-00-15 | Top  | 375          | 694          | 535          |              | n/a       |
| 5   | E36(i2249)         | Conc. Pt. (lbs)   | L    | 00-01-14 | 00-01-14 | Top  |              | 41           | 37           |              | n/a       |

### Controls Summary

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1641 ft-lbs     | 35392 ft-lbs        | 4.6%              | 1    | 02-09-01 |
| End Shear             | 1612 lbs        | 14464 lbs           | 11.1%             | 13   | 01-05-02 |
| Total Load Deflection | L/999 (0.02")   | n/a                 | n/a               | 35   | 04-07-10 |
| Live Load Deflection  | L/999 (0.011")  | n/a                 | n/a               | 51   | 04-06-05 |
| Max Defl.             | 0.02"           | n/a                 | n/a               | 35   | 04-07-10 |
| Span / Depth          | 9.3             |                     |                   |      |          |

### Bearing Supports

|         | Dim. (LxW)      | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material    |
|---------|-----------------|----------|---------------------------|--------------------------|-------------|
| B1 Beam | 5-1/4" x 3-1/2" | 2492 lbs | 25.4%                     | 11.1%                    | Unspecified |
| B2 Beam | 2-5/8" x 3-1/2" | 496 lbs  | 10.1%                     | 4.4%                     | Unspecified |

### Cautions

Concentrated side load(s) 13 are closer than 18" from end of member. Please consult a technical representative or Professional of Record.

### Notes

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

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

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

CONFORMS TO OBC 2012

AMENDED 2020


NEW NO. TAM 14512 - 20  
STRUCTURAL  
COM. ONENT ONLY



**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B8C(i2009) (Flush Beam)**

**PASSED**

BC CALC® Member Report  
Build 7493

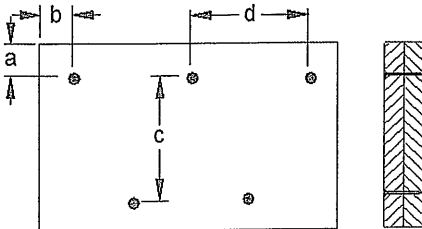
Dry | 1 span | No cant.

October 14, 2020 11:45:16

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

File name: 38-11 EL C.mmdl  
Description: 2ND FLR FRAMING\Flush Beams\B8C(i2009)  
Specifier:  
Designer: LBV  
Company:

**Connection Diagram: Full Length of Member**



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

Calculated Side Load = 373.5 lb/ft  
Connectors are: 16d Nails

**3-1/2" ARDOX SPIRAL**



DWG NO. TAM 14512-20  
STRUCTURAL  
COMPONENT ONLY

**Disclosure**

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

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP**  
**2ND FLR FRAMING\Flush Beams\B9C(i1987) (Flush Beam)**

**PASSED**

BC CALC® Member Report

Dry | 1 span | No cant.

October 14, 2020 11:45:16

Build 7493

Job name:

File name: 38-11 EL C.mmdl

Address:

Description: 2ND FLR FRAMING\Flush Beams\B9C(i1987)

City, Province, Postal Code: RICHMOND HILL

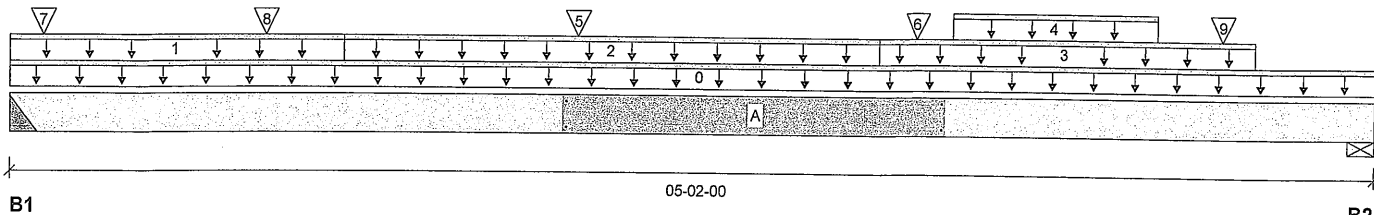
Specifier:

Customer:

Designer: LBV

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 05-02-00

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

| Bearing | Live    | Dead    | Snow    | Wind |
|---------|---------|---------|---------|------|
| B1, 4"  | 390 / 0 | 659 / 0 | 486 / 0 |      |
| B2, 5"  | 346 / 0 | 811 / 0 | 858 / 0 |      |

**Load Summary**

| Tag | Description | Load Type         | Ref. | Start    | End      | Loc. | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Tributary |
|-----|-------------|-------------------|------|----------|----------|------|--------------|--------------|--------------|--------------|-----------|
| 0   | Self-Weight | Unf. Lin. (lb/ft) | L    | 00-00-00 | 05-02-00 | Top  |              | 12           |              |              | 00-00-00  |
| 1   | E32(i1977)  | Unf. Lin. (lb/ft) | L    | 00-00-00 | 01-03-00 | Top  |              | 81           |              |              | n/a       |
| 2   | E33(i1978)  | Unf. Lin. (lb/ft) | L    | 01-03-00 | 03-03-00 | Top  |              | 61           |              |              | n/a       |
| 3   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 03-03-00 | 04-08-08 | Top  |              | 81           |              |              | n/a       |
| 4   | E24(i340)   | Unf. Lin. (lb/ft) | L    | 03-06-08 | 04-04-00 | Top  |              | 56           | 129          |              | n/a       |
| 5   | J4(i2026)   | Conc. Pt. (lbs)   | L    | 02-01-08 | 02-01-08 | Top  | 239          | 119          |              |              | n/a       |
| 6   | -           | Conc. Pt. (lbs)   | L    | 03-04-13 | 03-04-13 | Top  | 212          | 196          | 163          |              | n/a       |
| 7   | E32(i1977)  | Conc. Pt. (lbs)   | L    | 00-01-08 | 00-01-08 | Top  |              | 113          | 223          |              | n/a       |
| 8   | -           | Conc. Pt. (lbs)   | L    | 00-11-09 | 00-11-09 | Top  | 203          | 195          | 193          |              | n/a       |
| 9   | -           | Conc. Pt. (lbs)   | L    | 04-07-00 | 04-07-00 | Top  | 82           | 390          | 663          |              | n/a       |

**Controls Summary**

|                       | Factored Demand | Factored Resistance | Demand/Resistance | Case | Location |
|-----------------------|-----------------|---------------------|-------------------|------|----------|
| Pos. Moment           | 1704 ft-lbs     | 35392 ft-lbs        | 4.8%              | 1    | 02-07-07 |
| End Shear             | 1329 lbs        | 14464 lbs           | 9.2%              | 13   | 03-09-02 |
| Total Load Deflection | L/999 (0.005")  | n/a                 | n/a               | 35   | 02-06-09 |
| Live Load Deflection  | L/999 (0.003")  | n/a                 | n/a               | 51   | 02-07-07 |
| Max Defl.             | 0.005"          | n/a                 | n/a               | 35   | 02-06-09 |
| Span / Depth          | 4.6             |                     |                   |      |          |

**Bearing Supports**

|    | Dim. (LxW)             | Demand   | Demand/Resistance Support | Demand/Resistance Member | Material        |
|----|------------------------|----------|---------------------------|--------------------------|-----------------|
| B1 | Hanger 4" x 3-1/2"     | 1943 lbs | n/a                       | 11.4%                    | HGUS410         |
| B2 | Wall/Plate 5" x 3-1/2" | 2648 lbs | 24.6%                     | 12.4%                    | Spruce-Pine-Fir |

**Cautions**

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

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



BWG NO. TAM 14513-20  
 STRUCTURAL  
 COMPONENT ONLY

BC CALC® Member Report  
 Build 7493

Dry | 1 span | No cant.

October 14, 2020 11:45:16

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

File name: 38-11 EL C.mmdl  
 Description: 2ND FLR FRAMING\Flush Beams\B9C(i1987)  
 Specifier:  
 Designer: LBV  
 Company:

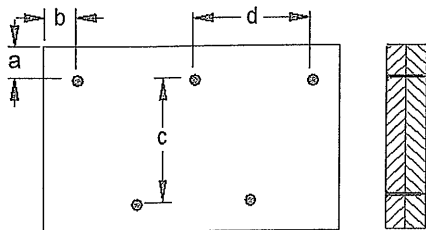
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume member is fully braced.  
 Hanger Manufacturer: Unassigned  
 Resistance Factor phi has been applied to all presented results per CSA O86.  
 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

CONFORMS TO OBC 2012

AMENDED 2020

## Connection Diagram: Full Length of Member



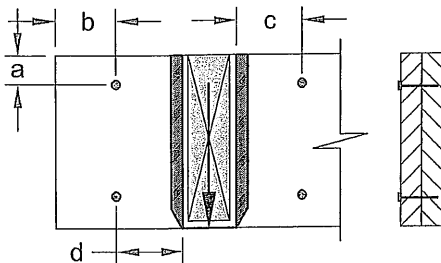
a minimum = 2"  
 b minimum = 3"  
 c = 7-7/8"  
 d = 8"

Calculated Side Load = 216.0 lb/ft  
 Connectors are: 1 Nails

**3-1/2" ARDOX SPIRAL**

## Connection Diagrams: Concentrated Side Loads

Connection Tag: A Applies to load tag(s): 19+26



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

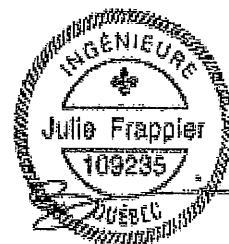
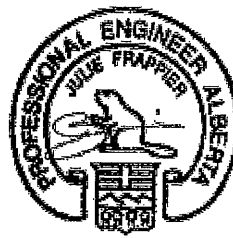
**3-1/2" ARDOX SPIRAL**



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



## Maximum Floor Spans

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

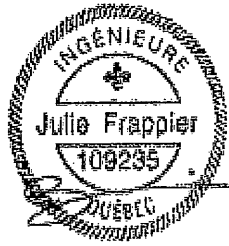
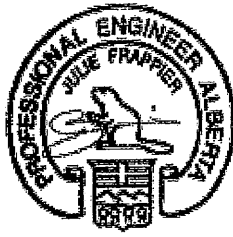
| Depth   | Series | Bare              |         |         |     | 1/2" Gypsum Ceiling |         |         |     |
|---------|--------|-------------------|---------|---------|-----|---------------------|---------|---------|-----|
|         |        | On Centre Spacing |         |         |     | On Centre Spacing   |         |         |     |
|         |        | 12"               | 16"     | 19.2"   | 24" | 12"                 | 16"     | 19.2"   | 24" |
| 9-1/2"  | NI-20  | 15'-1"            | 14'-2"  | 13'-9"  | N/A | 15'-7"              | 14'-8"  | 14'-2"  | N/A |
|         | NI-40x | 16'-1"            | 15'-2"  | 14'-8"  | N/A | 16'-7"              | 15'-7"  | 15'-1"  | N/A |
|         | NI-60  | 16'-3"            | 15'-4"  | 14'-10" | N/A | 16'-8"              | 15'-9"  | 15'-3"  | N/A |
|         | NI-70  | 17'-1"            | 16'-1"  | 15'-6"  | N/A | 17'-5"              | 16'-5"  | 15'-10" | N/A |
|         | NI-80  | 17'-3"            | 16'-3"  | 15'-8"  | N/A | 17'-8"              | 16'-7"  | 16'-0"  | N/A |
| 11-7/8" | NI-20  | 16'-11"           | 16'-0"  | 15'-5"  | N/A | 17'-6"              | 16'-6"  | 16'-0"  | N/A |
|         | NI-40x | 18'-1"            | 17'-0"  | 16'-5"  | N/A | 18'-9"              | 17'-6"  | 16'-11" | N/A |
|         | NI-60  | 18'-4"            | 17'-3"  | 16'-7"  | N/A | 19'-0"              | 17'-8"  | 17'-1"  | N/A |
|         | NI-70  | 19'-6"            | 18'-0"  | 17'-4"  | N/A | 20'-1"              | 18'-7"  | 17'-9"  | N/A |
|         | NI-80  | 19'-9"            | 18'-3"  | 17'-6"  | N/A | 20'-4"              | 18'-10" | 17'-11" | N/A |
| 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, L/480 Deflection Limit  
3/4" OSB G&N Sheathing

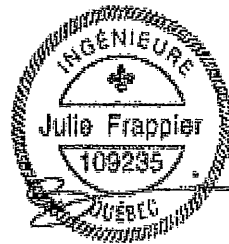
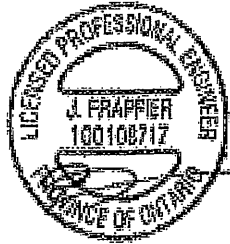
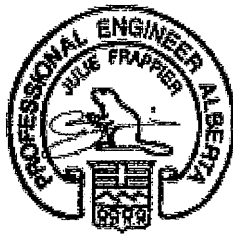


| Depth   | Series | Bare              |         |         |         | 1/2" Gypsum Ceiling |         |         |         |
|---------|--------|-------------------|---------|---------|---------|---------------------|---------|---------|---------|
|         |        | On Centre Spacing |         |    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

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

- 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 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

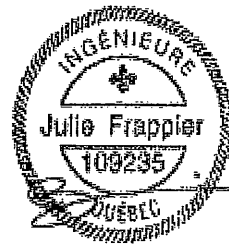
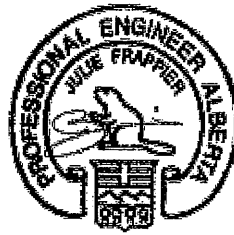
Live Load = 40 psf, Dead Load = 30 psf  
Simple Spans, L/480 Deflection Limit  
5/8" OSB G&N Sheathing

| 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'-3"              | 22'-5"  | 21'-5"  | N/A |
|         | NI-80  | 23'-11"           | 22'-1"  | 21'-1"  | N/A | 24'-8"              | 22'-10" | 21'-9"  | N/A |
|         | NI-90x | 24'-8"            | 22'-9"  | 21'-9"  | N/A | 25'-4"              | 23'-5"  | 22'-4"  | N/A |

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



## Maximum Floor Spans

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

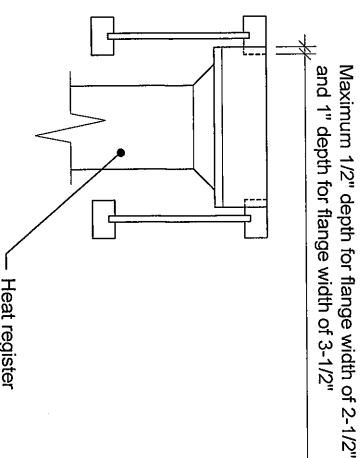
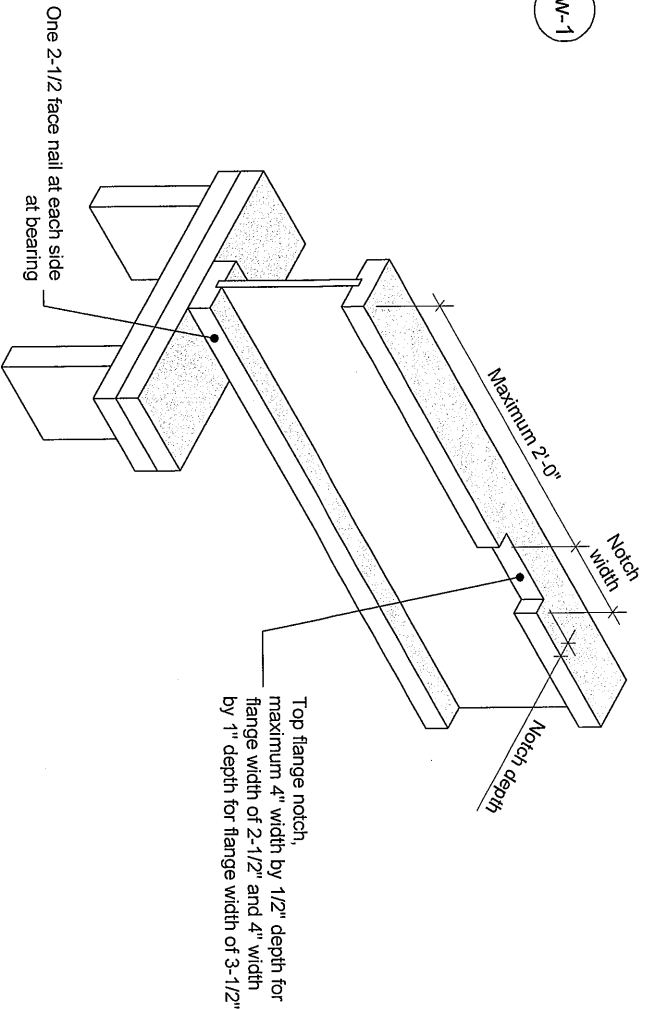
| Depth   | Series | Bare              |         |         |         | 1/2" Gypsum Ceiling |         |         |         |
|---------|--------|-------------------|---------|---------|---------|---------------------|---------|---------|---------|
|         |        | On Centre Spacing |         |         |         | 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.

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- Notes:**
1. Blocking required at bearing for lateral support, not shown for clarity.
  2. The maximum dimensions for a notch on the side of the top flange are 4-inch width by 1/2-inch depth for flange width of 2-1/2 inches, and 4-inch width by 1-inch depth for flange width of 3-1/2 inches.
  3. This detail applies to single-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](http://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.

TITLE

Notch in I-joist for Heat Register

DOCUMENT

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CATEGORY

I-joist - Typical Floor Framing and Construction Details

DATE

2018-04-10

NUMBER

1w-1

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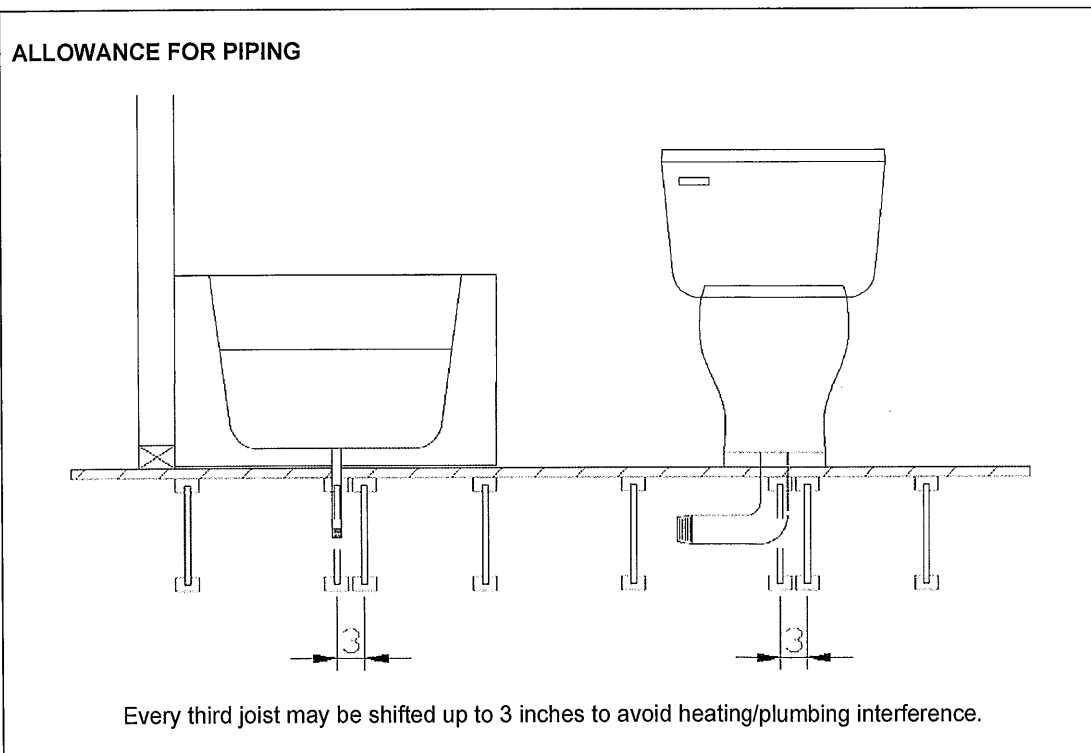
[nordic.ca](http://nordic.ca)

## 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