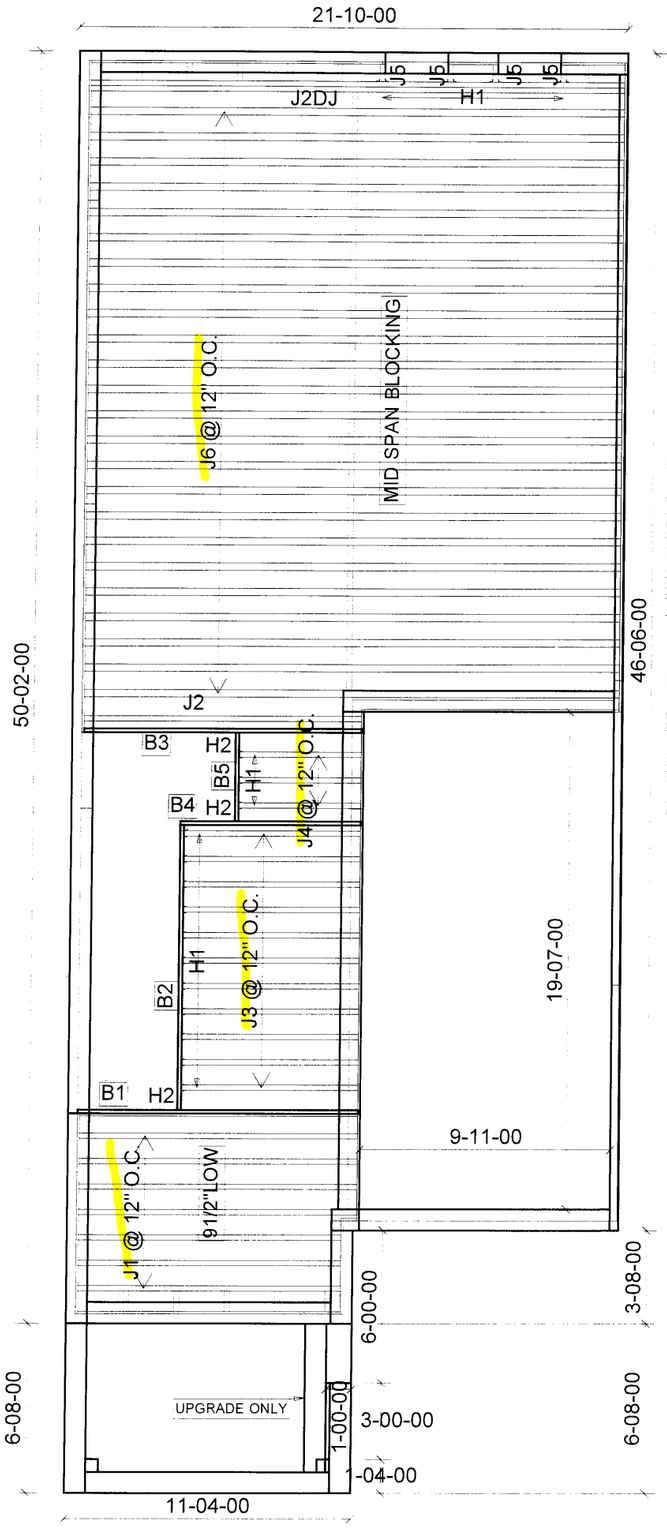



Town of Innisfil Certified Model
10/24/2018 9:02:17 AM kbayley

Products

| PlotID | Length | Product | Plies | Net Qty |
|---|---|---|---|---|
| J1 | 12-00-00 | 9 1/2" NI-40x | 1 | 7 |
| J2DJ | 22-00-00 | 11 7/8" NI-40x | 2 | 2 |
| J2 | 12-00-00 | 11 7/8" NI-40x | 1 | 1 |
| J3 | 8-00-00 | 11 7/8" NI-40x | 1 | 11 |
| J4 | 6-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J5 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J6 | 22-00-00 | 11 7/8" NI-80 | 1 | 24 |
| B1 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B2 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B3 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B4 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B5 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

Connector Summary

| Qty | Manuf | Product |
|---|---|---|
| 14 | H1 | IUS2.56/11.88 |
| 4 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: A,A2,B,A2UPGRADE

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

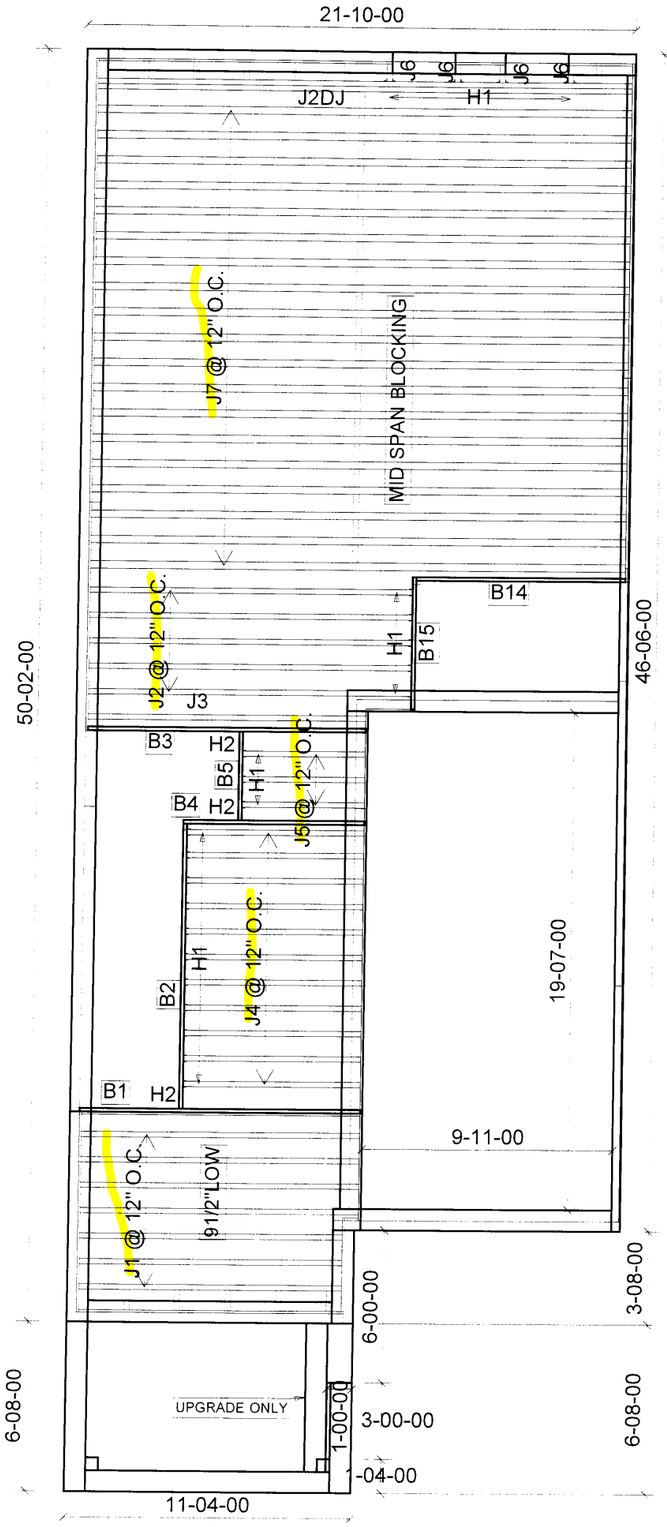
NOTES:
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
**SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS.
**MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK**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

**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

**DATE:** 31/07/2018

# 1st FLOOR




Products

| PlotID | Length | Product | Plies | Net Qty |
|---|---|---|---|---|
| J1 | 12-00-00 | 9 1/2" NI-40x | 1 | 7 |
| J2DJ | 22-00-00 | 11 7/8" NI-40x | 2 | 2 |
| J2 | 14-00-00 | 11 7/8" NI-40x | 1 | 5 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 1 |
| J4 | 8-00-00 | 11 7/8" NI-40x | 1 | 11 |
| J5 | 6-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J6 | 2-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J7 | 22-00-00 | 11 7/8" NI-80 | 1 | 19 |
| B1 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B2 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B3 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B14 | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B4 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B15 | 6-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B5 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

Connector Summary

| Qty | Manuf | Product |
|---|---|---|
| 19 | H1 | IUS2.56/11.88 |
| 4 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: A,A2,B A2 UPGRADE

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

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

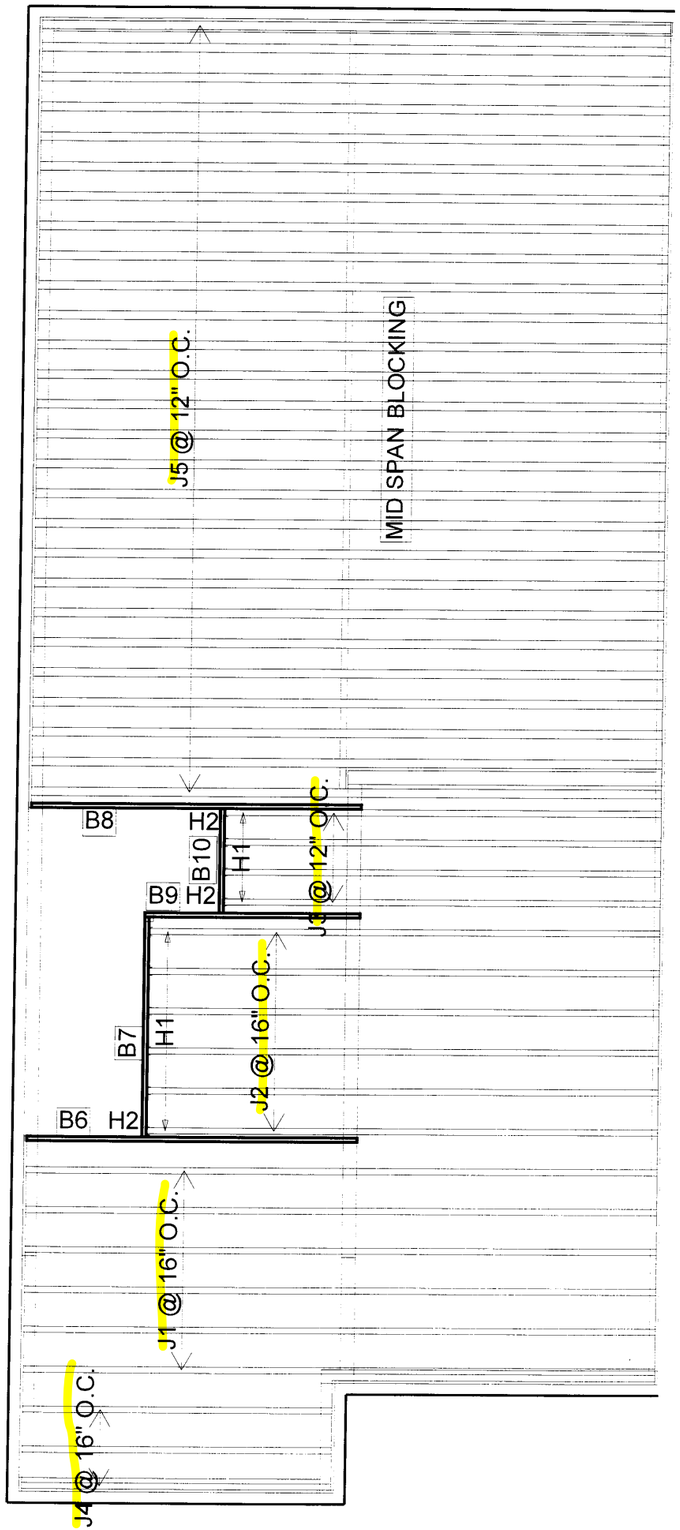
**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

**DATE:** 31/07/2018

# 1st FLOOR

SUNKEN




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 22-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J2 | 18-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J3 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J4 | 12-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J5 | 22-00-00 | 11 7/8" NI-80 | 1 | 27 |
| B6 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B7 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B9 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B10 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 10 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: A

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

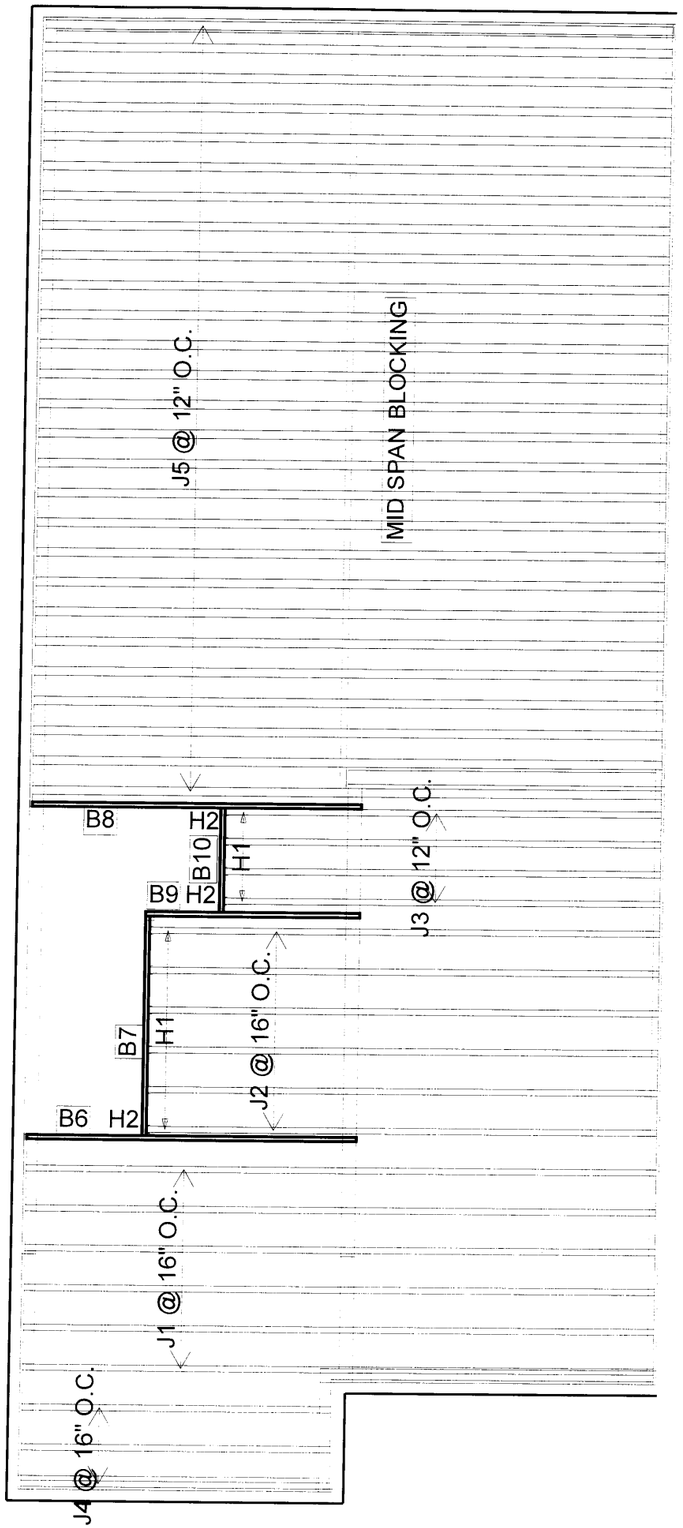
NOTES:
REFER TO THE NORDIC **INSTALLATION GUIDE** FOR PROPER STORAGE AND INSTALLATION. **SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F. REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER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

**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

**DATE:** 31/07/2018

# 2nd FLOOR




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 22-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J2 | 18-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J3 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J4 | 12-00-00 | 11 7/8" NI-40x | 1 | 3 |
| J5 | 22-00-00 | 11 7/8" NI-80 | 1 | 27 |
| B6 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B7 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B9 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B10 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 10 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: B

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

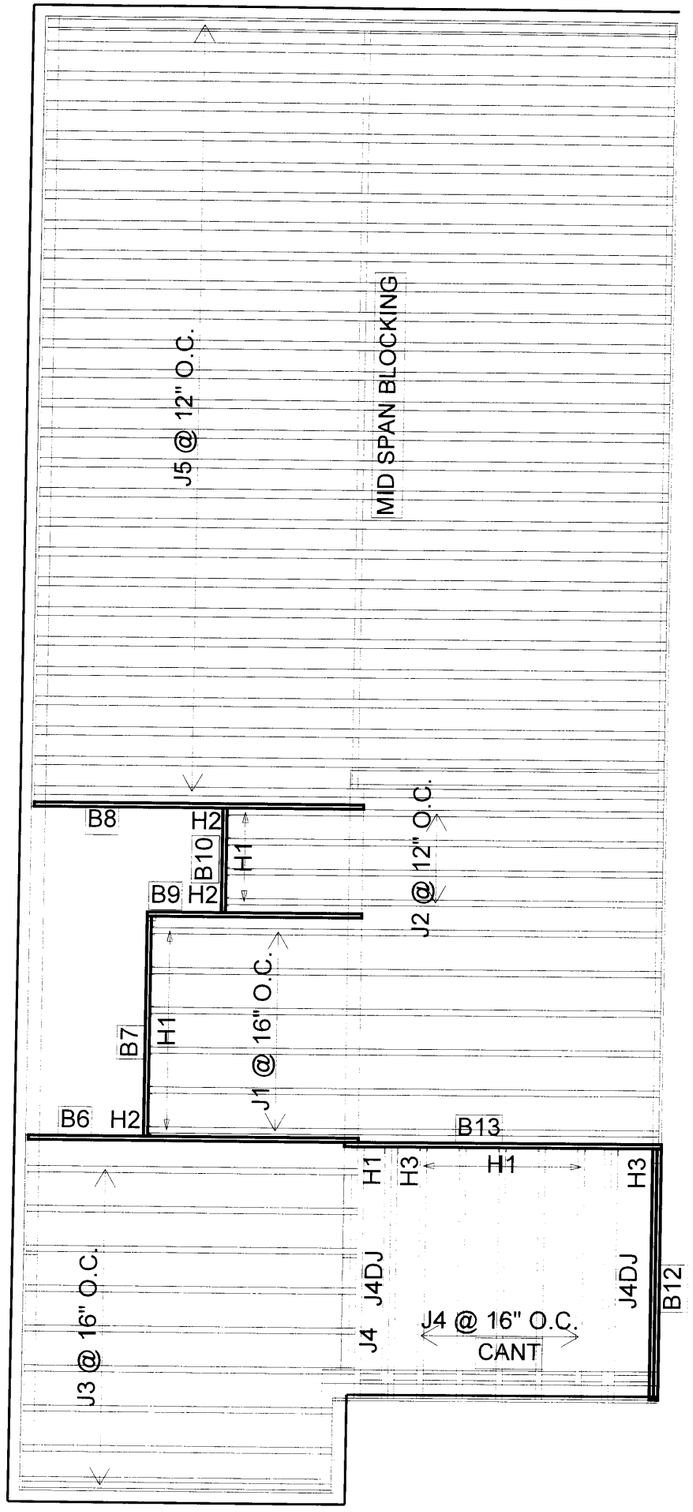
NOTES:
REFER TO THE NORDIC **INSTALLATION GUIDE** FOR PROPER STORAGE AND INSTALLATION. **SQUASH BLOCKS** OF 2x4, 2x6, 2x8 #2 S.P.F. REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER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

**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

**DATE:** 31/07/2018

# 2nd FLOOR




| Products | | | | |
|---|---|---|---|---|
| PlotID | Length | Product | Plies | Net Qty |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 9 |
| J4 | 10-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J4DJ | 10-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J5 | 22-00-00 | 11 7/8" NI-80 | 1 | 27 |
| B13 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B6 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B12 | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B7 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B9 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B10 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

| Connector Summary | | |
|---|---|---|
| Qty | Manuf | Product |
| 16 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |
| 2 | H3 | HU310-2 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: A2

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

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

**LOADING:**
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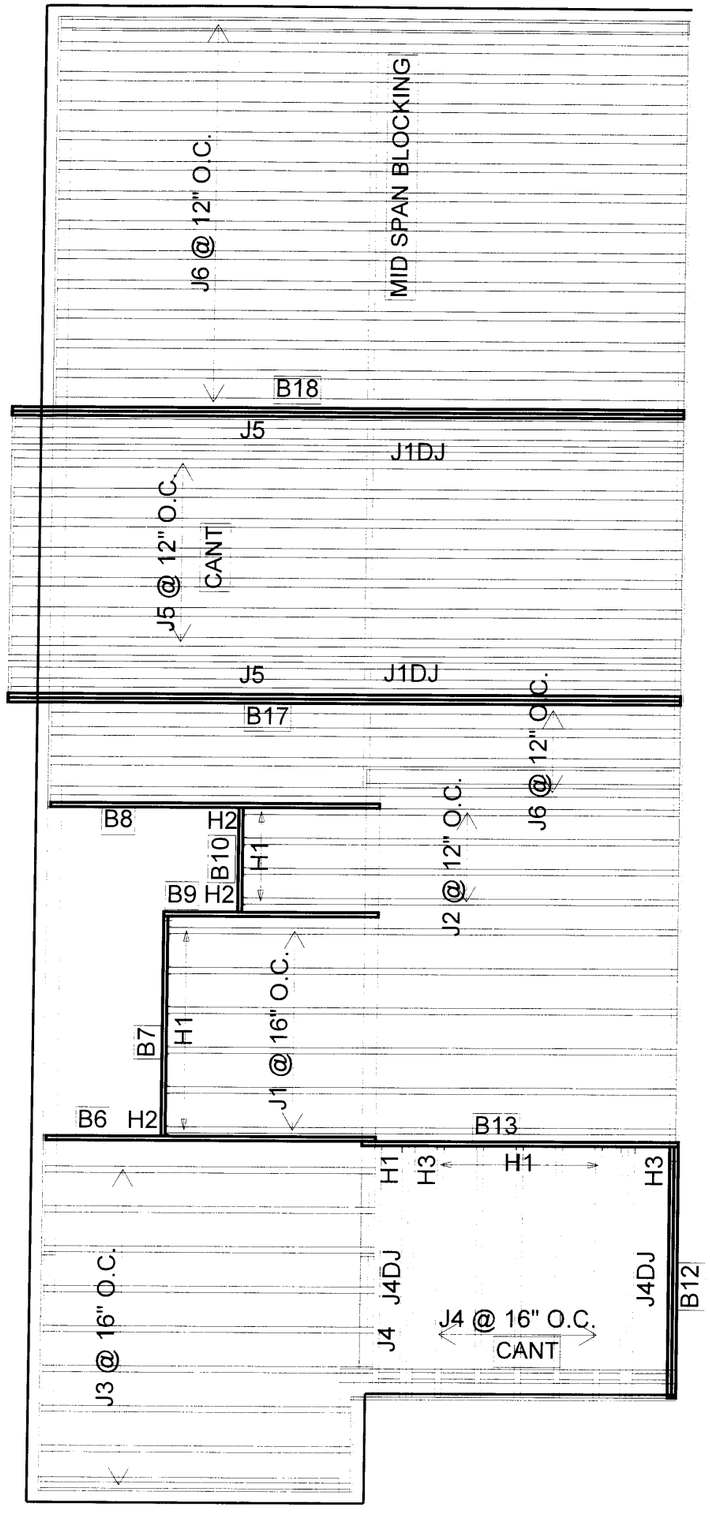
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

**DATE:** 31/07/2018

# 2nd FLOOR




Products

| PlotID | Length | Product | Plies | Net Qty |
|---|---|---|---|---|
| J1DJ | 24-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J1 | 18-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J2 | 16-00-00 | 11 7/8" NI-40x | 1 | 4 |
| J3 | 12-00-00 | 11 7/8" NI-40x | 1 | 9 |
| J4 | 10-00-00 | 11 7/8" NI-40x | 1 | 6 |
| J4DJ | 10-00-00 | 11 7/8" NI-40x | 2 | 4 |
| J5 | 24-00-00 | 11 7/8" NI-80 | 1 | 9 |
| J6 | 22-00-00 | 11 7/8" NI-80 | 1 | 18 |
| B17 | 24-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B18 | 24-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B13 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B6 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B8 | 12-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B12 | 10-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 2 | 2 |
| B7 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B9 | 8-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |
| B10 | 4-00-00 | 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP | 1 | 1 |

Connector Summary

| Qty | Manuf | Product |
|---|---|---|
| 16 | H1 | IUS2.56/11.88 |
| 3 | H2 | HUS1.81/10 |
| 2 | H3 | HU310-2 |

TAMARACK LUMBER INC
ALPA LUMBER GROUP

FROM PLAN DATED: JAN 2018

BUILDER: BAYVIEW WELLINGTON

SITE: ALCONA SHORES

MODEL: TH-7E

ELEVATION: A2 UPGRADE

LOT:

CITY: INNISFIL

SALESMAN: M D
DESIGNER: CZ
REVISION:

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

**LOADING:**
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²

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

DATE: 31/07/2018

# 2nd FLOOR

NORDIC STRUCTURES

**COMPANY**
TAMARACK LUMBER
3269 NORTH SERVICE ROAD
BURLINGTON, ON
by CZ
Apr. 26, 2018 16:11

**PROJECT**
J6-1ST FL.wwb

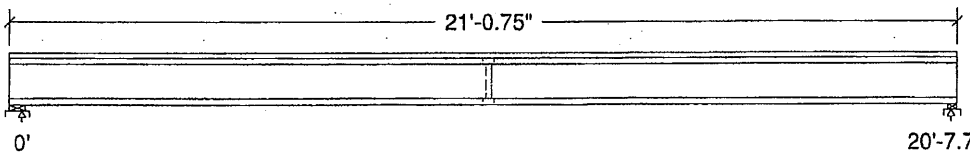
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.0

### Loads:

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

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




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 206 | | 206 |
| Live | 413 | | 413 |
| Factored: | | | |
| Total | 878 | | 878 |
| Bearing: | | | |
| Resistance | | | |
| Joist | 2336 | | 2186 |
| Support | 10829 | | 5559 |
| Des ratio | | | |
| Joist | 0.38 | | 0.40 |
| Support | 0.08 | | 0.16 |
| Load case | #2 | | #2 |
| Length | 4-3/8 | | 2-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | 1.00 | | 1.00 |
| fcp sup | 769 | | 769 |
| Kzcp sup | 1.15 | | 1.09 |


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

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

Total length: 21'-0.75"; Clear span: 20'-5.99"; 3/4" nailed and glued OSB sheathing with 1 row of blocking

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

### Limit States Design using CSA-O86-09 and Vibration Criterion:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 878 | Vr = 2336 | lbs | Vf/Vr = 0.38 |
| Moment(+) | Mf = 4530 | Mr = 11609 | lbs-ft | Mf/Mr = 0.39 |
| Perm. Defl'n | 0.15 = < L/999 | 0.69 = L/360 | in | 0.21 |
| Live Defl'n | 0.29 = L/840 | 0.52 = L/480 | in | 0.57 |
| Total Defl'n | 0.44 = L/560 | 1.03 = L/240 | in | 0.43 |
| Bare Defl'n | 0.33 = L/746 | 0.69 = L/360 | in | 0.48 |
| Vibration | Lmax = 20'-7.8 | Lv = 22'-6.2 | ft | 0.92 |
| Defl'n | = 0.026 | = 0.032 | in | 0.82 |

DWG NO. TAM 42/0-18 H
STRUCTURAL
COMPONENT ONLY

T-18071562

## Additional Data:

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

CRITICAL LOAD COMBINATIONS:

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

CALCULATIONS:

```
 Deflection:  EIeff =    625e06 lb-in2  K=  6.18e06 lbs
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow…)
```

## Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-09 Engineering Design in Wood standard, which includes Update No.1
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.

CONFORMS TO OBC 2012

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

DWG NO. TAM 4210 -18H
STRUCTURAL
COMPONENT ONLY

T-18071562C2)

**NORDIC STRUCTURES**

| COMPANY | PROJECT |
|---|---|
| TAMARACK LUMBER<br>3269 NORTH SERVICE ROAD<br>BURLINGTON, ON<br>by CZ<br>Apr. 26, 2018 15:40 | J5-2ND FL.wwb |

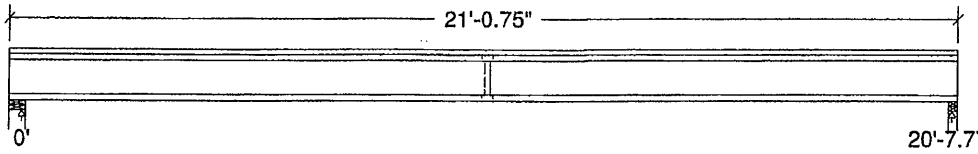
## Design Check Calculation Sheet

Nordic Sizer – Canada 7.0

### Loads:

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

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




| | | | |
|---|---|---|---|
| Unfactored: | | | |
| Dead | 206 | | 206 |
| Live | 413 | | 413 |
| Factored: | | | |
| Total | 878 | | 878 |
| Bearing: | | | |
| Resistance | | | |
| Joist | 2336 | | 2186 |
| Support | 10829 | | 5559 |
| Des ratio | | | |
| Joist | 0.38 | | 0.40 |
| Support | 0.08 | | 0.16 |
| Load case | #2 | | #2 |
| Length | 4-3/8 | | 2-3/8 |
| Min req'd | 1-3/4 | | 1-3/4 |
| Stiffener | No | | No |
| KD | 1.00 | | 1.00 |
| KB support | 1.00 | | 1.00 |
| fcp sup | 769 | | 769 |
| Kzcp sup | 1.15 | | 1.09 |

REGISTERED PROFESSIONAL ENGINEER E. FOK PROVINCE OF ONTARIO

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

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

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

Total length: 21'-0.75"; Clear span: 20'-5.99"; 3/4" nailed and glued OSB sheathing with 1 row of blocking and 1/2" gypsum ceiling

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

DWG NO. TAM 4211-18H
STRUCTURAL COMPONENT ONLY

P6 of 6

T-18071563

## Limit States Design using CSA-O86-09 and Vibration Criterion:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---|---|---|---|---|
| Shear | Vf = 878 | Vr = 2336 | lbs | Vf/Vr = 0.38 |
| Moment(+) | Mf = 4530 | Mr = 11609 | lbs-ft | Mf/Mr = 0.39 |
| Perm. Defl'n | 0.15 = < L/999 | 0.69 = L/360 | in | 0.21 |
| Live Defl'n | 0.29 = L/840 | 0.52 = L/480 | in | 0.57 |
| Total Defl'n | 0.44 = L/560 | 1.03 = L/240 | in | 0.43 |
| Bare Defl'n | 0.33 = L/746 | 0.69 = L/360 | in | 0.48 |
| Vibration | Lmax = 20'-7.8 | Lv = 24'-3.6 | ft | 0.85 |
| Defl'n | = 0.022 | = 0.032 | in | 0.69 |

## Additional Data:

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

CRITICAL LOAD COMBINATIONS:

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

CALCULATIONS:

Deflection: EIeff = 625e06 lb-in2 K= 6.18e06 lbs
"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

REGISTERED PROFESSIONAL ENGINEER E. FOK PROVINCE OF ONTARIO

## Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC), Division B, Part 4, and the CSA O86-09 Engineering Design in Wood standard, which includes Update No.1
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.

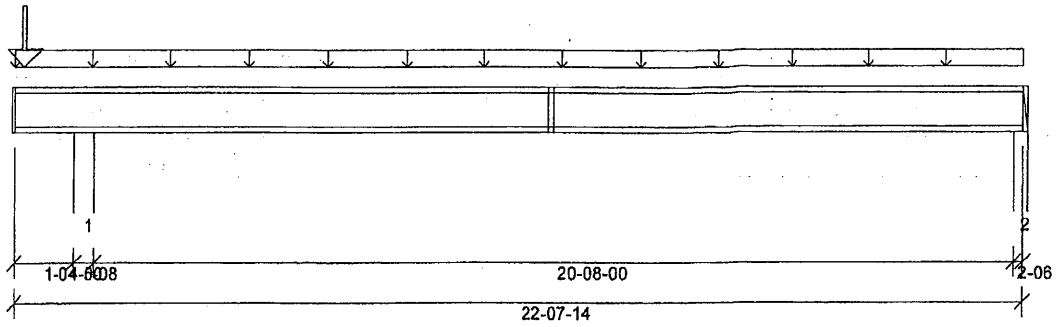
CONFORMS TO OBC 2012

DWG NO. TAM 4211 -18 V4
STRUCTURAL COMPONENT ONLY

T-18071563(2)

| TAMARACK LUMBER INC. | Customer: | Job Name: TH-7E-ELA2UPGRADE | 2 Ply Member | Status: |
|---|---|---|---|---|
| | Street 1: | Level: 2ND FLOOR FRAMING | 11 7/8" NI-40x | Design Passed |
| | City: | Label: J1 - i2006 | | |
| | From Plan Date: JAN 2018 | Type: FloorJoist | | |

Graphical Illustration Not to Scale. Pitch: 0/12 Designed by: MiTek SAPPHIRE™ Structure Version 8.2.0.246.Update1 ReportVersion: 2016.08.17 05/10/2018 15:15




## DESIGN INFORMATION

| | |
|---|---|
| Building Code: | NBCC 2010, Part9 |
| Design Methodology: | LSD |
| Service Condition: | Dry |
| System Live Load: | 40.0 psf |
| System Dead Load: | 20.0 psf |
| System Spacing: | 16" c.c |
| LL Deflection Limit: | L/480, |
| TL Deflection Limit: | L/240, |

CONFORMS TO OBC 2012

**Floor Assembly Requirements:**

| | |
|---|---|
| Subfloor: | 3/4" Softwood Plywood |
| Connection: | Glued And Nailed |
| Ceiling: | None |
| Blocking | None |
| Bridging: | None |
| Strapping: | None |

**Lateral Restraint Requirements:**

Top and bottom edges of member to be fully restrained laterally, or have the following maximum unbraced length:

Top: 0-00 Bottom: 10-03-08

**Factored Resistance of Support Material:**

- 534 psi Wall @ 1-06-12
- 534 psi Wall @ 22-06-08

**Ply to Ply Connection:**

Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

MITEK RECOMMENDS 2x6 @ 24" O/C TOP & BOTTOM CHORD STAGGERED.

## ANALYSIS RESULTS

| Design Criteria | Location | Load Combination | Design | Limit | Result |
|---|---|---|---|---|---|
| Max Factored Moment: | 12-04-04 | 1.25D + 1.5L | 2941 lb ft | 13761 lb ft | Passed - 21% |
| Max Factored Shear: | 1-03-15 | 1.25D + 1.5S + 0.5L | 1118 lb | 4680 lb | Passed - 24% |
| Live Load (LL) Deflection: | 12-00-10 | L | 0.162" | L/480 | Passed - L/999 |
| Total Load (TL) Deflection: | 12-02-01 | D + L | 0.225" | L/240 | Passed - L/999 |
| Vibration Controlled Span: | - | - | 20-08-00 | 20-09-14 | Passed - 99% |

## SUPPORT AND REACTION INFORMATION

| Support Location | Input Bearing Length | Controlling Load Combination | LDF | Factored Downward Reaction | Factored Uplift Reaction | Factored Resistance of Member | Factored Resistance of Support | Result |
|---|---|---|---|---|---|---|---|---|
| 1-06-12 | 5-08 | 1.25D + 1.5S + 0.5L | 1.00 | 1510 lb | | 11180 lb | 14685 lb | Passed - 14% |
| 22-06-08 | 2-06 | 1.25D + 1.5L | 1.00 | 589 lb | | 4203 lb | 6341 lb | Passed - 14% |

## SPECIFIED LOADS

| Type | Start Loc | End Loc | Source | Dead (D) | Live (L) | Snow (S) |
|---|---|---|---|---|---|---|
| Uniform | 0-00 | 22-07-14 | FC3 Floor Material | 13.00 lb/ft | 27.00 lb/ft | - |
| Point | 2-12 | 2-12 | E18(I1701) | 203.00 lb | 145.00 lb | 501.00 lb |

## UNFACTORED REACTIONS

| ID | Start Loc | End Loc | Source | Dead (D) | Live (L) | Snow (S) |
|---|---|---|---|---|---|---|
| 1 | 1-04-00 | 1-09-08 | E2(I135) | 380.00 lb | 479.00 lb | 538.00 lb |
| 2 | 22-05-08 | 22-07-14 | E10(I186) | 127.00 lb | 285.00/-12.00 lb | -37.00 lb |

## DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as sloped dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Design for vibration control is based on the concluding report: "Development of Design Procedures for Vibration Controlled Spans Using Engineered Wood Members," dated Sep-04-97
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Actual field conditions may differ from those shown. These results should be reviewed by a qualified design professional.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Anchorage for uplift reactions to be specified by others. Installation of member as per manufacturer's instruction.
- The deflection at the cantilever for either live and/or total loads is less than 3/8" and therefore has been excluded from the deflection ratio considerations.

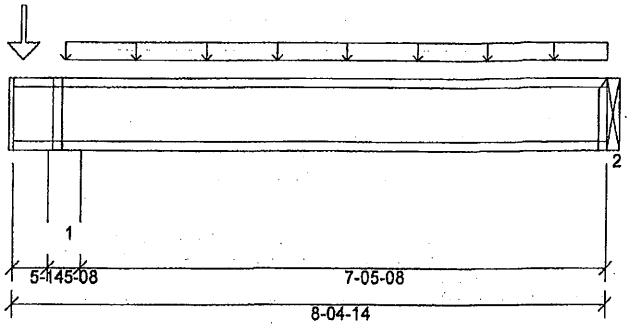
REGISTERED PROFESSIONAL ENGINEER E. FOK PROVINCE OF ONTARIO

DWG NO. TAM 4212-18H
STRUCTURAL
COMPONENT ONLY

T-18071564

| TAMARACK LUMBER INC. | Customer: | Job Name: TH-7E-ELA2 | 2 Ply Member | Status: |
|---|---|---|---|---|
| | Street 1: | Level: 2ND FLOOR FRAMING | 11 7/8" NI-40x | Design Passed |
| | City: | Label: J4DJ - I1517 | | |
| | From Plan Date: JAN 2018 | Type: FloorJoist | | |

Graphical Illustration Not to Scale. Pitch: 0/12 Designed by: MiTek SAPPHIRE™ Structure Version 8.2.0.246.Update1 ReportVersion: 2016.08.17 05/10/2018 15:13




## DESIGN INFORMATION

| | |
|---|---|
| Building Code: | NBCC 2010, Part9 |
| Design Methodology: | LSD |
| Service Condition: | Dry |
| System Live Load: | 40.0 psf |
| System Dead Load: | 20.0 psf |
| System Spacing: | 16" c.c |
| LL Deflection Limit: | L/480, |
| TL Deflection Limit: | L/240, |

CONFORMS TO OBC 2012

**Floor Assembly Requirements:**

| | |
|---|---|
| Subfloor: | 3/4" Softwood Plywood |
| Connection: | Glued And Nailed |
| Ceiling: | None |
| Blocking | None |
| Bridging: | None |
| Strapping: | None |

**Lateral Restraint Requirements:**

Top and bottom edges of member to be fully restrained laterally, or have the following maximum unbraced length:

Top: 0-00 Bottom: 7-05-08

**Factored Resistance of Support Material:**

- 534 psi Wall @ 8-10
- 534 psi Beam @ 8-04-14

**Ply to Ply Connection:**

Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

MIN 2" CLIP OR EQUAL ALONG TOP & BOTTOM CHORD @ 24" O/C STAGGERED.

## ANALYSIS RESULTS

| Design Criteria | Location | Load Combination | Design | Limit | Result |
|---|---|---|---|---|---|
| Max Factored Moment: | 8-10 | 1.25D + 1.5S + 0.5L | 726 lb ft | 13761 lb ft | Passed - 5% |
| Max Factored Shear: | 1-10 | 1.25D + 1.5S + 0.5L | 1240 lb | 4680 lb | Passed - 26% |
| Live Load (LL) Deflection: | 4-07-15 | S + 0.5L | 0.005" | L/480 | Passed - L/999 |
| Total Load (TL) Deflection: | 4-08-15 | D + L | 0.013" | L/240 | Passed - L/999 |
| Vibration Controlled Span: | - | - | 7-05-08 | 20-09-15 | Passed - 36% |

## SUPPORT AND REACTION INFORMATION

| Support Location | Input Bearing Length | Controlling Load Combination | LDF | Factored Downward Reaction | Factored Uplift Reaction | Factored Resistance of Member | Factored Resistance of Support | Result |
|---|---|---|---|---|---|---|---|---|
| 8-10 | 5-08 | 1.25D + 1.5S + 0.5L | 1.00 | 1565 lb | | 4680 lb | 14685 lb | Passed - 33% |
| 8-04-14 | 1-12 | 1.25D + 1.5L | 1.00 | 398 lb | | 4020 lb | - | Passed - 10% |

## CONNECTOR INFORMATION

| ID | Part No. | Manufacturer | Other Information or Requirement for Reinforcement Accessories |
|---|---|---|---|
| 2 | HU310-2 | | Connector has not been designed. Connector to be specified by others.. |

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction.

## SPECIFIED LOADS

| Type | Start Loc | End Loc | Source | Dead (D) | Live (L) | Snow (S) |
|---|---|---|---|---|---|---|
| Uniform | 8-10 | 8-04-14 | FC3 Floor Material | 27.00 lb/ft | 53.00 lb/ft | - |
| Point | 1-09 | 1-09 | - | 260.00 lb | 181.00 lb | 550.00 lb |

## UNFACTORED REACTIONS

| ID | Start Loc | End Loc | Source | Dead (D) | Live (L) | Snow (S) |
|---|---|---|---|---|---|---|
| 1 | 5-14 | 11-06 | E8(I185) | 387.00 lb | 403.00 lb | 601.00 lb |
| 2 | 8-04-14 | 8-04-14 | B13(I1504) | 80.00 lb | 192.00 lb | -51.00 lb |

## DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as sloped dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Design for vibration control is based on the concluding report: "Development of Design Procedures for Vibration Controlled Spans Using Engineered Wood Members," dated Sep-04-97
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Actual field conditions may differ from those shown. These results should be reviewed by a qualified design professional.
- Review all loads and reactions to ensure that the member bearing/connection structure can resist adequately. Anchorage for uplift reactions to be specified by others. Installation of member as per manufacturer's instruction.
- The deflection at the cantilever for either live and/or total loads was small (0.0" and therefore has been excluded from the deflection ratio considerations.

REGISTERED PROFESSIONAL ENGINEER E. FOK PROVINCE OF ONTARIO

DWG NO. TAM 4213-18 H
STRUCTURAL COMPONENT ONLY

T-18071565

Boise Cascade

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

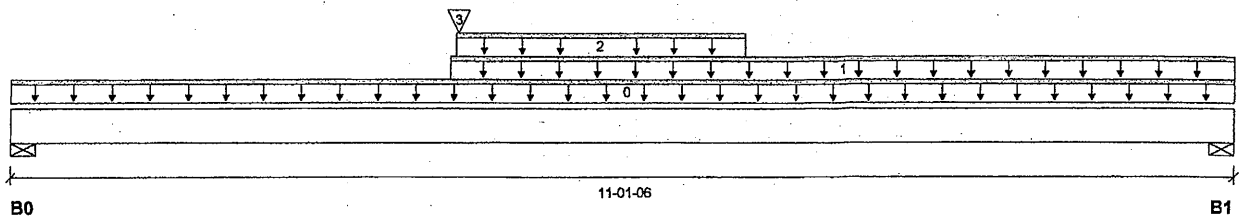
**PASSED**

**1ST FLOOR FRAMING\Flush Beams\B1(i1639)**

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:38:10

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 1ST FLOOR FRAMING\Flush Beams\B1(i1639) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 11-01-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 5-1/2" | 517 / 0 | 497 / 0 | | |
| B1, 4-3/8" | 391 / 0 | 368 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-06 | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 03-11-08 | 11-01-06 | 31 | 15 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 04-00-01 | 06-07-08 | | 60 | | | n\a |
| 3 | B2(i1664) | Conc. Pt. (lbs) | L | 04-00-06 | 04-00-06 | 688 | 531 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5,019 ft-lbs | 13,592 ft-lbs | 36.9 % | 1 | 04-00-06 |
| End Shear | 1,386 lbs | 7,232 lbs | 19.2 % | 1 | 01-05-06 |
| Total Load Deflection | L/999 (0.124") | n\a | n\a | 4 | 05-03-15 |
| Live Load Deflection | L/999 (0.063") | n\a | n\a | 5 | 05-03-15 |
| Max Defl. | 0.124" | n\a | n\a | 4 | 05-03-15 |
| Span / Depth | 10.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 5-1/2" x 1-3/4" | 1,397 lbs | 27.2 % | 11.9 % | Unspecified |
| B1 | Wall/Plate | 4-3/8" x 1-3/4" | 1,047 lbs | 25.6 % | 11.2 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume unbraced length of Top: 03-06-00, Bottom: 03-06-00.
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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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



DWG NO. TAM 4214-18 H
STRUCTURAL COMPONENT ONLY

T-18071566

Boise Cascade

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

**PASSED**

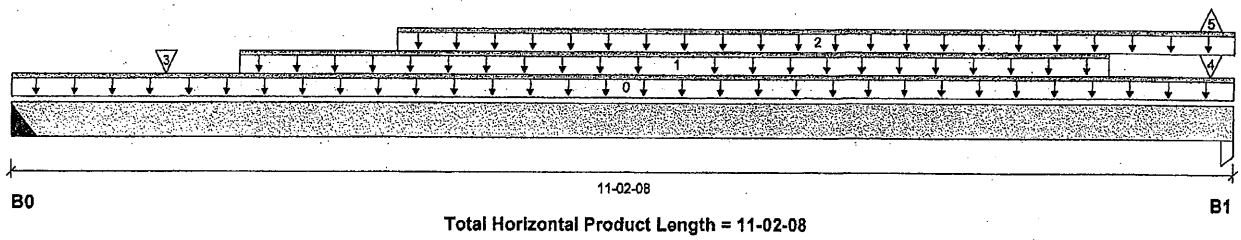
## 1ST FLOOR FRAMING\Flush Beams\B2(i941)

BC CALC® Design Report
Build 6215
Job name:
Address:
City, Province, Postal Code: INNISFIL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

April 30, 2018 10:17:16

File name: TH-7E.mmdl
Description: 1ST FLOOR FRAMING\Flush Beams\B2(i941)
Specifier:
Designer: CZ
Company:




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

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 2" | 693 / 0 | 535 / 0 | | |
| B1, 2-3/4" | 997 / 88 | 953 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-02-08 | | 6 | | | 00-00-00 |
| 1 | Smoothed Load | Unf. Lin. (lb/ft) | L | 02-00-12 | 10-00-12 | 140 | 70 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 03-06-00 | 11-02-08 | | 60 | | | n\a |
| 3 | J3(i1006) | Conc. Pt. (lbs) | L | 01-04-12 | 01-04-12 | 202 | 101 | | | n\a |
| 4 | - | Conc. Pt. (lbs) | L | 10-11-15 | 10-11-15 | 366 | 299 | | | n\a |
| 5 | - | Conc. Pt. (lbs) | L | 10-11-15 | 10-11-15 | -88 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 5,487 ft-lbs | 17,696 ft-lbs | 31.0 % | 1 | 05-04-12 |
| End Shear | 1,737 lbs | 7,232 lbs | 24.0 % | 1 | 09-11-14 |
| Total Load Deflection | L/759 (0.173") | n\a | 31.6 % | 6 | 05-06-12 |
| Live Load Deflection | L/999 (0.092") | n\a | n\a | 8 | 05-06-12 |
| Max Defl. | 0.173" | n\a | n\a | 6 | 05-06-12 |
| Span / Depth | 11.1 | | | | |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Hanger | 2" x 1-3/4" | 1,707 lbs | n\a | 40.0 % | HUS1.81/10 |
| B1 | Column | 2-3/4" x 1-3/4" | 2,688 lbs | 68.8 % | 45.8 % | Unspecified |

## Cautions

Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4215-18
STRUCTURAL
COMPONENT ONLY

T-18071567

Boise Cascade

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

**PASSED**

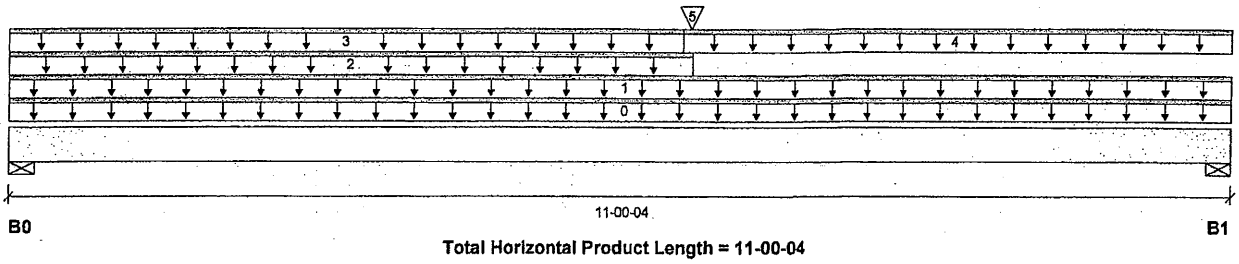
## 1ST FLOOR FRAMING\Flush Beams\B3(i1668)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:38:36

Build 6215

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

File name: TH-7E-ELA2.mmdl
Description: 1ST FLOOR FRAMING\Flush Beams\B3(i1668)
Specifier:
Designer: CZ
Company:




Total Horizontal Product Length = 11-00-04

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 4-3/8" | 330 / 0 | 472 / 0 | | |
| B1, 4-3/8" | 400 / 0 | 336 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-00-04 | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-00-04 | 9 | 5 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-01-06 | | 60 | | | n\a |
| 3 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-00-06 | 3 | | | | n\a |
| 4 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 06-00-06 | 11-00-04 | 4 | 2 | | | n\a |
| 5 | B5(i1630) | Conc. Pt. (lbs) | L | 06-01-04 | 06-01-04 | 590 | 305 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4,280 ft-lbs | 17,696 ft-lbs | 24.2 % | 1 | 06-01-04 |
| End Shear | 972 lbs | 7,232 lbs | 13.4 % | 1 | 09-08-00 |
| Total Load Deflection | L/999 (0.106") | n\a | n\a | 4 | 05-07-02 |
| Live Load Deflection | L/999 (0.055") | n\a | n\a | 5 | 05-08-14 |
| Max Defl. | 0.106" | n\a | n\a | 4 | 05-07-02 |
| Span / Depth | 10.5 | | | | |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 4-3/8" x 1-3/4" | 1,086 lbs | 26.6 % | 11.6 % | Unspecified |
| B1 | Wall/Plate | 4-3/8" x 1-3/4" | 1,021 lbs | 25.0 % | 10.9 % | 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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4216-18 H
STRUCTURAL COMPONENT ONLY

T-18071568

Boise Cascade

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

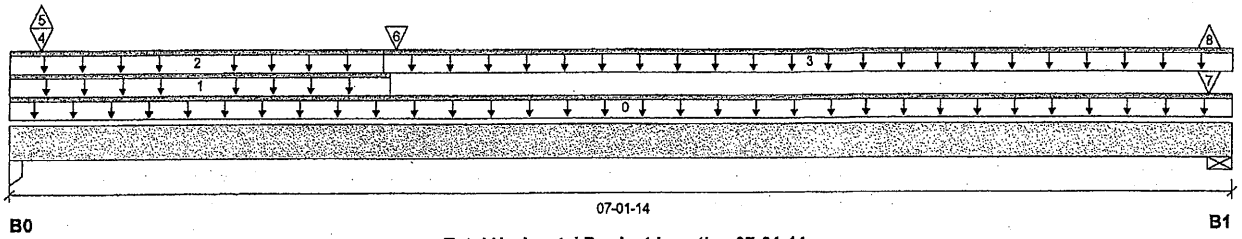
**PASSED**

## 1ST FLOOR FRAMING\Flush Beams\B4(i665)

BC CALC® Design Report | Dry | 1 span | No cant. | April 30, 2018 10:17:16

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E.mmdl |
| Address: | | Description: | 1ST FLOOR FRAMING\Flush Beams\B4(i665) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 07-01-14**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 3-1/2" | 721 / 176 | 738 / 0 | | |
| B1, 4-3/8" | 254 / 46 | 185 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-01-14 | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-02-07 | | 60 | | | n\a |
| 2 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-02-00 | 12 | 6 | | | n\a |
| 3 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 02-02-00 | 07-01-14 | 27 | 13 | | | n\a |
| 4 | PBO2(i215) | Conc. Pt. (lbs) | L | 00-02-01 | 00-02-01 | 462 | 465 | | | n\a |
| 5 | PBO2(i215) | Conc. Pt. (lbs) | L | 00-02-01 | 00-02-01 | -176 | | | | n\a |
| 6 | B5(i877) | Conc. Pt. (lbs) | L | 02-02-14 | 02-02-14 | 275 | 148 | | | n\a |
| 7 | 2(i190) | Conc. Pt. (lbs) | L | 07-00-04 | 07-00-04 | 78 | 54 | | | n\a |
| 8 | 2(i190) | Conc. Pt. (lbs) | L | 07-00-04 | 07-00-04 | -46 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,197 ft-lbs | 17,696 ft-lbs | 6.8 % | 1 | 02-02-14 |
| End Shear | 590 lbs | 7,232 lbs | 8.2 % | 1 | 01-03-06 |
| Total Load Deflection | L/999 (0.012") | n\a | n\a | 6 | 03-03-09 |
| Live Load Deflection | L/999 (0.007") | n\a | n\a | 8 | 03-04-04 |
| Max Defl. | 0.012" | n\a | n\a | 6 | 03-03-09 |
| Span / Depth | 6.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Column | 3-1/2" x 1-3/4" | 2,004 lbs | 40.3 % | 26.8 % | Unspecified |
| B1 | Wall/Plate | 4-3/8" x 1-3/4" | 611 lbs | 15.0 % | 6.5 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume 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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

**CONFORMS TO OBC 2012**

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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



DWG NO. TAM 4/17-18 H
STRUCTURAL
COMPONENT ONLY

T-18071569

Boise Cascade

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

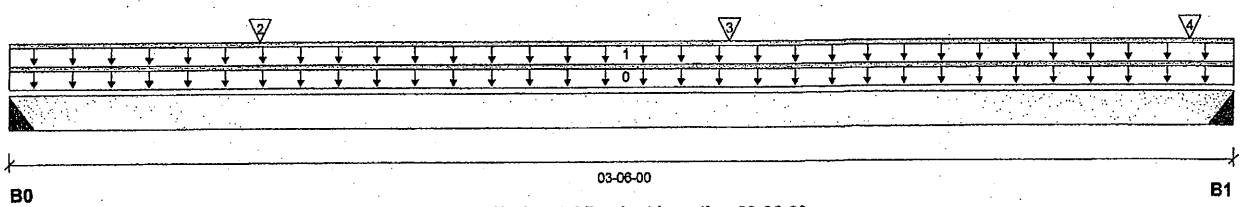
**PASSED**

## 1ST FLOOR FRAMING\Flush Beams\B5(i1630)

BC CALC® Design Report | Dry | 1 span | No cant. | May 10, 2018 15:38:48

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 1ST FLOOR FRAMING\Flush Beams\B5(i1630) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 03-06-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 2" | 557 / 0 | 289 / 0 | | |
| B1, 2" | 588 / 0 | 304 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-06-00 | | 6 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-06-00 | 240 | 120 | | | n\a |
| 2 | J5(i1672) | Conc. Pt. (lbs) | L | 00-08-08 | 00-08-08 | 102 | 51 | | | n\a |
| 3 | J5(i1622) | Conc. Pt. (lbs) | L | 02-00-08 | 02-00-08 | 129 | 64 | | | n\a |
| 4 | J5(i1657) | Conc. Pt. (lbs) | L | 03-04-08 | 03-04-08 | 74 | 37 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 958 ft-lbs | 17,696 ft-lbs | 5.4 % | 1 | 01-10-08 |
| End Shear | 507 lbs | 7,232 lbs | 7.0 % | 1 | 02-04-02 |
| Total Load Deflection | L/999 (0.003") | n\a | n\a | 4 | 01-09-03 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 5 | 01-09-03 |
| Max Defl. | 0.003" | n\a | n\a | 4 | 01-09-03 |
| Span / Depth | 3.3 | | | | |


## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Hanger | 2" x 1-3/4" | 1,196 lbs | n\a | 28.0 % | HUS1.81/10 |
| B1 | Hanger | 2" x 1-3/4" | 1,263 lbs | n\a | 29.6 % | HUS1.81/10 |

## Cautions

Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4/18-BM
STRUCTURAL
COMPONENT ONLY

T-18071570

Boise Cascade

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

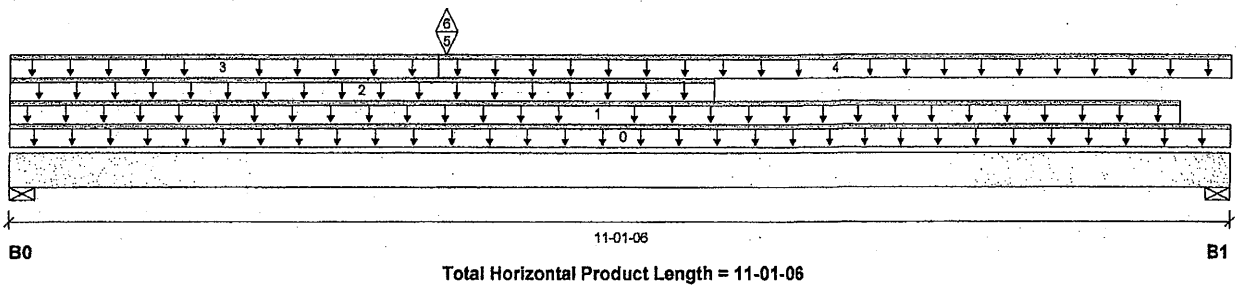
**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B6(i1243)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:39:08

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B6(i1243) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |



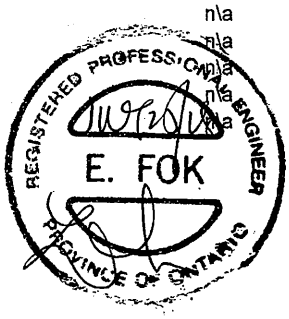

Total Horizontal Product Length = 11-01-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 4-3/8" | 441 / 109 | 632 / 0 | | |
| B1, 5-1/2" | 302 / 59 | 345 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-06 | | 6 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 10-07-14 | 21 | 11 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-04-06 | | 60 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-10-06 | 3 | | | | n\a |
| 4 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 03-10-06 | 11-01-06 | 6 | 3 | | | n\a |
| 5 | B7(i1363) | Conc. Pt. (lbs) | L | 03-11-04 | 03-11-04 | 465 | 389 | | | n\a |
| 6 | B7(i1363) | Conc. Pt. (lbs) | L | 03-11-04 | 03-11-04 | -168 | | | | n\a |




## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4,245 ft-lbs | 17,696 ft-lbs | 24.0 % | 1 | 03-11-04 |
| End Shear | 1,270 lbs | 7,232 lbs | 17.6 % | 1 | 01-04-04 |
| Total Load Deflection | L/999 (0.108") | n\a | n\a | 6 | 05-01-13 |
| Live Load Deflection | L/999 (0.048") | n\a | n\a | 8 | 05-01-13 |
| Max Defl. | 0.108" | n\a | n\a | 6 | 05-01-13 |
| Span / Depth | 10.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 4-3/8" x 1-3/4" | 1,451 lbs | 35.5 % | 15.5 % | Unspecified |
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 884 lbs | 17.2 % | 7.5 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4219-18
STRUCTURAL
COMPONENT ONLY

T-18071571

Boise Cascade

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

**PASSED**

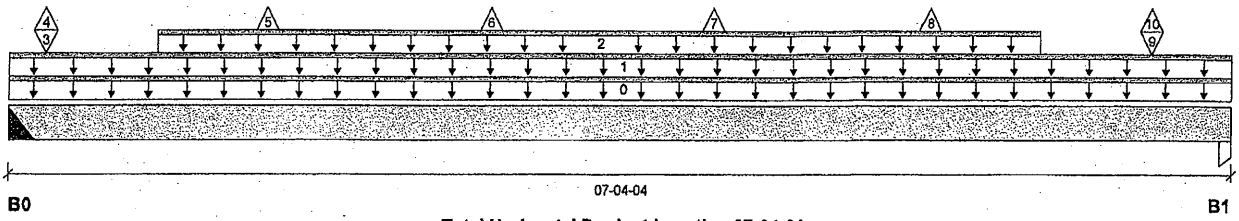
## 2ND FLOOR FRAMING\Flush Beams\B7(i1005)

BC CALC® Design Report
Build 6215
Job name:
Address:
City, Province, Postal Code: INNISFIL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

April 30, 2018 10:17:16

File name: TH-7E.mmdl
Description: 2ND FLOOR FRAMING\Flush Beams\B7(i1005)
Specifier:
Designer: CZ
Company:




Total Horizontal Product Length = 07-04-04

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 2" | 470 / 189 | 384 / 0 | | |
| B1, 1-3/4" | 452 / 175 | 381 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-04-04 | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-04-04 | | 60 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-10-08 | 06-02-08 | 130 | 42 | | | n\a |
| 3 | J2(i1007) | Conc. Pt. (lbs) | L | 00-02-08 | 00-02-08 | 105 | 23 | | | n\a |
| 4 | J2(i1007) | Conc. Pt. (lbs) | L | 00-02-08 | 00-02-08 | -60 | | | | n\a |
| 5 | J2(i883) | Conc. Pt. (lbs) | L | 01-06-08 | 01-06-08 | -61 | | | | n\a |
| 6 | J2(i934) | Conc. Pt. (lbs) | L | 02-10-08 | 02-10-08 | -61 | | | | n\a |
| 7 | J2(i1008) | Conc. Pt. (lbs) | L | 04-02-08 | 04-02-08 | -61 | | | | n\a |
| 8 | J2(i1010) | Conc. Pt. (lbs) | L | 05-06-08 | 05-06-08 | -61 | | | | n\a |
| 9 | J2(i898) | Conc. Pt. (lbs) | L | 06-10-08 | 06-10-08 | 125 | 33 | | | n\a |
| 10 | J2(i898) | Conc. Pt. (lbs) | L | 06-10-08 | 06-10-08 | -60 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2,076 ft-lbs | 17,696 ft-lbs | 11.7 % | 1 | 04-01-08 |
| End Shear | 912 lbs | 7,232 lbs | 12.6 % | 1 | 01-01-14 |
| Total Load Deflection | L/999 (0.028") | n\a | n\a | 6 | 03-08-08 |
| Live Load Deflection | L/999 (0.015") | n\a | n\a | 8 | 03-08-08 |
| Max Defl. | 0.028" | n\a | n\a | 6 | 03-08-08 |
| Span / Depth | 7.2 | | | | |


## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Hanger | 2" x 1-3/4" | 1,186 lbs | n\a | 27.8 % | HUS1.81/10 |
| B1 | Column | 1-3/4" x 1-3/4" | 1,154 lbs | 46.4 % | 30.9 % | Unspecified |

## Cautions

Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

P6 '2

DWG NO. TAM 4220-18 H
STRUCTURAL
COMPONENT ONLY

T-18071572

Boise Cascade

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

**PASSED**

**2ND FLOOR FRAMING\Flush Beams\B7(i1005)**

BC CALC® Design Report | Dry | 1 span | No cant. | April 30, 2018 10:17:16

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B7(i1005) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

**CONFORMS TO OBC 2012**

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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

DWG NO. TAM 4220-18

STRUCTURAL COMPONENT ONLY

T-18071572(2)

Boise Cascade

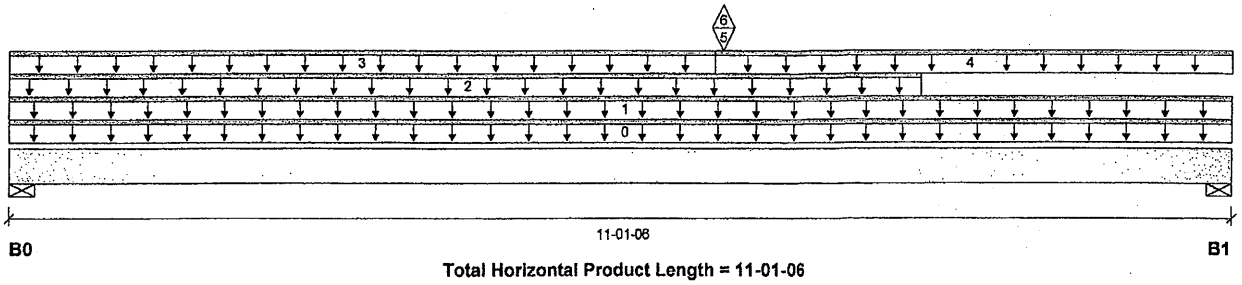
# Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B8(i1701)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:39:22
Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B8(i1701) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |



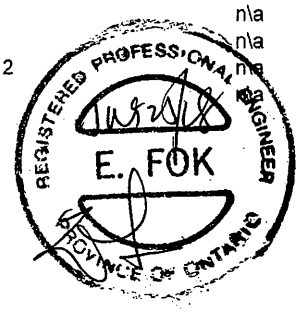

Total Horizontal Product Length = 11-01-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 4-3/8" | 304 / 70 | 468 / 0 | | |
| B1, 5-1/2" | 410 / 101 | 378 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-06 | | 6 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 11-01-06 | 9 | 5 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-05 | | 60 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 06-04-06 | 3 | | | | n\a |
| 4 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 06-04-06 | 11-01-06 | 4 | 2 | | | n\a |
| 5 | B10(i1698) | Conc. Pt. (lbs) | L | 06-05-04 | 06-05-04 | 572 | 212 | | | n\a |
| 6 | B10(i1698) | Conc. Pt. (lbs) | L | 06-05-04 | 06-05-04 | -171 | | | | |




## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4,140 ft-lbs | 17,696 ft-lbs | 23.4 % | 1 | 06-05-04 |
| End Shear | 1,036 lbs | 7,232 lbs | 14.3 % | 1 | 09-08-00 |
| Total Load Deflection | L/999 (0.104") | n\a | n\a | 6 | 05-07-00 |
| Live Load Deflection | L/999 (0.053") | n\a | n\a | 8 | 05-08-14 |
| Max Defl. | 0.104" | n\a | n\a | 6 | 05-07-00 |
| Span / Depth | 10.5 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 4-3/8" x 1-3/4" | 1,041 lbs | 25.5 % | 11.1 % | Unspecified |
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 1,087 lbs | 21.2 % | 9.3 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4221-17H
STRUCTURAL
COMPONENT ONLY

T-18071573

Boise Cascade

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

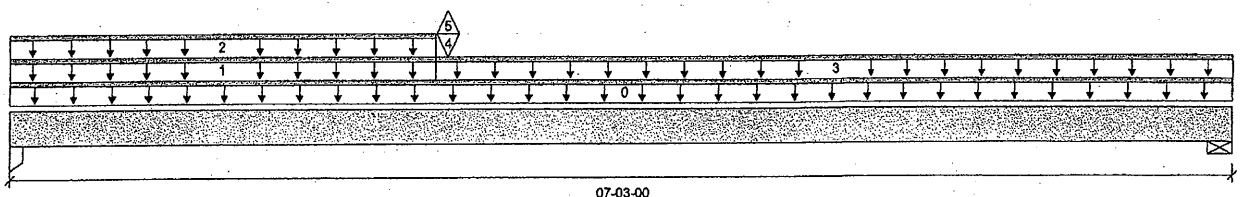
**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B9(i897)

BC CALC® Design Report — Dry | 1 span | No cant. — April 30, 2018 10:17:16

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B9(i897) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 07-03-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 3-1/2" | 234 / 87 | 229 / 0 | | |
| B1, 5-1/2" | 186 / 47 | 119 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 07-03-00 | | 6 | | | 00-00-00 |
| 1 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-06-00 | | 60 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-06-00 | 12 | 6 | | | n\a |
| 3 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 02-06-00 | 07-03-00 | 27 | 13 | | | n\a |
| 4 | B10(i1012) | Conc. Pt. (lbs) | L | 02-06-14 | 02-06-14 | 262 | 75 | | | n\a |
| 5 | B10(i1012) | Conc. Pt. (lbs) | L | 02-06-14 | 02-06-14 | -134 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,134 ft-lbs | 17,696 ft-lbs | 6.4 % | 1 | 02-06-14 |
| Neg. Moment | -35 ft-lbs | -17,696 ft-lbs | 0.2 % | 4 | 02-06-14 |
| End Shear | 497 lbs | 7,232 lbs | 6.9 % | 1 | 01-03-06 |
| Total Load Deflection | L/999 (0.011") | n\a | n\a | 6 | 03-04-09 |
| Live Load Deflection | L/999 (0.007") | n\a | n\a | 8 | 03-04-09 |
| Max Defl. | 0.011" | n\a | n\a | 6 | 03-04-09 |
| Span / Depth | 6.7 | | | | |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Column | 3-1/2" x 1-3/4" | 637 lbs | 12.8 % | 8.5 % | Unspecified |
| B1 | Wall/Plate | 5-1/2" x 1-3/4" | 428 lbs | 8.3 % | 3.6 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume member is fully braced.
Resistance Factor phi has been applied to all presented results per CSA O86.
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## 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.



DWG NO. TAM 4222-18
STRUCTURAL COMPONENT ONLY

T-18071574

Boise Cascade

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

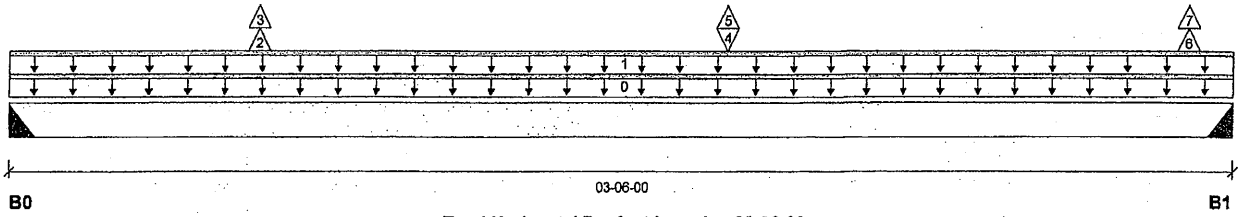
**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B10(i1698)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:39:35

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B10(i1698) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 03-06-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 2" | 543 / 136 | 215 / 0 | | |
| B1, 2" | 571 / 169 | 212 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-06-00 | | 6 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-00-00 | 03-06-00 | 240 | 120 | | | n\a |
| 2 | J2(i1269) | Conc. Pt. (lbs) | L | 00-08-08 | 00-08-08 | 92 | -8 | | | n\a |
| 3 | J2(i1269) | Conc. Pt. (lbs) | L | 00-08-08 | 00-08-08 | -110 | | | | n\a |
| 4 | J2(i1251) | Conc. Pt. (lbs) | L | 02-00-08 | 02-00-08 | 116 | | | | n\a |
| 5 | J2(i1251) | Conc. Pt. (lbs) | L | 02-00-08 | 02-00-08 | -112 | | | | n\a |
| 6 | J2(i1351) | Conc. Pt. (lbs) | L | 03-04-08 | 03-04-08 | 66 | -8 | | | n\a |
| 7 | J2(i1351) | Conc. Pt. (lbs) | L | 03-04-08 | 03-04-08 | -83 | | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 862 ft-lbs | 17,696 ft-lbs | 4.9 % | 1 | 01-09-13 |
| Neg. Moment | -35 ft-lbs | -17,696 ft-lbs | 0.2 % | 4 | 00-08-08 |
| End Shear | 434 lbs | 7,232 lbs | 6.0 % | 1 | 02-04-02 |
| Total Load Deflection | L/999 (0.002") | n\a | n\a | 6 | 01-09-03 |
| Live Load Deflection | L/999 (0.002") | n\a | n\a | 8 | 01-09-03 |
| Max Defl. | 0.002" | n\a | n\a | 6 | 01-09-03 |
| Span / Depth | 3.3 | | | | |


## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Hanger | 2" x 1-3/4" | 1,083 lbs | n\a | 25.4 % | HUS1.81/10 |
| B1 | Hanger | 2" x 1-3/4" | 1,122 lbs | n\a | 26.3 % | HUS1.81/10 |

## Cautions

Uplift of 62 lbs found at span 1 - Right.
Hanger B1 cannot handle uplift of -62 lbs. ) - (SIMPSON 1-HUS1.81/10 @ B1)
Hanger model HUS1.81/10 and seat length were input by the user. Hanger has not been analyzed for adequate capacity.

DWG NO. TAM 4223-18H
STRUCTURAL COMPONENT ONLY

T-180715 25

Boise Cascade

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

**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B10(i1698)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 15:39:35

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B10(i1698) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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

DWG NO. TAM 4223-18
STRUCTURAL
COMPONENT ONLY

T-18071575(2)

Boise Cascade

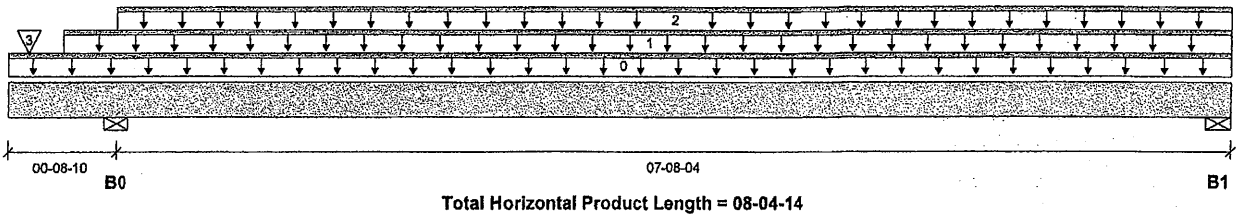
# Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP

**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B12(i1486)

BC CALC® Design Report — Dry | 2 spans | L cant. — April 30, 2018 11:34:53
Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B12(i1486) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 08-04-14

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

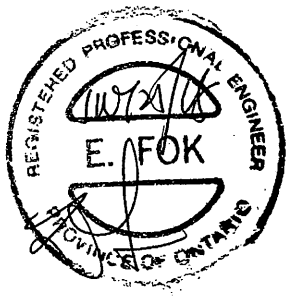
| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 5-1/2" | 670 / 0 | 1,145 / 0 | 2,184 / 0 | |
| B1, 5-3/4" | 589 / 9 | 958 / 0 | 1,858 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-04-14 | | 12 | | | 00-00-00 |
| 1 | E15(i1437) | Unf. Lin. (lb/ft) | L | 00-04-06 | 08-04-14 | 112 | 212 | 462 | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-08-10 | 08-04-14 | 33 | 17 | | | n\a |
| 3 | - | Conc. Pt. (lbs) | L | 00-01-09 | 00-01-09 | 94 | 164 | 312 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 6,894 ft-lbs | 35,392 ft-lbs | 19.5 % | 66 | 04-04-06 |
| Neg. Moment | -495 ft-lbs | -35,392 ft-lbs | 1.4 % | 49 | 00-08-10 |
| End Shear | 2,713 lbs | 14,464 lbs | 18.8 % | 66 | 06-11-04 |
| Cont. Shear | 2,645 lbs | 14,464 lbs | 18.3 % | 49 | 01-11-04 |
| Total Load Deflection | L/999 (0.049") | n\a | n\a | 154 | 04-04-06 |
| Live Load Deflection | L/999 (0.034") | n\a | n\a | 206 | 04-04-06 |
| Total Neg. Defl. | 2xL/1,998 (-0.015") | n\a | n\a | 154 | 00-00-00 |
| Max Defl. | 0.049" | n\a | n\a | 154 | 04-04-06 |
| Span / Depth | 7.3 | | | | |




## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 5-1/2" x 3-1/2" | 5,043 lbs | 49.1 % | 21.5 % | Unspecified |
| B1 | Wall/Plate | 5-3/4" x 3-1/2" | 4,279 lbs | 39.8 % | 17.4 % | 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 2010 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
CONFORMS TO OBC 2012
Importance Factor : Normal Part code : Part 9
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

DWG NO. TAM 4224-18H
STRUCTURAL COMPONENT ONLY

T.18071576

Boise Cascade

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

**PASSED**

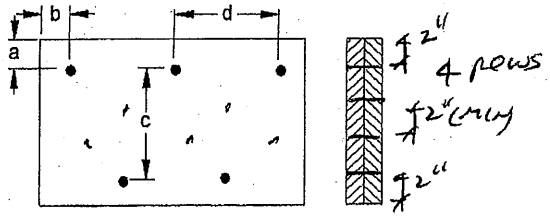
**2ND FLOOR FRAMING\Flush Beams\B12(i1486)**

BC CALC® Design Report | Dry | 2 spans | L cant. | April 30, 2018 11:34:53

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B12(i1486) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

## Connection Diagram




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

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

3-1/2" ARDOX SPIRAL

REGISTERED PROFESSIONAL ENGINEER
E. FOK
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## Disclosure

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

DWG NO. TAM4224-B
STRUCTURAL COMPONENT ONLY

T-18071576(2)

Boise Cascade

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

**PASSED**

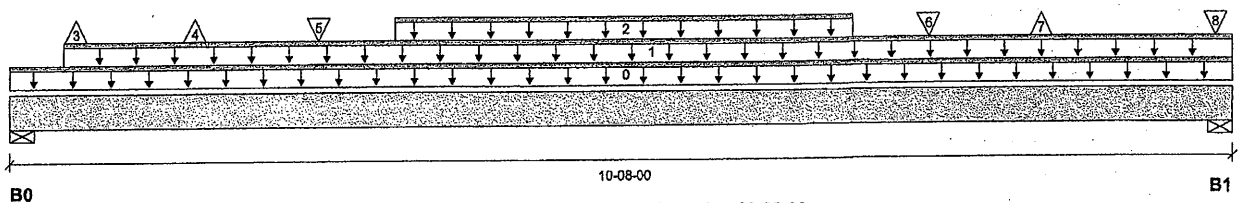
## 2ND FLOOR FRAMING\Flush Beams\B13(i1504)

BC CALC® Design Report
Build 6215
Job name:
Address:
City, Province, Postal Code: INNISFIL
Customer:
Code reports: CCMC 12472-R

Dry | 1 span | No cant.

April 30, 2018 11:34:53

File name: TH-7E-ELA2.mmdl
Description: 2ND FLOOR FRAMING\Flush Beams\B13(i1504)
Specifier:
Designer: CZ
Company:




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

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 5-1/2" | 825 / 0 | 404 / 0 | 0 / 57 | |
| B1, 3-1/2" | 730 / 0 | 385 / 0 | 67 / 50 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 10-08-00 | | 6 | | | 00-00-00 |
| 1 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-05-08 | 10-08-00 | 9 | 4 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 03-04-00 | 07-04-00 | 155 | 72 | | | n\a |
| 3 | J4(i1406) | Conc. Pt. (lbs) | L | 00-06-12 | 00-06-12 | 120 | 53 | -7 | | n\a |
| 4 | J4DJ(i1421) | Conc. Pt. (lbs) | L | 01-07-00 | 01-07-00 | 149 | 61 | -49 | | n\a |
| 5 | J4(i1425) | Conc. Pt. (lbs) | L | 02-08-00 | 02-08-00 | 187 | 85 | | | n\a |
| 6 | J4(i1432) | Conc. Pt. (lbs) | L | 08-00-00 | 08-00-00 | 181 | 82 | | | n\a |
| 7 | J4DJ(i1517) | Conc. Pt. (lbs) | L | 09-00-00 | 09-00-00 | 192 | 80 | -51 | | n\a |
| 8 | E15(i1437) | Conc. Pt. (lbs) | L | 10-06-04 | 10-06-04 | 16 | 31 | 67 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 4,362 ft-lbs | 17,696 ft-lbs | 24.6 % | 5 | 05-04-00 |
| End Shear | 1,490 lbs | 7,232 lbs | 20.6 % | 5 | 01-05-06 |
| Total Load Deflection | L/999 (0.113") | n\a | n\a | 69 | 05-06-00 |
| Live Load Deflection | L/999 (0.076") | n\a | n\a | 100 | 05-06-00 |
| Max Defl. | 0.113" | n\a | n\a | 69 | 05-06-00 |
| Span / Depth | 10.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 5-1/2" x 1-3/4" | 1,742 lbs | 33.9 % | 14.8 % | Unspecified |
| B1 | Wall/Plate | 3-1/2" x 1-3/4" | 1,609 lbs | 49.2 % | 21.5 % | Unspecified |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
Calculations assume 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 2010 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

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure



DWG NO. TAM 4225-18K
STRUCTURAL
COMPONENT ONLY

T-18071577

Boise Cascade

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

**PASSED**

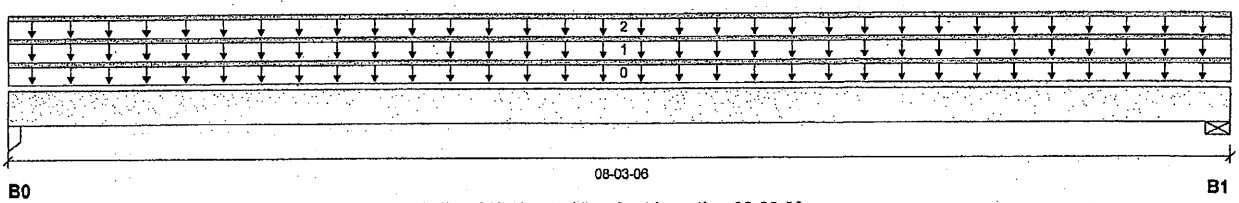
## 1ST FLOOR FRAMING\Flush Beams\B14(i1578)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 16:36:21

Build 6215

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

File name: TH-7E-ELA2.mmdl
Description: 1ST FLOOR FRAMING\Flush Beams\B14(i1578)
Specifier:
Designer: CZ
Company:




Total Horizontal Product Length = 08-03-06

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 1-3/4" | 470 / 0 | 507 / 0 | | |
| B1, 2-3/8" | 476 / 0 | 513 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | 114 | 57 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | | 60 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2,642 ft-lbs | 17,696 ft-lbs | 14.9 % | 1 | 04-01-06 |
| End Shear | 969 lbs | 7,232 lbs | 13.4 % | 1 | 01-01-10 |
| Total Load Deflection | L/999 (0.046") | n\a | n\a | 4 | 04-01-06 |
| Live Load Deflection | L/999 (0.022") | n\a | n\a | 5 | 04-01-06 |
| Max Defl. | 0.046" | n\a | n\a | 4 | 04-01-06 |
| Span / Depth | 8.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Column | 1-3/4" x 1-3/4" | 1,338 lbs | 53.8 % | 35.8 % | Unspecified |
| B1 | Wall/Plate | 2-3/8" x 1-3/4" | 1,355 lbs | 61.0 % | 26.7 % | Unspecified |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## 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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4226-18 H
STRUCTURAL COMPONENT ONLY

T-18071578

Boise Cascade

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

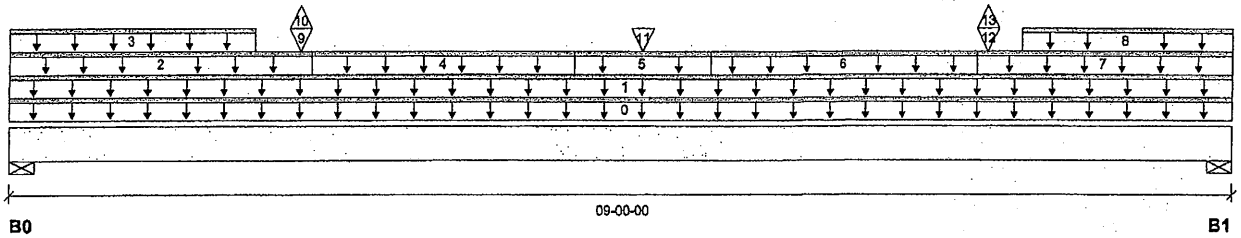
**PASSED**

## 2ND FLOOR FRAMING\Dropped Beams\B14ADR(i1085)

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 16:37:58

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELB.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Dro... Beams\B14ADR(i1085) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 09-00-00

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 4" | 191 / 5 | 554 / 0 | 515 / 0 | |
| B1, 4" | 190 / 4 | 551 / 0 | 512 / 0 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-00-00 | | 10 | | | 00-00-00 |
| 1 | R1(i1092) | Unf. Lin. (lb/ft) | L | 00-00-00 | 09-00-00 | 8 | 7 | | | n\a |
| 2 | R1(i1092) | Unf. Lin. (lb/ft) | L | 00-00-00 | 02-02-08 | | 81 | | | n\a |
| 3 | R1(i1092) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-09-08 | 33 | 30 | 114 | | n\a |
| 4 | R1(i1092) | Unf. Lin. (lb/ft) | L | 02-02-08 | 04-01-08 | | 61 | | | n\a |
| 5 | R1(i1092) | Unf. Lin. (lb/ft) | L | 04-01-08 | 05-01-08 | | 81 | | | n\a |
| 6 | R1(i1092) | Unf. Lin. (lb/ft) | L | 05-01-08 | 07-01-08 | | 61 | | | n\a |
| 7 | R1(i1092) | Unf. Lin. (lb/ft) | L | 07-01-08 | 09-00-00 | | 81 | | | n\a |
| 8 | R1(i1092) | Unf. Lin. (lb/ft) | L | 07-05-08 | 09-00-00 | 33 | 30 | 114 | | n\a |
| 9 | R1(i1092) | Conc. Pt. (lbs) | L | 02-01-08 | 02-01-08 | 51 | 49 | 157 | | n\a |
| 10 | R1(i1092) | Conc. Pt. (lbs) | L | 02-01-08 | 02-01-08 | -5 | | | | n\a |
| 11 | R1(i1092) | Conc. Pt. (lbs) | L | 04-07-08 | 04-07-08 | 99 | 109 | 343 | | n\a |
| 12 | R1(i1092) | Conc. Pt. (lbs) | L | 07-02-08 | 07-02-08 | 47 | 46 | 147 | | n\a |
| 13 | R1(i1092) | Conc. Pt. (lbs) | L | 07-02-08 | 07-02-08 | -4 | | | | n\a |


## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3,218 ft-lbs | 23,220 ft-lbs | 13.9 % | 25 | 04-07-08 |
| End Shear | 1,166 lbs | 11,571 lbs | 10.1 % | 25 | 01-01-08 |
| Total Load Deflection | L/999 (0.058") | n\a | n\a | 73 | 04-06-00 |
| Live Load Deflection | L/999 (0.031") | n\a | n\a | 100 | 04-06-00 |
| Max Defl. | 0.058" | n\a | n\a | 73 | 04-06-00 |
| Span / Depth | 10.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 4" x 3-1/2" | 1,561 lbs | 13.7 % | 9.1 % | Unspecified |
| B1 | Wall/Plate | 4" x 3-1/2" | 1,551 lbs | 13.6 % | 9.1 % | Unspecified |

P6 14

DWG NO. TAM 4227-18 H
STRUCTURAL
COMPONENT ONLY

T-18071579

Boise Cascade

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

**PASSED**

**2ND FLOOR FRAMING\Dropped Beams\B14ADR(i1085)**

BC CALC® Design Report — Dry | 1 span | No cant. — May 10, 2018 16:37:58

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELB.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Dro... Beams\B14ADR(i1085) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

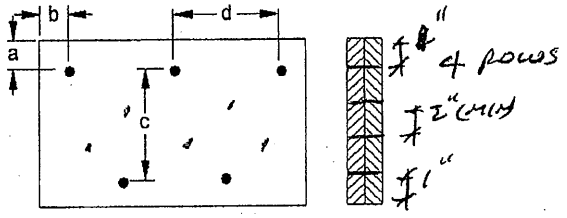
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.

CONFORMS TO OBC 2012

Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

## Connection Diagram




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

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

3-1/2" ARDOX SPIRAL

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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



DWG NO. TAM 4227-18

STRUCTURAL COMPONENT ONLY

T-18071579(2)

Boise Cascade

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

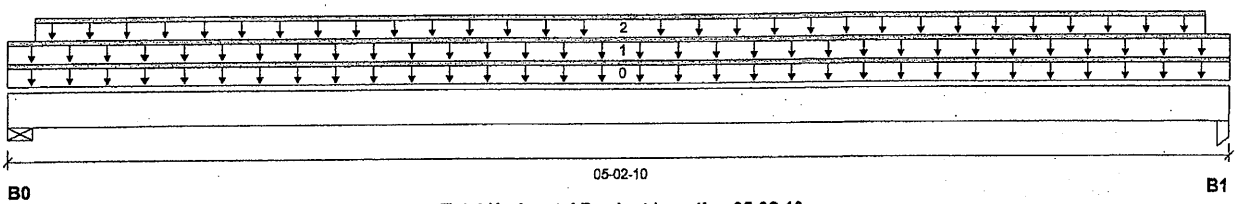
**PASSED**

## 1ST FLOOR FRAMING\Flush Beams\B15(i1579)

BC CALC® Design Report | Dry | 1 span | No cant. | May 10, 2018 15:01:49

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 1ST FLOOR FRAMING\Flush Beams\B15(i1579) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 05-02-10

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 4-3/8" | 738 / 0 | 386 / 0 | | |
| B1, 3-1/2" | 726 / 0 | 380 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-02-10 | | 6 | | | 00-00-00 |
| 1 | STAIR | Unf. Lin. (lb/ft) | L | 00-00-00 | 05-02-10 | 40 | 20 | | | n\a |
| 2 | Smoothed Load | Unf. Lin. (lb/ft) | L | 00-01-06 | 05-01-06 | 252 | 126 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 1,789 ft-lbs | 17,696 ft-lbs | 10.1 % | 1 | 02-07-06 |
| End Shear | 1,077 lbs | 7,232 lbs | 14.9 % | 1 | 01-04-04 |
| Total Load Deflection | L/999 (0.01") | n\a | n\a | 4 | 02-08-02 |
| Live Load Deflection | L/999 (0.007") | n\a | n\a | 5 | 02-08-02 |
| Max Defl. | 0.01" | n\a | n\a | 4 | 02-08-02 |
| Span / Depth | 4.7 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 4-3/8" x 1-3/4" | 1,590 lbs | 38.9 % | 17.0 % | Unspecified |
| B1 | Column | 3-1/2" x 1-3/4" | 1,564 lbs | 31.5 % | 20.9 % | Unspecified |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## 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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

## Disclosure



DWG NO. TAM 4228-18H
STRUCTURAL
COMPONENT ONLY

T-18071580

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

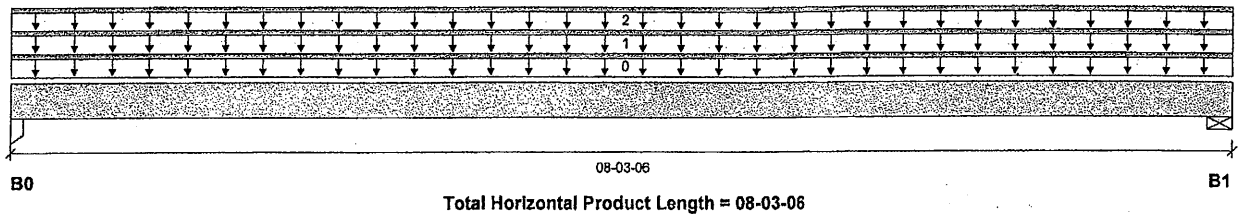
**PASSED**

**1ST FLOOR FRAMING\Flush Beams\B16(i1578)**

BC CALC® Design Report — Dry | 1 span | No cant. — April 30, 2018 11:59:36

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2.mmdl |
| Address: | | Description: | 1ST FLOOR FRAMING\Flush Beams\B16(i1578) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




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

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 1-3/4" | 470 / 0 | 507 / 0 | | |
| B1, 2-3/8" | 476 / 0 | 513 / 0 | | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | | 6 | | | 00-00-00 |
| 1 | FC1 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | 114 | 57 | | | n\a |
| 2 | WALL | Unf. Lin. (lb/ft) | L | 00-00-00 | 08-03-06 | | 60 | | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 2,642 ft-lbs | 17,696 ft-lbs | 14.9 % | 1 | 04-01-06 |
| End Shear | 969 lbs | 7,232 lbs | 13.4 % | 1 | 01-01-10 |
| Total Load Deflection | L/999 (0.046") | n\a | n\a | 4 | 04-01-06 |
| Live Load Deflection | L/999 (0.022") | n\a | n\a | 5 | 04-01-06 |
| Max Defl. | 0.046" | n\a | n\a | 4 | 04-01-06 |
| Span / Depth | 8.1 | | | | |

## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Column | 1-3/4" x 1-3/4" | 1,338 lbs | 53.8 % | 35.8 % | Unspecified |
| B1 | Wall/Plate | 2-3/8" x 1-3/4" | 1,355 lbs | 61.0 % | 26.7 % | Unspecified |

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## 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 2010 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9

**CONFORMS TO OBC 2012**

## Disclosure



DWG NO. TAM 4229-18

STRUCTURAL COMPONENT ONLY

T-18071581

Boise Cascade

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

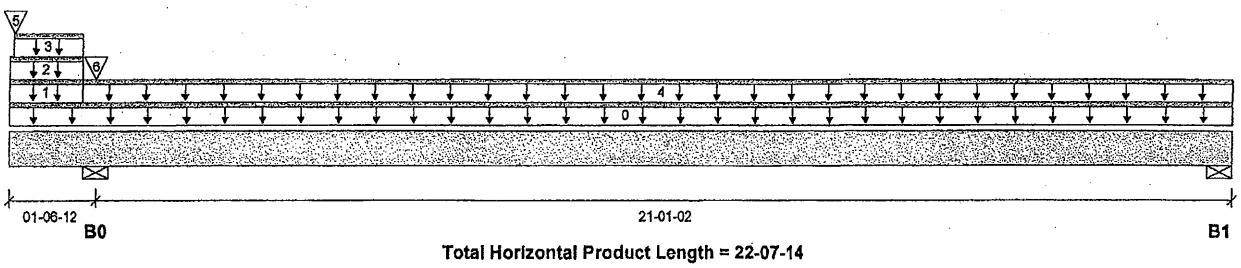
**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B17(i1706)

BC CALC® Design Report | Dry | 2 spans | L cant. | April 30, 2018 13:44:30

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2UPGRADE.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B17(i1706) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




Total Horizontal Product Length = 22-07-14

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

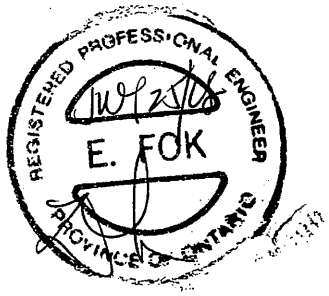
| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 5-1/2" | 349 / 0 | 498 / 0 | 237 / 0 | |
| B1, 2-3/8" | 251 / 4 | 245 / 0 | 0 / 9 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 22-07-14 | | 12 | | | 00-00-00 |
| 1 | E19(i1702) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-00 | | 81 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-00 | 20 | 10 | | | n\a |
| 3 | E19(i1702) | Unf. Lin. (lb/ft) | L | 00-00-15 | 01-04-00 | 33 | 30 | 114 | | n\a |
| 4 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 01-04-00 | 22-07-14 | 24 | 11 | | | n\a |
| 5 | E19(i1702) | Conc. Pt. (lbs) | L | 00-01-02 | 00-01-02 | 13 | 12 | 46 | | n\a |
| 6 | E20(i1703) | Conc. Pt. (lbs) | L | 01-06-12 | 01-06-12 | 11 | 47 | 39 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3,481 ft-lbs | 35,392 ft-lbs | 9.8 % | 45 | 12-00-15 |
| Neg. Moment | -542 ft-lbs | -35,392 ft-lbs | 1.5 % | 49 | 01-06-12 |
| End Shear | 606 lbs | 14,464 lbs | 4.2 % | 45 | 21-05-10 |
| Cont. Shear | 626 lbs | 14,464 lbs | 4.3 % | 13 | 02-09-06 |
| Total Load Deflection | L/1,239 (0.203") | n\a | 19.4 % | 108 | 12-00-15 |
| Live Load Deflection | L/999 (0.105") | n\a | n\a | 160 | 12-00-14 |
| Total Neg. Defl. | 2xL/1,998 (-0.047") | n\a | n\a | 108 | 00-00-00 |
| Max Defl. | 0.203" | n\a | n\a | 108 | 12-00-15 |
| Span / Depth | 21.2 | | | | |




## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 5-1/2" x 3-1/2" | 1,264 lbs | 12.3 % | 5.4 % | Unspecified |
| B1 | Wall/Plate | 2-3/8" x 3-1/2" | 683 lbs | 15.4 % | 6.7 % | Unspecified |

DWG NO. TAM 4230 -18H
STRUCTURAL
COMPONENT ONLY

T-18071582

Boise Cascade

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

**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B17(i1706)

BC CALC® Design Report | Dry | 2 spans | L cant. | April 30, 2018 13:44:30

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2UPGRADE.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B17(i1706) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

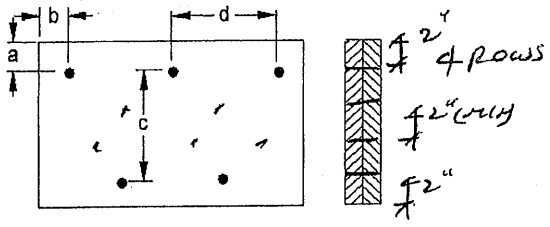
## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 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

Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

## Connection Diagram




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

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

3-1/2" ARDOX SPIRAL

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

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

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

DWG NO. TAM 4230-18 H

STRUCTURAL COMPONENT ONLY

T-18071582(2)

Boise Cascade

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

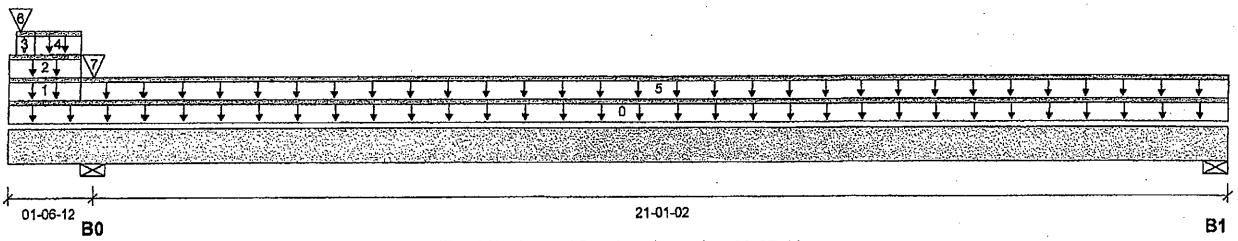
**PASSED**

## 2ND FLOOR FRAMING\Flush Beams\B18(i1705)

BC CALC® Design Report | Dry | 2 spans | L cant. | April 30, 2018 13:44:30

Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2UPGRADE.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B18(i1705) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |




**Total Horizontal Product Length = 22-07-14 .**

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

| Bearing | Live | Dead | Snow | Wind |
|---|---|---|---|---|
| B0, 5-1/2" | 321 / 0 | 528 / 0 | 245 / 0 | |
| B1, 2-3/8" | 223 / 4 | 229 / 0 | 0 / 9 | |

## Load Summary

| Tag | Description | Load Type | Ref. | Start | End | Live 1.00 | Dead 0.65 | Snow 1.00 | Wind 1.15 | Tributary |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Self-Weight | Unf. Lin. (lb/ft) | L | 00-00-00 | 22-07-14 | | 12 | | | 00-00-00 |
| 1 | E17(i1700) | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-00 | | 81 | | | n\a |
| 2 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 00-00-00 | 01-04-00 | 18 | 9 | | | n\a |
| 3 | E17(i1700) | Unf. Lin. (lb/ft) | L | 00-01-07 | 00-05-08 | 16 | 15 | 57 | | n\a |
| 4 | E17(i1700) | Unf. Lin. (lb/ft) | L | 00-05-08 | 01-04-00 | 33 | 30 | 114 | | n\a |
| 5 | FC3 Floor Material | Unf. Lin. (lb/ft) | L | 01-04-00 | 22-07-14 | 21 | 10 | | | n\a |
| 6 | - | Conc. Pt. (lbs) | L | 00-02-06 | 00-02-06 | 22 | 61 | 76 | | n\a |
| 7 | E16(i1698) | Conc. Pt. (lbs) | L | 01-06-12 | 01-06-12 | 12 | 48 | 41 | | n\a |

## Controls Summary

| | Factored Demand | Factored Resistance | Demand/ Resistance | Case | Location |
|---|---|---|---|---|---|
| Pos. Moment | 3,140 ft-lbs | 35,392 ft-lbs | 8.9 % | 33 | 12-04-05 |
| Neg. Moment | -617 ft-lbs | -35,392 ft-lbs | 1.7 % | 37 | 01-06-12 |
| End Shear | 550 lbs | 14,464 lbs | 3.8 % | 33 | 21-05-10 |
| Cont. Shear | 577 lbs | 14,464 lbs | 4.0 % | 1 | 02-09-06 |
| Total Load Deflection | L/1,377 (0.183") | n\a | 17.4 % | 80 | 12-00-12 |
| Live Load Deflection | L/999 (0.094") | n\a | n\a | 118 | 12-00-12 |
| Total Neg. Defl. | 2xL/1,998 (-0.042") | n\a | n\a | 80 | 00-00-00 |
| Max Defl. | 0.183" | n\a | n\a | 80 | 12-00-12 |
| Span / Depth | 21.2 | | | | |


## Bearing Supports

| | | Dim. (LxW) | Demand | Demand/ Resistance Support | Demand/ Resistance Member | Material |
|---|---|---|---|---|---|---|
| B0 | Wall/Plate | 5-1/2" x 3-1/2" | 1,264 lbs | 12.3 % | 5.4 % | Unspecified |
| B1 | Wall/Plate | 2-3/8" x 3-1/2" | 621 lbs | 14.0 % | 6.1 % | Unspecified |

DWG NO. TAM 4231-18H pg 1/2
STRUCTURAL COMPONENT ONLY

T 18071583

Boise Cascade

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

**PASSED**

**2ND FLOOR FRAMING\Flush Beams\B18(i1705)**

BC CALC® Design Report — Dry | 2 spans | L cant. — April 30, 2018 13:44:30

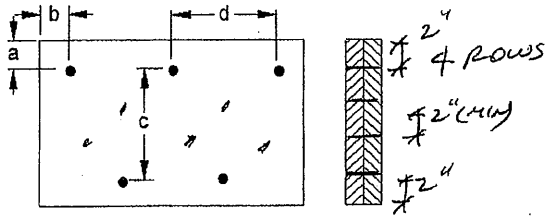
Build 6215

| | | | |
|---|---|---|---|
| Job name: | | File name: | TH-7E-ELA2UPGRADE.mmdl |
| Address: | | Description: | 2ND FLOOR FRAMING\Flush Beams\B18(i1705) |
| City, Province, Postal Code: | INNISFIL | Specifier: | |
| Customer: | | Designer: | CZ |
| Code reports: | CCMC 12472-R | Company: | |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2010 and CSA O86.
Unbalanced snow loads determined from building geometry were used in selected product's verification.
Design based on Dry Service Condition.
CONFORMS TO OBC 2012
Importance Factor : Normal Part code : Part 9
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.
Member has no side loads.

## Connection Diagram




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

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

3-1/2" ARDOX SPIRAL

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

## Disclosure

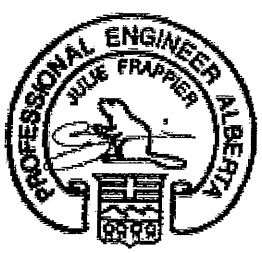
Use of the Boise Cascade Software is subject to the terms of the End User License Agreement (EULA). Completeness and accuracy of input must be reviewed and verified by a qualified engineer or other appropriate expert to assure its adequacy, prior to anyone relying on such output as evidence of suitability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

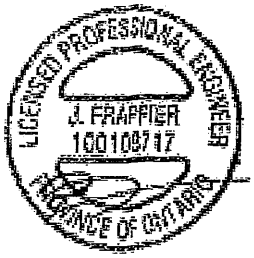
BC CALC®, BC FRAMER® , AJS™, ALLJOIST® , BC RIM BOARD™, BCI® , BOISE GLULAM™, BC FloorValue® , VERSA-LAM®, VERSA-RIM PLUS®.

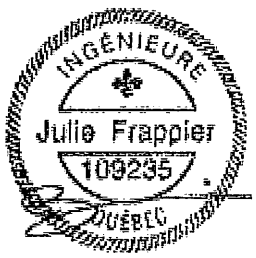
DWG NO. TAM 4231 - B
STRUCTURAL COMPONENT ONLY

T-18071583(2)

NORDIC ENGINEERED WOOD



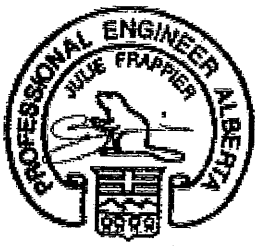

## Maximum Floor Spans

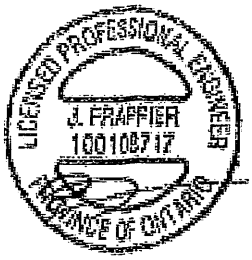
Live Load = 40 psf, Dead Load = 15 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

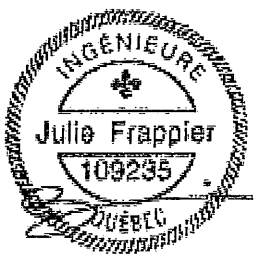
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-1" | 14'-2" | 13'-9" | N/A | 15'-7" | 14'-8" | 14'-2" | N/A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

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

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



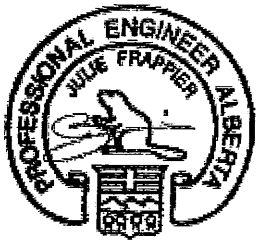

## Maximum Floor Spans

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

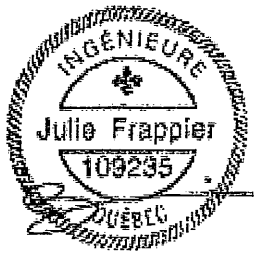
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-10" | 15'-0" | 14'-5" | 13'-5" | 16'-4" | 15'-5" | 14'-6" |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

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

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







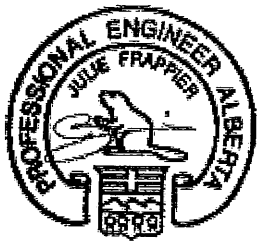

## Maximum Floor Spans

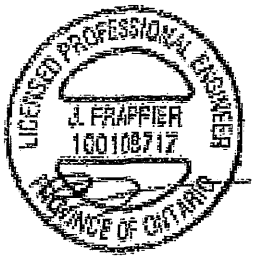
Live Load = 40 psf, Dead Load = 30 psf
Simple Spans, L/480 Deflection Limit
5/8" OSB G&N Sheathing

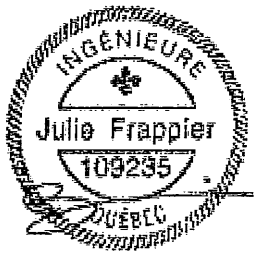
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-1" | 14'-1" | 13'-3" | N/A | 15'-7" | 14'-1" | 13'-3" | N/A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

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

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




## Maximum Floor Spans

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

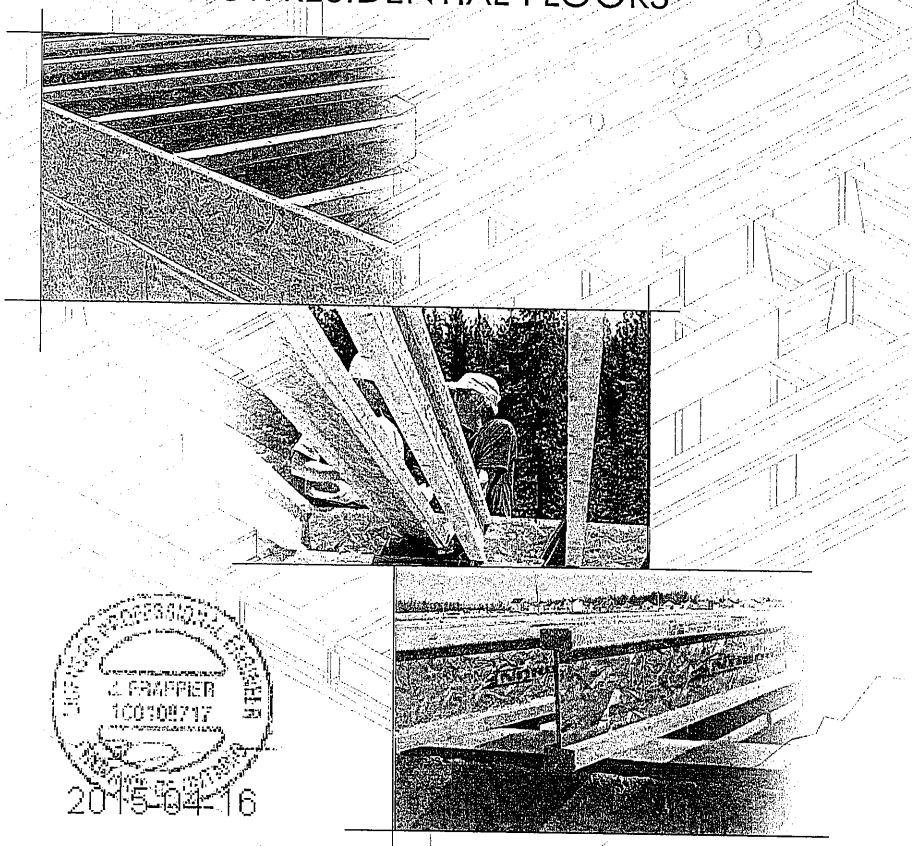
| Depth | Series | Bare | | | | 1/2" Gypsum Ceiling | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | On Centre Spacing | | | | On Centre Spacing | | | |
| | | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" |
| 9-1/2" | NI-20 | 15'-7" | 14'-2" | 13'-4" | 12'-4" | 15'-7" | 14'-2" | 13'-4" | 12'-4"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

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

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

NORDIC
ENGINEERED WOOD

# INSTALLATION GUIDE
## FOR RESIDENTIAL FLOORS



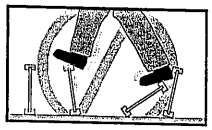


Distributed by:

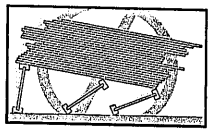


N-C301 / November 2014

## SAFETY AND CONSTRUCTION PRECAUTIONS



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



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

WARNING

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

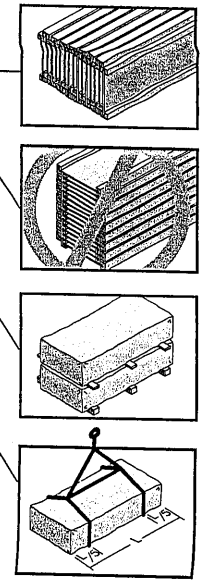
**Avoid Accidents by Following these Important Guidelines:**

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

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

## STORAGE AND HANDLING GUIDELINES

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



## MAXIMUM FLOOR SPANS

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

### MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS

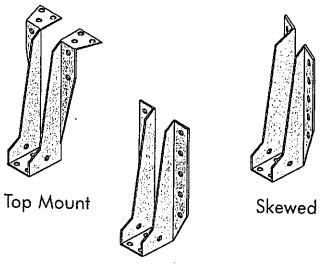
SIMPLE AND MULTIPLE SPANS

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

## I-JOIST HANGERS

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



Top Mount | Face Mount | Skewed

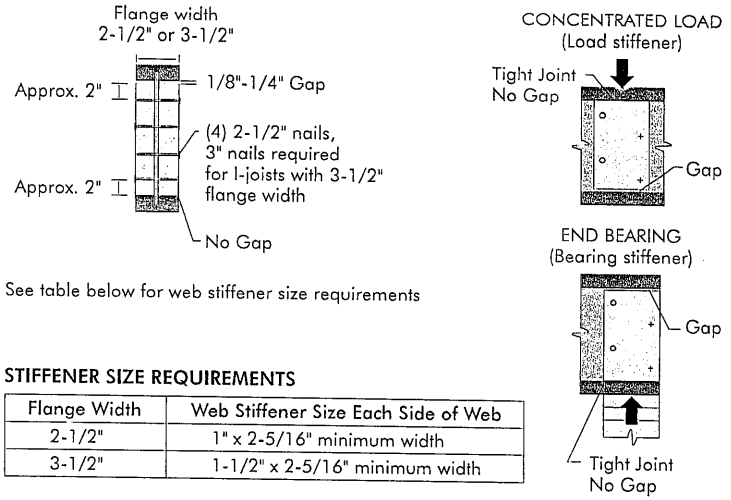
## WEB STIFFENERS

RECOMMENDATIONS:

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

SI units conversion: 1 inch = 25.4 mm

FIGURE 2
**WEB STIFFENER INSTALLATION DETAILS**

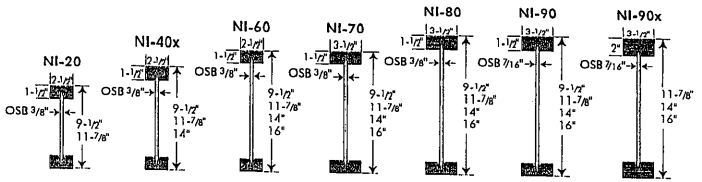



See table below for web stiffener size requirements

**STIFFENER SIZE REQUIREMENTS**

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

## NORDIC I-JOIST SERIES

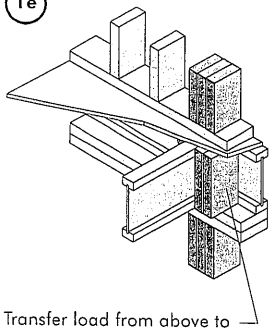



| 33 pieces per unit | 33 pieces per unit | 33 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 pieces per unit | 23 pieces per unit |
|---|---|---|---|---|---|---|

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

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

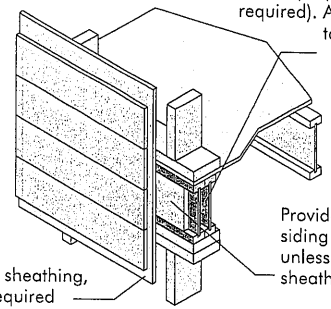
**1e**



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

**1f**

Use single I-joist for loads up to 3,300 plf, double I-joists for loads up to 6,600 plf (filler block not required). Attach I-joist to top plate using 2-1/2" nails at 6" o.c.



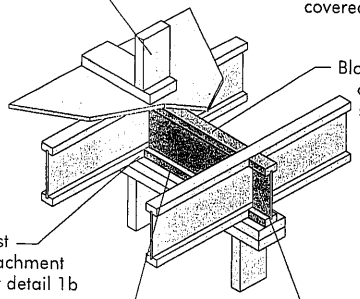
Provide backer for siding attachment unless nailable sheathing is used.

Wall sheathing, as required

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

**1g**

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

Joist attachment per detail 1b

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

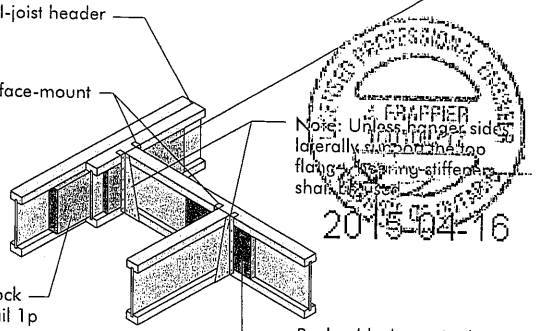
NI blocking panel per detail 1a

**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.

Double I-joist header

Top- or face-mount hanger



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

Filler block per detail 1p

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.

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

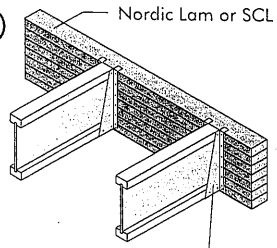
| Flange Width | Material Thickness Required* | Minimum Depth** |
|---|---|---|
| 2-1/2" | 1" | 5-1/2" |
| 3-1/2" | 1-1/2" | 7-1/4" |

* 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**

Nordic Lam or SCL



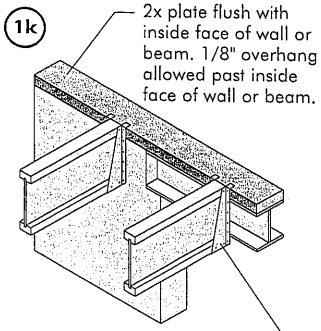
Top- or face-mount hanger installed per manufacturer's recommendations

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

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

**1k**

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



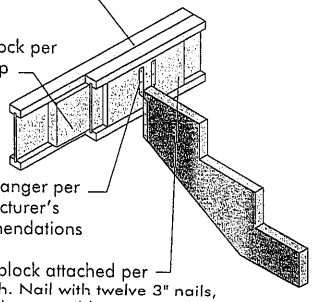
Top-mount hanger installed per manufacturer's recommendations

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

**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.

Filler block per detail 1p



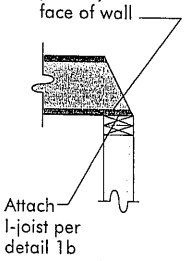
Install hanger per manufacturer's recommendations

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

Maximum support capacity = 1,620 lbs.

**1n**

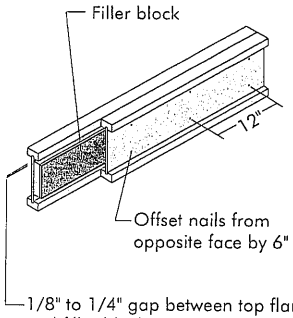
Do not bevel-cut joist beyond inside face of wall



Attach I-joist per detail 1b

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

**1p**




Notes:

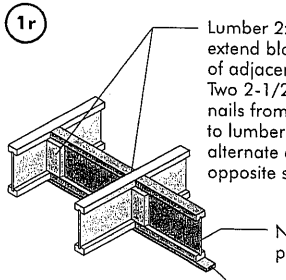
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 3" nails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

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

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

**1r**

Lumber 2x4 min., extend block to face of adjacent web. Two 2-1/2" spiral nails from each web to lumber piece, alternate on opposite side.



NI blocking panel

**Optional:** Minimum 1x4 inch strap applied to underside of joist at blocking line or 1/2 inch minimum gypsum ceiling attached to underside of joists.

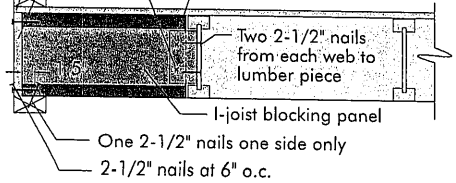
**1s**

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

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

Rim board

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



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

I-joist blocking panel

One 2-1/2" nails one side only

2-1/2" nails at 6" o.c.

Notes:

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

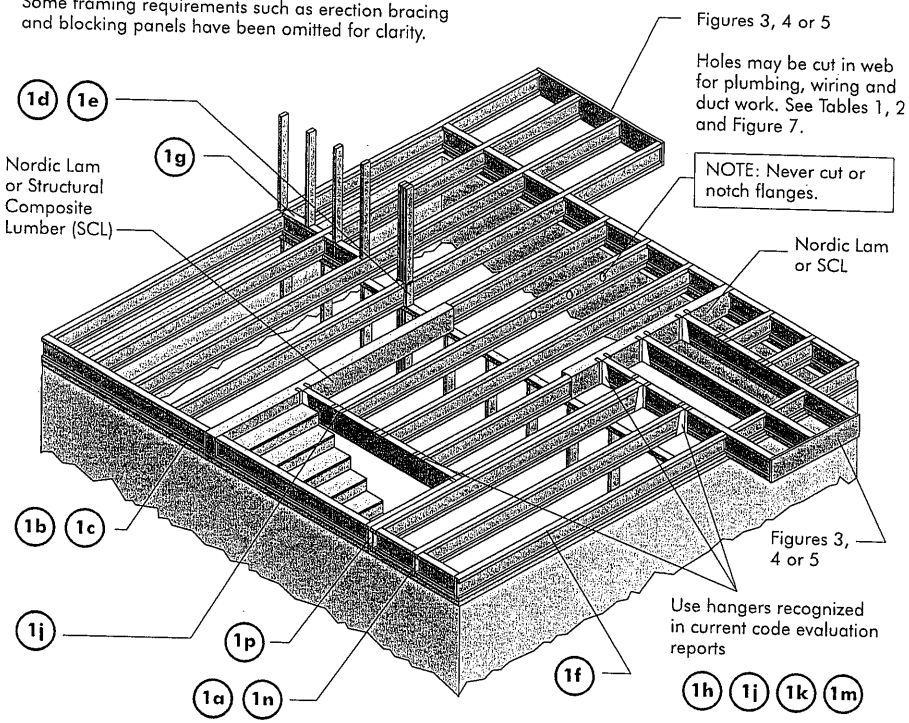
# INSTALLING NORDIC I-JOISTS

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



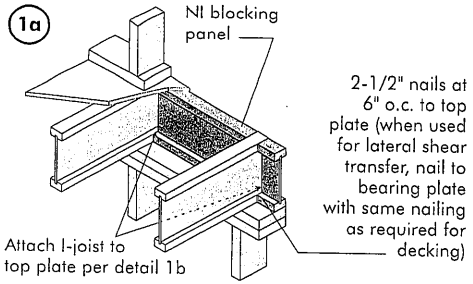
FIGURE 1
**TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS**

Some framing requirements such as erection 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.

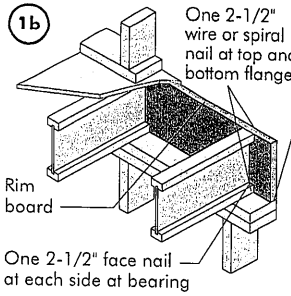
**1a**




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

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

**1b**




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

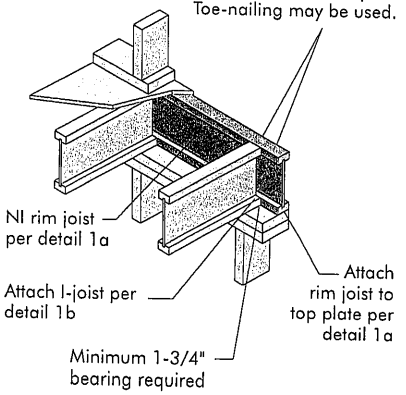
To avoid splitting flange, start nails at least 1-1/2" from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

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

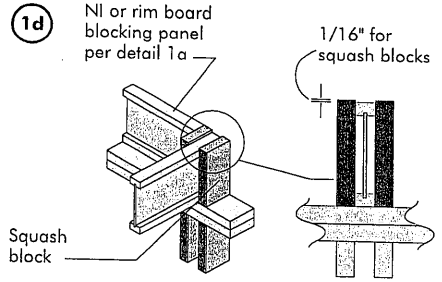
| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load* (plf) |
|---|---|
| 1-1/8" Rim Board Plus | 8,090 |

*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.

**1c**




**1d**

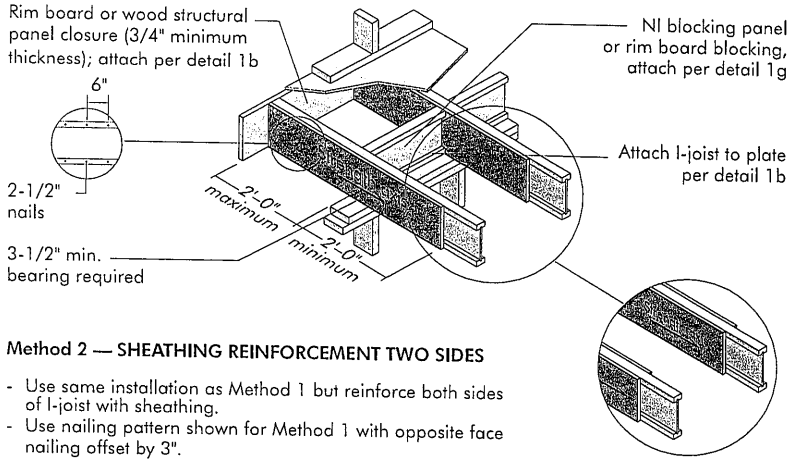



| Pair of Squash Blocks | Maximum Factored Vertical per Pair of Squash Blocks (lbs) | |
|---|---|---|
| | 3-1/2" wide | 5-1/2" wide |
| 2x Lumber | 5,500 | 8,500 |
| 1-1/8" Rim Board Plus | 4,300 | 6,600 |

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

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

## 4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE

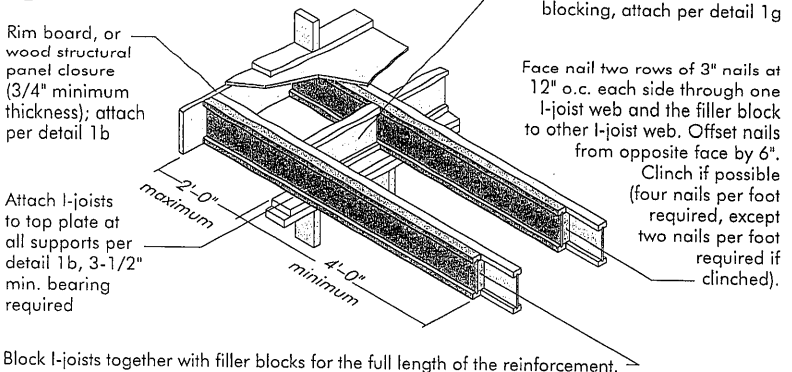



### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

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

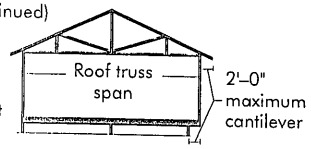
## 4b Alternate Method 2 — DOUBLE I-JOIST

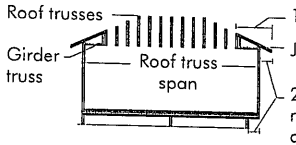



Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 3" nails along the centreline of the reinforcing panel from each side. Clinch when possible.

FIGURE 4 (continued)

See table below for NI reinforcement requirements at cantilever.




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

### CANTILEVER REINFORCEMENT METHODS ALLOWED

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

1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

# WEB HOLES

## RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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

TABLE 1

**LOCATION OF CIRCULAR HOLES IN JOIST WEBS**

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

| Joist Depth | Joist Series | Minimum distance from inside face of any support to centre of hole (ft-in.) — Round hole diameter (in.) | | | | | | | | | | | | | | Span adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 6-1/4 | 7 | 8 | 8-5/8 | 9 | 10 | 10-3/4 | 11 | 12 | 12-3/4 | |
| 9-1/2" | NI-20 | 0'-7" | 1'-6" | 2'-10" | 4'-3" | 5'-8" | 6'-0" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 13'-6" |
| | NI-40x | 0'-7" | 1'-6" | 3'-0" | 4'-4" | 6'-0" | 6'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14'-9" |
| | NI-60 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 7'-0" | 7'-5" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14'-11" |
| | NI-70 | 2'-0" | 3'-4" | 4'-9" | 6'-3" | 8'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15'-7" |
| | NI-80 | 2'-3" | 3'-6" | 5'-0" | 6'-6" | 8'-2" | 8'-8" | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15'-9" |
| 11-7/8" | NI-20 | 0'-7" | 0'-8" | 1'-0" | 2'-4" | 3'-8" | 4'-0" | 5'-0" | 6'-6" | 7'-9" | --- | --- | --- | --- | --- | --- | 15'-6" |
| | NI-40x | 0'-7" | 0'-8" | 1'-3" | 2'-8" | 4'-0" | 4'-4" | 5'-5" | 7'-0" | 8'-4" | --- | --- | --- | --- | --- | --- | 16'-6" |
| | NI-60 | 0'-7" | 1'-8" | 3'-0" | 4'-3" | 5'-9" | 6'-0" | 7'-3" | 8'-10" | 10'-0" | --- | --- | --- | --- | --- | --- | 16'-9" |
| | NI-70 | 1'-3" | 2'-6" | 4'-0" | 5'-4" | 6'-9" | 7'-2" | 8'-4" | 10'-0" | 11'-2" | --- | --- | --- | --- | --- | --- | 17'-5" |
| | NI-80 | 1'-6" | 2'-10" | 4'-2" | 5'-6" | 7'-0" | 7'-5" | 8'-6" | 10'-3" | 11'-4" | --- | --- | --- | --- | --- | --- | 17'-7" |
| | NI-90 | 0'-7" | 0'-8" | 1'-5" | 3'-2" | 4'-10" | 5'-4" | 6'-9" | 8'-9" | 10'-2" | --- | --- | --- | --- | --- | --- | 17'-11" |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-5" | 4'-4" | 4'-9" | 6'-3" | --- | --- | --- | --- | --- | --- | --- | --- | 18'-0" |
| 14" | NI-40x | 0'-7" | 0'-8" | 0'-8" | 1'-0" | 2'-4" | 2'-9" | 3'-9" | 5'-2" | 6'-0" | 6'-6" | 8'-3" | 10'-2" | --- | --- | --- | 17'-11" |
| | NI-60 | 0'-7" | 0'-8" | 1'-8" | 3'-0" | 4'-3" | 4'-8" | 5'-8" | 7'-2" | 8'-0" | 8'-8" | 10'-4" | 11'-9" | --- | --- | --- | 18'-2" |
| | NI-70 | 0'-8" | 1'-10" | 3'-0" | 4'-5" | 5'-10" | 6'-2" | 7'-3" | 8'-9" | 9'-9" | 10'-4" | 12'-0" | 13'-5" | --- | --- | --- | 19'-2" |
| | NI-80 | 0'-10" | 2'-0" | 3'-4" | 4'-9" | 6'-2" | 6'-5" | 7'-6" | 9'-0" | 10'-0" | 10'-8" | 12'-4" | 13'-9" | --- | --- | --- | 19'-5" |
| | NI-90 | 0'-7" | 0'-8" | 0'-10" | 2'-5" | 4'-0" | 4'-5" | 5'-9" | 7'-5" | 8'-8" | 9'-4" | 11'-4" | 12'-11" | --- | --- | --- | 19'-9" |
| | NI-90x | 0'-7" | 0'-8" | 0'-8" | 2'-0" | 3'-9" | 4'-2" | 5'-5" | 7'-3" | 8'-5" | 9'-2" | --- | --- | --- | --- | --- | 20'-0" |
| 16" | NI-60 | 0'-7" | 0'-8" | 0'-8" | 1'-6" | 2'-10" | 3'-2" | 4'-2" | 5'-6" | 6'-4" | 7'-0" | 8'-5" | 9'-8" | 10'-2" | 12'-2" | 13'-9" | 19'-10" |
| | NI-70 | 0'-7" | 1'-0" | 2'-3" | 3'-6" | 4'-10" | 5'-3" | 6'-3" | 7'-8" | 8'-6" | 9'-2" | 10'-8" | 12'-0" | 12'-4" | 14'-0" | 15'-6" | 20'-10" |
| | NI-80 | 0'-7" | 1'-3" | 2-6" | 3'-10" | 5'-3" | 5'-6" | 6'-6" | 8'-0" | 9'-0" | 9'-5" | 11'-0" | 12'-3" | 12'-9" | 14'-5" | 16'-0" | 21'-2" |
| | NI-90 | 0'-7" | 0'-8" | 0'-8" | 1'-9" | 3'-3" | 3'-8" | 4'-9" | 6'-5" | 7'-5" | 8'-0" | 9'-10" | 11'-3" | 11'-9" | 13'-9" | 15'-4" | 21'-6" |
| | NI-90x | 0'-7" | 0'-8" | 0'-9" | 2'-0" | 3'-6" | 4'-0" | 5'-0" | 6'-9" | 7'-9" | 8'-4" | 10'-2" | 11'-6" | 12'-0" | --- | --- | 21'-10" |

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

### OPTIONAL:

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

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

Where:

$D_{reduced}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft). The reduced distance shall not be less than 6 inches from the face of the support to edge of the hole.

$L_{actual}$ = The actual measured span distance between the inside faces of supports (ft).

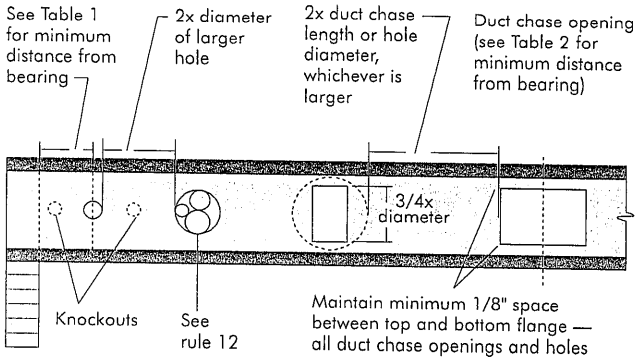
SAF = Span Adjustment Factor given in this table.

D = The minimum distance from the inside face of any support to centre of hole from this table.

If $\frac{L_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{L_{actual}}{SAF}$.

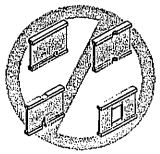

FIGURE 7

**FIELD-CUT HOLE LOCATOR**




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

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



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

Holes in webs should be cut with a sharp saw.

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

TABLE 2

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

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

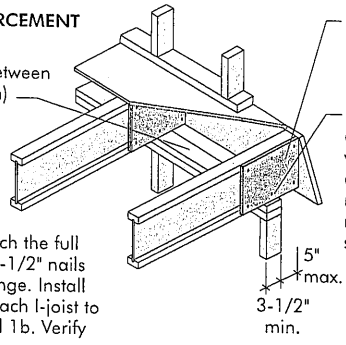
1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. Distances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

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

## 5a SHEATHING REINFORCEMENT

Provide full depth blocking between joists over support (not shown)

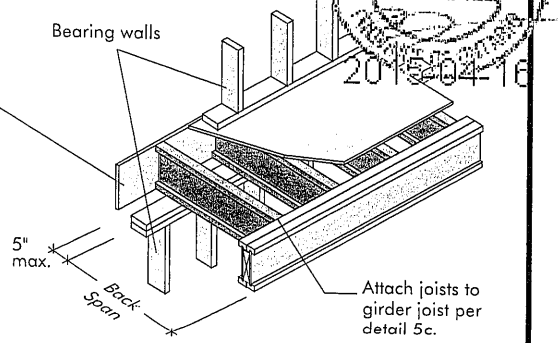
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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




## 5b SET-BACK DETAIL

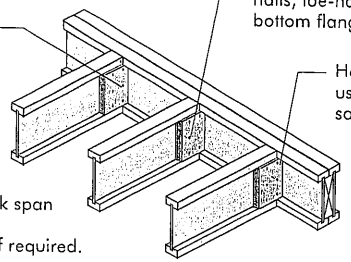
Rim board or wood structural panel closure (3/4" minimum thickness), attach per detail 1b.

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




## 5c SET-BACK CONNECTION

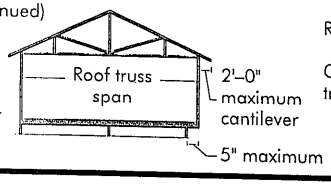
Vertical solid sawn blocks (2x6 S-P-F No. 2 or better) nailed through joist web and web of girder using 2-1/2" nails.
Alternate for opposite side.

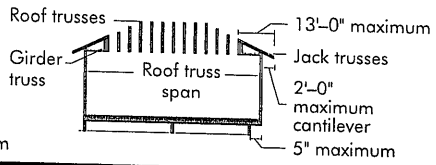



Notes:
- Verify girder joist capacity if the back span exceeds the joist spacing.
- Attach double I-joist per detail 1p, if required.

FIGURE 5 (continued)

See table below for NI reinforcement requirements at cantilever.




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

### BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

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

1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

## INSTALLING THE GLUED FLOOR SYSTEM

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

### FASTENERS FOR SHEATHING AND SUBFLOORING(1)

| Maximum Joist Spacing (in.) | Minimum Panel Thickness (in.) | Nail Size and Type | | | Maximum Spacing of Fasteners | |
|---|---|---|---|---|---|---|
| | | Common Wire or Spiral Nails | Ring Thread Nails or Screws | Staples | Edges | Interm. Supports |
| 16 | 5/8 | 2" | 1-3/4" | 2" | 6" | 12" |
| 20 | 5/8 | 2" | 1-3/4" | 2" | 6" | 12" |
| 24 | 3/4 | 2" | 1-3/4" | 2" | 6" | 12" |

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

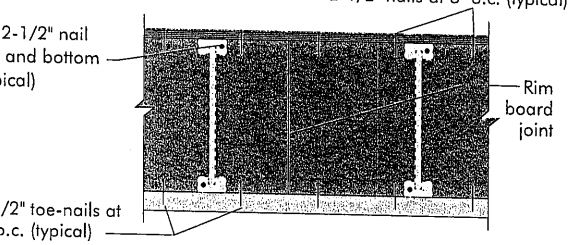
*Ref.: NRC-CNRC, National Building Code of Canada 2010, Table 9.23.3.5.*

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

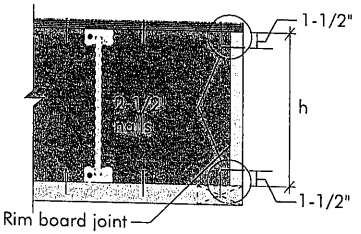
## RIM BOARD INSTALLATION DETAILS

### 8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

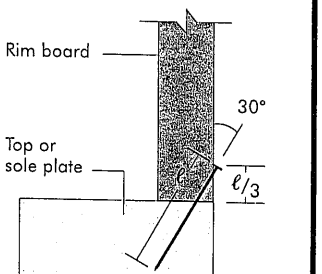
**Rim board Joint Between Floor Joists**




**Rim board Joint at Corner**

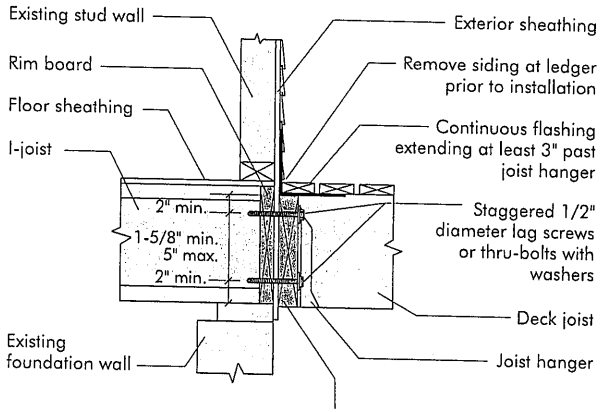



### 8b TOE-NAIL CONNECTION AT RIM BOARD






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




CHANTIERS CHIBOUGAMAU

## PRODUCT WARRANTY

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

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