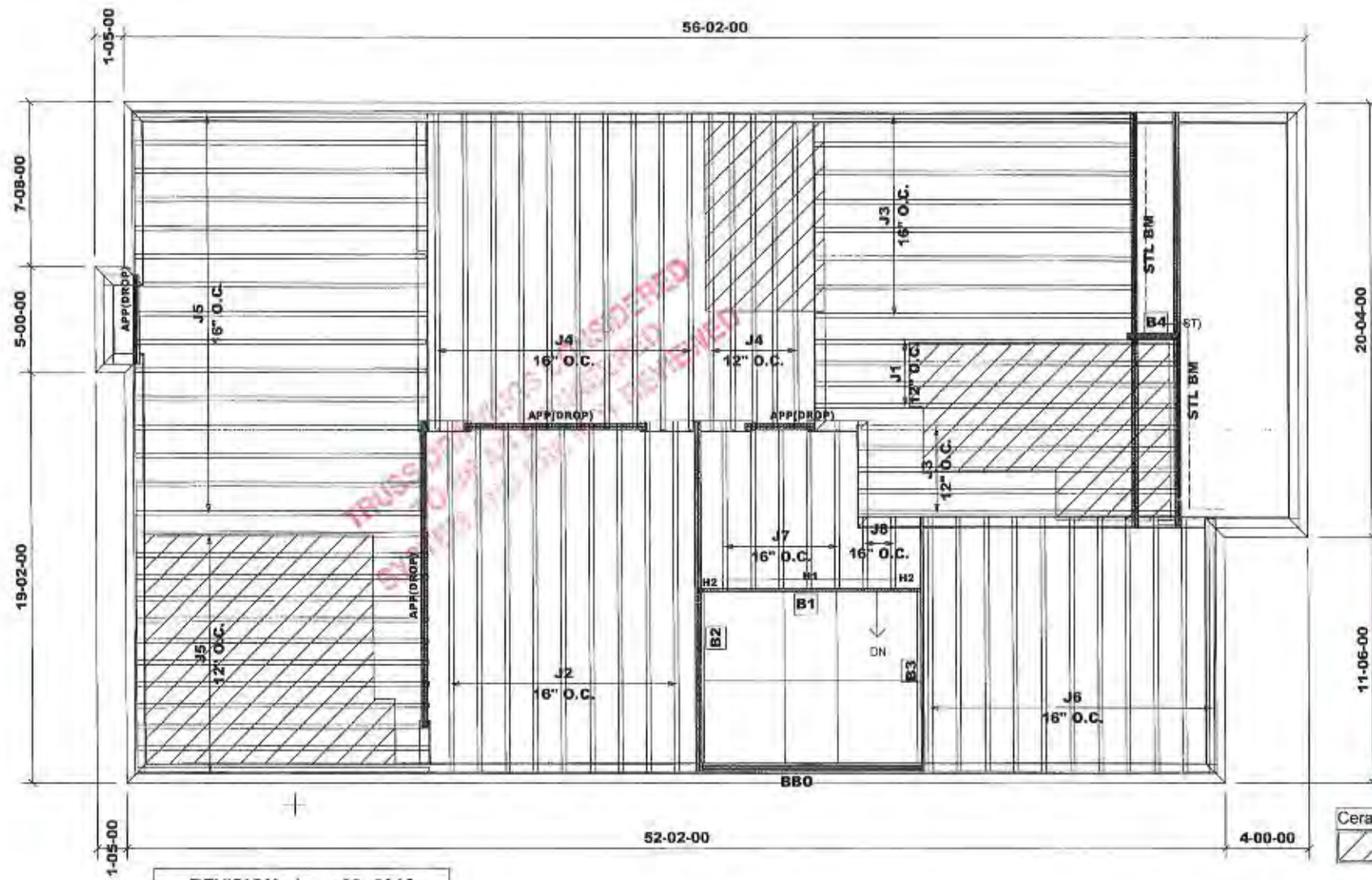


20-120002-GLD-00-CM



REVISION: June 29, 2018  
MODEL: UNIT 4002 - EL.A  
+ OPT. LOGGIA

**Second Floor Framing**  
Do not scale - refer to architectural plans for dimensions

ENGINEERING FILE NO.  
S - 152689 - 152705

| Products |          |                  |       |         |
|----------|----------|------------------|-------|---------|
| PlotID   | Length   | Product          | Plies | Net Qty |
| J1       | 18-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J2       | 17-00-00 | 11 7/8" NI-20    | 1     | 9       |
| J3       | 16-00-00 | 11 7/8" NI-20    | 1     | 13      |
| J4       | 15-00-00 | 11 7/8" NI-20    | 1     | 15      |
| J5       | 14-00-00 | 11 7/8" NI-20    | 1     | 27      |
| J6       | 12-00-00 | 11 7/8" NI-20    | 1     | 11      |
| J7       | 8-00-00  | 11 7/8" NI-20    | 1     | 5       |
| J8       | 4-00-00  | 11 7/8" NI-20    | 1     | 2       |
| B2       | 17-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B3       | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B1       | 11-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B4       | 3-00-00  | VERSALAM-12 2.0E | 2     | 2       |

HANGER SCHEDULE  
H1 ———— LT251188 (TM)  
H2 ———— HUS1.81/10(FM)  
  
NOTE:  
TM ———— TOP MOUNT HANGERS  
FM ———— FACE MOUNT HANGERS

RIMBOARD  
1- 1/8" X 11 7/8" O.S.B.  
SUBFLOOR - 3/4" NAILED & GLUED  
APP - AS PER PLAN  
BBB - BEAM BY OTHERS

**FOR OFFICE USE ONLY**

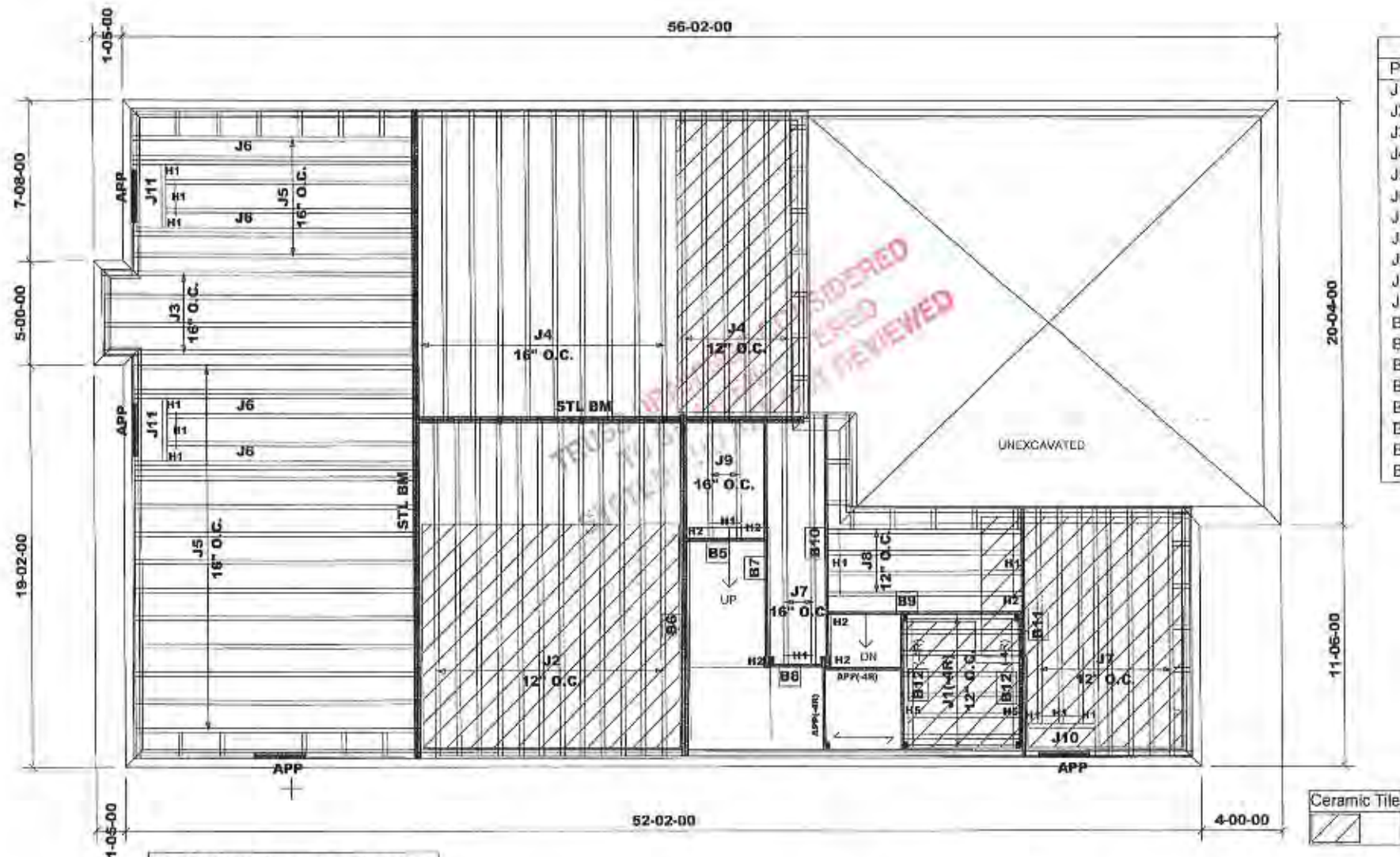
CITY OF VAUGHAN  
BUILDING STANDARDS DEPARTMENT  
PLANS EXAMINATION

RECEIVED

ZONING  
GRADING  
BUILDING CODE  
MECHANICAL  
PLUMBING  
FIRE

DATE REVIEWED: [ ]  
BY: [ ]  
REVIEWED: [ ]  
BY: [ ]

Ceramic tile application as per O.B.C. 9.30.6  
1"X6" SPF#2 Squash Block req'd on one side of each joist under interior load bearing wall. Multiple Squash Blocks are req'd under concentrated loads.



| Products |          |                  |       |         |
|----------|----------|------------------|-------|---------|
| PlotID   | Length   | Product          | Plies | Net Qty |
| J1       | 6-00-00  | 9 1/2" NI-20     | 1     | 8       |
| J2       | 17-00-00 | 11 7/8" NI-20    | 1     | 12      |
| J3       | 16-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J4       | 15-00-00 | 11 7/8" NI-20    | 1     | 16      |
| J5       | 14-00-00 | 11 7/8" NI-20    | 1     | 17      |
| J6       | 14-00-00 | 11 7/8" NI-20    | 2     | 8       |
| J7       | 12-00-00 | 11 7/8" NI-20    | 1     | 10      |
| J8       | 10-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J9       | 6-00-00  | 11 7/8" NI-20    | 1     | 2       |
| J10      | 4-00-00  | 11 7/8" NI-20    | 1     | 1       |
| J11      | 3-00-00  | 11 7/8" NI-20    | 1     | 2       |
| B6       | 17-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B10      | 13-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B11      | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B7       | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B9       | 10-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B12      | 7-00-00  | VERSALAM-10 2.0E | 1     | 2       |
| B5       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |
| B8       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |

#### HANGER SCHEDULE

H1-----LT251188 (TM)  
H2-----HUS1.81/10(FM)  
H5-----LT259(TM)

#### NOTE:

TM-----TOP MOUNT HANGERS  
FM-----FACE MOUNT HANGERS

#### RIMBOARD

1- 1/8" X 9 1/2" O.S.B.  
1- 1/8" X 11 7/8" O.S.B.

SUBFLOOR - 3/4" NAILED & GLUED

APP - AS PER PLAN  
BBO - BEAM BY OTHERS

Ceramic tile application as per O.B.C. 9.30.6

1-2X8 SPF#2 Squash Block req'd on one side of each joist under interior load bearing wall. Multiple Squash Blocks are req'd under concentrated loads.

REVISION: December 18, 2017

MODEL: UNIT 4002 - EL.A  
+ OPT. LOGGIA

### First Floor Framing

Do not scale - refer to architectural plans for dimensions

11 7/8" BLOCKING

TOTAL LENGTH: 48

98879/June 28, 2018  
9595

JT/PL: 45147/95234

LI: 290669

Builder: Gold Park

Project: Pine Valley

Location: Vaughan

Date: November 9, 2017

Designer: NL

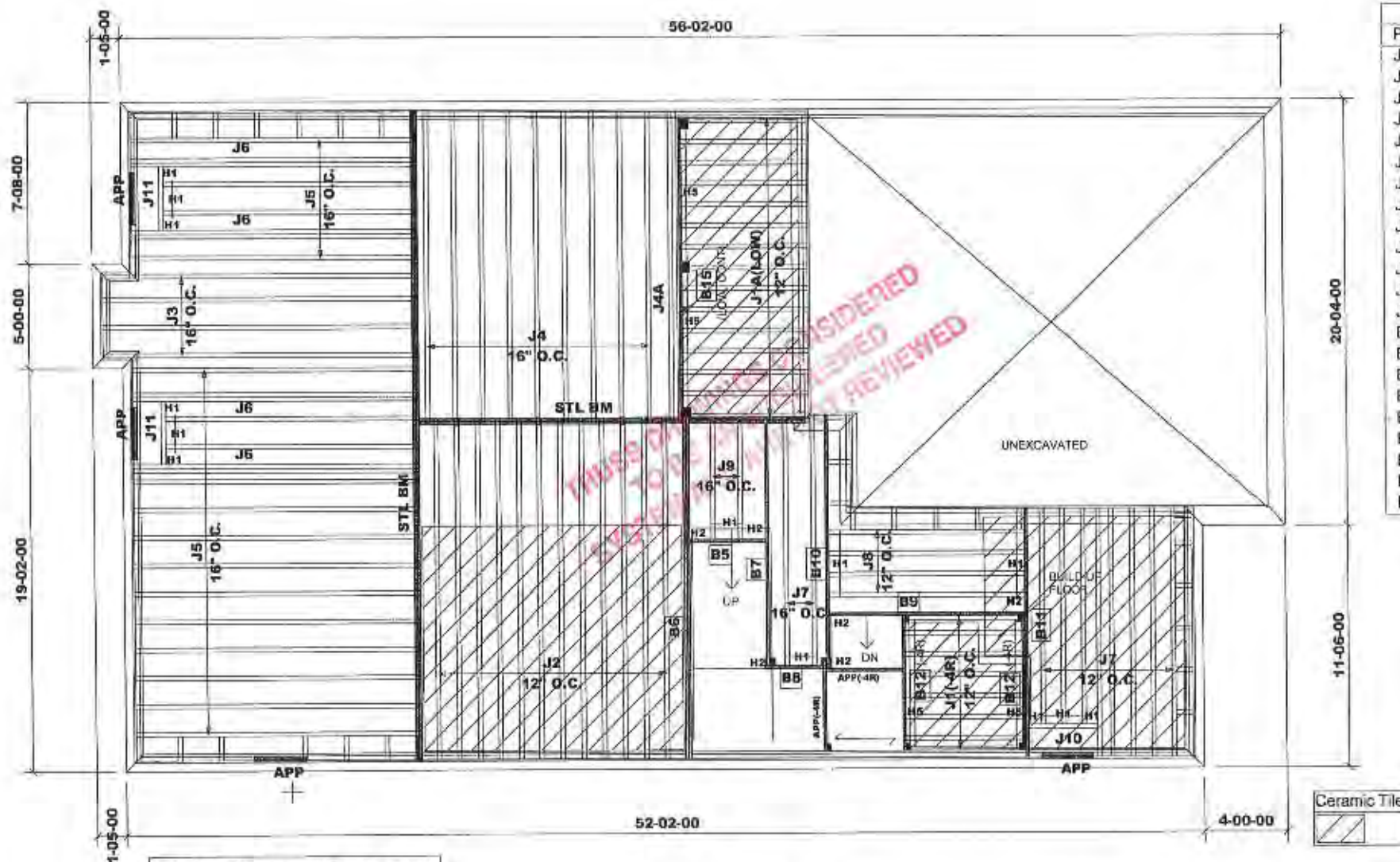
Sheet: 2 of 6

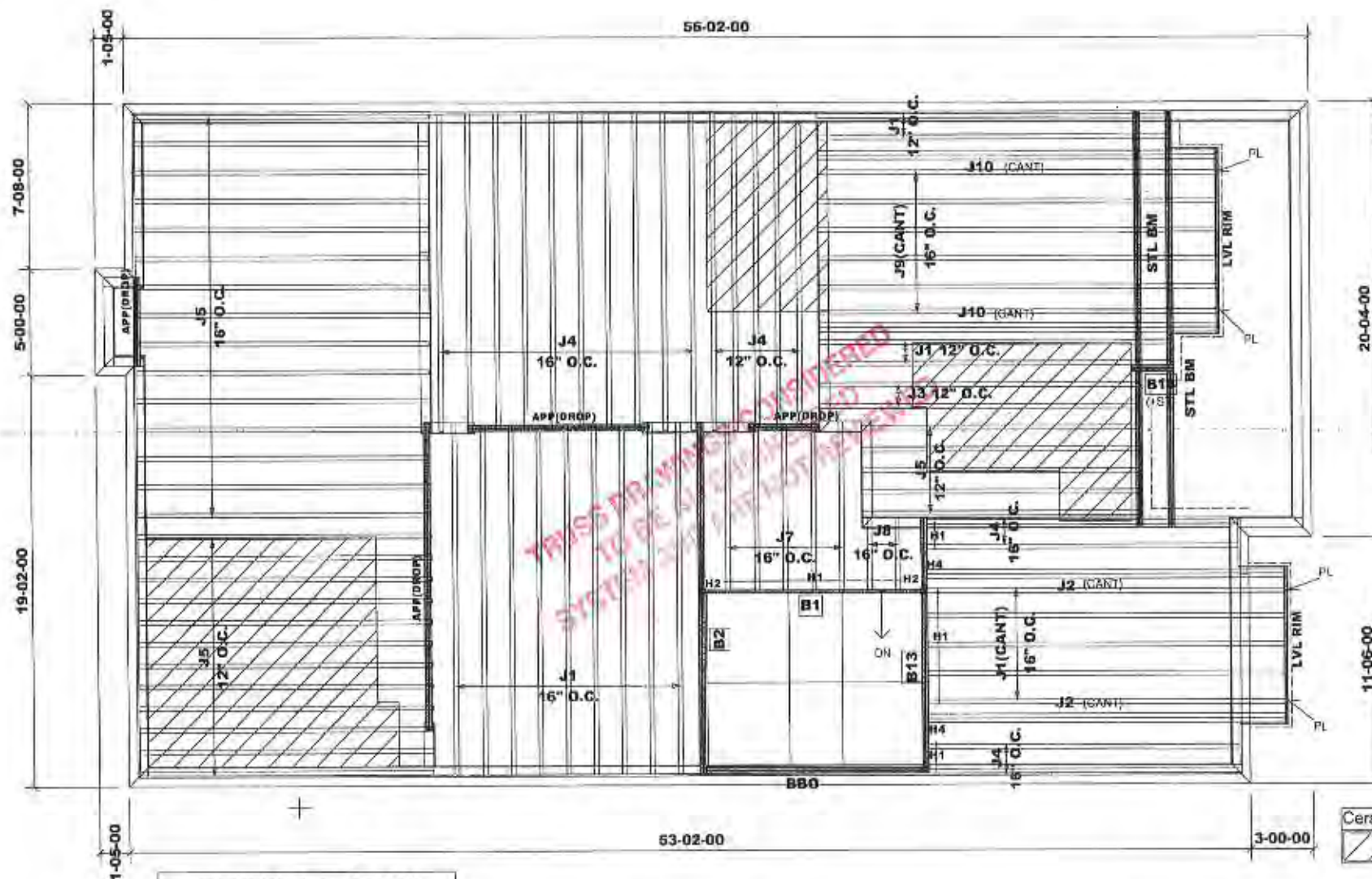
Alpa Roof Trusses Inc.

Maple, Ontario

Salesperson: Derek

Home Lumber





REVISION: June 29, 2018

MODEL: UNIT 4002 - EL.B  
+ OPT. LOGGIA

## Second Floor Framing

Do not scale - refer to architectural plans for dimensions

| Products |          |                  |       |         |
|----------|----------|------------------|-------|---------|
| PlotID   | Length   | Product          | Piles | Net Qty |
| J1       | 17-00-00 | 11 7/8" NI-20    | 1     | 18      |
| J2       | 17-00-00 | 11 7/8" NI-20    | 2     | 4       |
| J3       | 16-00-00 | 11 7/8" NI-20    | 1     | 2       |
| J4       | 15-00-00 | 11 7/8" NI-20    | 1     | 19      |
| J5       | 14-00-00 | 11 7/8" NI-20    | 1     | 32      |
| J7       | 8-00-00  | 11 7/8" NI-20    | 1     | 5       |
| J8       | 4-00-00  | 11 7/8" NI-20    | 1     | 2       |
| J9       | 19-00-00 | 11 7/8" NI-40x   | 1     | 6       |
| J10      | 19-00-00 | 11 7/8" NI-40x   | 2     | 4       |
| B2       | 17-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B13      | 12-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B1       | 11-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| LVL RIM  | 9-00-00  | VERSALAM-12 2.0E | 1     | 1       |
| LVL RIM  | 8-00-00  | VERSALAM-12 2.0E | 1     | 1       |
| B14      | 2-00-00  | VERSALAM-12 2.0E | 2     | 2       |

### HANGER SCHEDULE

H1 — LT251188 (TM)  
H2 — HUS1.81/10(FM)  
H4 — MIT311.88-2(TM)

### NOTE

TM — TOP MOUNT HANGERS  
FM — FACE MOUNT HANGERS

### RIMBOARD

1-1/8" X 11 7/8" O.S.B.  
SUBFLOOR - 3/4" NAILED & GLUED  
APP - AS PER PLAN  
BBO - BEAM BY OTHERS

Ceramic tile application as per O.B.C. 9.30.6

Provide 1-Joist Blocking between cantilevered joists (along bearing) and rimboard closure at ends.

1-2X6 SPF#2 Squash Block req'd on one side of each joist under interior load bearing wall. Multiple Squash Blocks are req'd under concentrated loads.

JT/PL: 45147/98839

LI: 299721(290669)

Builder: Gold Park

Project: Pine Valley

Location: Vaughan

Date: June 29, 2018

Designer: NL

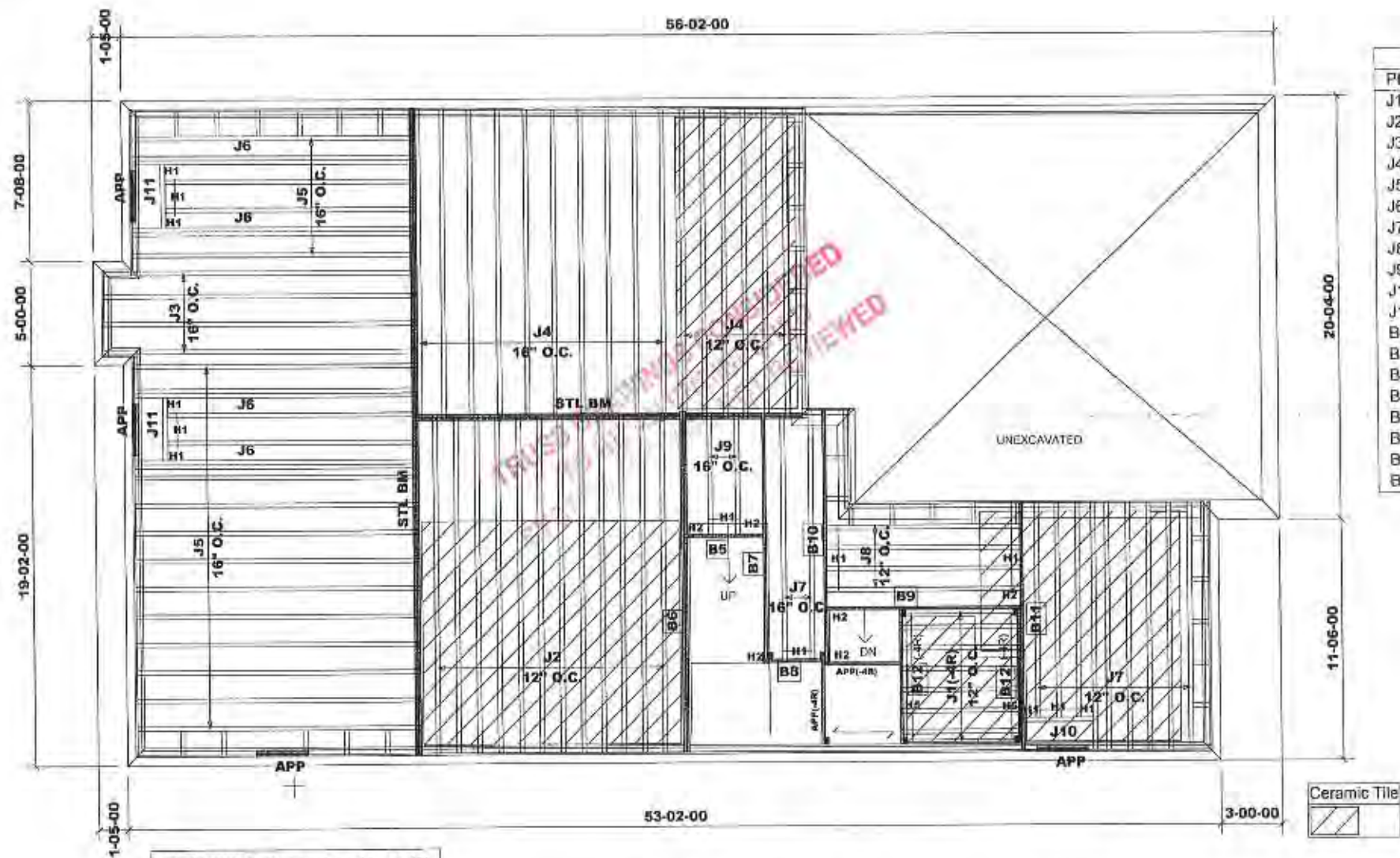
Sheet: 4 of 6

Alpa Roof Trusses Inc.

Maple, Ontario

Salesperson: Derek

Home Lumber



| Products |          |                  |       |         |
|----------|----------|------------------|-------|---------|
| PlotID   | Length   | Product          | Plies | Net Qty |
| J1       | 6-00-00  | 9 1/2" NI-20     | 1     | 8       |
| J2       | 17-00-00 | 11 7/8" NI-20    | 1     | 12      |
| J3       | 16-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J4       | 15-00-00 | 11 7/8" NI-20    | 1     | 16      |
| J5       | 14-00-00 | 11 7/8" NI-20    | 1     | 17      |
| J6       | 14-00-00 | 11 7/8" NI-20    | 2     | 8       |
| J7       | 12-00-00 | 11 7/8" NI-20    | 1     | 11      |
| J8       | 10-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J9       | 6-00-00  | 11 7/8" NI-20    | 1     | 2       |
| J10      | 4-00-00  | 11 7/8" NI-20    | 1     | 1       |
| J11      | 3-00-00  | 11 7/8" NI-20    | 1     | 2       |
| B6       | 17-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B10      | 13-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B11      | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B7       | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B9       | 10-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B12      | 7-00-00  | VERSALAM-10 2.0E | 1     | 2       |
| B5       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |
| B8       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |

#### HANGER SCHEDULE

H1-----LT251188 (TM)  
H2-----HUS1.81/10(FM)  
H5-----LT259(TM)

#### NOTE:

TM-----TOP MOUNT HANGERS  
FM-----FACE MOUNT HANGERS

#### RIMBOARD

1- 1/8" X 9 1/2" O.S.B.  
1- 1/8" X 11 7/8" O.S.B.

SUBFLOOR - 3/4" NAILED & GLUED

APP - AS PER PLAN  
BBO - BEAM BY OTHERS

Ceramic tile application as per O.B.C. 9.30.6

1-2X8 SPF#2 Squeash Block req'd on one side of each joist under interior load bearing wall. Multiple Squeash Blocks are req'd under concentrated loads.

REVISION: December 18, 2017

MODEL: UNIT 4002 - EL.B  
+ OPT. LOGGIA

### First Floor Framing

Do not scale - refer to architectural plans for dimensions

11 7/8" BLOCKING

TOTAL LENGTH: 48'

JT/PL: 45147/95234  
LI: 290669

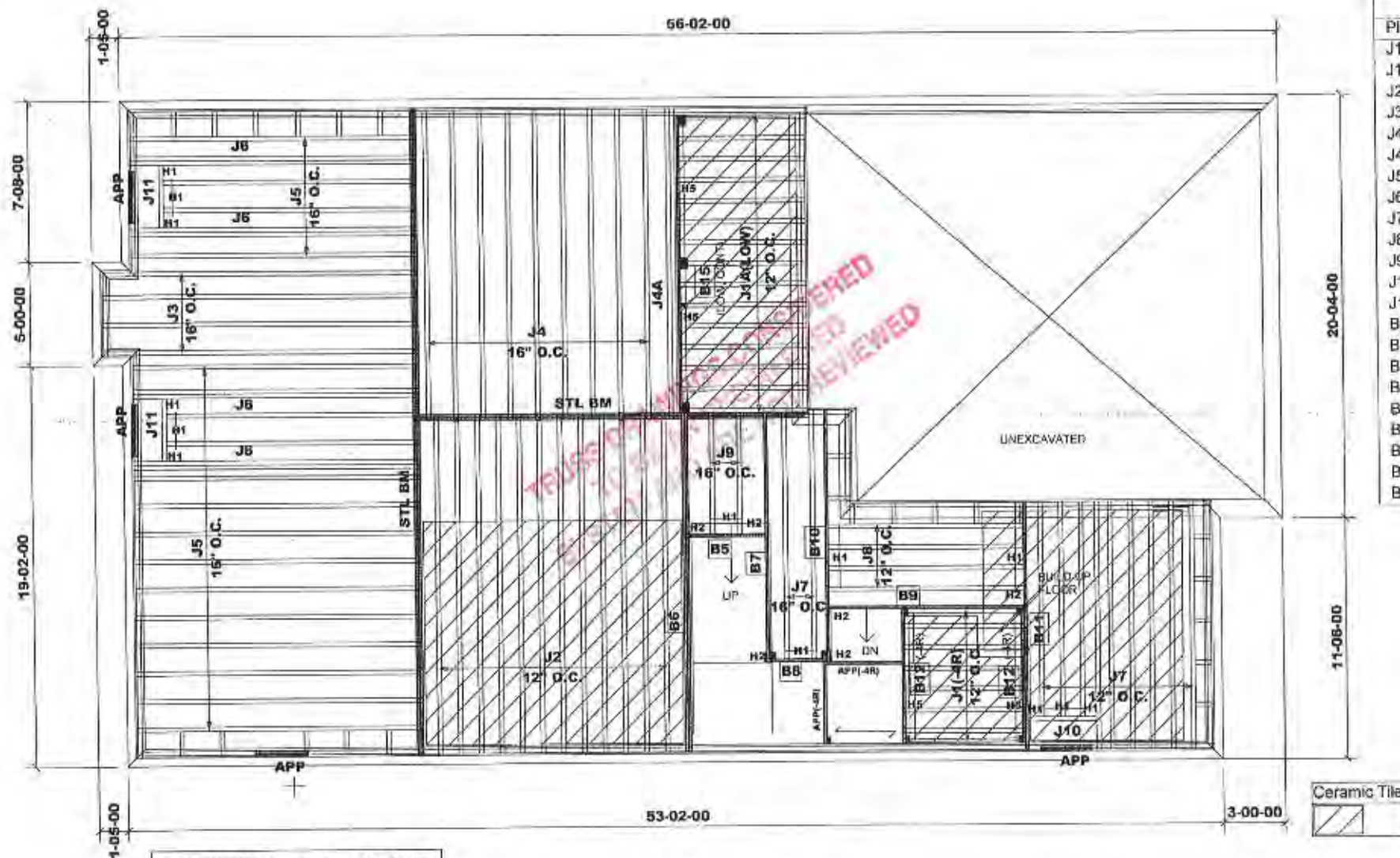
Builder: Gold Park  
Project: Pine Valley

Location: Vaughan  
Date: November 9, 2017

Designer: NL  
Sheet: 5 of 6

Alpa Roof Trusses Inc.  
Maple, Ontario

Salesperson: Derek  
Home Lumber



| Products |          |                  |       |         |
|----------|----------|------------------|-------|---------|
| PlotID   | Length   | Product          | Piles | Net Qty |
| J1A      | 7-00-00  | 9 1/2" NI-20     | 1     | 15      |
| J1       | 6-00-00  | 9 1/2" NI-20     | 1     | 8       |
| J2       | 17-00-00 | 11 7/8" NI-20    | 1     | 12      |
| J3       | 18-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J4       | 15-00-00 | 11 7/8" NI-20    | 1     | 9       |
| J4A      | 15-00-00 | 11 7/8" NI-20    | 2     | 2       |
| J5       | 14-00-00 | 11 7/8" NI-20    | 1     | 17      |
| J6       | 14-00-00 | 11 7/8" NI-20    | 2     | 8       |
| J7       | 12-00-00 | 11 7/8" NI-20    | 1     | 11      |
| J8       | 10-00-00 | 11 7/8" NI-20    | 1     | 4       |
| J9       | 6-00-00  | 11 7/8" NI-20    | 1     | 2       |
| J10      | 4-00-00  | 11 7/8" NI-20    | 1     | 1       |
| J11      | 3-00-00  | 11 7/8" NI-20    | 1     | 2       |
| B6       | 17-00-00 | VERSALAM-12 2.0E | 2     | 2       |
| B15      | 15-00-00 | VERSALAM-10 2.0E | 1     | 1       |
| B10      | 13-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B11      | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B7       | 12-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B9       | 10-00-00 | VERSALAM-12 2.0E | 1     | 1       |
| B12      | 7-00-00  | VERSALAM-10 2.0E | 1     | 2       |
| B5       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |
| B8       | 4-00-00  | VERSALAM-12 2.0E | 1     | 1       |

#### HANGER SCHEDULE

H1-----LT251188 (TM)  
H2-----HUS1.61/10(FM)  
H5-----LT259(TM)

#### NOTE:

TM-----TOP MOUNT HANGERS  
FM-----FACE MOUNT HANGERS

#### RIMBOARD

1- 1/8" X 8 1/2" O.S.B.  
1- 1/8" X 11 7/8" O.S.B.

SUBFLOOR - 3/4" NAILED & GLUED

APP - AS PER PLAN  
BBQ - BEAM BY OTHERS

Ceramic tile application as per O.B.C. 9.30.8

1-2X6 SPF#2 Squash Block req'd on one side of each joist under interior load bearing wall. Multiple Squash Blocks are req'd under concentrated loads.

REVISION: December 18, 2017

MODEL: UNIT 4002 - EL.B  
+ OPT. LOGGIA(W/SUNKEN)

### First Floor Framing

Do not scale - refer to architectural plans for dimensions

11 7/8" BLOCKING

TOTAL LENGTH: 40'

JT/PL: 45147/95234  
LI: 290669

Builder: Gold Park  
Project: Pine Valley

Location: Vaughan  
Date: November 9, 2017

Designer: NL  
Sheet: 6 of 6

Alpa Roof Trusses Inc.  
Maple, Ontario

Salesperson: Derek  
Home Lumber



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

Floor Beam\B01

BC CALC® Design Report



Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 8, 2017 15:50:27

Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code: Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

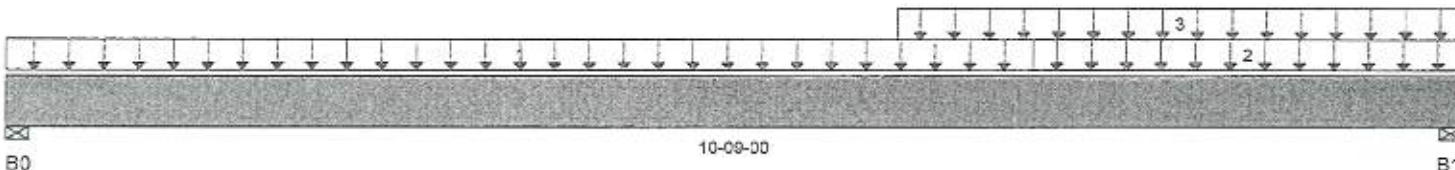
Description: Second Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 10-09-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 902 / 0 | 371 / 0 |      |      |
| B1, 3-1/2" | 982 / 0 | 400 / 0 |      |      |

## Load Summary

| Tag | Description   | Load Type                       | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|---------------|---------------------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   | Standard Load | Unf. Area (lb/ft <sup>2</sup> ) | L    | 00-00-00 | 07-07-00 | 40           | 15           |              |              | 04-00-00 |
| 2   |               | Unf. Area (lb/ft <sup>2</sup> ) | L    | 07-07-00 | 10-09-00 | 40           | 15           |              |              | 02-00-00 |
| 3   |               | Unf. Area (lb/ft <sup>2</sup> ) | L    | 06-07-00 | 10-09-00 | 40           | 15           |              |              | 02-06-00 |

## Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 4,704 ft-lbs    | 17,696 ft-lbs       | 26.6%               | 1         | 05-07-01 |
| End Shear        | 1,509 lbs       | 7,232 lbs           | 20.9%               | 1         | 09-05-10 |
| Total Load Defl. | L/959 (0.129")  | 0.515"              | 25%                 | 4         | 05-05-01 |
| Live Load Defl.  | L/999 (0.091")  | n/a                 | n/a                 | 5         | 05-05-01 |
| Max Defl.        | 0.129"          | 1"                  | 12.9%               | 4         | 05-05-01 |
| Span / Depth     | 10.4            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here 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 1-800-964-6999 before installation.

## Bearing Supports

|               | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|---------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 1,816 lbs | 48.2%                     | 24.3%                    | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 1,973 lbs | 52.4%                     | 26.4%                    | Spruce Pine Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4



S. 152689

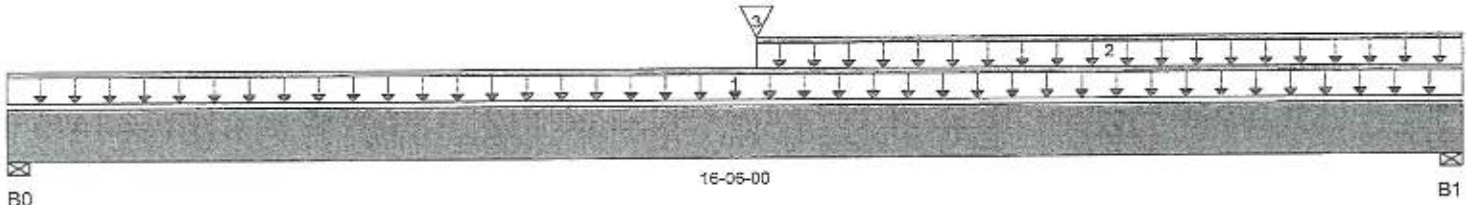
**BC CALC® Design Report**


Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 8, 2017 15:51:21

Build 6080  
 Job Name: 45147 (4002)  
 Address: Pine Valley  
 City, Province, Postal Code: Vaughan, ON  
 Customer: Gold Park  
 Code reports: CCMC 12472-R

File Name: 290669.bcc  
 Description: Second Floor Framing  
 Specifier:  
 Designer: NL  
 Company: Alpa Roof Trusses  
 Misc:



Total Horizontal Product Length = 16-06-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 710 / 0 | 916 / 0 |      |      |
| B1, 3-1/2" | 853 / 0 | 987 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type         | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib. |
|-----|-------------|-------------------|------|----------|----------|--------------|--------------|--------------|--------------|-------|
| 1   |             | Unf. Lin. (lb/ft) | L    | 00-00-00 | 16-06-00 | 27           | 74           |              |              | n/a   |
| 2   |             | Unf. Lin. (lb/ft) | L    | 08-06-00 | 16-06-00 | 27           | 14           |              |              | n/a   |
| 3   |             | Conc. Pt. (lbs)   | L    | 08-06-00 | 08-06-00 | 902          | 371          |              |              | n/a   |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 12,939 ft-lbs   | 35,392 ft-lbs       | 36.6%               | 1         | 08-06-00 |
| End Shear        | 2,249 lbs       | 14,464 lbs          | 15.5%               | 1         | 15-02-10 |
| Total Load Defl. | L/487 (0.396")  | 0.802"              | 49.3%               | 4         | 08-03-04 |
| Live Load Defl.  | L/973 (0.198")  | 0.535"              | 37%                 | 5         | 08-03-04 |
| Max Defl.        | 0.396"          | 1"                  | 39.6%               | 4         | 08-03-04 |
| Span / Depth     | 16.2            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Bearing Supports**

|    |            |                 |           |       |       |                 |
|----|------------|-----------------|-----------|-------|-------|-----------------|
| B0 | Wall/Plate | 3-1/2" x 3-1/2" | 2,211 lbs | 29.3% | 14.8% | Spruce Pine Fir |
| B1 | Wall/Plate | 3-1/2" x 3-1/2" | 2,513 lbs | 33.3% | 16.8% | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

Nail one ply to another with  
 3 1/2" spiral nails @ 12"  
 o.c., staggered in 2 rows



S152690



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

Floor Beam\B03

Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 8, 2017 15:52:11

BC CALC® Design Report



Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code: Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

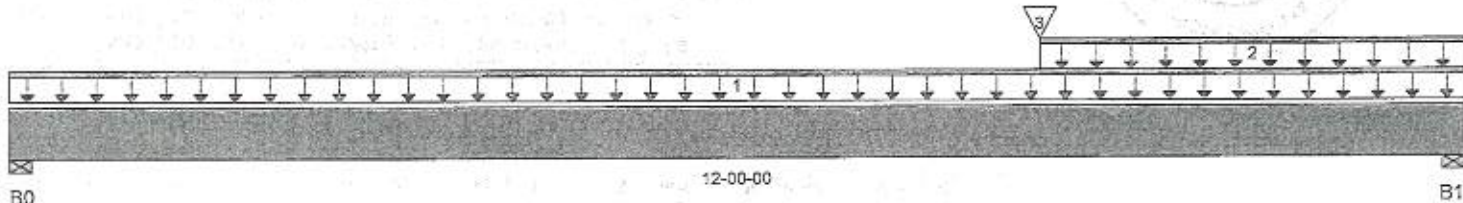
Description: Second Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 12-00-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 453 / 0 | 600 / 0 |      |      |
| B1, 3-1/2" | 948 / 0 | 809 / 0 |      |      |

## Load Summary

| Tag | Description | Load Type         | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib. |
|-----|-------------|-------------------|------|----------|----------|--------------|--------------|--------------|--------------|-------|
| 1   |             | Unf. Lin. (lb/ft) | L    | 00-00-00 | 12-00-00 | 27           | 74           |              |              | n/a   |
| 2   |             | Unf. Lin. (lb/ft) | L    | 08-06-00 | 12-00-00 | 27           | 14           |              |              | n/a   |
| 3   |             | Conc. Pt. (lbs)   | L    | 08-06-00 | 08-06-00 | 982          | 400          |              |              | n/a   |

## Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 6,747 ft-lbs    | 17,696 ft-lbs       | 38.1%               | 1         | 08-06-00 |
| End Shear        | 2,179 lbs       | 7,232 lbs           | 30.1%               | 1         | 10-08-10 |
| Total Load Defl. | L/649 (0.214")  | 0.577"              | 37%                 | 4         | 06-04-04 |
| Live Load Defl.  | L/999 (0.112")  | n/a                 | n/a                 | 5         | 06-05-10 |
| Max Defl.        | 0.214"          | 1"                  | 21.4%               | 4         | 06-04-04 |
| Span / Depth     | 11.7            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

## Disclosure

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## Bearing Supports

|               | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|---------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 1,429 lbs | 37.9%                     | 19.1%                    | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 2,433 lbs | 64.6%                     | 32.6%                    | Spruce Pine Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BC1®, BOISE GLULAM™, SIMPLE FRAMING SYSTEM®, VERSA-LAM®, VERSA-RIM PLUS®, VERSA-RIMS®, VERSA-STRAND®, VERSA-STUD® are trademarks of Boise Cascade Wood Products LLC.



S152691

BC CALC® Design Report



Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 09:07:47

Build 6080

File Name: 290669.bcc

Job Name:

45147 (4002)

Description: Second Floor Framing

Address:

Pine Valley

Specifier:

City, Province, Postal Code:

Vaughan, ON

Designer: NL

Customer:

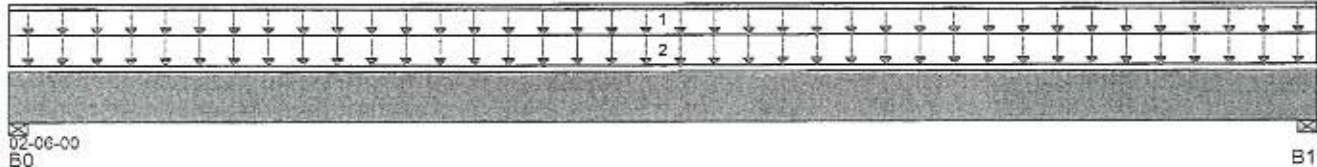
Gold Park

Company: Alpa Roof Trusses

Code reports:

CCMC 12472-R

Misc:



Total Horizontal Product Length = 02-06-00

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

| Bearing    | Live   | Dead    | Snow    | Wind |
|------------|--------|---------|---------|------|
| B0, 3-1/2" | 34 / 0 | 336 / 0 | 341 / 0 |      |
| B1, 3-1/2" | 34 / 0 | 336 / 0 | 341 / 0 |      |

### Load Summary

| Tag | Description | Load Type           | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|---------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)   | L    | 00-00-00 | 02-06-00 | 27           | 114          |              |              | n/a      |
| 2   |             | Unf. Area (lb/ft^2) | L    | 00-00-00 | 02-06-00 |              | 11           | 21           |              | 13-00-00 |

### Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 396 ft-lbs      | 35,392 ft-lbs       | 1.1%                | 5         | 01-03-00 |
| End Shear        | 24 lbs          | 14,464 lbs          | 0.2%                | 5         | 01-03-06 |
| Total Load Defl. | L/999 (0")      | n/a                 | n/a                 | 13        | 01-03-00 |
| Live Load Defl.  | L/999 (0")      | n/a                 | n/a                 | 17        | 01-03-00 |
| Max Defl.        | 0"              | n/a                 | n/a                 | 13        | 01-03-00 |
| Span / Depth     | 2.1             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

### Bearing Supports

|                  |            |                 | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material        |
|------------------|------------|-----------------|----------------------------------|---------------------------------|-----------------|
| Bearing Supports |            | Dim. (L x W)    | Demand                           |                                 |                 |
| B0               | Wall/Plate | 3-1/2" x 3-1/2" | 949 lbs                          | 12.6%                           | 6.4%            |
| B1               | Wall/Plate | 3-1/2" x 3-1/2" | 949 lbs                          | 12.6%                           | 6.4%            |
|                  |            |                 |                                  |                                 | Spruce Pine Fir |
|                  |            |                 |                                  |                                 | Spruce Pine Fir |

### Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Design meets User specified (1") Maximum Total 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 4

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



BC CALC® Design Report



Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 09:11:35

Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code:

Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

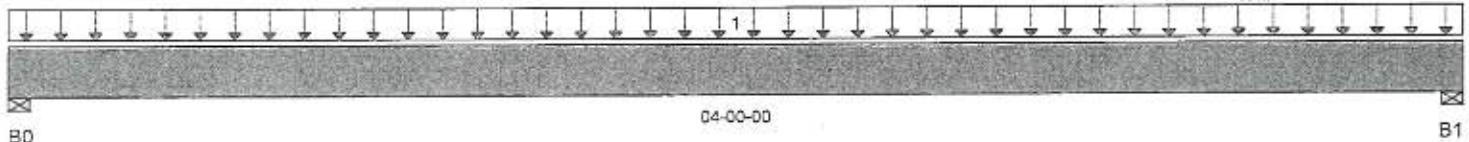
Description: First Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 04-00-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 560 / 0 | 222 / 0 |      |      |
| B1, 3-1/2" | 560 / 0 | 222 / 0 |      |      |

**Load Summary**

| Tag | Description        | Load Type | Ref. | Start    | End      | Live | Dead | Snow | Wind | Trib.    |
|-----|--------------------|-----------|------|----------|----------|------|------|------|------|----------|
| 1   | Unf. Area (lb/ft²) |           | L    | 00-00-00 | 04-00-00 | 40   | 15   |      |      | 07-00-00 |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 876 ft-lbs      | 17,696 ft-lbs       | 5%                  | 1         | 02-00-00 |
| End Shear        | 402 lbs         | 7,232 lbs           | 5.6%                | 1         | 01-03-06 |
| Total Load Defl. | L/999 (0.003")  | n/a                 | n/a                 | 4         | 02-00-00 |
| Live Load Defl.  | L/999 (0.002")  | n/a                 | n/a                 | 5         | 02-00-00 |
| Max Defl.        | 0.003"          | n/a                 | n/a                 | 4         | 02-00-00 |
| Span / Depth     | 3.6             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Disclosure**

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**Bearing Supports**

|    |            | Dim. (L x W)    | Demand    | Demand/ Resistance Support | Demand/ Resistance Member | Material        |
|----|------------|-----------------|-----------|----------------------------|---------------------------|-----------------|
| B0 | Wall/Plate | 3-1/2" x 1-3/4" | 1,118 lbs | 29.7%                      | 15%                       | Spruce Pine Fir |
| B1 | Wall/Plate | 3-1/2" x 1-3/4" | 1,118 lbs | 29.7%                      | 15%                       | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4





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

Floor Beam\B06

BC CALC® Design Report



Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 09:12:21

Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code: Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

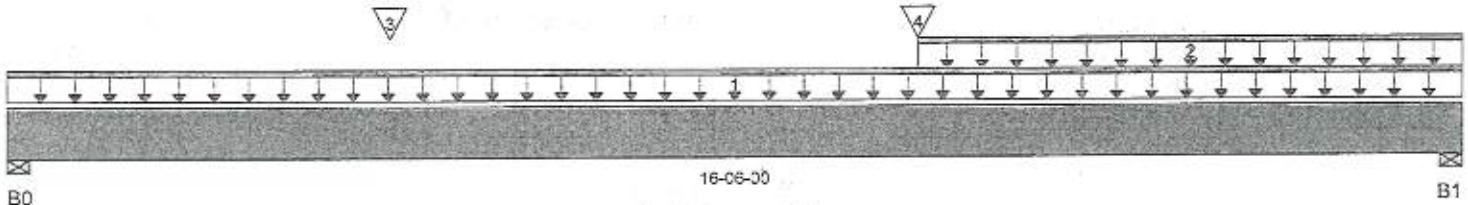
Description: First Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 16-06-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 895 / 0 | 971 / 0 |      |      |
| B1, 3-1/2" | 862 / 0 | 977 / 0 |      |      |

## Load Summary

| Tag | Description | Load Type         | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib. |
|-----|-------------|-------------------|------|----------|----------|--------------|--------------|--------------|--------------|-------|
| 1   |             | Unf. Lin. (lb/ft) | L    | 00-00-00 | 16-06-00 | 27           | 74           |              |              | n/a   |
| 2   |             | Unf. Lin. (lb/ft) | L    | 10-04-00 | 16-06-00 | 27           | 14           |              |              | n/a   |
| 3   |             | Conc. Pt. (lbs)   | L    | 04-04-00 | 04-04-00 | 585          | 220          |              |              | n/a   |
| 4   |             | Conc. Pt. (lbs)   | L    | 10-04-00 | 10-04-00 | 560          | 222          |              |              | n/a   |

## Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 11,067 ft-lbs   | 35,392 ft-lbs       | 31.3%               | 1         | 09-04-12 |
| End Shear        | 2,367 lbs       | 14,464 lbs          | 16.4%               | 1         | 01-03-06 |
| Total Load Defl. | L/500 (0.385")  | 0.802"              | 48%                 | 4         | 08-03-04 |
| Live Load Defl.  | L/997 (0.193")  | 0.535"              | 36.1%               | 5         | 08-03-04 |
| Max Defl.        | 0.385"          | 1"                  | 38.5%               | 4         | 08-03-04 |
| Span / Depth     | 16.2            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

| Bearing Supports | Dim. (L x W)    | Demand    | Demand / Resistance Support | Demand / Resistance Member | Material        |
|------------------|-----------------|-----------|-----------------------------|----------------------------|-----------------|
| B0 Wall/Plate    | 3-1/2" x 3-1/2" | 2,556 lbs | 33.9%                       | 17.1%                      | Spruce Pine Fir |
| B1 Wall/Plate    | 3-1/2" x 3-1/2" | 2,514 lbs | 33.4%                       | 16.8%                      | Spruce Pine Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

Nail one ply to another with  
 3 1/2" spiral nails @ 12"  
 o.c., staggered in 2 rows



S. 152694

**BC CALC® Design Report**


Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 09:13:45

Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code:

Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

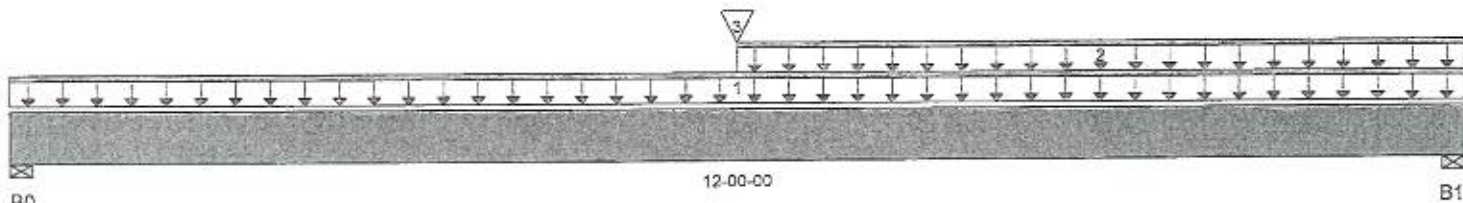
Description: First Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 12-00-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 481 / 0 | 251 / 0 |      |      |
| B1, 3-1/2" | 565 / 0 | 295 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type         | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib. |
|-----|-------------|-------------------|------|----------|----------|--------------|--------------|--------------|--------------|-------|
| 1   |             | Unf. Lin. (lb/ft) | L    | 00-00-00 | 12-00-00 | 27           | 14           |              |              | n/a   |
| 2   |             | Unf. Lin. (lb/ft) | L    | 06-00-00 | 12-00-00 | 27           | 14           |              |              | n/a   |
| 3   |             | Conc. Pt. (lbs)   | L    | 06-00-00 | 06-00-00 | 560          | 222          |              |              | n/a   |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 4,798 ft-lbs    | 17,696 ft-lbs       | 27.1%               | 1         | 06-00-00 |
| End Shear        | 1,058 lbs       | 7,232 lbs           | 14.6%               | 1         | 10-08-10 |
| Total Load Defl. | L/963 (0.144")  | 0.577"              | 24.9%               | 4         | 06-00-00 |
| Live Load Defl.  | L/999 (0.097")  | n/a                 | n/a                 | 5         | 06-00-00 |
| Max Defl.        | 0.144"          | 1"                  | 14.4%               | 4         | 06-00-00 |
| Span / Depth     | 11.7            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

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**Bearing Supports**

|               | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|---------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 1,036 lbs | 27.5%                     | 13.9%                    | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 1,216 lbs | 32.3%                     | 16.3%                    | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, SIMPLE FRAMING SYSTEM®, VERSA-LAM®, VERSA-RIM PLUS®, VERSA-RIM®, VERSA-STRAND®, VERSA-STUD® are trademarks of Boise Cascade Wood Products L.L.C.



BC CALC® Design Report

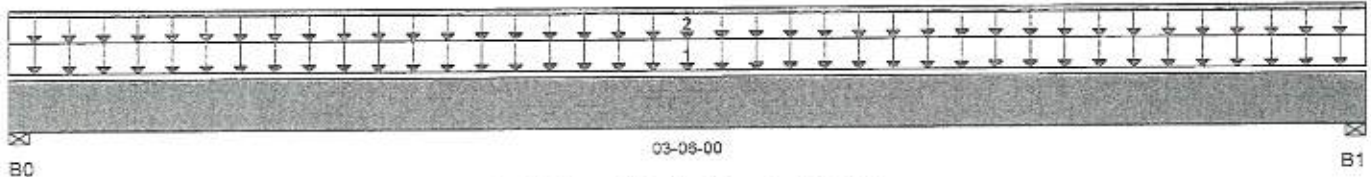


Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 09:14:07

Build 6080  
Job Name: 45147 (4002)  
Address: Pine Valley  
City, Province, Postal Code: Vaughan, ON  
Customer: Gold Park  
Code reports: CCMC 12472-R

File Name: 290669.bcc  
Description: First Floor Framing  
Specifier:  
Designer: NL  
Company: Alpa Roof Trusses  
Misc:



Total Horizontal Product Length = 03-06-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 420 / 0 | 273 / 0 |      |      |
| B1, 3-1/2" | 420 / 0 | 273 / 0 |      |      |

### Load Summary

| Tag | Description | Load Type          | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|--------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 03-06-00 | 40           | 15           |              |              | 06-00-00 |
| 2   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 03-06-00 |              | 60           |              |              | n/a      |

### Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 642 ft-lbs      | 17,696 ft-lbs       | 3.6%                | 1         | 01-09-00 |
| End Shear        | 260 lbs         | 7,232 lbs           | 3.6%                | 1         | 01-03-06 |
| Total Load Defl. | L/999 (0.002")  | n/a                 | n/a                 | 4         | 01-09-00 |
| Live Load Defl.  | L/999 (0.001")  | n/a                 | n/a                 | 5         | 01-09-00 |
| Max Defl.        | 0.002"          | n/a                 | n/a                 | 4         | 01-09-00 |
| Span / Depth     | 3.1             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

### Disclosure

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### Bearing Supports

|               | Dim. (L x W)    | Demand  | Demand / Resistance Support | Demand / Resistance Member | Material        |
|---------------|-----------------|---------|-----------------------------|----------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 971 lbs | 25.8%                       | 13%                        | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 971 lbs | 25.8%                       | 13%                        | Spruce Pine Fir |

### Notes

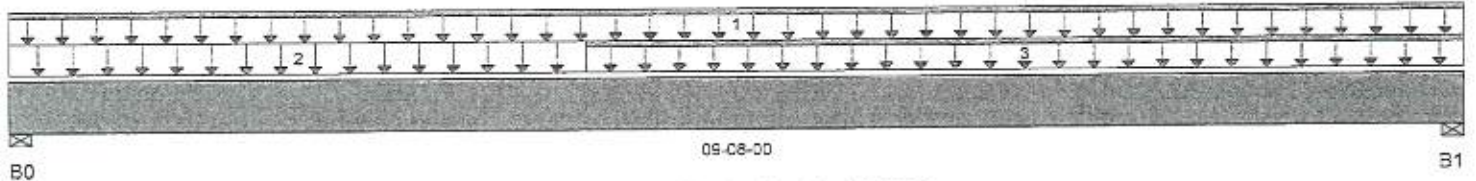
Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Design meets User specified (1") Maximum Total load deflection criteria.  
Calculations assume member is fully braced.  
Resistance Factor phi has been applied to all 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 4



**BC CALC® Design Report**


Build 6080  
 Job Name: 45147 (4002)  
 Address: Pine Valley  
 City, Province, Postal Code: Vaughan, ON  
 Customer: Gold Park  
 Code reports: CCMC 12472-R

File Name: 290669.bcc  
 Description: First Floor Framing  
 Specifier:  
 Designer: NL  
 Company: Alpa Roof Trusses  
 Misc:



Total Horizontal Product Length = 09-08-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 318 / 0 | 269 / 0 |      |      |
| B1, 3-1/2" | 173 / 0 | 360 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type           | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|---------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)   | L    | 00-00-00 | 09-08-00 | 27           | 14           |              |              | n/a      |
| 2   |             | Unf. Area (lb/ft^2) | L    | 00-00-00 | 03-10-00 | 40           | 15           |              |              | 01-06-00 |
| 3   |             | Unf. Lin. (lb/ft)   | L    | 03-10-00 | 09-08-00 |              | 60           |              |              | n/a      |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 1,633 ft-lbs    | 17,696 ft-lbs       | 9.2%                | 1         | 04-08-04 |
| End Shear        | 579 lbs         | 7,232 lbs           | 8%                  | 1         | 01-03-06 |
| Total Load Defl. | L/999 (0.038")  | n/a                 | n/a                 | 4         | 04-09-15 |
| Live Load Defl.  | L/999 (0.016")  | n/a                 | n/a                 | 5         | 04-08-04 |
| Max Defl.        | 0.038"          | n/a                 | n/a                 | 4         | 04-09-15 |
| Span / Depth     | 9.3             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Disclosure**

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**Bearing Supports**

|               | Dim. (L x W)    | Demand  | Demand / Resistance Support | Demand / Resistance Member | Material        |
|---------------|-----------------|---------|-----------------------------|----------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 814 lbs | 21.6%                       | 10.9%                      | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 504 lbs | 20.6%                       | 10.4%                      | Spruce Pine Fir |

**Notes**

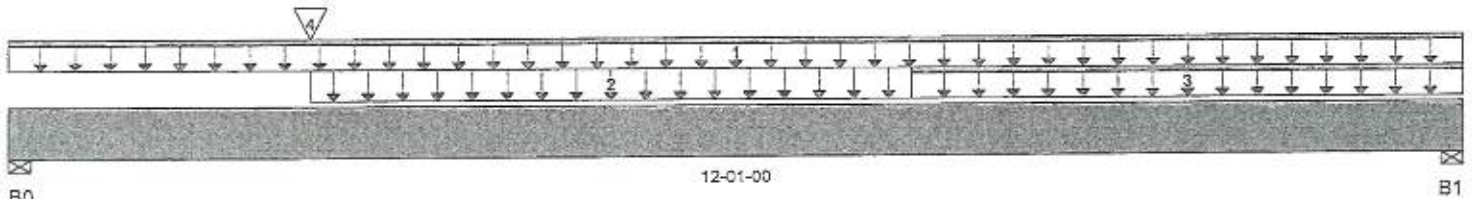
Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total load deflection criteria.  
 Calculations assume member is fully braced.  
 Resistance Factor phi has been applied to 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 4



**BC CALC® Design Report**


Build 6080  
 Job Name: 45147 (4002)  
 Address: Pine Valley  
 City, Province, Postal Code: Vaughan, ON  
 Customer: Gold Park  
 Code reports: CCMC 12472-R

File Name: 290669.bcc  
 Description: First Floor Framing  
 Specifier:  
 Designer: NL  
 Company: Alpa Roof Trusses  
 Misc:



Total Horizontal Product Length = 12-01-00

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

| Bearing    | Live      | Dead    | Snow | Wind |
|------------|-----------|---------|------|------|
| B0, 3-1/2" | 1,031 / 0 | 644 / 0 |      |      |
| B1, 3-1/2" | 737 / 0   | 431 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type          | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|--------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 12-01-00 | 27           | 14           |              |              | n/a      |
| 2   |             | Unf. Area (lb/ft²) | L    | 02-06-00 | 07-06-00 | 40           | 20           |              |              | 05-00-00 |
| 3   |             | Unf. Lin. (lb/ft)  | L    | 07-06-00 | 12-01-00 | 27           | 14           |              |              | n/a      |
| 4   |             | Conc. Pt. (lbs)    | L    | 02-06-00 | 02-06-00 | 318          | 269          |              |              | n/a      |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 7,057 ft-lbs    | 17,696 ft-lbs       | 39.9%               | 1         | 05-03-12 |
| End Shear        | 2,267 lbs       | 7,232 lbs           | 31.3%               | 1         | 01-03-06 |
| Total Load Defl. | L/579 (0.241")  | 0.581"              | 41.5%               | 4         | 05-09-06 |
| Live Load Defl.  | L/916 (0.152")  | 0.387"              | 39.3%               | 5         | 05-09-06 |
| Max Defl.        | 0.241"          | 1"                  | 24.1%               | 4         | 05-09-06 |
| Span / Depth     | 11.7            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Disclosure**

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here 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 1-800-964-6999 before installation.

**Bearing Supports**

|    | Dim. (L x W)    | Demand    | Demand / Resistance Support | Demand / Resistance Member | Material        |
|----|-----------------|-----------|-----------------------------|----------------------------|-----------------|
| B0 | 3-1/2" x 1-3/4" | 2,351 lbs | 62.4%                       | 31.5%                      | Spruce Pine Fir |
| B1 | 3-1/2" x 1-3/4" | 1,645 lbs | 43.7%                       | 22%                        | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, SIMPLE FRAMING SYSTEM®, VERSA-LAM®, VERSA-RIM PLUS®, VERSA-RIM®, VERSA-STRAND®, VERSA-STUD® are trademarks of Boise Cascade Wood Products L.L.C.



**BC CALC® Design Report**


Build 6080

Job Name: 45147 (4002)

Address: Pine Valley

City, Province, Postal Code: Vaughan, ON

Customer: Gold Park

Code reports: CCMC 12472-R

File Name: 290669.bcc

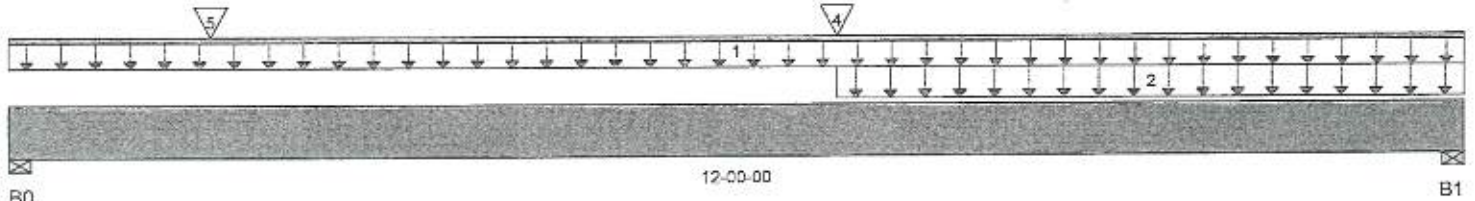
Description: First Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 12-00-00

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

| Bearing    | Live      | Dead      | Snow | Wind |
|------------|-----------|-----------|------|------|
| B0, 3-1/2" | 867 / 0   | 950 / 0   |      |      |
| B1, 3-1/2" | 1,143 / 0 | 1,127 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type           | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|---------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)   | L    | 00-00-00 | 12-00-00 | 27           | 74           |              |              | n/a      |
| 2   |             | Unf. Area (lb/ft^2) | L    | 06-10-00 | 12-00-00 | 40           | 20           |              |              | 05-00-00 |
| 4   |             | Conc. Pt. (lbs)     | L    | 06-10-00 | 06-10-00 | 173          | 360          |              |              | n/a      |
| 5   |             | Conc. Pt. (lbs)     | L    | 01-08-00 | 01-08-00 | 480          | 240          |              |              | n/a      |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 7,887 ft-lbs    | 17,696 ft-lbs       | 44.6%               | 1         | 06-10-00 |
| End Shear        | 2,398 lbs       | 7,232 lbs           | 33.2%               | 1         | 10-08-10 |
| Total Load Defl. | L/511 (0.271")  | 0.577"              | 46.9%               | 4         | 06-02-04 |
| Live Load Defl.  | L/999 (0.124")  | n/a                 | n/a                 | 5         | 06-02-04 |
| Max Defl.        | 0.271"          | 1"                  | 27.1%               | 4         | 06-02-04 |
| Span / Depth     | 11.7            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Disclosure**

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**Bearing Supports**

|               | Dim. (L x W)    | Demand    | Demand / Resistance Support | Demand / Resistance Member | Material        |
|---------------|-----------------|-----------|-----------------------------|----------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 2,488 lbs | 66%                         | 33.3%                      | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 3,123 lbs | 82.9%                       | 41.8%                      | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

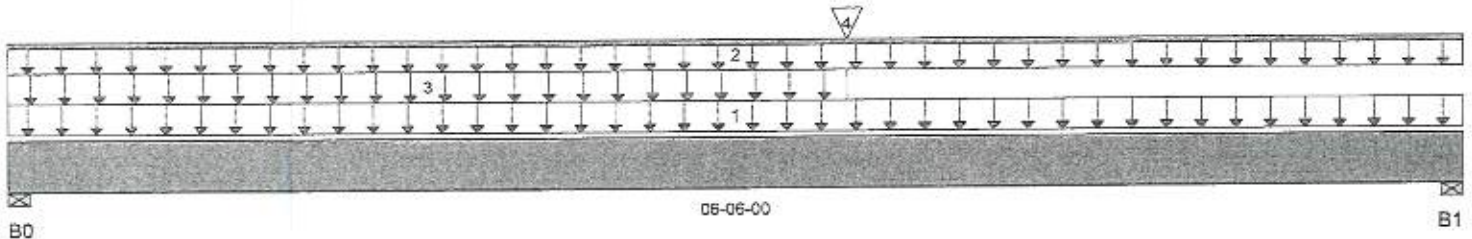
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**BC CALC® Design Report**


Build 6080  
 Job Name: 45147 (4002)  
 Address: Pine Valley  
 City, Province, Postal Code: Vaughan, ON  
 Customer: Gold Park  
 Code reports: CCMC 12472-R

File Name: 290669.bcc  
 Description: First Floor Framing  
 Specifier:  
 Designer: NL  
 Company: Alpa Roof Trusses  
 Misc:



Total Horizontal Product Length = 06-06-00

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

| Bearing    | Live    | Dead    | Snow | Wind |
|------------|---------|---------|------|------|
| B0, 3-1/2" | 696 / 0 | 523 / 0 |      |      |
| B1, 3-1/2" | 587 / 0 | 482 / 0 |      |      |

**Load Summary**

| Tag | Description | Load Type          | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|--------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 06-06-00 | 40           | 20           |              |              | 03-02-00 |
| 2   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 06-06-00 |              | 60           |              |              | n/a      |
| 3   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 03-09-00 | 40           | 15           |              |              | 02-00-00 |
| 4   |             | Conc. Pt. (lbs)    | L    | 03-09-00 | 03-09-00 | 160          | 60           |              |              | n/a      |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 2,466 ft-lbs    | 11,610 ft-lbs       | 21.2%               | 1         | 03-04-00 |
| End Shear        | 1,149 lbs       | 5,785 lbs           | 19.9%               | 1         | 01-01-00 |
| Total Load Defl. | L/999 (0.046")  | n/a                 | n/a                 | 4         | 03-03-00 |
| Live Load Defl.  | L/999 (0.026")  | n/a                 | n/a                 | 5         | 03-03-00 |
| Max Defl.        | 0.046"          | n/a                 | n/a                 | 4         | 03-03-00 |
| Span / Depth     | 7.6             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Disclosure**

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**Bearing Supports**

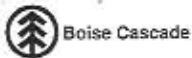
|               | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|---------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 1,699 lbs | 45.1%                     | 22.7%                    | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 1,483 lbs | 39.4%                     | 19.8%                    | Spruce Pine Fir |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCI®, BOISE GLULAM™, SIMPLE FRAMING SYSTEM®, VERSA-LAM®, VERSA-RIM PLUS®, VERSA-RIM®, VERSA-STRAND®, VERSA-STUD® are trademarks of Boise Cascade Wood Products LLC.





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

Floor Beam\B13

Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 9, 2017 10:22:26

BC CALC® Design Report



Build 6080

Job Name:

45147 (4002)

Address:

Pine Valley

City, Province, Postal Code: Vaughan, ON

Customer:

Gold Park

Code reports:

CCMC 12472-R

File Name: 290669.bcc

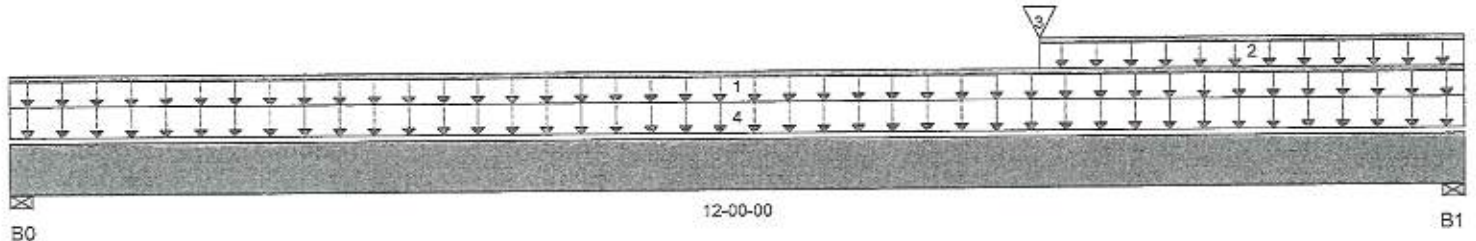
Description: Second Floor Framing

Specifier:

Designer: NL

Company: Alpa Roof Trusses

Misc:



Total Horizontal Product Length = 12-00-00

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

| Bearing    | Live      | Dead      | Snow | Wind |
|------------|-----------|-----------|------|------|
| B0, 3-1/2" | 2,111 / 0 | 1,235 / 0 |      |      |
| B1, 3-1/2" | 2,606 / 0 | 1,444 / 0 |      |      |

## Load Summary

| Tag | Description | Load Type          | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|--------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 12-00-00 |              | 60           |              |              | n/a      |
| 2   |             | Unf. Lin. (lb/ft)  | L    | 08-06-00 | 12-00-00 | 27           | 14           |              |              | n/a      |
| 3   |             | Conc. Pt. (lbs)    | L    | 08-06-00 | 08-06-00 | 982          | 400          |              |              | n/a      |
| 4   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 12-00-00 | 40           | 15           |              |              | 07-07-00 |

## Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 15,073 ft-lbs   | 35,392 ft-lbs       | 42.6%               | 1         | 06-11-01 |
| End Shear        | 4,759 lbs       | 14,464 lbs          | 32.9%               | 1         | 10-08-10 |
| Total Load Defl. | L/527 (0.263")  | 0.577"              | 45.5%               | 4         | 06-01-09 |
| Live Load Defl.  | L/823 (0.168")  | 0.385"              | 43.8%               | 5         | 06-01-09 |
| Max Defl.        | 0.263"          | 1"                  | 26.3%               | 4         | 06-01-09 |
| Span / Depth     | 11.7            | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

## Bearing Supports

| Bearing Supports |            | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|------------------|------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0               | Wall/Plate | 3-1/2" x 3-1/2" | 4,709 lbs | 62.5%                     | 31.5%                    | Spruce Pine Fir |
| B1               | Wall/Plate | 3-1/2" x 3-1/2" | 5,713 lbs | 75.8%                     | 38.2%                    | Spruce Pine Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

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

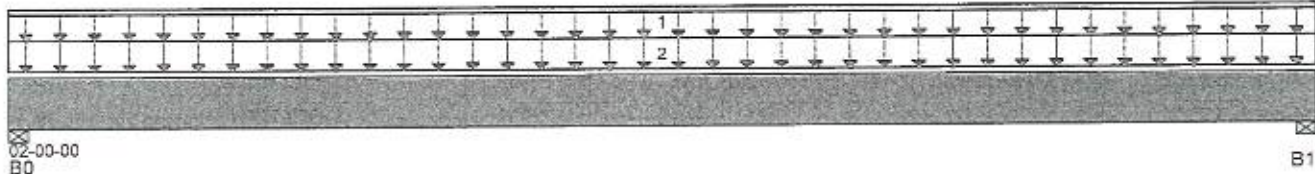


8152701

**BC CALC® Design Report**


Build 6080  
 Job Name: 45147 (4002)  
 Address: Pine Valley  
 City, Province, Postal Code: Vaughan, ON  
 Customer: Gold Park  
 Code reports: CCMC 12472-R

File Name: 290669.bcc  
 Description: Second Floor Framing  
 Specifier:  
 Designer: NL  
 Company: Alpa Roof Trusses  
 Misc:



Total Horizontal Product Length = 02-00-00

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

| Bearing    | Live   | Dead    | Snow    | Wind |
|------------|--------|---------|---------|------|
| B0, 3-1/2" | 27 / 0 | 225 / 0 | 189 / 0 |      |
| B1, 3-1/2" | 27 / 0 | 225 / 0 | 189 / 0 |      |

**Load Summary**

| Tag | Description | Load Type          | Ref. | Start    | End      | Live<br>1.00 | Dead<br>0.65 | Snow<br>1.00 | Wind<br>1.15 | Trib.    |
|-----|-------------|--------------------|------|----------|----------|--------------|--------------|--------------|--------------|----------|
| 1   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 02-00-00 | 27           | 114          |              |              | n/a      |
| 2   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 02-00-00 |              | 11           | 21           |              | 09-00-00 |

**Controls Summary**

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 172 ft-lbs      | 35,392 ft-lbs       | 0.5%                | 5         | 01-00-00 |
| End Shear        | 163 lbs         | 14,464 lbs          | 1.1%                | 5         | 01-03-06 |
| Total Load Defl. | L/999 (0")      | n/a                 | n/a                 | 13        | 01-00-00 |
| Max Defl.        | 0"              | n/a                 | n/a                 | 13        | 01-00-00 |
| Span / Depth     | 1.6             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

**Bearing Supports**

|                  |              |                 | Demand/<br>Resistance<br>Support | Demand/<br>Resistance<br>Member | Material |
|------------------|--------------|-----------------|----------------------------------|---------------------------------|----------|
| Bearing Supports | Dim. (L x W) | Demand          |                                  |                                 |          |
| B0               | Wall/Plate   | 3-1/2" x 3-1/2" | 578 lbs                          | 7.7%                            | 3.9%     |
| B1               | Wall/Plate   | 3-1/2" x 3-1/2" | 578 lbs                          | 7.7%                            | 3.9%     |

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets User specified (1") Maximum Total 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 4

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





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

Floor Beam\B15

Dry | 2 spans | No cantilevers | 0/12 slope (deg)

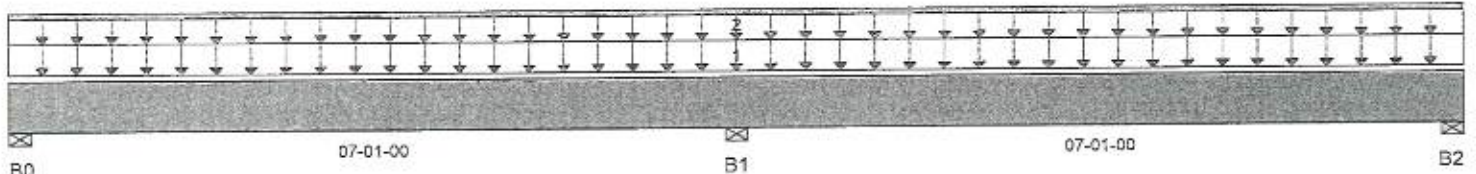
November 9, 2017 10:47:42

BC CALC® Design Report



Build 6080  
Job Name: 45147 (4002)  
Address: Pine Valley  
City, Province, Postal Code: Vaughan, ON  
Customer: Gold Park  
Code reports: CCMC 12472-R

File Name: 290669.bcc  
Description: First Floor Framing  
Specifier:  
Designer: NL  
Company: Alpa Roof Trusses  
Misc:



Total Horizontal Product Length = 14-02-00

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

| Bearing    | Live      | Dead      | Snow | Wind |
|------------|-----------|-----------|------|------|
| B0, 3-1/2" | 420 / 56  | 363 / 0   |      |      |
| B1, 3-1/2" | 1,114 / 0 | 1,112 / 0 |      |      |
| B2, 3-1/2" | 420 / 56  | 363 / 0   |      |      |

## Load Summary

| Tag | Description | Load Type          | Ref. | Start    | End      | Live | Dead | Snow | Wind | Trib.    |
|-----|-------------|--------------------|------|----------|----------|------|------|------|------|----------|
| 1   |             | Unf. Area (lb/ft²) | L    | 00-00-00 | 14-02-00 | 40   | 20   |      |      | 03-03-00 |
| 2   |             | Unf. Lin. (lb/ft)  | L    | 00-00-00 | 14-02-00 |      | 60   |      |      | n/a      |

## Controls Summary

|                  | Factored Demand | Factored Resistance | Demand / Resistance | Load Case | Location |
|------------------|-----------------|---------------------|---------------------|-----------|----------|
| Pos. Moment      | 1,404 ft-lbs    | 11,610 ft-lbs       | 12.1%               | 2         | 03-00-12 |
| Neg. Moment      | -2,098 ft-lbs   | -11,610 ft-lbs      | 18.1%               | 1         | 07-01-00 |
| End Shear        | 697 lbs         | 5,785 lbs           | 12%                 | 2         | 01-01-00 |
| Cont. Shear      | 1,196 lbs       | 5,785 lbs           | 20.7%               | 1         | 06-01-12 |
| Total Load Defl. | L/999 (0.029")  | n/a                 | n/a                 | 9         | 03-03-09 |
| Live Load Defl.  | L/999 (0.018")  | n/a                 | n/a                 | 12        | 03-05-08 |
| Total Neg. Defl. | L/999 (-0.003") | n/a                 | n/a                 | 10        | 06-00-13 |
| Max Defl.        | 0.029"          | n/a                 | n/a                 | 9         | 03-03-09 |
| Span / Depth     | 8.7             | n/a                 | n/a                 |           | 00-00-00 |
| Squash Blocks    | Valid           |                     |                     |           |          |

## Disclosure

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## Bearing Supports

|               | Dim. (L x W)    | Demand    | Demand/Resistance Support | Demand/Resistance Member | Material        |
|---------------|-----------------|-----------|---------------------------|--------------------------|-----------------|
| B0 Wall/Plate | 3-1/2" x 1-3/4" | 1,084 lbs | 28.8%                     | 14.5%                    | Spruce Pine Fir |
| B1 Wall/Plate | 3-1/2" x 1-3/4" | 3,061 lbs | 81.2%                     | 41%                      | Spruce Pine Fir |
| B2 Wall/Plate | 3-1/2" x 1-3/4" | 1,084 lbs | 28.8%                     | 14.5%                    | Spruce Pine Fir |

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
Design meets Code minimum (L/360) Live load deflection criteria.  
Design meets User specified (1") Maximum Total 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 4



S152703

PROJECT  
451-4714002  
Gold Park  
Pine Valley, Vaughan  
5-16-2015 CANT - 2ND FLOOR

Loads:

| Label | Type | Distinction (as<br>seen) | Position | Location<br>Source | Int.<br>Ref. | Magnitude<br>Visual | Notes |
|-------|------|--------------------------|----------|--------------------|--------------|---------------------|-------|
| QW01  | Star | Full: A988               | Yes      |                    |              | 19.50               | SA1   |
| QW02  | Star | Full: A988               | Yes      |                    |              | 19.50               | SA1   |
| QW03  | Star | Point                    | No       | 17.17              |              | 2.34                | SA2   |
| QW04  | Star | Point                    | No       | 17.17              |              | 3.0                 | SA3   |
| QW05  | Star | Point                    | Yes      | 17.17              |              | 5.6                 | SA4   |
| QW06  | Star | Point                    | Yes      | 17.17              |              | 15.6                | SA5   |
| QW07  | Star | Point                    | No       | 17.17              |              | 16.6                | SA6   |
| QW08  | Star | Point                    | No       | 17.17              |              | 16.6                | SA7   |
| QW09  | Star | Point                    | No       | 17.17              |              | 16.6                | SA8   |
| QW10  | Star | Point                    | No       | 17.17              |              | 16.6                | SA9   |
| QW11  | Star | Point                    | No       | 17.17              |              | 16.6                | SA10  |
| QW12  | Star | Point                    | No       | 17.17              |              | 16.6                | SA11  |
| QW13  | Star | Point                    | No       | 17.17              |              | 16.6                | SA12  |
| QW14  | Star | Point                    | No       | 17.17              |              | 16.6                | SA13  |
| QW15  | Star | Point                    | No       | 17.17              |              | 16.6                | SA14  |
| QW16  | Star | Point                    | No       | 17.17              |              | 16.6                | SA15  |
| QW17  | Star | Point                    | No       | 17.17              |              | 16.6                | SA16  |
| QW18  | Star | Point                    | No       | 17.17              |              | 16.6                | SA17  |
| QW19  | Star | Point                    | No       | 17.17              |              | 16.6                | SA18  |
| QW20  | Star | Point                    | No       | 17.17              |              | 16.6                | SA19  |
| QW21  | Star | Point                    | No       | 17.17              |              | 16.6                | SA20  |
| QW22  | Star | Point                    | No       | 17.17              |              | 16.6                | SA21  |
| QW23  | Star | Point                    | No       | 17.17              |              | 16.6                | SA22  |
| QW24  | Star | Point                    | No       | 17.17              |              | 16.6                | SA23  |
| QW25  | Star | Point                    | No       | 17.17              |              | 16.6                | SA24  |
| QW26  | Star | Point                    | No       | 17.17              |              | 16.6                | SA25  |
| QW27  | Star | Point                    | No       | 17.17              |              | 16.6                | SA26  |
| QW28  | Star | Point                    | No       | 17.17              |              | 16.6                | SA27  |
| QW29  | Star | Point                    | No       | 17.17              |              | 16.6                | SA28  |
| QW30  | Star | Point                    | No       | 17.17              |              | 16.6                | SA29  |
| QW31  | Star | Point                    | No       | 17.17              |              | 16.6                | SA30  |
| QW32  | Star | Point                    | No       | 17.17              |              | 16.6                | SA31  |
| QW33  | Star | Point                    | No       | 17.17              |              | 16.6                | SA32  |
| QW34  | Star | Point                    | No       | 17.17              |              | 16.6                | SA33  |
| QW35  | Star | Point                    | No       | 17.17              |              | 16.6                | SA34  |
| QW36  | Star | Point                    | No       | 17.17              |              | 16.6                | SA35  |
| QW37  | Star | Point                    | No       | 17.17              |              | 16.6                | SA36  |
| QW38  | Star | Point                    | No       | 17.17              |              | 16.6                | SA37  |
| QW39  | Star | Point                    | No       | 17.17              |              | 16.6                | SA38  |
| QW40  | Star | Point                    | No       | 17.17              |              | 16.6                | SA39  |
| QW41  | Star | Point                    | No       | 17.17              |              | 16.6                | SA40  |
| QW42  | Star | Point                    | No       | 17.17              |              | 16.6                | SA41  |
| QW43  | Star | Point                    | No       | 17.17              |              | 16.6                | SA42  |
| QW44  | Star | Point                    | No       | 17.17              |              | 16.6                | SA43  |
| QW45  | Star | Point                    | No       | 17.17              |              | 16.6                | SA44  |
| QW46  | Star | Point                    | No       | 17.17              |              | 16.6                | SA45  |
| QW47  | Star | Point                    | No       | 17.17              |              | 16.6                | SA46  |
| QW48  | Star | Point                    | No       | 17.17              |              | 16.6                | SA47  |
| QW49  | Star | Point                    | No       | 17.17              |              | 16.6                | SA48  |
| QW50  | Star | Point                    | No       | 17.17              |              | 16.6                | SA49  |
| QW51  | Star | Point                    | No       | 17.17              |              | 16.6                | SA50  |
| QW52  | Star | Point                    | No       | 17.17              |              | 16.6                | SA51  |
| QW53  | Star | Point                    | No       | 17.17              |              | 16.6                | SA52  |
| QW54  | Star | Point                    | No       | 17.17              |              | 16.6                | SA53  |
| QW55  | Star | Point                    | No       | 17.17              |              | 16.6                | SA54  |
| QW56  | Star | Point                    | No       | 17.17              |              | 16.6                | SA55  |
| QW57  | Star | Point                    | No       | 17.17              |              | 16.6                | SA56  |
| QW58  | Star | Point                    | No       | 17.17              |              | 16.6                | SA57  |
| QW59  | Star | Point                    | No       | 17.17              |              | 16.6                | SA58  |
| QW60  | Star | Point                    | No       | 17.17              |              | 16.6                | SA59  |
| QW61  | Star | Point                    | No       | 17.17              |              | 16.6                | SA60  |
| QW62  | Star | Point                    | No       | 17.17              |              | 16.6                | SA61  |
| QW63  | Star | Point                    | No       | 17.17              |              | 16.6                | SA62  |
| QW64  | Star | Point                    | No       | 17.17              |              | 16.6                | SA63  |
| QW65  | Star | Point                    | No       | 17.17              |              | 16.6                | SA64  |
| QW66  | Star | Point                    | No       | 17.17              |              | 16.6                | SA65  |
| QW67  | Star | Point                    | No       | 17.17              |              | 16.6                | SA66  |
| QW68  | Star | Point                    | No       | 17.17              |              | 16.6                | SA67  |
| QW69  | Star | Point                    | No       | 17.17              |              | 16.6                | SA68  |
| QW70  | Star | Point                    | No       | 17.17              |              | 16.6                | SA69  |
| QW71  | Star | Point                    | No       | 17.17              |              | 16.6                | SA70  |
| QW72  | Star | Point                    | No       | 17.17              |              | 16.6                | SA71  |
| QW73  | Star | Point                    | No       | 17.17              |              | 16.6                | SA72  |
| QW74  | Star | Point                    | No       | 17.17              |              | 16.6                | SA73  |
| QW75  | Star | Point                    | No       | 17.17              |              | 16.6                | SA74  |
| QW76  | Star | Point                    | No       | 17.17              |              | 16.6                | SA75  |
| QW77  | Star | Point                    | No       | 17.17              |              | 16.6                | SA76  |
| QW78  | Star | Point                    | No       | 17.17              |              | 16.6                | SA77  |
| QW79  | Star | Point                    | No       | 17.17              |              | 16.6                | SA78  |
| QW80  | Star | Point                    | No       | 17.17              |              | 16.6                | SA79  |
| QW81  | Star | Point                    | No       | 17.17              |              | 16.6                | SA80  |
| QW82  | Star | Point                    | No       | 17.17              |              | 16.6                | SA81  |
| QW83  | Star | Point                    | No       | 17.17              |              | 16.6                | SA82  |
| QW84  | Star | Point                    | No       | 17.17              |              | 16.6                | SA83  |
| QW85  | Star | Point                    | No       | 17.17              |              | 16.6                | SA84  |
| QW86  | Star | Point                    | No       | 17.17              |              | 16.6                | SA85  |
| QW87  | Star | Point                    | No       | 17.17              |              | 16.6                | SA86  |
| QW88  | Star | Point                    | No       | 17.17              |              | 16.6                | SA87  |
| QW89  | Star | Point                    | No       | 17.17              |              | 16.6                | SA88  |
| QW90  | Star | Point                    | No       | 17.17              |              | 16.6                | SA89  |
| QW91  | Star | Point                    | No       | 17.17              |              | 16.6                | SA90  |
| QW92  | Star | Point                    | No       | 17.17              |              | 16.6                | SA91  |
| QW93  | Star | Point                    | No       | 17.17              |              | 16.6                | SA92  |
| QW94  | Star | Point                    | No       | 17.17              |              | 16.6                | SA93  |
| QW95  | Star | Point                    | No       | 17.17              |              | 16.6                | SA94  |
| QW96  | Star | Point                    | No       | 17.17              |              | 16.6                | SA95  |
| QW97  | Star | Point                    | No       | 17.17              |              | 16.6                | SA96  |
| QW98  | Star | Point                    | No       | 17.17              |              | 16.6                | SA97  |
| QW99  | Star | Point                    | No       | 17.17              |              | 16.6                | SA98  |
| QW100 | Star | Point                    | No       | 17.17              |              | 16.6                | SA99  |
| QW101 | Star | Point                    | No       | 17.17              |              | 16.6                | SA100 |
| QW102 | Star | Point                    | No       | 17.17              |              | 16.6                | SA101 |
| QW103 | Star | Point                    | No       | 17.17              |              | 16.6                | SA102 |
| QW104 | Star | Point                    | No       | 17.17              |              | 16.6                | SA103 |
| QW105 | Star | Point                    | No       | 17.17              |              | 16.6                | SA104 |
| QW106 | Star | Point                    | No       | 17.17              |              | 16.6                | SA105 |
| QW107 | Star | Point                    | No       | 17.17              |              | 16.6                | SA106 |
| QW108 | Star | Point                    | No       | 17.17              |              | 16.6                | SA107 |
| QW109 | Star | Point                    | No       | 17.17              |              | 16.6                | SA108 |
| QW110 | Star | Point                    | No       | 17.17              |              | 16.6                | SA109 |
| QW111 | Star | Point                    | No       | 17.17              |              | 16.6                | SA110 |
| QW112 | Star | Point                    | No       | 17.17              |              | 16.6                | SA111 |
| QW113 | Star | Point                    | No       | 17.17              |              | 16.6                | SA112 |
| QW114 | Star | Point                    | No       | 17.17              |              | 16.6                | SA113 |
| QW115 | Star | Point                    | No       | 17.17              |              | 16.6                | SA114 |
| QW116 | Star | Point                    | No       | 17.17              |              | 16.6                | SA115 |
| QW117 | Star | Point                    | No       | 17.17              |              | 16.6                | SA116 |
| QW118 | Star | Point                    | No       | 17.17              |              | 16.6                | SA117 |
| QW119 | Star | Point                    | No       | 17.17              |              | 16.6                | SA118 |
| QW120 | Star | Point                    | No       | 17.17              |              | 16.6                | SA119 |
| QW121 | Star | Point                    | No       | 17.17              |              | 16.6                | SA120 |
| QW122 | Star | Point                    | No       | 17.17              |              | 16.6                | SA121 |
| QW123 | Star | Point                    | No       | 17.17              |              | 16.6                | SA122 |
| QW124 | Star | Point                    | No       | 17.17              |              | 16.6                | SA123 |
| QW125 | Star | Point                    | No       | 17.17              |              | 16.6                | SA124 |
| QW126 | Star | Point                    | No       | 17.17              |              | 16.6                | SA125 |
| QW127 | Star | Point                    | No       | 17.17              |              | 16.6                | SA126 |
| QW128 | Star | Point                    | No       | 17.17              |              | 16.6                | SA127 |
| QW129 | Star | Point                    | No       | 17.17              |              | 16.6                | SA128 |
| QW130 | Star | Point                    | No       | 17.17              |              | 16.6                | SA129 |
| QW131 | Star | Point                    | No       | 17.17              |              | 16.6                | SA130 |
| QW132 | Star | Point                    | No       | 17.17              |              | 16.6                | SA131 |
| QW133 | Star | Point                    | No       | 17.17              |              | 16.6                | SA132 |
| QW134 | Star | Point                    | No       | 17.17              |              | 16.6                | SA133 |
| QW135 | Star | Point                    | No       | 17.17              |              | 16.6                | SA134 |
| QW136 | Star | Point                    | No       | 17.17              |              | 16.6                | SA135 |
| QW137 | Star | Point                    | No       | 17.17              |              | 16.6                | SA136 |
| QW138 | Star | Point                    | No       | 17.17              |              | 16.6                | SA137 |
| QW139 | Star | Point                    | No       | 17.17              |              | 16.6                | SA138 |
| QW140 | Star | Point                    | No       | 17.17              |              | 16.6                | SA139 |
| QW141 | Star | Point                    | No       | 17.17              |              | 16.6                | SA140 |
| QW142 | Star | Point                    | No       | 17.17              |              | 16.6                | SA141 |
| QW143 | Star | Point                    | No       | 17.17              |              | 16.6                | SA142 |
| QW144 | Star | Point                    | No       | 17.17              |              | 16.6                | SA143 |
| QW145 | Star | Point                    | No       | 17.17              |              | 16.6                | SA144 |
| QW146 | Star | Point                    | No       | 17.17              |              | 16.6                | SA145 |
| QW147 | Star | Point                    | No       | 17.17              |              | 16.6                | SA146 |
| QW148 | Star | Point                    | No       | 17.17              |              | 16.6                | SA147 |
| QW149 | Star | Point                    | No       | 17.17              |              | 16.6                | SA148 |
| QW150 | Star | Point                    | No       | 17.17              |              | 16.6                | SA149 |
| QW151 | Star | Point                    | No       | 17.17              |              | 16.6                | SA150 |
| QW152 | Star | Point                    | No       | 17.17              |              | 16.6                | SA151 |
| QW153 | Star | Point                    | No       | 17.17              |              | 16.6                | SA152 |
| QW154 | Star | Point                    | No       | 17.17              |              | 16.6                | SA153 |
| QW155 | Star | Point                    | No       | 17.17              |              | 16.6                | SA154 |
| QW156 | Star | Point                    | No       | 17.17              |              | 16.6                | SA155 |
| QW157 | Star | Point                    | No       | 17.17              |              | 16.6                | SA156 |
| QW158 | Star | Point                    | No       | 17.17              |              | 16.6                | SA157 |
| QW159 | Star | Point                    | No       | 17.17              |              | 16.6                | SA158 |
| QW160 | Star | Point                    | No       | 17.17              |              | 16.6                | SA159 |
| QW161 | Star | Point                    | No       | 17.17              |              | 16.6                | SA160 |
| QW162 | Star | Point                    | No       | 17.17              |              | 16.6                | SA161 |
| QW163 | Star | Point                    | No       | 17.17              |              | 16.6                | SA162 |
| QW164 | Star | Point                    | No       | 17.17              |              | 16.6                | SA163 |
| QW165 | Star | Point                    | No       | 17.17              |              | 16.6                | SA164 |
| QW166 | Star | Point                    | No       | 17.17              |              | 16.6                | SA165 |
| QW167 | Star | Point                    | No       | 17.17              |              | 16.6                | SA166 |
| QW168 | Star | Point                    | No       | 17.17              |              | 16.6                | SA167 |
| QW169 | Star | Point                    | No       | 17.17              |              | 16.6                | SA168 |
| QW170 | Star | Point                    | No       | 17.17              |              | 16.6                | SA169 |
| QW171 | Star | Point                    | No       | 17.17              |              | 16.6                | SA170 |
| QW172 | Star | Point                    | No       | 17.17              |              | 16.6                | SA171 |
| QW173 | Star | Point                    | No       | 17.17              |              | 16.6                | SA172 |
| QW174 | Star | Point                    | No       | 17.17              |              | 16.6                | SA173 |
| QW175 | Star | Point                    | No       | 17.17              |              | 16.6                | SA174 |
| QW176 | Star | Point                    | No       | 17.17              |              | 16.6                | SA175 |
| QW177 | Star | Point                    | No       | 17.17              |              | 16.6                | SA176 |
| QW178 | Star | Point                    | No       | 17.17              |              | 16.6                | SA177 |
| QW179 | Star | Point                    | No       | 17.17              |              | 16.6                | SA178 |
| QW180 | Star | Point                    | No       | 17.17              |              | 16.6                | SA179 |
| QW181 | Star | Point                    | No       | 17.17              |              | 16.6                | SA180 |
| QW182 | Star | Point                    | No       | 17.17              |              | 16.6                | SA181 |
| QW183 | Star | Point                    | No       | 17.17              |              | 16.6                | SA182 |
| QW184 | Star | Point                    | No       | 17.17              |              | 16.6                | SA183 |
| QW185 | Star | Point                    | No       | 17.17              |              | 16.6                | SA184 |
| QW186 | Star | Point                    | No       | 17.17              |              | 16.6                | SA185 |
| QW187 | Star | Point                    | No       | 17.17              |              | 16.6                | SA186 |
| QW188 | Star | Point                    | No       | 17.17              |              | 16.6                | SA187 |
| QW189 | Star | Point                    | No       | 17.17              |              | 16.6                | SA188 |
| QW190 | Star | Point                    | No       | 17.17              |              | 16.6                | SA189 |
| QW191 | Star | Point                    | No       | 17.17              |              | 16.6                | SA190 |
| QW192 | Star | Point                    | No       | 17.17              |              | 16.6                | SA191 |
| QW193 | Star | Point                    | No       | 17.17              |              | 16.6                | SA192 |
| QW194 | Star | Point                    | No       | 17.17              |              | 16.6                | SA193 |
| QW195 | Star | Point                    | No       | 17.17              |              | 16.6                | SA194 |
| QW196 | Star | Point                    | No       | 17.17              |              | 16.6                | SA195 |
| QW197 | Star | Point                    | No       | 17.17              |              | 16.6                | SA196 |
| QW198 | Star | Point                    | No       | 17.17              |              | 16.6                | SA197 |
| QW199 | Star | Point                    | No       | 17.17              |              | 16.                 |       |

| Software                                                                                                          | Year | Full CDB | MS | 2-4 | 100 |
|-------------------------------------------------------------------------------------------------------------------|------|----------|----|-----|-----|
| <p>Our marriage does not include some important factor from MS Table 2.2.2, which is applied during analysis.</p> |      |          |    |     |     |

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

| Maximum Resistance (kN), Bearing Resistance (kN) and Tension (kN) |       | 17.3' |  |
|-------------------------------------------------------------------|-------|-------|--|
| Infected:                                                         | 100   | 500   |  |
| Live                                                              | 304   | 529   |  |
| Dead                                                              | -24   | 248   |  |
| Factored:                                                         |       | 1074  |  |
| Total                                                             | 143   |       |  |
| Design:                                                           |       |       |  |
| Resistance                                                        | 1905  | 4794  |  |
| Support                                                           | 2795  | 6108  |  |
| Max. ratio                                                        |       | 0.39  |  |
| Joint                                                             | 0.39  | 0.27  |  |
| Support                                                           | 0.27  | 84    |  |
| Load case                                                         | 112   | 2-1/2 |  |
| Length                                                            | 1-3/4 | 3-1/2 |  |
| Min. req'd                                                        | 1-3/4 | 82    |  |
| Stiffener                                                         | 82    | 1.50  |  |
| W                                                                 | 1.00  | 1.20  |  |
| W support                                                         | 1.00  | 769   |  |
| Top up                                                            | 769   | 1.15  |  |
| Core up                                                           | 1.22  |       |  |

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

Nordic Joist 11-7/8" NI-20 Floor joist @ 16" o.c.  
Supports: All - Lumber Wall, Rr.19No.2  
Total length: 17-2 3/4" 6" nailed and glued OSB sheathing  
This section PASSES the design code check.

Limit States Design using CSA C308-16 and Vibration Criteria

[illegible]

Additional Data:

| FACTORS: | JFK  | KD   | KH   | KS | KL    | KT | KS | KW | LBI |
|----------|------|------|------|----|-------|----|----|----|-----|
| Vt       | 30+1 | 1.00 | 1.00 | -  | -     | -  | -  | -  | 84  |
| Mv+      | 5000 | 1.00 | 1.00 | -  | 1,000 | -  | -  | -  | 110 |
| Mw-      | 6000 | 0.98 | 1.00 | -  | 1,000 | -  | -  | -  | 15  |

CRITICAL LOAD COMBINATIONS:

[illegible]

Design Notes:

- Design Notes:**
1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA C88-14 Engineering Design in Wood standards (May 2014 edition).
  2. Please verify that the default deflection limits are appropriate for your application.
  3. Refer to technical documentation for installation guidelines and construction details.
  4. Note's 1)Notes are listed in CSWIP notation per 13002-41.
  5. Joints shall be liberally 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, or design is the responsibility of the client. The analysis does not constitute a record of the structural integrity of the building nor the reliability of the design assumptions made. Note Structures is responsible only for the accuracy of the information based on the design criteria and loadings shown.



S. 15270ef

S 152705



## Maximum Floor Spans

Live Load = 40 psf, Dead Load = 15 psf  
Simple Spans, L/360 Deflection Limit  
3/4" OSB G&N Sheathing

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

- Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of  $1.50L + 1.25D$ . The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/360 and a total load deflection limit of L/240.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O85-09, NBC 2010, and OBC 2012.
- Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.



| NI-20              | NI-40x             | NI-60              | NI-70              | NI-80              | NI-90              | NI-90x             |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                    |                    |                    |                    |                    |                    |                    |
| S-RF No.2          | 1950f MSR          | 2100f MSR          | 1950f MSR          | 2100f MSR          | 2400f MSR          | NPG Lumber         |
| 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 |

5. The sides of square holes or longer sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the side of the largest square hole (or twice the length of the longest side of the longest rectangular hole or twice chord opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller are permitted anywhere in a nonstressed 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 workmanlike 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.

| Joist Depth | Joist Series | Minimum distance from inside face of supports to centre of opening (ft. - in.) |        |         |        |         |        |        |        |         |  |
|-------------|--------------|--------------------------------------------------------------------------------|--------|---------|--------|---------|--------|--------|--------|---------|--|
|             |              | Duct Chase Length (in.)                                                        |        |         |        |         |        |        |        |         |  |
|             |              | 8                                                                              | 10     | 12      | 14     | 16      | 18     | 20     | 22     | 24      |  |
| 9-1/2"      | N-20         | 4'-1"                                                                          | 4'-3"  | 4'-10"  | 5'-0"  | 5'-8"   | 6'-1"  | 6'-9"  | 7'-1"  | 7'-5"   |  |
|             | N-40x        | 5'-3"                                                                          | 5'-8"  | 6'-0"   | 6'-5"  | 5'-10"  | 7'-3"  | 7'-8"  | 8'-2"  | 8'-6"   |  |
|             | N-60         | 5'-1"                                                                          | 5'-5"  | 5'-10"  | 6'-3"  | 6'-7"   | 7'-5"  | 8'-0"  | 8'-3"  | 8'-7"   |  |
|             | N-80         | 5'-1"                                                                          | 5'-5"  | 6'-0"   | 6'-3"  | 6'-7"   | 7'-1"  | 7'-6"  | 8'-1"  | 8'-6"   |  |
|             | N-90         | 5'-3"                                                                          | 5'-8"  | 6'-0"   | 6'-3"  | 6'-10"  | 7'-3"  | 7'-8"  | 8'-2"  | 8'-6"   |  |
| 11-7/8"     | N-20         | 5'-5"                                                                          | 6'-2"  | 6'-6"   | 7'-1"  | 7'-5"   | 7'-9"  | 8'-3"  | 8'-9"  | 9'-4"   |  |
|             | N-40x        | 6'-8"                                                                          | 7'-2"  | 7'-6"   | 8'-1"  | 8'-6"   | 9'-1"  | 9'-6"  | 10'-1" | 10'-9"  |  |
|             | N-60         | 7'-3"                                                                          | 7'-8"  | 8'-0"   | 8'-6"  | 9'-0"   | 9'-3"  | 9'-9"  | 10'-3" | 11'-0"  |  |
|             | N-80         | 7'-1"                                                                          | 7'-4"  | 7'-9"   | 8'-3"  | 8'-7"   | 9'-1"  | 9'-6"  | 10'-1" | 10'-4"  |  |
|             | N-90         | 7'-2"                                                                          | 7'-7"  | 8'-0"   | 8'-5"  | 8'-10"  | 9'-3"  | 9'-8"  | 10'-2" | 10'-8"  |  |
| 14"         | N-90x        | 7'-6"                                                                          | 7'-11" | 8'-4"   | 8'-9"  | 9'-2"   | 9'-7"  | 10'-1" | 10'-7" | 10'-11" |  |
|             | N-20x        | 7'-7"                                                                          | 8'-1"  | 8'-5"   | 8'-10" | 9'-4"   | 9'-8"  | 10'-2" | 10'-7" | 11'-2"  |  |
|             | N-40x        | 8'-1"                                                                          | 8'-7"  | 9'-0"   | 9'-6"  | 10'-1"  | 10'-7" | 11'-2" | 12'-0" | 12'-8"  |  |
|             | N-60         | 8'-9"                                                                          | 9'-3"  | 9'-8"   | 10'-1" | 10'-6"  | 11'-1" | 11'-6" | 13'-3" | 13'-8"  |  |
|             | N-75x        | 8'-7"                                                                          | 9'-1"  | 9'-3"   | 9'-10" | 10'-4"  | 10'-8" | 11'-2" | 11'-7" | 12'-3"  |  |
| 16"         | N-80         | 9'-0"                                                                          | 9'-5"  | 9'-9"   | 10'-1" | 10'-7"  | 11'-1" | 11'-6" | 12'-1" | 12'-6"  |  |
|             | N-90         | 9'-2"                                                                          | 9'-7"  | 10'-0"  | 10'-6" | 10'-11" | 11'-5" | 11'-9" | 12'-5" | 12'-11" |  |
|             | N-90x        | 9'-4"                                                                          | 9'-9"  | 10'-3"  | 10'-7" | 11'-1"  | 11'-5" | 12'-1" | 12'-7" | 13'-2"  |  |
|             | N-60x        | 10'-3"                                                                         | 10'-8" | 11'-2"  | 11'-6" | 12'-1"  | 12'-6" | 13'-2" | 14'-0" | 14'-11" |  |
|             | N-70         | 10'-1"                                                                         | 10'-5" | 11'-0"  | 11'-6" | 11'-10" | 12'-3" | 12'-8" | 13'-3" | 14'-0"  |  |
| 16"         | N-90         | 10'-4"                                                                         | 10'-9" | 11'-3"  | 11'-8" | 12'-1"  | 12'-7" | 13'-1" | 13'-8" | 14'-4"  |  |
|             | N-90x        | 10'-9"                                                                         | 11'-2" | 11'-8"  | 12'-3" | 12'-8"  | 13'-0" | 13'-6" | 14'-2" | 14'-10" |  |
|             | N-90x        | 11'-1"                                                                         | 11'-5" | 11'-10" | 12'-4" | 12'-10" | 13'-2" | 13'-8" | 14'-4" | 15'-2"  |  |

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

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

See Table 1 for minimum distance from bearing

2x diameter of larger hole

2x duct chase length or hole diameter, whichever is larger

Duct chase opening (see Table 2 for minimum distance from bearing)

Knockouts

See rule 12

3/4" diameter

Maintain minimum 1/8" space between top and bottom flange — all duct chase openings and holes



Knockouts are predrilled 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 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.

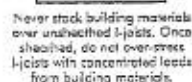
For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cut between the holes is another good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

**WARNING:** I-joints 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-joint as it is installed, using hangers, blocking panels, rim board, and/or cross-briding or 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-joint rollover or buckling.
  - \* Temporary bracing or struts must be 1-1/4 inch minimum, at least 8 feet long and spaced no more than 8 feet on centers, and must be secured with a minimum of two 2-1/2" nails fastened in the top surface of each I-joint. Nail the bracing to a lateral restraint at the end of each bay. Top ends of adjoining bracing over at least two I-joists.
  - \* Or, sheathing temporary or permanent can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-briding.
4. Install and fully nail permanent sheathing to each I-joint before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. Never install a damaged I-joint.

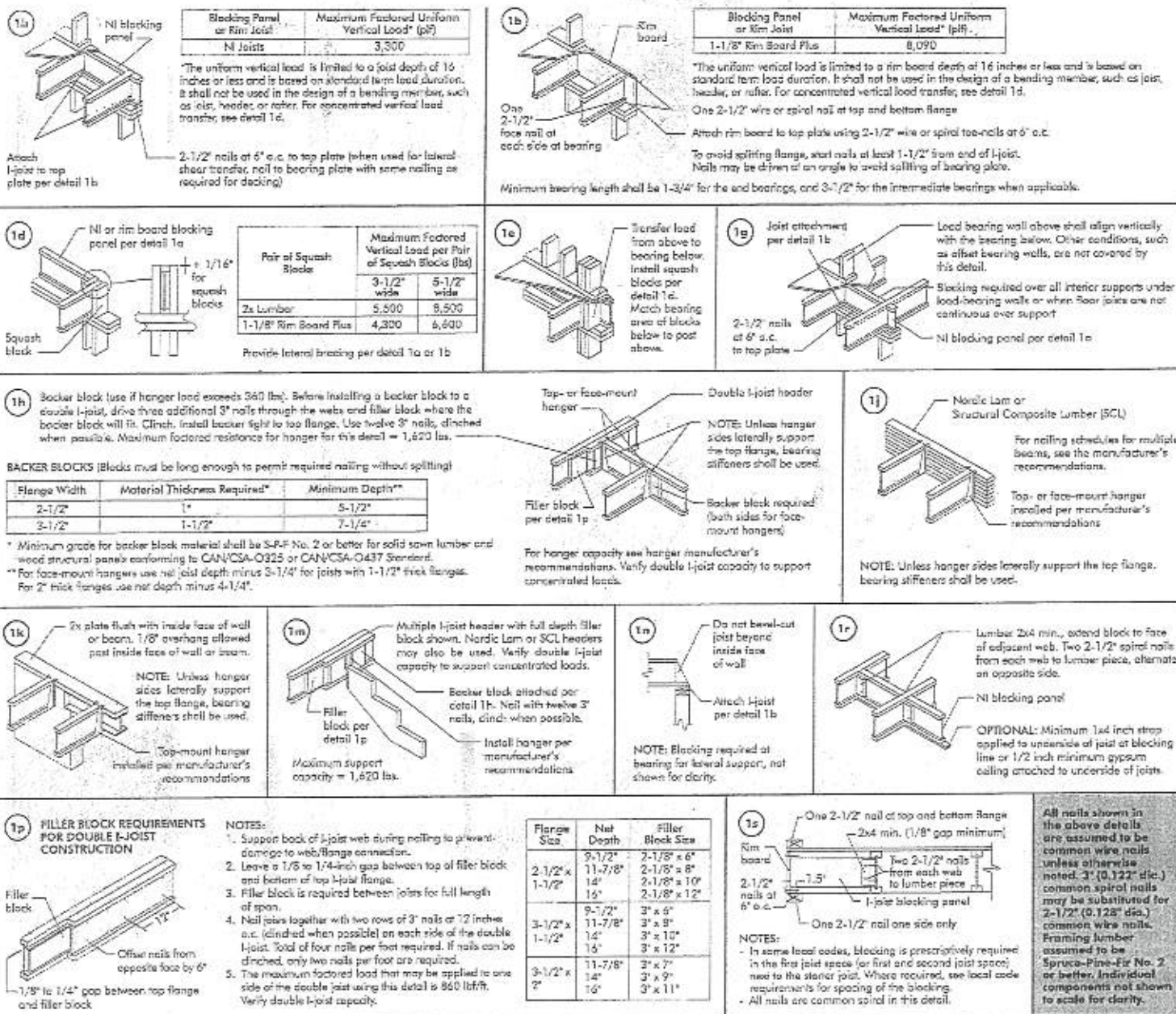
Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic Joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.



## PRODUCT WARRANTY

Contracting *Chibungoma guarantees* that, in accordance with our specifications, *Novelle products* are free from manufacturing defects in material and workmanship.

Furthermore, *Champion Chibongwea* 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.

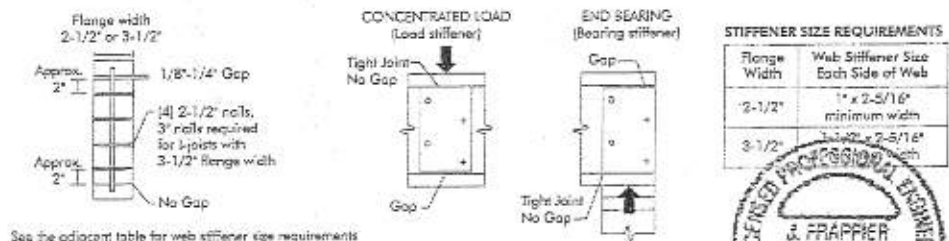


## WEB STIFFENERS

### RECOMMENDATIONS:

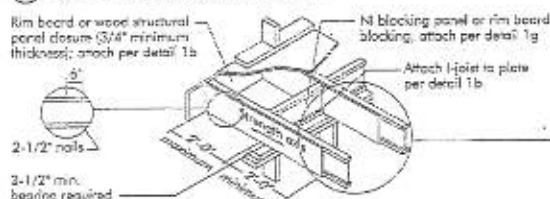
- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joint properties table found in the I-joint Construction Guide (C101). The gap between the stiffener and the flange is at the top.
- A bearing stiffener is required when the I-joint is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

FIGURE 2  
WEB STIFFENER INSTALLATION DETAILS



## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

### Method 1 — SHEATHING REINFORCEMENT ONE SIDE



### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

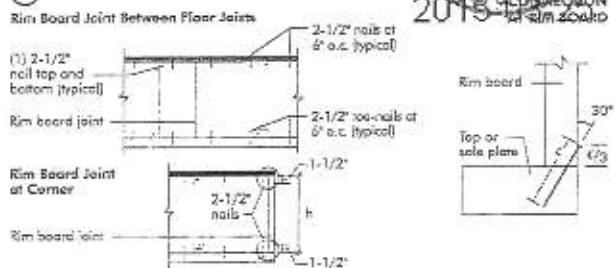
Use same installation as Method 1 but reinforce both sides of I-joint with sheathing.



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

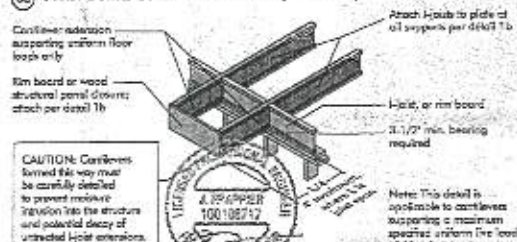
## RIM BOARD INSTALLATION DETAILS

### 8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

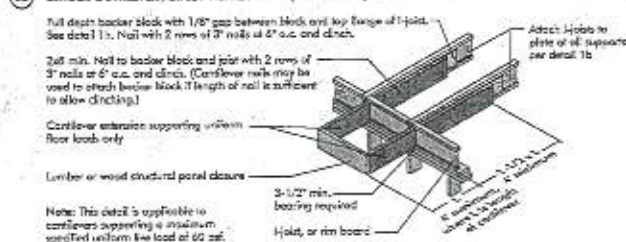


# CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

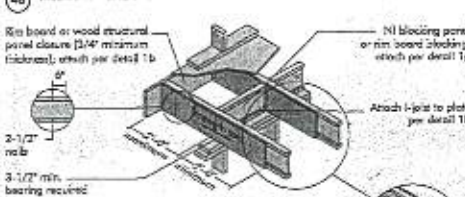


## 3d) LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



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

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

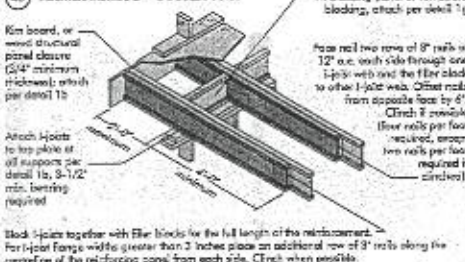


## Method 2 — SHEATHING REINFORCEMENT TWO SIDES

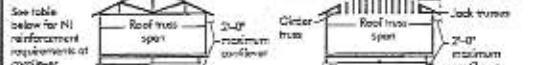
- Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.
- Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 2x4) 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 of all supports per detail 1b. Verify reinforced I-joist capacity.

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



## FIGURE 4 (continued)



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.

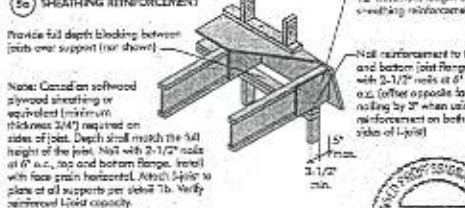
## CANTILEVER REINFORCEMENT METHODS ALLOWED

| JOIST DEPTH (in.) | ROOF TRUSS SPAN (ft.) | ROOF LOADING (UNFACTORED) |    |      |    |                          |    |      |    |
|-------------------|-----------------------|---------------------------|----|------|----|--------------------------|----|------|----|
|                   |                       | LL = 30 psf, DL = 15 psf  |    |      |    | LL = 30 psf, DL = 15 psf |    |      |    |
|                   |                       | JOIST SPACING (in.)       |    |      |    | JOIST SPACING (in.)      |    |      |    |
|                   |                       | 12                        | 16 | 19.2 | 24 | 12                       | 16 | 19.2 | 24 |
| 9-1/2"            | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 11-7/8"           | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 14"               | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 16"               | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 18"               | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |

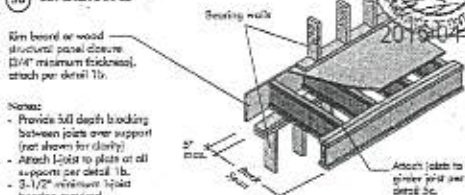
- N = No reinforcement required.
  - 1 = N1 reinforced with 2x4 wood structural panel on one side only.
  - 2 = N2 reinforced with 2x4 wood structural panel on both sides, or double I-joist.
  - X = Try a deeper joist or closer spacing.
2. Maximum edge load shall be 15 psf and dead load, 50 psf floor load, and 90 psf wall load. Wall load is based on 24" maximum width window or door openings.
- For larger openings, or multiple 24" wide openings spaced less than 6'-0" o.c., additional reinforcement is required in the opening's cripple studs and 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 beam, the Roof Truss Span is equivalent to the distance between the supporting walls or 8 ft from its end.
5. Cantilevered joists supporting girder trusses or roof trusses may require additional reinforcement.

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

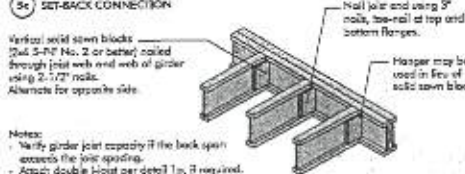
## 5a) SHEATHING REINFORCEMENT



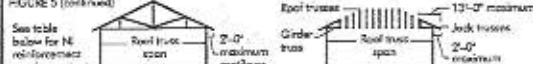
## 5b) SET-BACK DETAIL



## 5c) SET-BACK CONNECTION



## FIGURE 5 (continued)



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  |    |      |    | LL = 30 psf, DL = 15 psf |    |      |    |
|                   |                       | JOIST SPACING (in.)       |    |      |    | JOIST SPACING (in.)      |    |      |    |
|                   |                       | 12                        | 16 | 19.2 | 24 | 12                       | 16 | 19.2 | 24 |
| 9-1/2"            | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 11-7/8"           | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 14"               | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
| 16"               | 24                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 28                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 32                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |
|                   | 36                    | N                         | N  | N    | 1  | N                        | 1  | 2    | X  |

- N = No reinforcement required.
  - 1 = N1 reinforced with 2x4 wood structural panel on one side only.
  - 2 = N2 reinforced with 2x4 wood structural panel on both sides, or double I-joist.
  - X = Try a deeper joist or closer spacing.
2. Maximum edge load shall be 15 psf and dead load, 50 psf floor load, and 90 psf wall load. Wall load is based on 24" maximum width window or door openings.
- For larger openings, or multiple 24" wide openings spaced less than 6'-0" o.c., additional reinforcement is required in the opening's cripple studs and 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 beam, the Roof Truss Span is equivalent to the distance between the supporting walls or 8 ft from its end.
5. Cantilevered joists supporting girder trusses or roof trusses may require additional reinforcement.

## WEB HOLES

### RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS

- The distance between the inside edge of the support and the centerline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
- Light and batten flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centered on the middle of the web.
- The maximum hole size or the maximum depth of a duct chase opening that can be cut into a light web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
- The sides of square holes or larger holes of rectangular holes should not exceed 5/16 of the diameter of the minimum round hole permitted at that location.
- Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole or duct chase opening. Each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
- A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
- Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
- A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
- All holes and duct chase openings shall be cut in a workmanlike manner in accordance with the provisions listed above and as illustrated in Figure 7.
- Limit three maximum size holes per span, of which one may be a duct chase opening.
- A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

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

| Minimum distance from inside face of joist support to center of hole (in.) |                 |      |      |      |      |      |       |      |      |       |      |      |        |      |      |        | Span<br>(Feet) |
|----------------------------------------------------------------------------|-----------------|------|------|------|------|------|-------|------|------|-------|------|------|--------|------|------|--------|----------------|
| Joist<br>Depth                                                             | Joist<br>Series | 2    | 3    | 4    | 5    | 6    | 6-1/2 | 7    | 8    | 8-1/2 | 9    | 10   | 10-1/2 | 11   | 12   | 12-3/4 |                |
| 10-1/2"                                                                    | N-10            | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   | 11.0           |
|                                                                            | N-10-1          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   | 11.0           |
|                                                                            | N-10-2          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   | 11.0           |
|                                                                            | N-10-3          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   | 11.0           |
| 12-1/2"                                                                    | N-12            | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   | 13.0           |
|                                                                            | N-12-1          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   | 13.0           |
|                                                                            | N-12-2          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   | 13.0           |
|                                                                            | N-12-3          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   | 13.0           |
| 14-1/2"                                                                    | N-14            | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   | 15.0           |
|                                                                            | N-14-1          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   | 15.0           |
|                                                                            | N-14-2          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   | 15.0           |
|                                                                            | N-14-3          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   | 15.0           |
| 16-1/2"                                                                    | N-16            | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   | 17.0           |
|                                                                            | N-16-1          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   | 17.0           |
|                                                                            | N-16-2          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   | 17.0           |
|                                                                            | N-16-3          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   | 17.0           |
| 18-1/2"                                                                    | N-18            | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   | 19.0           |
|                                                                            | N-18-1          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   | 19.0           |
|                                                                            | N-18-2          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   | 19.0           |
|                                                                            | N-18-3          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   | 19.0           |

- Always hole may be used for light spacing of 24 inches on center or less.
- Hole location distance is measured from inside face of support to center of hole.
- Distances in this table are based on uniformly loaded joists.

#### OPTIONAL:

The above table is based on the I-joist used of their maximum span. If the I-joist is placed at less than their full maximum span (see Manufacturer's Span Table), the minimum distance from the centerline of the hole to the face of any support (S) may be reduced as follows:

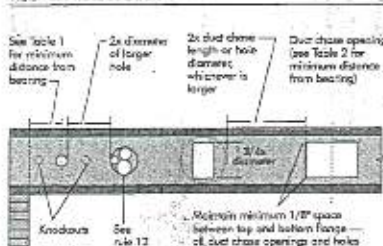
Reduced S =  $\frac{S}{L} \times D$

Where:

- $\frac{S}{L}$  = Distance from the inside face of any support to center of hole, reduced for I-joist maximum span application.
- $D$  = Distance from the inside face of any support to center of hole.
- $S$  = The center-to-center span distance between the inside face of supports (S).
- $L$  = Span Adjustment Factor given in this table.
- $D$  = The minimum distance from the inside face of any support to center of hole from this table.

If  $\frac{S}{L}$  is greater than 1, use 1 in the above calculation for  $\frac{S}{L}$ .

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 predrilled 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 center (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 cut through 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 will then making the cut between the holes is a quicker speed 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 joist support to center of opening (in.) |      |      |      |      |       |      |      |       |      |      |        |      |      |        |
|-------------|--------------|-------------------------------------------------------------------------------|------|------|------|------|-------|------|------|-------|------|------|--------|------|------|--------|
|             |              | 2                                                                             | 3    | 4    | 5    | 6    | 6 1/2 | 7    | 8    | 8 1/2 | 9    | 10   | 10 1/2 | 11   | 12   | 12 3/4 |
| 8-1/2"      | N-8          | 11.0                                                                          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   |
|             | N-8-1        | 11.0                                                                          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   |
|             | N-8-2        | 11.0                                                                          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   |
|             | N-8-3        | 11.0                                                                          | 11.0 | 11.0 | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0  | 11.0 | 11.0 | 11.0   | 11.0 | 11.0 | 11.0   |
| 11-1/2"     | N-11         | 13.0                                                                          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   |
|             | N-11-1       | 13.0                                                                          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   |
|             | N-11-2       | 13.0                                                                          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   |
|             | N-11-3       | 13.0                                                                          | 13.0 | 13.0 | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0  | 13.0 | 13.0 | 13.0   | 13.0 | 13.0 | 13.0   |
| 14"         | N-14         | 15.0                                                                          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   |
|             | N-14-1       | 15.0                                                                          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   |
|             | N-14-2       | 15.0                                                                          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   |
|             | N-14-3       | 15.0                                                                          | 15.0 | 15.0 | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0  | 15.0 | 15.0 | 15.0   | 15.0 | 15.0 | 15.0   |
| 16"         | N-16         | 17.0                                                                          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   |
|             | N-16-1       | 17.0                                                                          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   |
|             | N-16-2       | 17.0                                                                          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   |
|             | N-16-3       | 17.0                                                                          | 17.0 | 17.0 | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0  | 17.0 | 17.0 | 17.0   | 17.0 | 17.0 | 17.0   |
| 18"         | N-18         | 19.0                                                                          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   |
|             | N-18-1       | 19.0                                                                          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   |
|             | N-18-2       | 19.0                                                                          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   |
|             | N-18-3       | 19.0                                                                          | 19.0 | 19.0 | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0  | 19.0 | 19.0 | 19.0   | 19.0 | 19.0 | 19.0   |

- Always hole may be used for light spacing of 24 inches on center or less.
- Duct chase opening location distance is measured from inside face of support to center of opening.
- The above table is based on simple span only. For other applications, consult your local distributor.
- Distances are based on uniformly loaded floor joists that meet the span requirements for a design 8-4 load of 42 psf and dead load of 15 psf, and a live load deflection limit of L/360. For other applications, consult your local distributor.

## INSTALLING THE GLUED FLOOR SYSTEM

- Wipe any dust, dirt, water, or foreign material before gluing.
- Snap a chalk line across the joists four feet from the wall for panel edge alignment and as a reference for spreading glue.
- Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
- 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 it is applied to place with a back and draghammer.
- Apply a continuous line of glue (about 1/4-inch diameter) to the top flange of a single I-joist. Apply glue in a mixing pattern on wide areas, such as with double I-joists.
- Apply two lines of glue on I-joists where panels butt to ensure proper gluing of each end.
- 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 separation by applying a thinner line (1/8 inch) than used on I-joist flanges.
- Tap the second row of panels into place, using a block to protect groove edges.
- Stagger and joint 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 seams, is recommended. Use a spade tool or an 8-1/2" common nail to ensure accurate and consistent spacing.
- Complete all nailing of each panel before glue sets. Check the manufacturer's recommendations for glue time. Warm weather requires 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 display construction. The intended deck can be walked on right away and will carry construction loads without damage to the glue bond.

### FASTENERS FOR SHEATHING AND SUBFLOORING

| Maximum Joist Spacing (in.) | Minimum Joist Spacing (in.) | Nail Size and Type |                 |       | Minimum Distance of Fasteners |          |
|-----------------------------|-----------------------------|--------------------|-----------------|-------|-------------------------------|----------|
|                             |                             | Common Nail        | Ring-Shank Nail | Screw | Edges                         | Interior |
| 16                          | 8/8                         | 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"      |

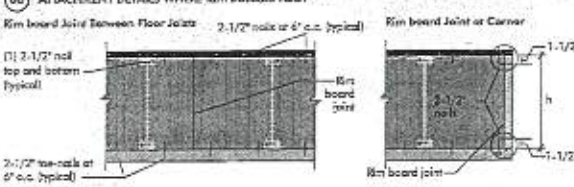
- Fasteners of sheathing and subflooring shall conform to the above table.
- Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown given with the crown parallel to framing.
- Flooring screws shall not be less than 1/8-inch in diameter.
- Special conditions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

Ref.: NTC-2482 National Building Code of Canada 2010, Table 9.23.3.5.

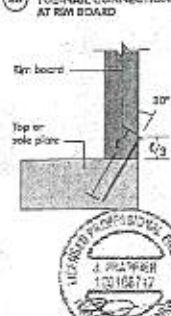
**IMPORTANT NOTE:**  
Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.

## RIM BOARD INSTALLATION DETAILS

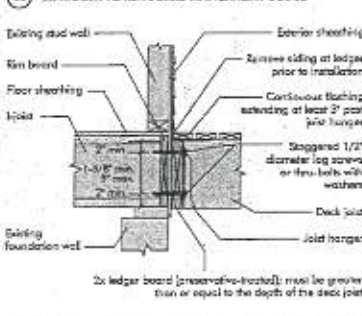
### (8a) ATTACHMENT DETAILS WHERE RIM BOARDS ABUT



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



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

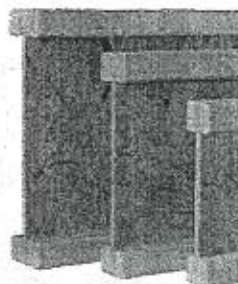


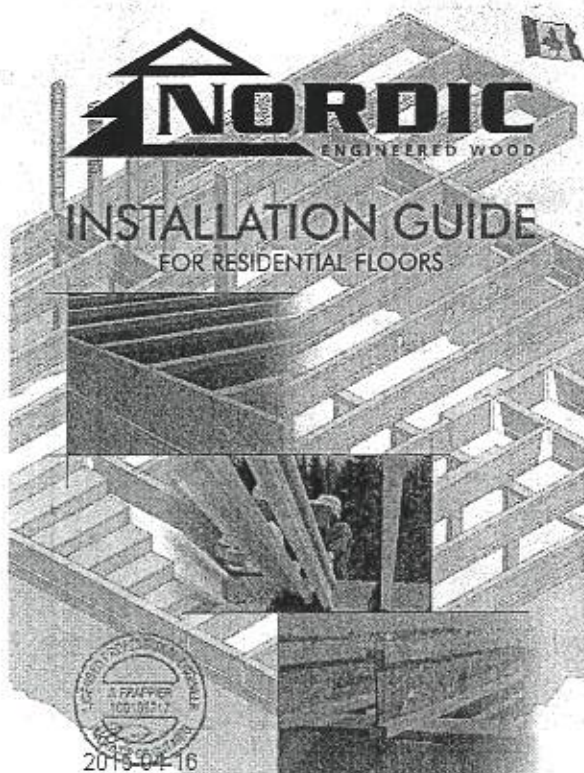
**PRODUCT WARRANTY**

Champion Construction Corporation warrants that its products will conform to the specifications, standards, and performance criteria set forth in the product literature and will be free from defects in material and workmanship.

This warranty is void if the products are not installed in accordance with the instructions and specifications provided by Champion Construction Corporation.

For more information, please contact your local distributor or Champion Construction Corporation.





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## 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 unbraced I-joists. Once sheathed, do not over-stress I-joist webs. 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-bracing at joint ends. When I-joists are applied continuously over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
  - Temporary bracing or struts must be 1-1/2 inch minimum, at least 8 feet long and spaced no more than 8 feet on center, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at one end and 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 leave ends with closed panels, rim board, or cross-bracing.
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 L-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 debris.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept away 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 2nd 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.

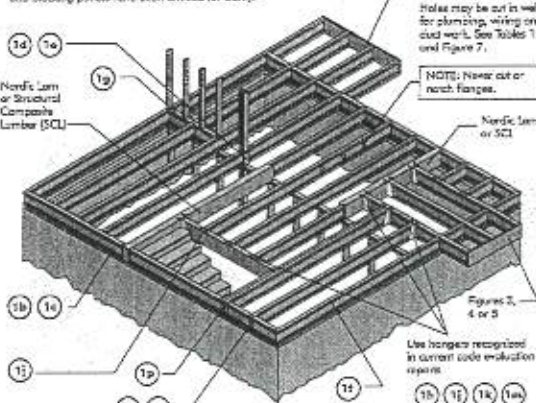


## INSTALLING NORDIC I-JOISTS

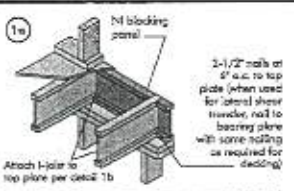
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, call supplier.
2. Except for cutting to length, I-joist flanges should never be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. I-joists must be anchored securely to supports before floor sheathing is attached, and supports must be braced to level.
5. Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
6. When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16-inch gap between the I-joist and end of 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 support unusual or heavy loads from the I-joist's bottom flange. Whenever possible, support 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. Reinforce 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 backing walls, use full depth blocking panels, rim board, or squish blocks (triple 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 board. 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 near to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the first 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 reaction bracing and blocking panels have been omitted for clarity.

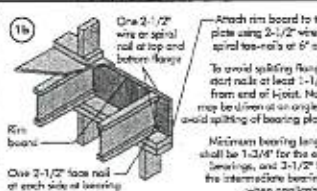


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.125" dia.) common spiral nails may be substituted for 2-1/2" (0.125" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.



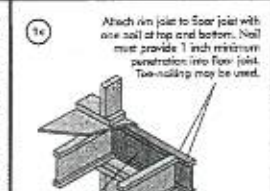
| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load (q <sub>u</sub> ) |
|-----------------------------|----------------------------------------------------------|
| I-joist                     | 9,300                                                    |

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



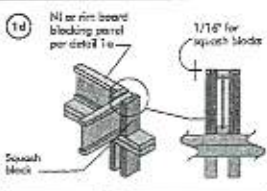
| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load (q <sub>u</sub> ) |
|-----------------------------|----------------------------------------------------------|
| 1-1/2" Rim Board Plus       | 8,500                                                    |

\*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.



| Blocking Panel or Rim Joist | Maximum Factored Uniform Vertical Load (q <sub>u</sub> ) |
|-----------------------------|----------------------------------------------------------|
| 1-1/2" Rim Board Plus       | 8,500                                                    |

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



| Pair of Squish Blocks | Maximum Factored Uniform Vertical Load (q <sub>u</sub> ) |
|-----------------------|----------------------------------------------------------|
| 2x Lumber             | 5,500                                                    |
| 1-1/2" Rim Board Plus | 4,300                                                    |

\*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.

## MAXIMUM FLOOR SPANS

- Maximum clear spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 10 psf. The ultimate live loads are based on the factored loads of 1.2SDL + 1.2SD. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 5/4 inch for joist spacing of 24 inches. OSB shall meet the requirements given in CCES-1324 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
- Bearing stiffeners are not required when joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
- Tables are based on Joint Series Design per CAN/CSA O86-09 Standard, and NRC 2010.
- SI units conversion: 1 inch = 25.4 mm  
1 foot = 0.305 m

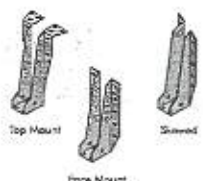
## MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS SIMPLE AND MULTIPLE SPANS

| Joist Depth | Joist Series | Simple spans      |                   |                   |                   | Multiple spans    |                   |                   |                   |
|-------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|             |              | On center spacing | On center spacing | On center spacing | On center spacing | On center spacing | On center spacing | On center spacing | On center spacing |
|             |              | 12"               | 15"               | 18"               | 24"               | 12"               | 15"               | 18"               | 24"               |
| 5-1/2"      | N-42         | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             |
|             | N-42         | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             |
|             | N-42         | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             |
|             | N-42         | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             | 5'-1"             | 4'-2"             | 3'-4"             | 2'-8"             |
| 7-1/2"      | N-50         | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             |
|             | N-50         | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             |
|             | N-50         | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             |
|             | N-50         | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 3'-0"             |
| 9-1/2"      | N-60         | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             |
|             | N-60         | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             |
|             | N-60         | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             |
|             | N-60         | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 4'-0"             |
| 11-1/2"     | N-70         | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             |
|             | N-70         | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             |
|             | N-70         | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             |
|             | N-70         | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 5'-0"             |
| 13-1/2"     | N-80         | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             |
|             | N-80         | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             |
|             | N-80         | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             |
|             | N-80         | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             | 9'-0"             | 8'-0"             | 7'-0"             | 6'-0"             |
| 15-1/2"     | N-90         | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             |
|             | N-90         | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             |
|             | N-90         | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             |
|             | N-90         | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             | 10'-0"            | 9'-0"             | 8'-0"             | 7'-0"             |
| 17-1/2"     | N-100        | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             |
|             | N-100        | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             |
|             | N-100        | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             |
|             | N-100        | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             | 11'-0"            | 10'-0"            | 9'-0"             | 8'-0"             |
| 19-1/2"     | N-110        | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             |
|             | N-110        | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             |
|             | N-110        | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             |
|             | N-110        | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             | 12'-0"            | 11'-0"            | 10'-0"            | 9'-0"             |
| 21-1/2"     | N-120        | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            |
|             | N-120        | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            |
|             | N-120        | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            |
|             | N-120        | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            | 13'-0"            | 12'-0"            | 11'-0"            | 10'-0"            |

CCES-1324-2

## I-JOIST HANGERS

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



## WEB STIFFENERS

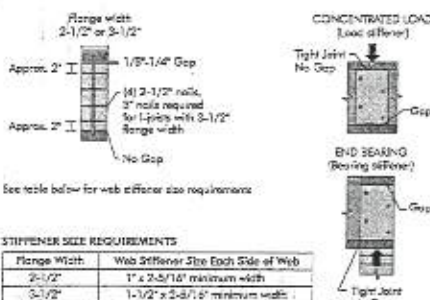
### RECOMMENDATIONS:

- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found in the I-joist Construction Guide (C7-01). 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, and support, the web 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 2,232 lbs is applied to the top flange between supports, or in the case of a connector, anywhere between the connector 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

### WFR STIFFENER INSTALLATION DETAILS



### STIFFENER SIZE REQUIREMENTS

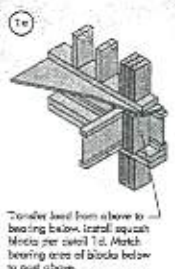
| Flange Width | Web Stiffener Size Each Side of Web |
|--------------|-------------------------------------|
| 2-1/2"       | 1" x 2-5/16" minimum width          |
| 3-1/2"       | 1-1/2" x 2-5/16" minimum width      |

## NORDIC I-JOIST SERIES

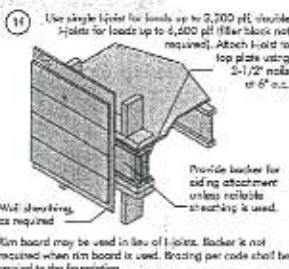
| N-25               | N-40               | N-50               | N-60               | N-70               | N-80               | N-90               | N-100              | N-110              | N-120              |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1-1/2" x 5-1/2"    | 1-1/2" x 7-1/2"    | 1-1/2" x 9-1/2"    | 1-1/2" x 11-1/2"   | 1-1/2" x 13-1/2"   | 1-1/2" x 15-1/2"   | 1-1/2" x 17-1/2"   | 1-1/2" x 19-1/2"   | 1-1/2" x 21-1/2"   | 1-1/2" x 23-1/2"   |
| 22 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit | 20 pieces per unit |

Charisma Challengemul Ltd. harvests its own trees, which enable it to produce a product with a high quality control process. Every phase of the operation, from the selection of the raw material to the final product, reflects our commitment to quality.

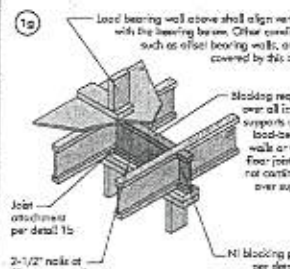
Nordic Engineered Wood I-joists use only finger-jointed, kiln-dried lumber in their flanges, ensuring consistent quality and superior longer span bearing capacity.



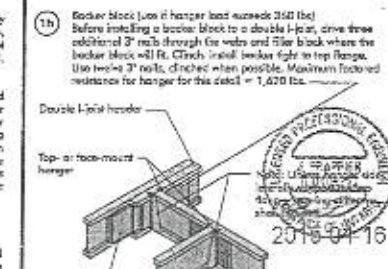
Transfer load from above to bearing below. Install square blocks per detail 1d. Match bearing area of blocks below to post above.



Use single I-joist for loads up to 2,200 plf. (double I-joists for loads up to 4,400 plf. (flange block not required). Attach I-joist to top plate using 2-1/2" nails at 6" o.c.



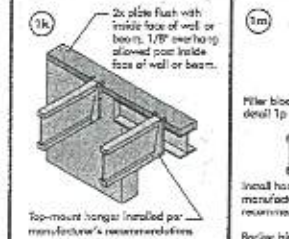
Load bearing wall above shall align vertically with the bearing below. Other conditions, such as offset bearing walls, are not covered by this detail.



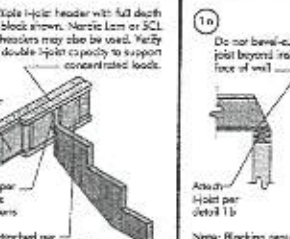
Backer block (use if hanger load exceeds 360 lbs) Before installing a backer block to a double I-joist, drive three additional 3" nails through the web and flange block where the backer block will fit. Check inside backer block to top flange. Use 1/2" x 2" nails, driven when possible. Maximum factored resistance for hanger for this detail = 1,620 lbs.



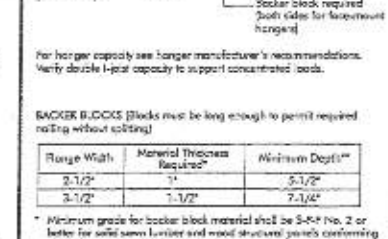
Top-on face-mount hanger installed per manufacturer's recommendations.



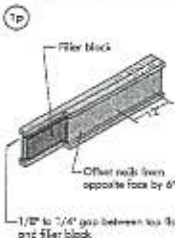
Top-mount hanger installed per manufacturer's recommendations.



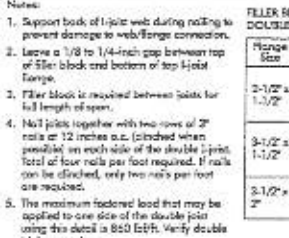
Double I-joist header with full depth flange block shown. Nordic Lamin or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.



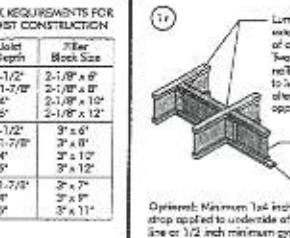
Do not bevel-cut joist beyond inside face of wall.



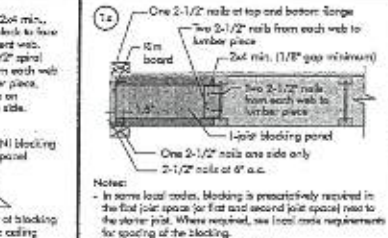
Filler block



Other nails from opposite face by 6"



1-1/2" x 1/4" gap between top flange and filler block



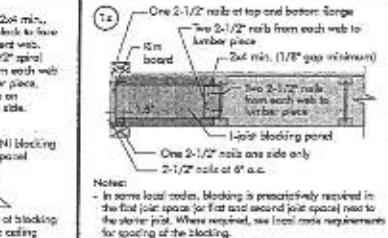
Notes:  
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.  
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.  
3. Filler block is required between joists for full length of span.  
4. Nail joists together with two rows of 2" nails at 12 inches o.c. (staggered when possible) on each side of the double I-joint. Total of four nails per foot required. If nails can be divided, only two nails per foot are required.  
5. The maximum factored load that may be applied to one side of the double joint using this detail is 850 lb/ft. Verify double I-joist capacity.

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

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



Optimum: Minimum 1/4 inch drop applied to underside of joist of blocking line or 1/2 inch minimum gypsum ceiling attached to underside of joist.



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