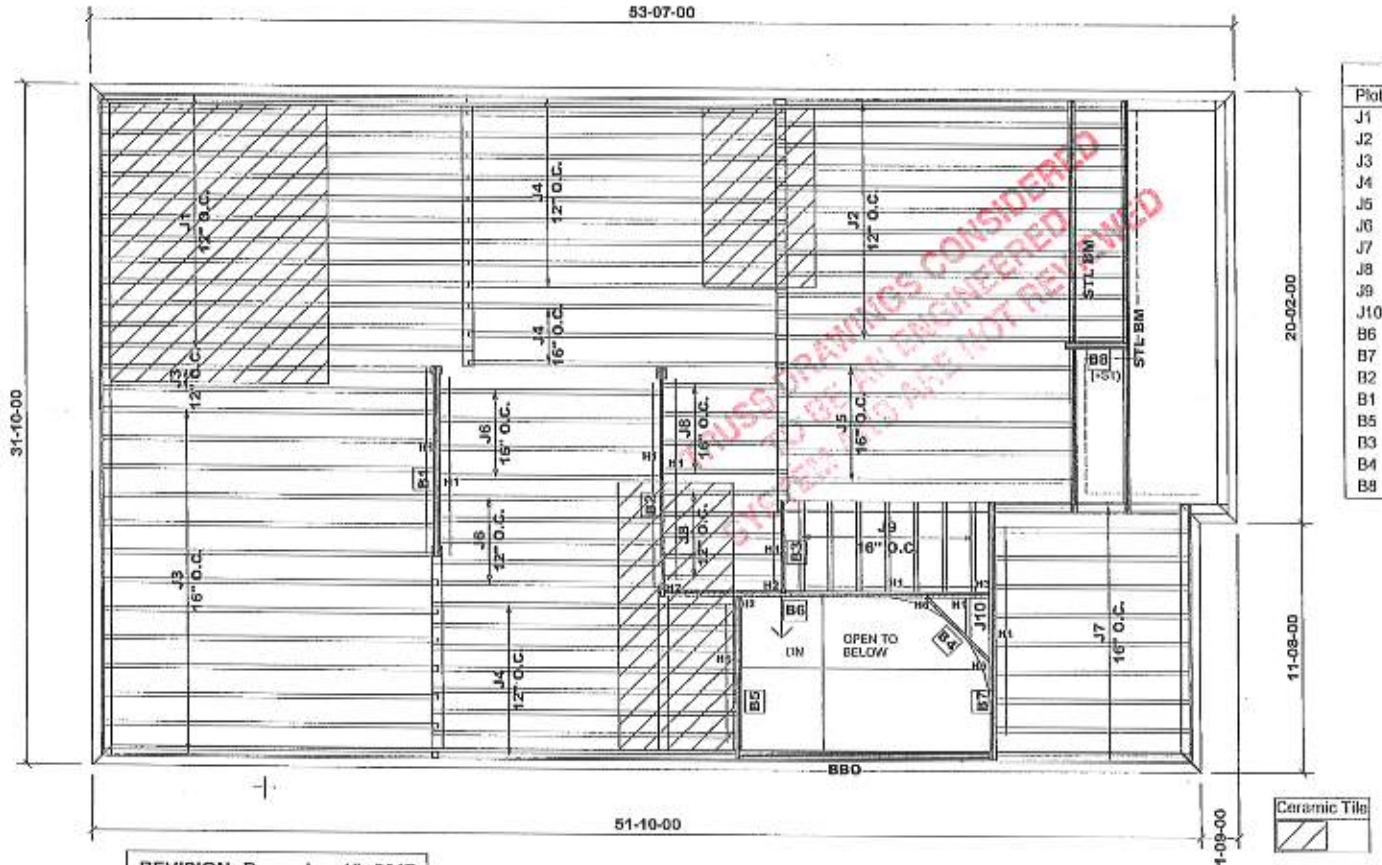


Products				
PlotID	Length	Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-20	1	13
J2	17-00-00	11 7/8" NI-20	1	12
J3	16-00-00	11 7/8" NI-20	1	15
J4	15-00-00	11 7/8" NI-20	1	21
J5	14-00-00	11 7/8" NI-20	1	5
J6	11-00-00	11 7/8" NI-20	1	9
J7	10-00-00	11 7/8" NI-20	1	10
J8	8-00-00	11 7/8" NI-20	1	9
J9	5-00-00	11 7/8" NI-20	1	7
J10	2-00-00	11 7/8" NI-20	1	1
B6	16-00-00	VERSALAM-12 2.0E	2	2
B7	13-00-00	VERSALAM-12 2.0E	2	2
B2	11-00-00	VERSALAM-12 2.0E	1	1
B1	9-00-00	VERSALAM-12 2.0E	2	2
B5	8-00-00	VERSALAM-12 2.0E	1	1
B3	5-00-00	VERSALAM-12 2.0E	1	1
B4	5-00-00	VERSALAM-12 2.0E	1	1
B8	3-00-00	VERSALAM-12 2.0E	2	2

HANGER SCHEDULE

H1----------LT251188 (TM)
H2----------HUS1.81/10(FM)
H3----------HGUS410(FM)
H8----------LSSUI25(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
BRO - BEAM BY OTHERS

Ceramic Tile

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

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 4001 - EL.A

Second Floor Framing

Do not scale - refer to architectural plans for dimensions

S. 152706 - S. 152723

JT/PL: 45147/95234	Builder: Gold Park	Location: Vaughan	Designer: NL	Alpa Roof Trusses Inc.
LI: 290675	Project: Pine Valley	Date: November 17, 2017	Sheet: 1 of 6	Maple, Ontario

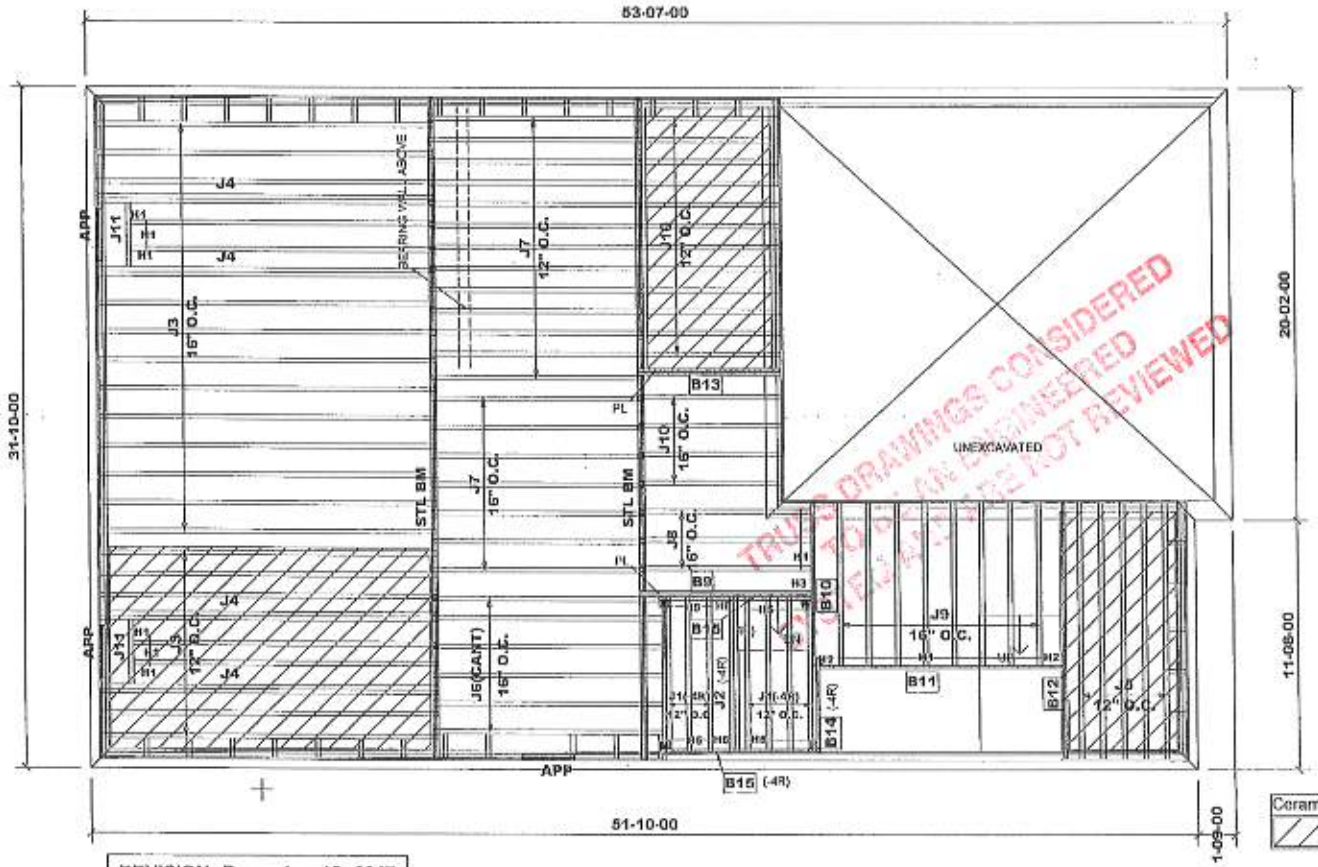
Salesperson: Derek
Home Lumber

20-120001-GLD-00-CM

FOR OFFICE USE ONLY
CITY OF VAUGHAN
BUILDING STANDARDS DEPARTMENT
PLANS EXAMINATION
RECEIVED

	DATE REVIEWED	INITIAL
ZONING		
GRADING		
BUILDING CODE		
MECHANICAL		
PLUMBING		
FIRE		

TRUSS DRAWINGS CONSIDERED TO BE ENGINEERED AND ARE NOT REVIEWED



Products				
PlotID	Length	Product	Plies	Net Qty
J1	8-00-00	9 1/2" NI-20	1	7
J2	8-00-00	9 1/2" NI-20	2	2
J3	16-00-00	11 7/8" NI-20	1	21
J4	16-00-00	11 7/8" NI-20	2	8
J5	12-00-00	11 7/8" NI-20	1	5
J6	11-00-00	11 7/8" NI-20	1	6
J7	10-00-00	11 7/8" NI-20	1	20
J8	9-00-00	11 7/8" NI-20	1	3
J9	8-00-00	11 7/8" NI-20	1	8
J10	7-00-00	11 7/8" NI-20	1	16
J11	3-00-00	11 7/8" NI-20	1	2
B11	12-00-00	VERSALAM-12 2.0E	1	1
B12	12-00-00	VERSALAM-12 2.0E	1	1
B9	9-00-00	VERSALAM-12 2.0E	2	2
B15	8-00-00	VERSALAM-10 2.0E	1	2
B10	8-00-00	VERSALAM-12 2.0E	1	1
B13	7-00-00	VERSALAM-12 2.0E	2	2
B14	5-00-00	VERSALAM-10 2.0E	1	1

HANGER SCHEDULE

H1----------LT251188 (TM)
H2----------HUS1.81/10(FM)
H5----------LT259(TM)
H9----------MIT39.5-2(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

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

Provide I-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.

REVISION: December 18, 2017

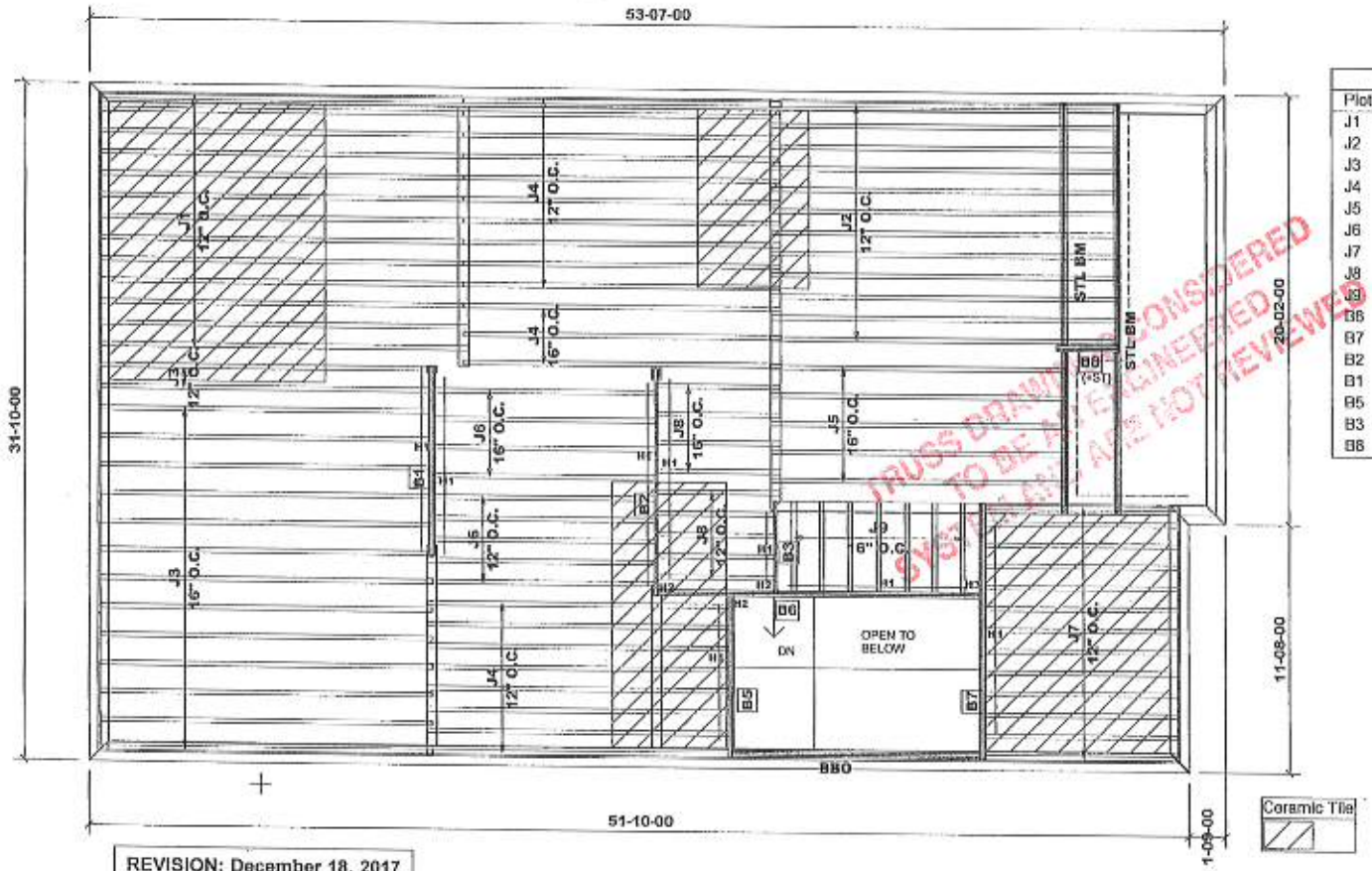
MODEL: UNIT 4001 - EL.A+B

First Floor Framing

Do not scale - refer to architectural plans for dimensions

TOTAL LENGTH: 51'

JT/PL: 45147/95234	Builder: Gold Park	Location: Vaughan	Designer: NL	Alpa Roof Trusses Inc.	Salesperson: Derek
LI: 290675	Project: Pine Valley	Date: November 17, 2017	Sheet: 2 of 6	Maple, Ontario	Home Lumber



Products				
PlotID	Length	Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-20	1	13
J2	17-00-00	11 7/8" NI-20	1	12
J3	16-00-00	11 7/8" NI-20	1	15
J4	15-00-00	11 7/8" NI-20	1	21
J5	14-00-00	11 7/8" NI-20	1	5
J6	11-00-00	11 7/8" NI-20	1	9
J7	10-00-00	11 7/8" NI-20	1	13
J8	6-00-00	11 7/8" NI-20	1	9
J9	5-00-00	11 7/8" NI-20	1	7
B6	16-00-00	VERSALAM-12 2.0E	2	2
B7	13-00-00	VERSALAM-12 2.0E	2	2
B2	11-00-00	VERSALAM-12 2.0E	1	1
B1	9-00-00	VERSALAM-12 2.0E	2	2
B5	8-00-00	VERSALAM-12 2.0E	1	1
B3	5-00-00	VERSALAM-12 2.0E	1	1
B8	3-00-00	VERSALAM-12 2.0E	2	2

HANGER SCHEDULE

H1----------LT251188 (TM)
H2----------HUS1.81/10(FM)
H3----------HGUS410(FM)
H6----------LSSUI25(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
BBO - BEAM BY OTHERS

Ceramic Tile

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

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.

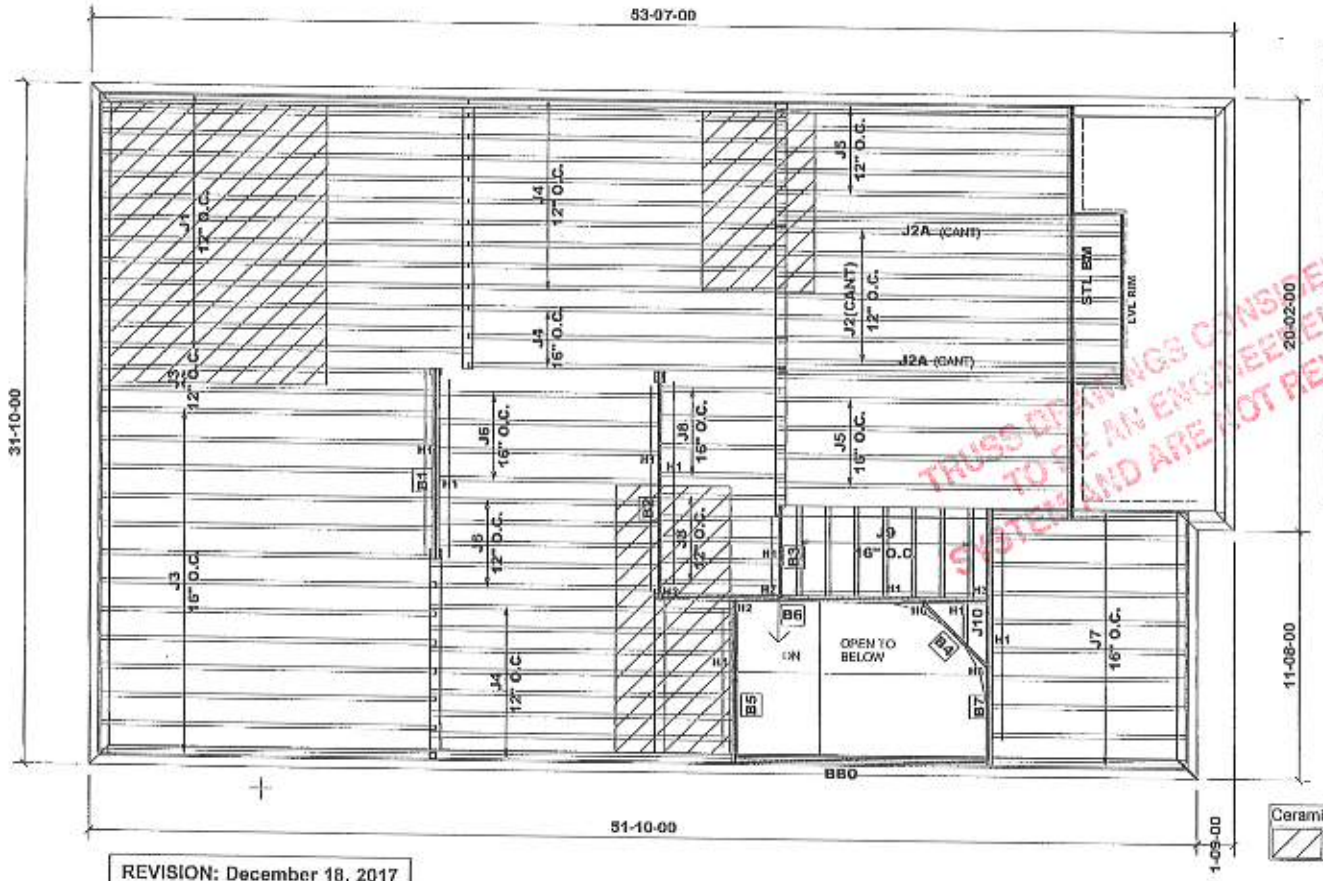
REVISION: December 18, 2017

MODEL: UNIT 4001 - EL.A W/OPT. 2ND FLOOR

Second Floor Framing

Do not scale - refer to architectural plans for dimensions

JT/PL: 45147/95234	Builder: Gold Park	Location: Vaughan	Designer: NL	Alpa Roof Trusses Inc.	Salesperson: Derek
LI: 290675	Project: Pine Valley	Date: November 19, 2017	Sheet: 3 of 6	Maple, Ontario	Home Lumber



Products				
PlotID	Length	Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-20	1	13
J2	17-00-00	11 7/8" NI-20	1	7
J2A	17-00-00	11 7/8" NI-20	2	4
J3	16-00-00	11 7/8" NI-20	1	15
J4	15-00-00	11 7/8" NI-20	1	21
J5	14-00-00	11 7/8" NI-20	1	9
J6	11-00-00	11 7/8" NI-20	1	9
J7	10-00-00	11 7/8" NI-20	1	10
J8	6-00-00	11 7/8" NI-20	1	9
J9	5-00-00	11 7/8" NI-20	1	7
J10	2-00-00	11 7/8" NI-20	1	1
B6	16-00-00	VERSALAM-12 2.0E	2	2
B7	13-00-00	VERSALAM-12 2.0E	2	2
B2	11-00-00	VERSALAM-12 2.0E	1	1
B1	9-00-00	VERSALAM-12 2.0E	2	2
B5	8-00-00	VERSALAM-12 2.0E	1	1
LVL RIM	8-00-00	VERSALAM-12 2.0E	1	1
B3	5-00-00	VERSALAM-12 2.0E	1	1
B4	5-00-00	VERSALAM-12 2.0E	1	1

HANGER SCHEDULE

H1----------LT2511BB (TM)
H2----------HUS1.81/10(FM)
H3----------HGUS410(FM)
H6----------LSSUI25(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
BBO - BEAM BY OTHERS

Ceramic Tile

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

Provide I-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.

REVISION: December 18, 2017

MODEL: UNIT 4001 - EL.B

Second Floor Framing

Do not scale - refer to architectural plans for dimensions

11 3/8" BLOCKING

TOTAL LENGTH: 8'

JT/PL: 45147/95234
LI: 290675

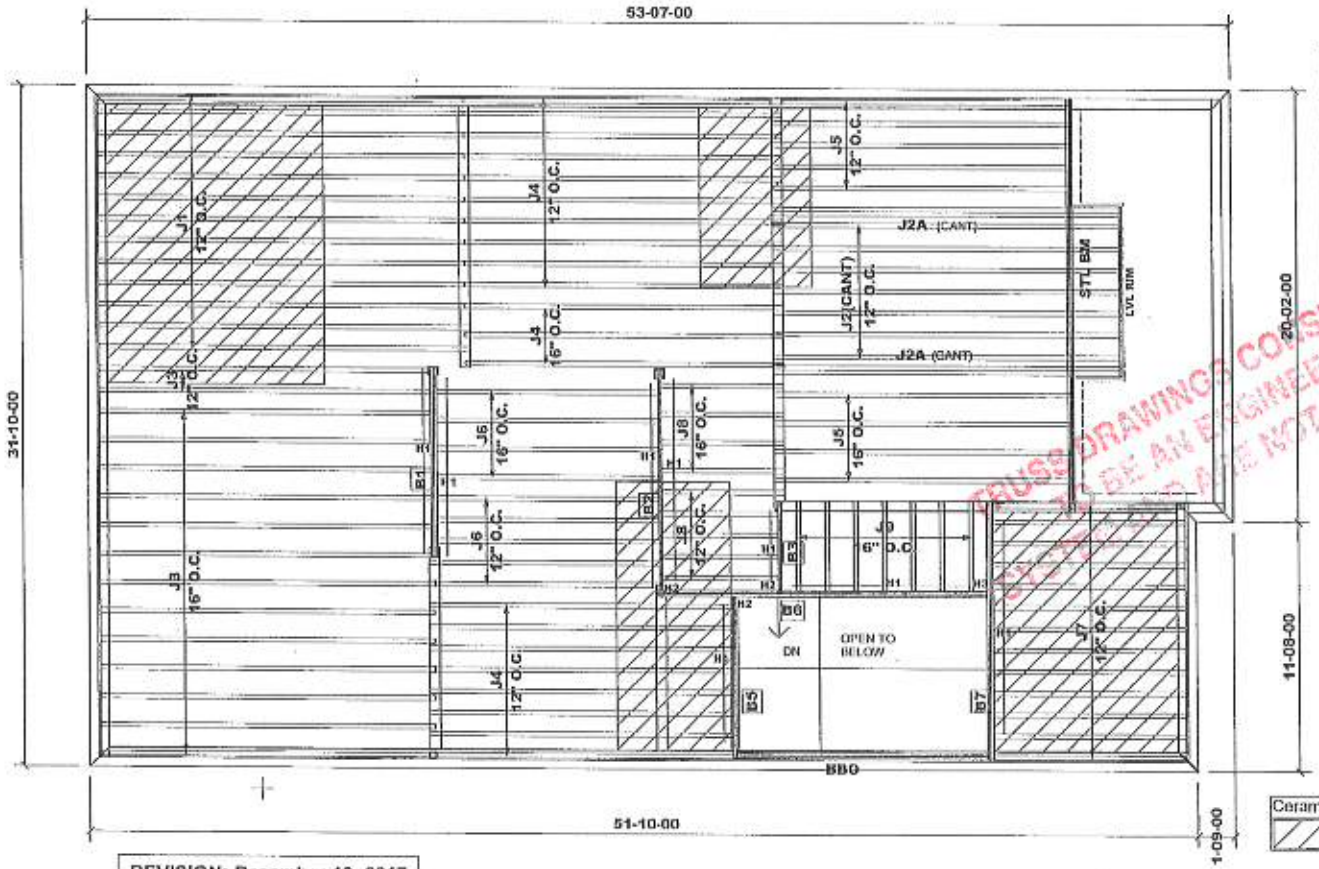
Builder: Gold Park
Project: Pine Valley

Location: Vaughan
Date: November 17, 2017

Designer: NL
Sheet: 4 of 6

Alpa Roof Trusses Inc.
Maple, Ontario

Salesperson: Derek
Home Lumber



Products				
PlotID	Length	Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-20	1	13
J2	17-00-00	11 7/8" NI-20	1	7
J2A	17-00-00	11 7/8" NI-20	2	4
J3	16-00-00	11 7/8" NI-20	1	15
J4	15-00-00	11 7/8" NI-20	1	21
J5	14-00-00	11 7/8" NI-20	1	9
J6	11-00-00	11 7/8" NI-20	1	9
J7	10-00-00	11 7/8" NI-20	1	13
J8	6-00-00	11 7/8" NI-20	1	9
J9	5-00-00	11 7/8" NI-20	1	7
B6	16-00-00	VERSALAM-12 2.0E	2	2
B7	13-00-00	VERSALAM-12 2.0E	2	2
B2	11-00-00	VERSALAM-12 2.0E	1	1
B1	9-00-00	VERSALAM-12 2.0E	2	2
B5	8-00-00	VERSALAM-12 2.0E	1	1
LVL RIM	8-00-00	VERSALAM-12 2.0E	1	1
B3	5-00-00	VERSALAM-12 2.0E	1	1

HANGER SCHEDULE

H1----------LT251188 (TM)
H2----------HUS1.81/10(FM)
H3----------HGUS410(FM)
H6----------LSSUI25(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
BBO - BEAM BY OTHERS

Ceramic Tile

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

Provide I-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.

REVISION: December 18, 2017

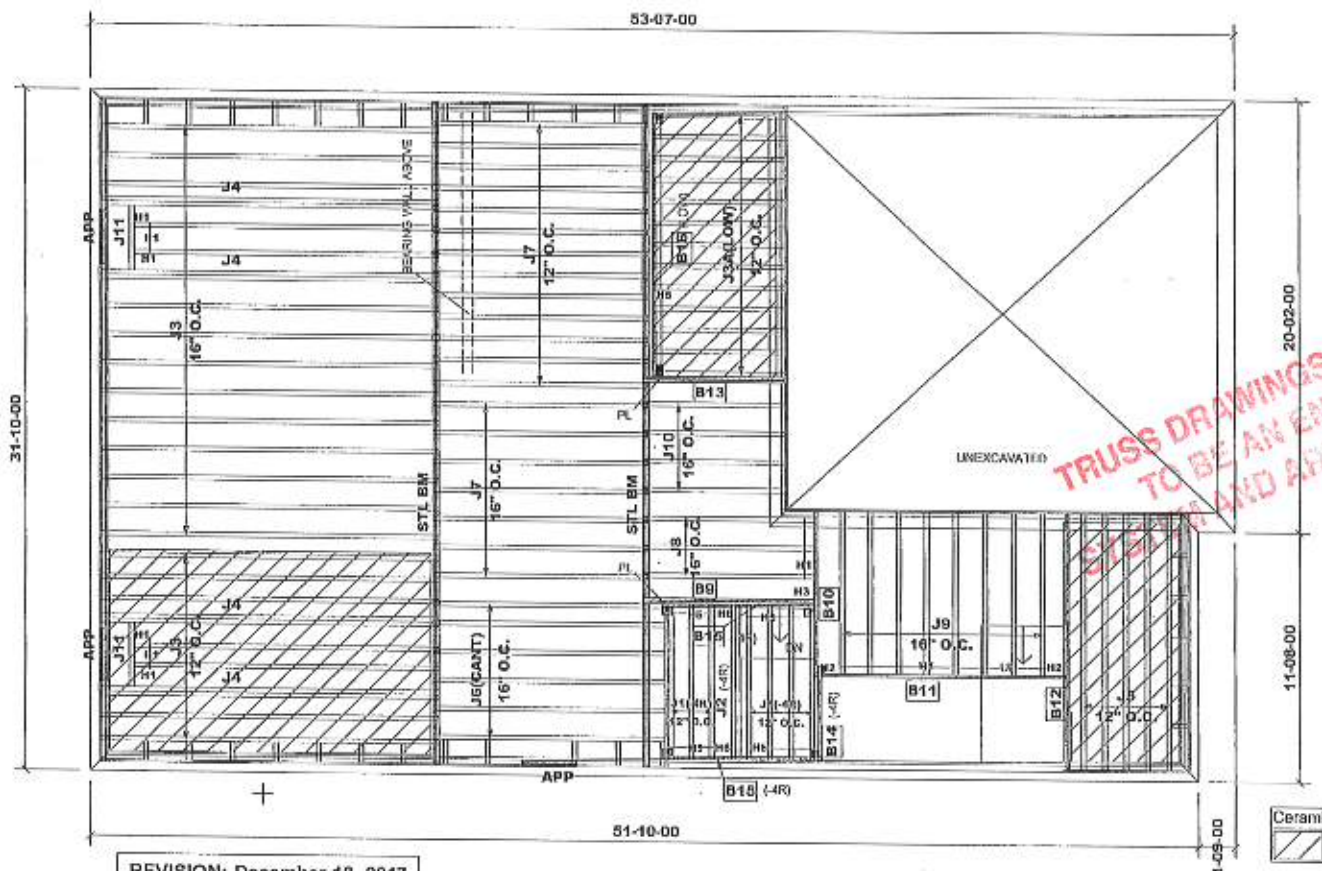
MODEL: UNIT 4001 - EL.B
W/OPT. 2ND FLOOR

Second Floor Framing

Do not scale - refer to architectural plans for dimensions

11 7/8" BLOCKING
TOTAL LENGTH 6"

JT/PL: 45147/95234	Builder: Gold Park	Location: Vaughan	Designer: NL	Alpa Roof Trusses Inc.	Salosperson: Derek
LI: 290675	Project: Pine Valley	Date: November 19, 2017	Sheet: 5 of 6	Maple, Ontario	Home Lumber



Products				
PlotID	Length	Product	Plies	Net Qty
J1	8-00-00	9 1/2" NI-20	1	7
J2	8-00-00	9 1/2" NI-20	2	2
J3A	7-00-00	9 1/2" NI-20	1	13
J3	16-00-00	11 7/8" NI-20	1	21
J4	16-00-00	11 7/8" NI-20	2	8
J5	12-00-00	11 7/8" NI-20	1	5
J6	11-00-00	11 7/8" NI-20	1	6
J7	10-00-00	11 7/8" NI-20	1	20
J8	9-00-00	11 7/8" NI-20	1	3
J9	8-00-00	11 7/8" NI-20	1	8
J10	7-00-00	11 7/8" NI-20	1	4
J11	3-00-00	11 7/8" NI-20	1	2
B16	13-00-00	VERSALAM-10 2.0E	1	1
B11	12-00-00	VERSALAM-12 2.0E	1	1
B12	12-00-00	VERSALAM-12 2.0E	1	1
B9	9-00-00	VERSALAM-12 2.0E	2	2
B15	8-00-00	VERSALAM-10 2.0E	1	2
B10	8-00-00	VERSALAM-12 2.0E	1	1
B13	7-00-00	VERSALAM-12 2.0E	2	2
B14	5-00-00	VERSALAM-10 2.0E	1	1

HANGER SCHEDULE

H1----------LT251108 (TM)
H2----------IUS1.81/10(FM)
H5----------LT250(TM)
H6----------MIT39.5-2(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

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

Provide I-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.

REVISION: December 18, 2017

MODEL: UNIT 4001 - EL.A+B W/SUNKEN

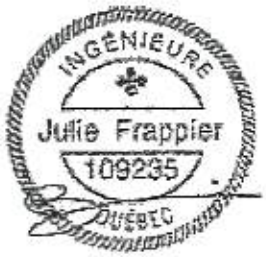
First Floor Framing

Do not scale - refer to architectural plans for dimensions

11 7/8" BLOCKING
TOTAL LENGTH: 51'

JT/PL: 45147/95234	Builder: Gold Park	Location: Vaughan	Designer: NL	Alpa Roof Trusses Inc.	Salesperson: Derek
LI: 290675	Project: Pine Valley	Date: November 17, 2017	Sheet: 6 of 6	Maple, Ontario	Home Lumber

NORDIC ENGINEERED WOOD



Maximum Floor Spans

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

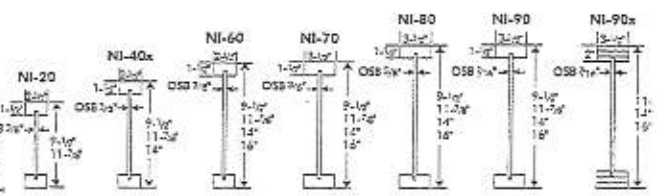
Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-10"	15'-0"	14'-5"	13'-5"	16'-4"	15'-5"	14'-6"	13'-5"
	NI-40x	17'-0"	16'-0"	15'-5"	14'-9"	17'-5"	16'-5"	15'-10"	15'-2"
	NI-60	17'-2"	16'-2"	15'-7"	14'-11"	17'-6"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

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

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/360 and a total load deflection limit of L/240.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 3/4 inch for a joist spacing of 24 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.

NORDIC ENGINEERED WOOD

www.nordicewp.com



S-P-F 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

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

VEB HOLE SPECIFICATIONS

JLES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified. Wherever possible, field-cut holes should be centred on the middle of the web. The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.

5. The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is not considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller are permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the w provided that it meets the requirements of rule number 6 abo
10. All holes and duct chase openings shall be cut in a workman- manner in accordance with the restrictions listed above and a illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may 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.

ABLE 1

OCATION OF CIRCULAR HOLES IN JOIST WEBS

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

Joist Depth	Joist Series	Minimum Distance from Inside Face of Any Support to Centre of Hole (ft - in.) Round Hole Diameter (in.)														
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4
9-1/2"	NI-20	0'-7"	1'-6"	2'-10"	4'-3"	5'-8"	6'-0"	---	---	---	---	---	---	---	---	---
	NI-40x	0'-7"	1'-6"	3'-0"	4'-4"	6'-0"	6'-4"	---	---	---	---	---	---	---	---	---
	NI-60	1'-3"	2'-6"	4'-0"	5'-4"	7'-0"	7'-5"	---	---	---	---	---	---	---	---	---
	NI-70	2'-0"	3'-4"	4'-9"	6'-3"	8'-0"	8'-4"	---	---	---	---	---	---	---	---	---
	NI-80	2'-3"	3'-6"	5'-0"	6'-6"	8'-2"	8'-8"	---	---	---	---	---	---	---	---	---
11-7/8"	NI-20	0'-7"	0'-8"	1'-0"	2'-4"	3'-8"	4'-0"	5'-0"	6'-6"	7'-5"	---	---	---	---	---	---
	NI-40x	0'-7"	0'-8"	1'-3"	2'-8"	4'-0"	4'-4"	5'-5"	7'-0"	8'-4"	---	---	---	---	---	---
	NI-60	0'-7"	1'-8"	3'-0"	4'-3"	5'-9"	6'-0"	7'-3"	8'-10"	10'-0"	---	---	---	---	---	---
	NI-70	1'-3"	2'-6"	4'-0"	5'-4"	6'-9"	7'-2"	8'-4"	10'-0"	11'-2"	---	---	---	---	---	---
	NI-80	1'-6"	2'-10"	4'-2"	5'-6"	7'-0"	7'-5"	8'-6"	10'-3"	11'-4"	---	---	---	---	---	---
	NI-90	0'-7"	0'-8"	1'-5"	3'-2"	4'-10"	5'-4"	6'-5"	8'-9"	10'-2"	---	---	---	---	---	---
	NI-90x	0'-7"	0'-8"	0'-9"	2'-5"	4'-4"	4'-9"	6'-3"	---	---	---	---	---	---	---	---
14"	NI-40x	0'-7"	0'-8"	0'-8"	1'-0"	2'-4"	2'-9"	3'-9"	5'-2"	6'-3"	6'-6"	8'-3"	10'-2"	---	---	---
	NI-60	0'-7"	0'-8"	1'-8"	3'-0"	4'-3"	4'-8"	5'-8"	7'-2"	8'-0"	8'-8"	10'-4"	11'-9"	---	---	---
	NI-70	0'-8"	1'-10"	3'-0"	4'-5"	5'-10"	6'-2"	7'-3"	8'-9"	9'-9"	10'-4"	12'-0"	13'-3"	---	---	---
	NI-80	0'-10"	2'-0"	3'-4"	4'-9"	6'-2"	6'-6"	7'-6"	9'-0"	10'-0"	10'-8"	12'-4"	13'-9"	---	---	---
	NI-90	0'-7"	0'-8"	0'-10"	2'-5"	4'-0"	4'-5"	5'-9"	7'-5"	8'-8"	9'-4"	11'-4"	12'-11"	---	---	---
	NI-90x	0'-7"	0'-8"	0'-8"	2'-0"	3'-6"	4'-2"	5'-5"	7'-3"	8'-5"	9'-2"	---	---	---	---	---
16"	NI-60	0'-7"	0'-8"	0'-8"	1'-9"	2'-10"	3'-2"	4'-2"	5'-6"	6'-6"	7'-0"	8'-5"	9'-8"	10'-2"	12'-2"	13'-9"
	NI-70	0'-7"	1'-0"	2'-3"	3'-6"	4'-10"	5'-3"	6'-3"	7'-8"	8'-6"	9'-2"	10'-8"	12'-0"	12'-6"	14'-0"	15'-6"
	NI-80	0'-7"	1'-3"	2'-6"	3'-10"	5'-3"	5'-6"	6'-6"	8'-0"	9'-0"	9'-5"	11'-0"	12'-3"	12'-9"	14'-5"	16'-0"
	NI-90	0'-7"	0'-8"	0'-8"	1'-9"	3'-3"	3'-8"	4'-9"	6'-5"	7'-5"	8'-0"	9'-10"	11'-3"	11'-9"	13'-9"	15'-4"
	NI-90x	0'-7"	0'-8"	0'-9"	2'-0"	3'-6"	4'-0"	5'-0"	6'-9"	7'-9"	8'-4"	10'-2"	11'-6"	12'-0"	---	---

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

TABLE 2

DUCT CHASE OPENING SIZES AND LOCATIONS

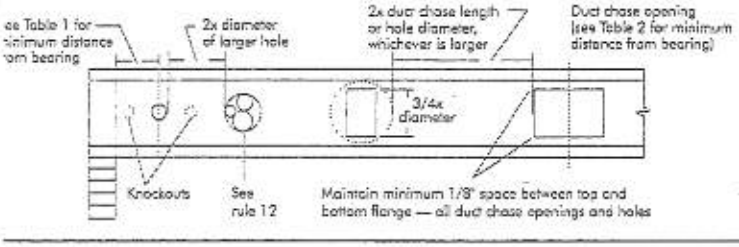
Simple Span Only

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

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

IGURE 7

IELD-CUT HOLE LOCATOR



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

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

Holes in webs should be cut with a sharp saw.

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

AFETY AND CONSTRUCTION PRECAUTIONS

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

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

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

AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

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

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

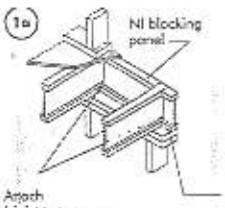
CHANTIERS CHIBOUGAMAU

PRODUCT WARRANTY

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

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

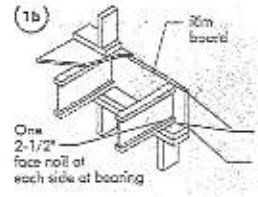
1a



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

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

1b



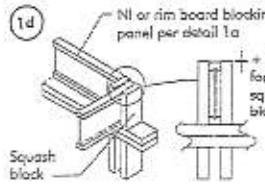
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

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

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

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

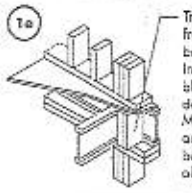
1d



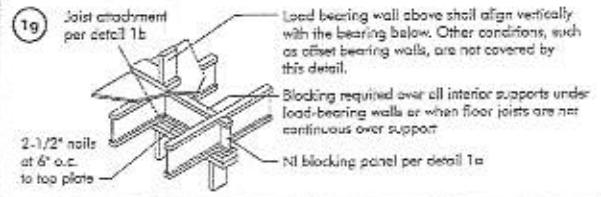
Pair of Squash Blocks	Maximum Factored Vertical Load per Pair of Squash Blocks (lbs)	
	3-1/2" wide	5-1/2" wide
2x Lumber	5,500	8,500
1-1/8" Rim Board Plus	4,300	6,600

Provide lateral bracing per detail 1a or 1b

1e



1g



1h

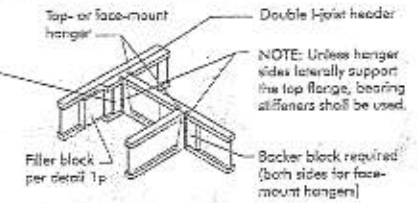
Backer block (use if hanger load exceeds 360 lbs). Before installing a backer block to a double I-joist, drive three additional 3" nails through the web and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 3" nails, clinched when possible. Maximum factored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

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

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

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

** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".

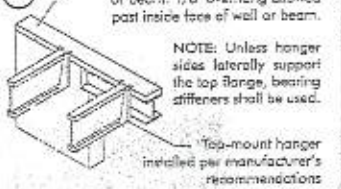


For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

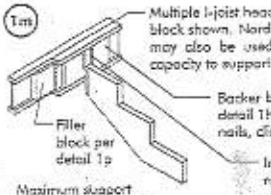
1i

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

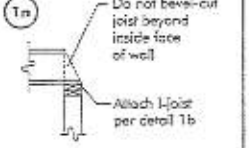
1k



1m



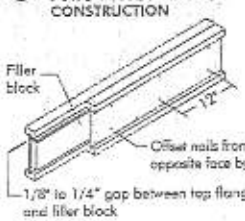
1n



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

1r

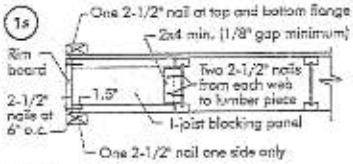
1p FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION



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

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

1s



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

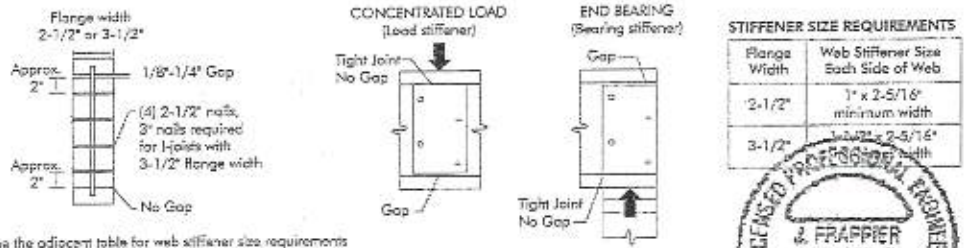
All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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

WEB STIFFENERS

RECOMMENDATIONS:

- A *bearing stiffener* is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found at the I-joist Construction Guide (C1D1). The gap between the stiffener and the flange is at the top.
- A *bearing stiffener* is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- A *load stiffener* is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

FIGURE 2
WEB STIFFENER INSTALLATION DETAILS



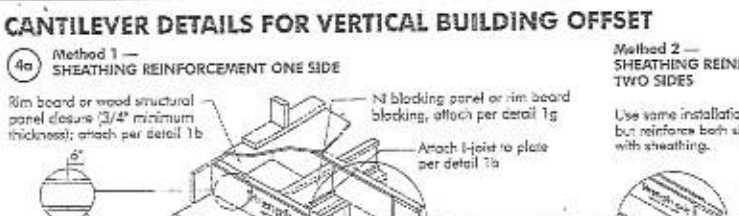
See the adjacent table for web stiffener size requirements

STIFFENER SIZE REQUIREMENTS

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

CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE



Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

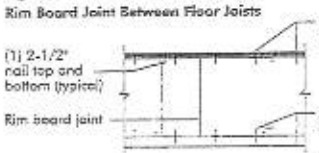
Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

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

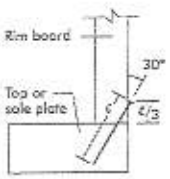
RIM BOARD INSTALLATION DETAILS

2a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

Rim Board Joint Between Floor Joists

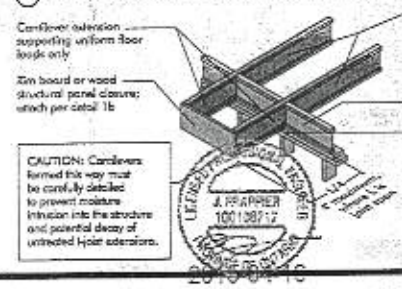


Rim Board Joint at Corner

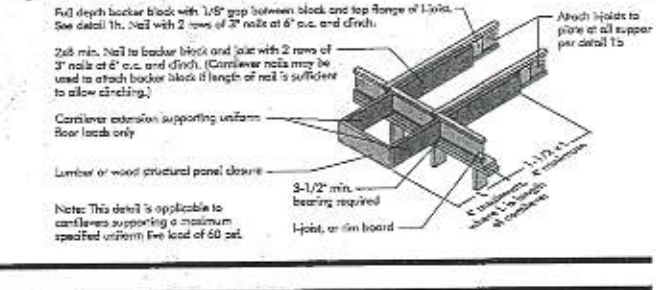


CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

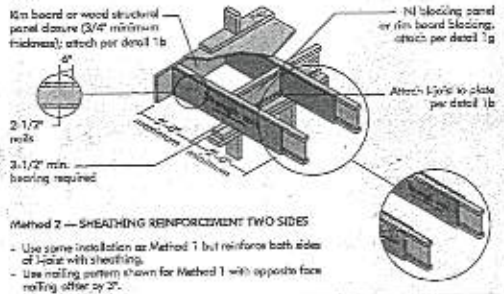


3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE

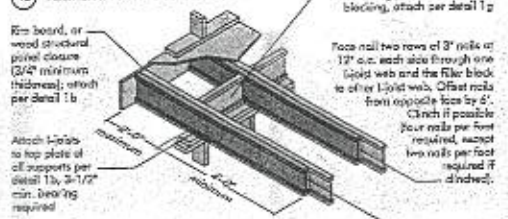


Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

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

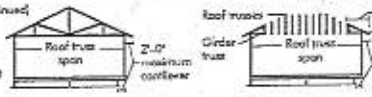
4b Alternate Method 2 — DOUBLE I-JOIST



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

FIGURE 4 (continued)

See table below for NI reinforcement requirements at cantilever.



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

CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	ROOF LOADING (UNFACTORED) LL = 30 psf, DL = 10 psf — JOIST SPACING (in.) 12	16	19.2	24	LL = 40 psf, DL = 10 psf — JOIST SPACING (in.) 12	16	19.2	24	LL = 50 psf, DL = 15 psf — JOIST SPACING (in.) 12	16	19.2	24
9-1/2"	26	N	N	1	2	N	1	2	X	N	2	X	X
	28	N	N	1	X	N	1	2	X	N	2	X	X
	30	N	1	1	X	N	1	2	X	1	2	X	X
	32	N	1	2	X	N	2	X	X	1	X	X	X
	34	N	1	2	X	N	2	X	X	1	X	X	X
	36	N	2	X	X	1	2	X	X	1	X	X	X
11-7/8"	26	N	N	N	1	N	N	1	2	N	1	1	2
	28	N	N	N	1	N	N	1	2	N	1	2	X
	30	N	N	1	1	N	N	1	2	N	1	2	X
	32	N	N	1	1	N	N	1	2	N	1	2	X
	34	N	N	1	2	N	1	1	X	N	1	2	X
	36	N	N	1	2	N	1	2	X	N	2	X	X
	38	N	N	1	2	N	1	2	X	N	2	X	X
14"	26	N	N	N	N	N	N	N	1	N	N	N	1
	28	N	N	N	N	N	N	N	1	N	N	1	1
	30	N	N	N	N	N	N	N	1	N	N	1	2
	32	N	N	N	1	N	N	N	1	N	N	1	2
	34	N	N	N	1	N	N	1	2	N	N	1	2
	36	N	N	N	1	N	N	1	2	N	1	1	2
	38	N	N	N	1	N	N	1	2	N	1	1	X
	40	N	N	N	1	N	N	1	2	N	1	2	X
16"	26	N	N	N	N	N	N	N	1	N	N	N	1
	28	N	N	N	N	N	N	N	1	N	N	N	1
	30	N	N	N	N	N	N	N	1	N	N	1	1
	32	N	N	N	N	N	N	N	1	N	N	1	2
	34	N	N	N	1	N	N	N	1	N	N	1	2
	36	N	N	N	1	N	N	N	1	N	N	1	2
	38	N	N	N	1	N	N	1	2	N	1	1	2
	40	N	N	N	1	N	N	1	2	N	1	2	X
	42	N	N	N	1	N	N	1	2	N	1	2	X

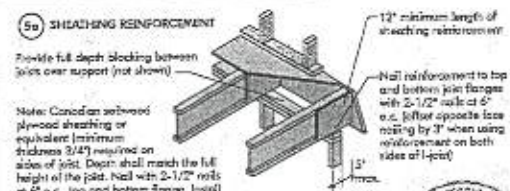
1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 50 plf wall load. Wall load is based on 2'-0" maximum width window or door openings.

For larger openings, or multiple 2'-0" width openings located less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.

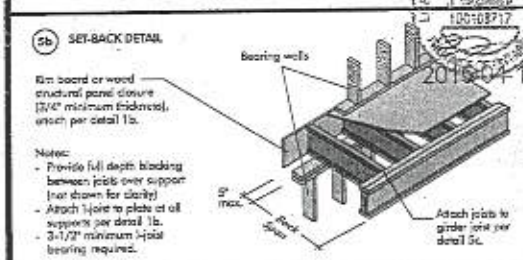
3. Table applies to joists 12" to 24" o.c. first meet the floor span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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

5a SHEATHING REINFORCEMENT



5b SET-BACK DETAIL



5c SET-BACK CONNECTION

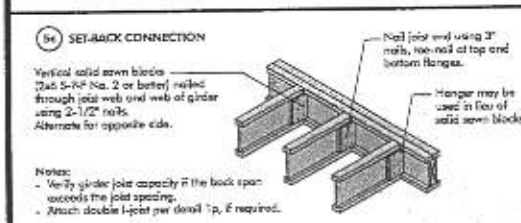


FIGURE 5 (continued)

See table below for NI reinforcement requirements at cantilever.

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

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

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

1. N = No reinforcement required.
   1 = NI reinforced with 3/4" wood structural panel on one side only.
   2 = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum design load shall be: 15 psf roof dead load, 55 psf floor total load, and 50 plf wall load. Wall load is based on 2'-0" maximum width window or door openings.

For larger openings, or multiple 2'-0" width openings located less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.

3. Table applies to joists 12" to 24" o.c. first meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

WEB HOLES

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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

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

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of hole (ft-in.) Round hole diameter (in.) 2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4	Span adjustment Factor
9-1/2"	NI-40	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	—	—	—	—	—	—	—	—	—	1.9
	NI-50	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	—	—	—	—	—	—	—	—	—	1.9
	NI-60	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	—	—	—	—	—	—	—	—	—	1.9
	NI-70	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	—	—	—	—	—	—	—	—	—	1.9
	NI-80	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	—	—	—	—	—	—	—	—	—	1.9
11-7/8"	NI-40	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	—	—	—	—	—	—	—	1.9
	NI-40A	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	—	—	—	—	—	—	—	1.9
	NI-50	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	—	—	—	—	—	—	—	1.9
	NI-60	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	—	—	—	—	—	—	—	1.9
	NI-70	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	—	—	—	—	—	—	—	1.9 (1)
	NI-80	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	—	—	—	—	—	—	—	1.9 (1)
14"	NI-40	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	—	—	—	1.9
	NI-40A	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	—	—	—	1.9
	NI-50	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	—	—	—	1.9
	NI-60	0'-8"	1'-1"	1'-7"	2'-1"	2'-7"	2'-8"	3'-0"	3'-9"	4'-6"	5'-1"	6'-0"	6'-7"	—	—	—	1.9
	NI-70	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	7'-1"	8'-0"	9'-6"	10'-5"	—	—	—	1.9 (1)
	NI-80	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	7'-1"	8'-0"	9'-6"	10'-5"	—	—	—	1.9 (1)
16"	NI-40	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	6'-5"	6'-10"	7'-3"	1.9
	NI-40A	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	6'-5"	6'-10"	7'-3"	1.9
	NI-50	0'-7"	1'-0"	1'-5"	1'-10"	2'-3"	2'-4"	2'-8"	3'-4"	4'-0"	4'-6"	5'-4"	5'-10"	6'-5"	6'-10"	7'-3"	1.9
	NI-60	0'-8"	1'-1"	1'-7"	2'-1"	2'-7"	2'-8"	3'-0"	3'-9"	4'-6"	5'-1"	6'-0"	6'-7"	7'-3"	7'-9"	8'-2"	1.9
	NI-70	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	7'-1"	8'-0"	9'-6"	10'-5"	11'-5"	12'-3"	12'-11"	1.9 (1)
	NI-80	1'-4"	2'-0"	2'-8"	3'-4"	4'-0"	4'-2"	4'-9"	5'-11"	7'-1"	8'-0"	9'-6"	10'-5"	11'-5"	12'-3"	12'-11"	1.9 (1)

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

OPTIONAL:

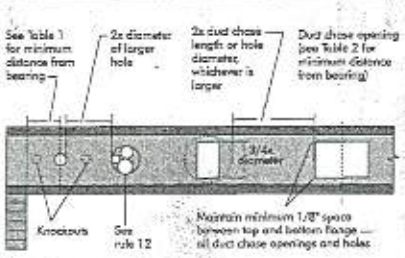
The above table is based on the I-joists used at their maximum spans. If the I-joists are placed at less than their full maximum span (see Maximum Spans for I-joists), the minimum distance from the centreline of the hole to the face of any support (D) as given above may be reduced as follows:

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

Where:
- $D_{reduced}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span conditions (this distance shall not be less than 0.6 times D from the face of the support to edge of the hole.
- I_{actual} = The actual measured span distance between the inside faces of supports (ft).
- SAF = Span Adjustment Factor given in this table.
- D = The minimum distance from the inside face of any support to centre of hole from this table.

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

FIGURE 7
FIELD-CUT HOLE LOCATOR



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

Knockouts are prepunched 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 1.5 inches on centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

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

Holes in webs should be cut with a sharp saw.

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

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

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of opening (ft-in.) Duct chase length (in.) 8	10	12	13	16	18	20	22	24
9-1/2"	NI-40	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-50	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-60	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-70	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-80	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
11-7/8"	NI-40	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-40A	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-50	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-60	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-70	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-80	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
14"	NI-40	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-40A	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-50	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-60	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-70	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-80	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
16"	NI-40	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-40A	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-50	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-60	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-70	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"
	NI-80	4'-1"	4'-4"	4'-7"	4'-8"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"

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

INSTALLING THE GLUED FLOOR SYSTEM

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

FASTENERS FOR SHEATHING AND SUBFLOORING(1)

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

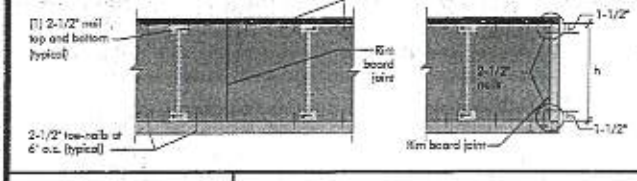
1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/16-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.
5. Use only adhesives conforming to CAN/CSA-O112.9 Standard, Adhesives for Field-Gluing Plywood to Lumber Framing for Floor System, applied in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.

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

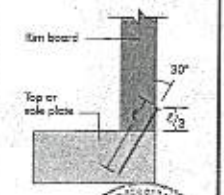
IMPORTANT NOTE:
Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.

RIM BOARD INSTALLATION DETAILS

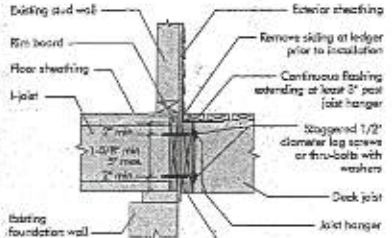
8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

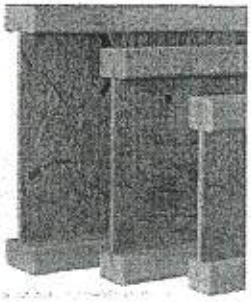


8b TOE-NAIL CONNECTION AT RIM BOARD



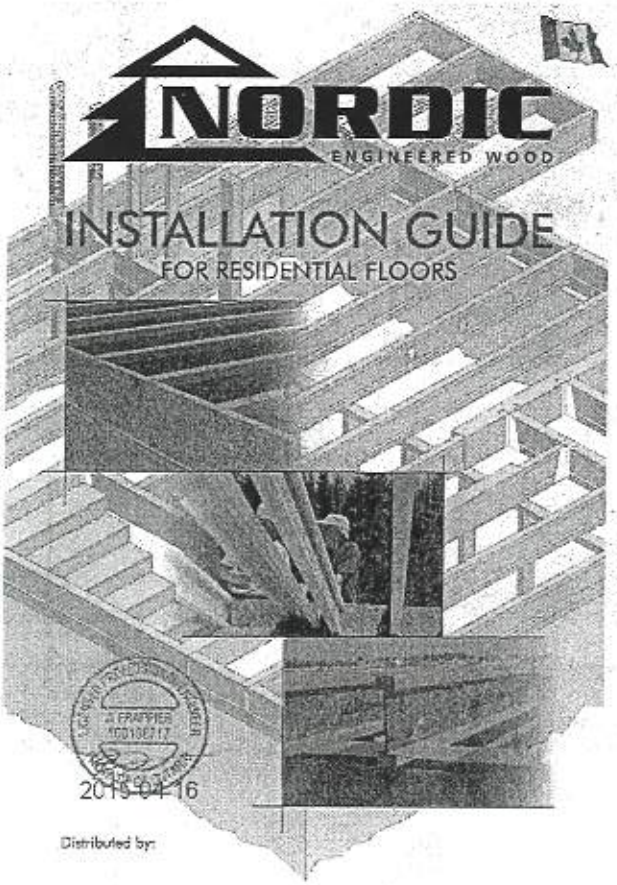
8c 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL





NORDIC
ENGINEERED WOOD

INSTALLATION GUIDE
FOR RESIDENTIAL FLOORS



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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 unsheathed I-joists. Once sheathed, do not over-stress I-joist with concentrated loads from building materials.

WARNING

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

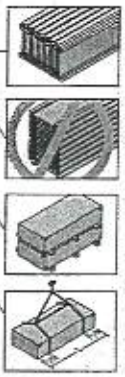
Avoid Accidents by Following these Important Guidelines:

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

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

STORAGE AND HANDLING GUIDELINES

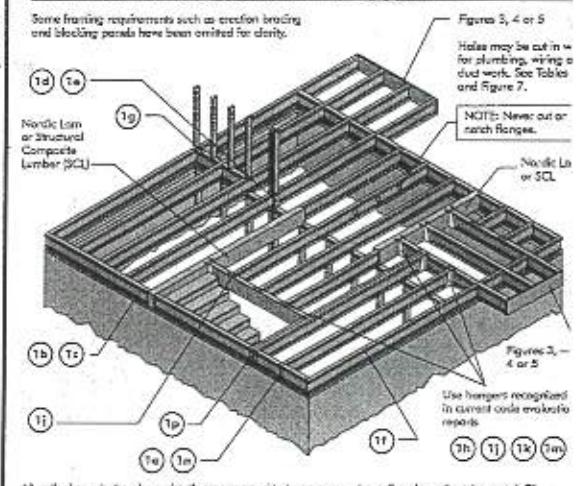
1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store, stack, and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or firetree.
5. Protect I-joists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



INSTALLING NORDIC I-JOISTS

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

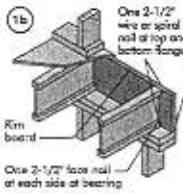
FIGURE 1
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS



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

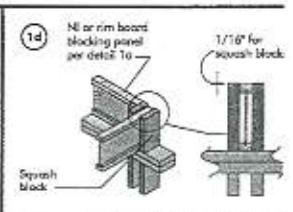
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
NI Joists	3,300

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



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

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



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

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

MAXIMUM FLOOR SPANS

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

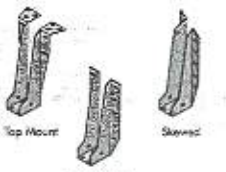
MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS
SIMPLE AND MULTIPLE SPANS

Joist Depth	Joist Series	Simple spans — On centre spacing				Multiple spans — On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-1"	14'-2"	13'-9"	13'-5"	16'-3"	15'-4"	14'-10"	14'-7"
	NI-40x	16'-1"	15'-2"	14'-8"	14'-3"	17'-5"	16'-5"	15'-10"	15'-6"
	NI-40	16'-3"	15'-4"	14'-10"	14'-5"	17'-7"	16'-7"	16'-0"	15'-7"
	NI-70	17'-1"	16'-1"	15'-6"	15'-1"	18'-7"	17'-6"	16'-9"	16'-5"
	NI-80	17'-3"	16'-3"	15'-8"	15'-3"	18'-10"	17'-9"	16'-11"	17'-0"
11-7/8"	NI-20	16'-11"	16'-0"	15'-6"	15'-6"	18'-4"	17'-3"	16'-8"	16'-3"
	NI-40x	18'-1"	17'-0"	16'-5"	16'-4"	20'-0"	18'-6"	17'-9"	17'-3"
	NI-40	18'-4"	17'-3"	16'-7"	16'-6"	20'-3"	18'-9"	18'-0"	18'-1"
	NI-70	19'-6"	18'-5"	17'-4"	17'-5"	21'-6"	19'-11"	19'-2"	19'-3"
	NI-80	19'-9"	18'-8"	17'-6"	17'-7"	21'-9"	20'-2"	19'-5"	19'-4"
	NI-90	20'-3"	18'-7"	17'-10"	17'-11"	22'-3"	20'-7"	19'-8"	19'-9"
	NI-90x	20'-4"	18'-9"	17'-11"	18'-0"	22'-5"	20'-8"	19'-10"	19'-11"
14"	NI-40x	20'-1"	18'-7"	17'-10"	17'-11"	21'-9"	20'-0"	19'-3"	19'-4"
	NI-40	20'-5"	18'-11"	18'-1"	18'-2"	22'-1"	20'-11"	20'-0"	20'-1"
	NI-70	21'-7"	20'-0"	19'-1"	19'-2"	23'-10"	22'-1"	21'-1"	21'-2"
	NI-80	21'-11"	20'-3"	19'-4"	19'-5"	24'-3"	22'-5"	21'-5"	21'-6"
	NI-90	22'-5"	20'-8"	19'-9"	19'-10"	24'-9"	22'-10"	21'-10"	21'-10"
	NI-90x	22'-6"	20'-11"	19'-11"	20'-0"	24'-10"	23'-1"	22'-0"	22'-0"
16"	NI-40	22'-5"	20'-8"	19'-9"	19'-10"	24'-3"	22'-5"	21'-5"	21'-10"
	NI-70	23'-6"	21'-9"	20'-9"	20'-10"	26'-0"	24'-0"	22'-11"	22'-9"
	NI-80	23'-11"	22'-1"	21'-1"	21'-2"	26'-6"	24'-5"	23'-3"	23'-4"
	NI-90	24'-5"	22'-6"	21'-5"	21'-6"	26'-11"	24'-10"	23'-8"	23'-8"
	NI-90x	24'-8"	22'-9"	21'-8"	21'-10"	27'-2"	25'-2"	24'-0"	24'-1"

CONCENTRATION REPORT 22028-R

I-JOIST HANGERS

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



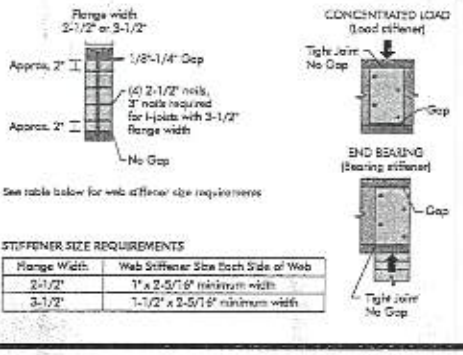
WEB STIFFENERS

RECOMMENDATIONS:

- A bearing stiffener is required in all engineered applications with factored reactions greater than shown in the I-joist properties table found of the I-joist Construction Guide (C161). The gap between the stiffener and the flange is at the top.
- A bearing stiffener is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- A load stiffener is required at locations where a factored concentrated load greater than 2,270 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

SI units conversion: 1 inch = 25.4 mm

FIGURE 2
WEB STIFFENER INSTALLATION DETAILS

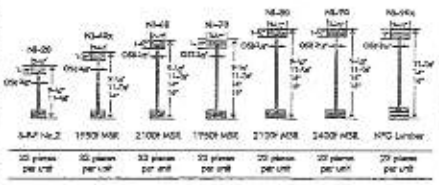


See table below for web stiffener size requirements

STIFFENER SIZE REQUIREMENTS

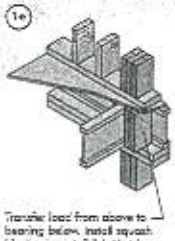
Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

NORDIC I-JOIST SERIES

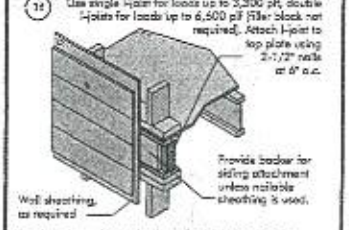


Chantiers Chibougamau Ltd. harvests its own trees, which enables Nordic products to adhere to strict quality control procedures throughout the manufacturing process. Every phase of the operation, from forest to finished product, reflects our commitment to quality.

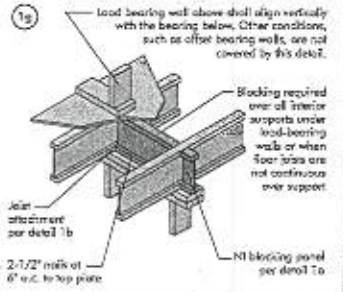
Nordic Engineered Wood I-joists use only finger-jointed spruce chord stock lumber in their flanges, ensuring consistent quality, superior dimensional stability and longer span carrying capacity.



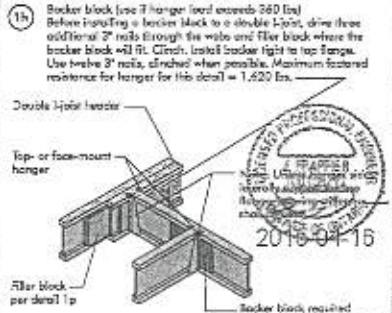
1e. Transfer load from above to bearing below. Install squash blocks per detail 1d. Match bearing area of blocks below to post above.



1f. Use single I-joist for loads up to 3,200 plf, double I-joists for loads up to 6,500 plf. Filler block not required. Attach I-joist to top plate using 2-1/2" nails at 6" o.c. Provide backer for siding attachment unless nailable sheathing is used. Rim board may be used in lieu of I-joists. Backer is not required when rim board is used. Bracing per code shall be carried to the foundation.



1g. Load bearing wall above shall align vertically with the bearing below. Other conditions, such as offset bearing walls, are not covered by this detail. Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support.



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

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

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

Flange Width	Material Thickness Required*	Minimum Depth**
2-1/2"	1"	9-1/2"
3-1/2"	1-1/2"	7-1/4"

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

1i. Nordic Lam or SCL. Top- or face-mount hanger installed per manufacturer's recommendations. For nailing schedules for multiple beams, see the manufacturer's recommendations.

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

1k. 2x plate flush with inside face of wall or beam. 1/8" overhang allowed past inside face of wall or beam. Top-mount hanger installed per manufacturer's recommendations.

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

1m. Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads. Filler block per detail 1p. Install hanger per manufacturer's recommendations. Backer block attached per detail 1h. Nail with twelve 3" nails, clinch when possible.

Maximum support capacity = 1,620 lbs.

1n. Do not bevel-cut joist beyond inside face of wall. Attach I-joist per detail 1b.

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

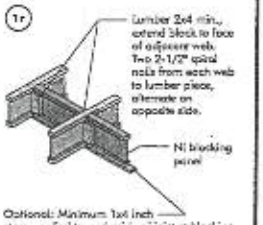
1p.

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

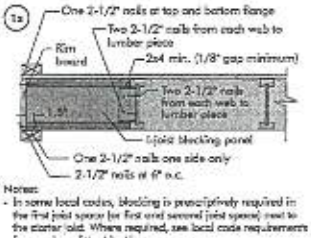
FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

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

1r.



1s.



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

Boise Cascade

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

Floor Beam\B01

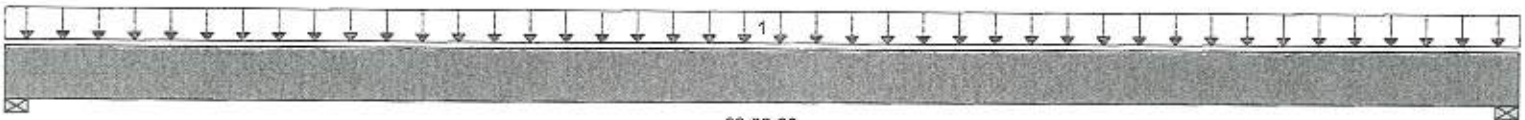
BC CALC® Design Report

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

November 19, 2017 08:23:44

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 09-00-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	2,370 / 0	1,239 / 0		
B1, 3-1/2"	2,370 / 0	1,239 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	09-00-00	40	20			13-02-00

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	10,344 ft-lbs	35,392 ft-lbs	29.2%	1	04-06-00
End Shear	3,651 lbs	14,464 lbs	25.2%	1	01-03-06
Total Load Defl.	L/999 (0.098")	n/a	n/a	4	04-06-00
Live Load Defl.	L/999 (0.065")	n/a	n/a	5	04-06-00
Max Defl.	0.098"	n/a	n/a	4	04-06-00
Span / Depth	8.6	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"	5,104 lbs	67.7%	34.2%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	5,104 lbs	67.7%	34.2%	Spruce Pine Fir

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 ½" spiral nails @ 12" o.c, staggered in 2 rows

S. 152706

Boise Cascade

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

Floor Beam\B02

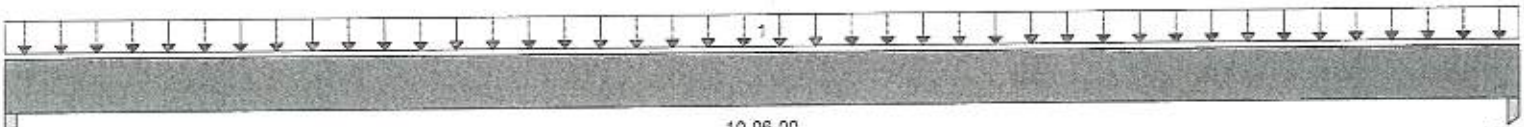
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:45

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 10-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,750 / 0	907 / 0		
B1, 3-1/2"	1,750 / 0	907 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	10-06-00	40	20			08-04-00

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	9,023 ft-lbs	17,696 ft-lbs	51%	1	05-03-00
End Shear	2,841 lbs	7,232 lbs	39.3%	1	01-03-06
Total Load Defl.	L/508 (0.237")	0.502"	47.2%	4	05-03-00
Live Load Defl.	L/772 (0.156")	0.335"	46.6%	5	05-03-00
Max Defl.	0.237"	1"	23.7%	4	05-03-00
Span / Depth	10.1	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	Post	3-1/2" x 1-3/4"	3,758 lbs	35.4%	50.3%	Spruce Pine Fir
B1	Post	3-1/2" x 1-3/4"	3,758 lbs	35.4%	50.3%	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

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.

S. 152707

Boise Cascade

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

Floor Beam\B03

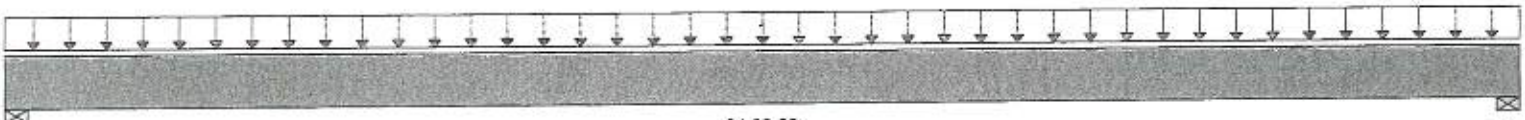
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:46

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 04-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	330 / 0	179 / 0		
B1, 3-1/2"	330 / 0	179 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	04-06-00	40	20			03-08-00

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	652 ft-lbs	17,696 ft-lbs	3.7%	1	02-03-00
End Shear	309 lbs	7,232 lbs	4.3%	1	01-03-06
Total Load Defl.	L/999 (0.003")	n/a	n/a	4	02-03-00
Live Load Defl.	L/999 (0.002")	n/a	n/a	5	02-03-00
Max Defl.	0.003"	n/a	n/a	4	02-03-00
Span / Depth	4.1	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 1-3/4"	718 lbs	19.1%	9.6%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	718 lbs	19.1%	9.6%	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

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.

S. 152708

Boise Cascade

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

Floor Beam\B04

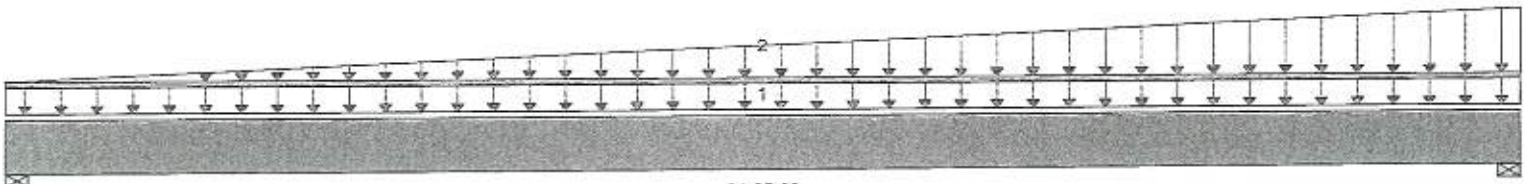
- Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:46

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 04-05-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	102 / 0	60 / 0		
B1, 3-1/2"	150 / 0	79 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	04-05-00	27	14			n/a
2		Trapezoidal (lb/ft)	L	00-00-00		0	0			n/a
					04-05-00	60	23			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	246 ft-lbs	17,696 ft-lbs	1.4%	1	02-03-14
End Shear	206 lbs	7,232 lbs	2.9%	1	03-01-10
Total Load Defl.	L/999 (0.001")	n/a	n/a	4	02-03-03
Live Load Defl.	L/999 (0.001")	n/a	n/a	5	02-03-03
Max Defl.	0.001"	n/a	n/a	4	02-03-03
Span / Depth	4	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 1-3/4"	228 lbs	6%	3%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	324 lbs	8.6%	4.3%	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

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.

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S152709

Boise Cascade

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

Floor Beam\B05

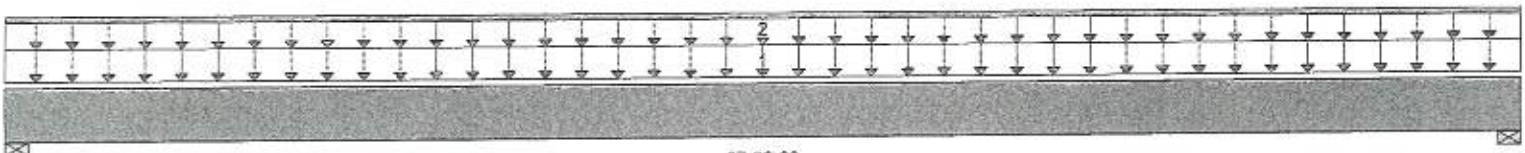
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:47

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 07-08-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,112 / 0	809 / 0		
B1, 3-1/2"	1,112 / 0	809 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	07-08-00	40	20			07-03-00
2		Unf. Lin. (lb/ft)	L	00-00-00	07-08-00		60			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,539 ft-lbs	17,696 ft-lbs	25.6%	1	03-10-00
End Shear	1,783 lbs	7,232 lbs	24.7%	1	01-03-06
Total Load Defl.	L/999 (0.062")	n/a	n/a	4	03-10-00
Live Load Defl.	L/999 (0.036")	n/a	n/a	5	03-10-00
Max Defl.	0.062"	n/a	n/a	4	03-10-00
Span / Depth	7.3	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 1-3/4"	2,679 lbs	71.1%	35.8%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	2,679 lbs	71.1%	35.8%	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

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.

S. 152710

Boise Cascade

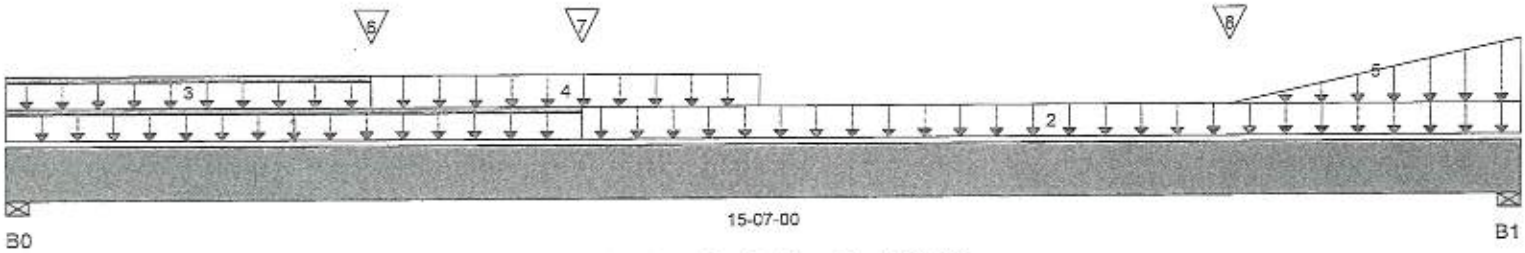
Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP — Floor Beam\B06

Dry | 1 span | No cantilevers | 0/12 slope (deg) — November 19, 2017 08:23:47

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 15-07-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,772 / 0	1,129 / 0		
B1, 3-1/2"	1,313 / 0	722 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	05-11-00	27	14			n/a
2		Unf. Area (lb/ft^2)	L	05-11-00	15-07-00	40	15			02-03-00
3		Unf. Lin. (lb/ft)	L	00-00-00	03-09-00	27	14			n/a
4		Unf. Area (lb/ft^2)	L	03-09-00	07-09-00	40	15			02-00-00
5		Trapezoidal (lb/ft)	L	12-07-00		0	0			n/a
					15-07-00	60	23			n/a
6		Conc. Pt. (lbs)	L	03-09-00	03-09-00	1,112	809			n/a
7		Conc. Pt. (lbs)	L	05-11-00	05-11-00	330	179			n/a
8		Conc. Pt. (lbs)	L	12-07-00	12-07-00	102	60			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	14,811 ft-lbs	35,392 ft-lbs	41.8%	1	05-11-00
End Shear	3,901 lbs	14,464 lbs	27%	1	01-03-06
Total Load Defl.	L/431 (0.421")	0.756"	55.7%	4	07-03-08
Live Load Defl.	L/686 (0.265")	0.504"	52.5%	5	07-06-04
Max Defl.	0.421"	1"	42.1%	4	07-03-08
Span / Depth	15.3	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"	4,069 lbs	54%	27.2%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	2,873 lbs	38.1%	19.2%	Spruce Pine Fir

REGISTERED PROFESSIONAL ENGINEER E. FOK PROVINCE OF ONTARIO

Notes

Nail one ply to another with 3 ½" spiral nails @ 12" o.c, staggered in 2 rows

S152711

Boise Cascade

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

Floor Beam\B07

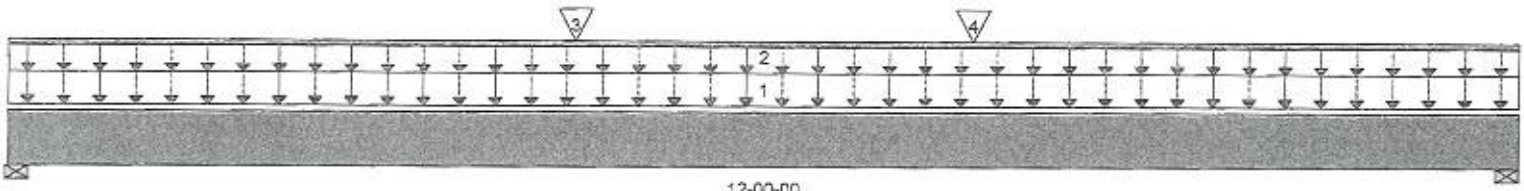
BC CALC® Design Report

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

November 19, 2017 08:23:24

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	Second Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 12-00-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3"	1,857 / 0	1,388 / 0		
B1, 3-1/2"	2,210 / 0	1,586 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	40	20			04-09-00
2		Unf. Lin. (lb/ft)	L	00-00-00	12-00-00	27	74			n/a
3		Conc. Pt. (lbs)	L	04-06-00	04-06-00	150	79			n/a
4		Conc. Pt. (lbs)	L	07-08-00	07-08-00	1,313	722			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	16,572 ft-lbs	35,392 ft-lbs	46.8%	1	07-08-00
End Shear	4,590 lbs	14,464 lbs	31.7%	1	10-08-10
Total Load Defl.	L/496 (0.28")	0.579"	48.4%	4	06-01-00
Live Load Defl.	L/845 (0.165")	0.386"	42.6%	5	06-01-00
Max Defl.	0.28"	1"	28%	4	06-01-00
Span / Depth	11.7	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" x 3-1/2"	4,520 lbs	70%	35.3%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	5,297 lbs	70.3%	35.4%	Spruce Pine Fir

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 ½" spiral nails @ 12"
o.c. staggered in 2 rows

S152712

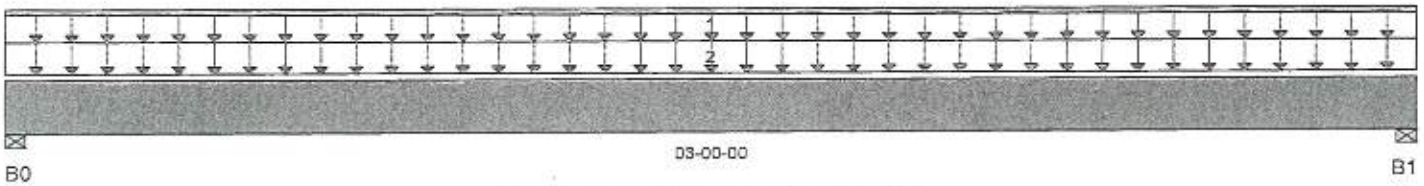
Boise Cascade

Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP — Floor Beam\B08

Dry | 1 span | No cantilevers | 0/12 slope (deg) — November 19, 2017 08:23:48

BC CALC® Design Report

Build 6080		File Name:	290675.bcc
Job Name:	45147 (4001)	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 = 03-00-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	40 / 0	329 / 0	268 / 0	
B1, 3-1/2"	41 / 0	329 / 0	268 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	03-00-00	27	114			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	03-00-00		11	21		08-06-00

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	449 ft-lbs	35,392 ft-lbs	1.3%	5	01-06-00
End Shear	122 lbs	14,464 lbs	0.8%	5	01-03-06
Total Load Defl.	L/999 (0")	n/a	n/a	13	01-06-00
Live Load Defl.	L/999 (0")	n/a	n/a	17	01-06-00
Max Defl.	0"	n/a	n/a	13	01-06-00
Span / Depth	2.6	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"	834 lbs	11.1%	5.6%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	834 lbs	11.1%	5.6%	Spruce Pine Fir

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 ½" spiral nails @ 6"
o.c, staggered in 2 rows

S 152713

Boise Cascade

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

Floor Beam\B09

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

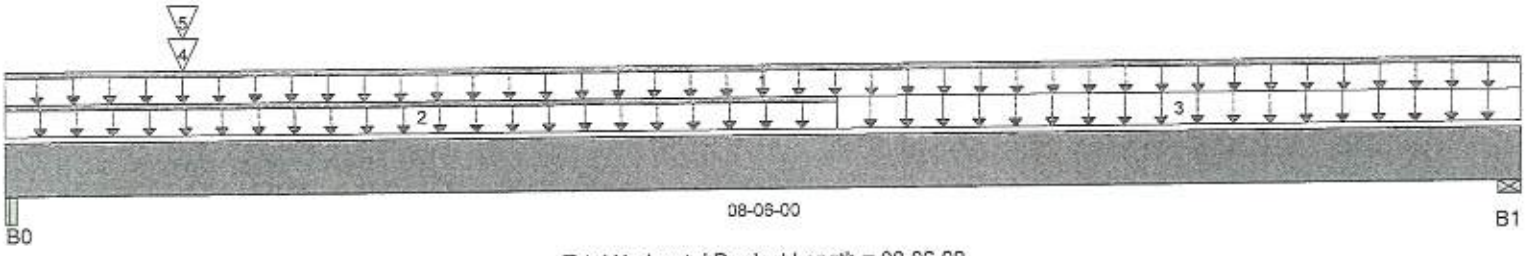
November 19, 2017 08:23:48

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)
Address:	Pine Valley
City, Province, Postal Code:	Vaughan, ON
Customer:	Gold Park
Code reports:	CCMC 12472-R

File Name:	290675.bcc
Description:	First Floor Framing
Specifier:	
Designer:	NL
Company:	Alpa Roof Trusses
Misc:	



Total Horizontal Product Length = 08-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	3,347 / 0	2,174 / 0		
B1, 3-1/2"	634 / 0	447 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	08-06-00	27	14			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	04-08-00		60			n/a
3		Unf. Area (lb/ft^2)	L	04-08-00	08-06-00	40	15			01-06-00
4		Conc. Pt. (lbs)	L	01-00-00	01-00-00	1,750	905			n/a
5		Conc. Pt. (lbs)	L	01-00-00	01-00-00	1,772	1,129			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,897 ft-lbs	35,392 ft-lbs	16.7%	1	01-00-00
End Shear	5,325 lbs	14,464 lbs	36.8%	1	01-03-06
Total Load Defl.	L/999 (0.043")	n/a	n/a	4	03-09-13
Live Load Defl.	L/999 (0.025")	n/a	n/a	5	03-09-13
Max Defl.	0.043"	n/a	n/a	4	03-09-13
Span / Depth	8.1	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	Beam	3-1/2" x 3-1/2"	7,739 lbs	1.6%	51.8%	Steel
B1	Wall/Plate	3-1/2" x 3-1/2"	1,510 lbs	20%	10.1%	Spruce Pine Fir

REGISTERED PROFESSIONAL ENGINEER
Dec 28/17
E. FOK
PROVINCE OF ONTARIO

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 ½" spiral nails @ 12"
o.c, staggered in 2 rows

S-152714

Boise Cascade

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

Floor Beam\B10

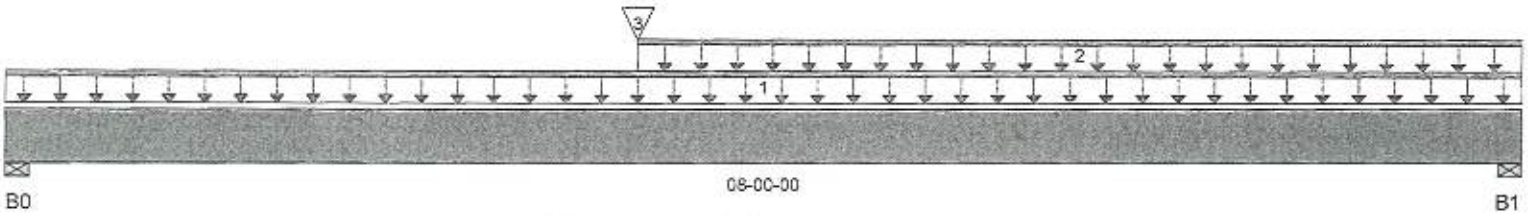
BC CALC® Design Report

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

November 19, 2017 08:23:49

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 08-00-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	516 / 0	361 / 0		
B1, 3-1/2"	460 / 0	311 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	08-00-00	27	14			n/a
2		Unf. Lin. (lb/ft)	L	03-04-00	08-00-00	27	14			n/a
3		Conc. Pt. (lbs)	L	03-04-00	03-04-00	634	447			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,443 ft-lbs	17,696 ft-lbs	19.5%	1	03-04-00
End Shear	1,142 lbs	7,232 lbs	15.8%	1	01-03-06
Total Load Defl.	L/999 (0.044")	n/a	n/a	4	03-10-06
Live Load Defl.	L/999 (0.026")	n/a	n/a	5	03-10-06
Max Defl.	0.044"	n/a	n/a	4	03-10-06
Span / Depth	7.6	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 1-3/4"	1,226 lbs	32.5%	16.4%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	1,078 lbs	28.6%	14.4%	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

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.

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S 152715

Boise Cascade

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

Floor Beam\B11

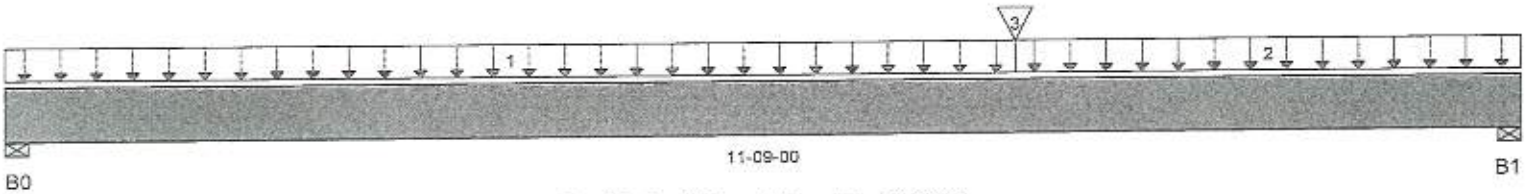
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:49

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 11-09-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,254 / 0	506 / 0		
B1, 3-1/2"	1,711 / 0	677 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	07-10-00	40	15			04-00-00
2		Unf. Area (lb/ft^2)	L	07-10-00	11-09-00	40	15			05-06-00
3		Conc. Pt. (lbs)	L	07-10-00	07-10-00	850	319			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	9,218 ft-lbs	17,696 ft-lbs	52.1%	1	07-10-00
End Shear	2,849 lbs	7,232 lbs	39.4%	1	10-05-10
Total Load Defl.	L/469 (0.289")	0.565"	51.1%	4	06-01-02
Live Load Defl.	L/656 (0.207")	0.376"	54.9%	5	06-01-02
Max Defl.	0.289"	1"	28.9%	4	06-01-02
Span / Depth	11.4	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 1-3/4"	2,512 lbs	66.7%	33.6%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	3,414 lbs	90.6%	45.7%	Spruce Pine Fir

Notes

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

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.

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S 152716

Boise Cascade

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

Floor Beam\B12

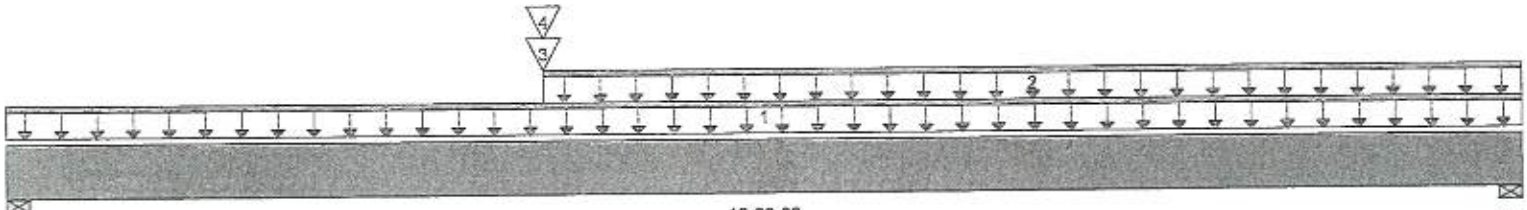
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:50

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	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"	1,603 / 0	1,053 / 0		
B1, 3-1/2"	1,041 / 0	843 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 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	04-03-00	12-00-00	27	14			n/a
3		Conc. Pt. (lbs)	L	04-03-00	04-03-00	400	150			n/a
4		Conc. Pt. (lbs)	L	04-03-00	04-03-00	1,711	677			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	13,703 ft-lbs	17,696 ft-lbs	77.4%	1	04-03-00
End Shear	3,542 lbs	7,232 lbs	49%	1	01-03-06
Total Load Defl.	L/342 (0.405")	0.577"	70.3%	4	05-08-00
Live Load Defl.	L/556 (0.249")	0.385"	64.8%	5	05-06-12
Max Defl.	0.405"	1"	40.5%	4	05-08-00
Span / Depth	11.7	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 1-3/4"	3,722 lbs	98.8%	49.8%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	2,614 lbs	69.4%	35%	Spruce Pine Fir

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.

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

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S152717

Boise Cascade

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

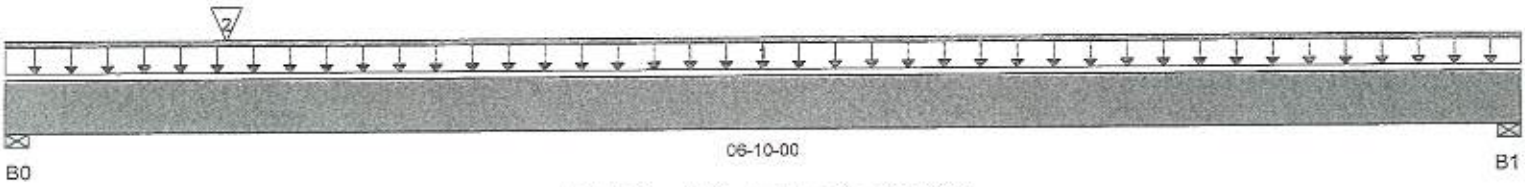
Floor Beam\B13

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

November 19, 2017 08:23:50

BC CALC® Design Report

Build 6080		File Name:	290675.bcc
Job Name:	45147 (4001)	Description:	First 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 = 06-10-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,723 / 0	1,134 / 0		
B1, 3-1/2"	396 / 0	448 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	06-10-00	54	87			n/a
2		Conc. Pt. (lbs)	L	01-00-00	01-00-00	1,750	905			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,992 ft-lbs	35,392 ft-lbs	8.5%	1	01-02-08
End Shear	2,672 lbs	14,464 lbs	18.5%	1	01-03-06
Total Load Defl.	L/999 (0.015")	n/a	n/a	4	03-01-13
Live Load Defl.	L/999 (0.008")	n/a	n/a	5	03-01-00
Max Defl.	0.015"	n/a	n/a	4	03-01-13
Span / Depth	6.4	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"	4,002 lbs	53.1%	26.8%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	1,154 lbs	15.3%	7.7%	Spruce Pine Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 ½" spiral nails @ 12"
o.c, staggered in 2 rows

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S 152718

Boise Cascade

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

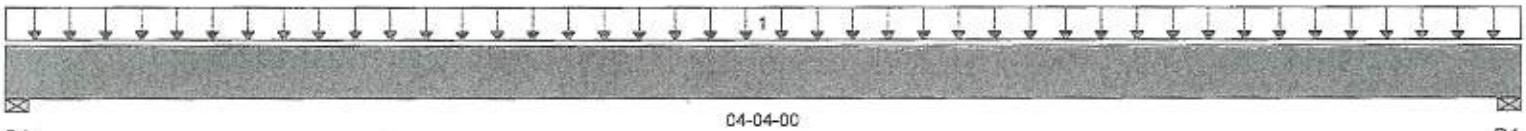
Floor Beam\B14

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

November 19, 2017 08:23:51

BC CALC® Design Report

Build 6080			
Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 04-04-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	520 / 0	205 / 0		
B1, 3-1/2"	520 / 0	205 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	04-04-00	40	15			06-00-00

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	898 ft-lbs	11,610 ft-lbs	7.7%	1	02-02-00
End Shear	518 lbs	5,785 lbs	9%	1	01-01-00
Total Load Defl.	L/999 (0.007")	n/a	n/a	4	02-02-00
Live Load Defl.	L/999 (0.005")	n/a	n/a	5	02-02-00
Max Defl.	0.007"	n/a	n/a	4	02-02-00
Span / Depth	4.9	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 1-3/4"	1,037 lbs	27.5%	13.9%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	1,037 lbs	27.5%	13.9%	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

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.

S. 152719

Boise Cascade

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

Floor Beam\B15

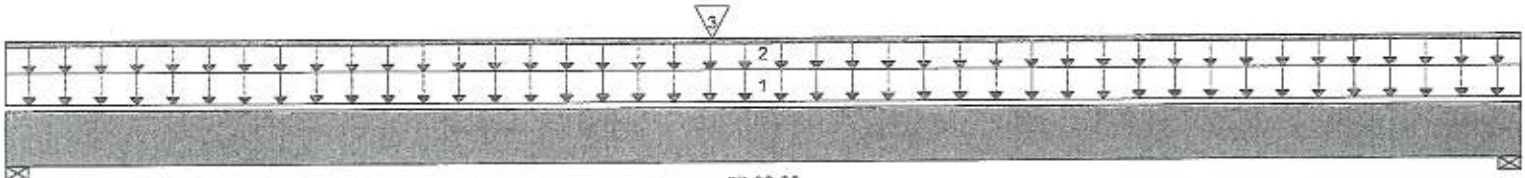
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:51

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 07-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	749 / 0	726 / 0		
B1, 3-1/2"	725 / 0	699 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	07-06-00	40	20			03-09-00
2		Unf. Lin. (lb/ft)	L	00-00-00	07-06-00		60			n/a
3		Conc. Pt. (lbs)	L	03-06-00	03-06-00	349	377			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,208 ft-lbs	11,610 ft-lbs	36.2%	1	03-06-00
End Shear	1,599 lbs	5,785 lbs	27.6%	1	01-01-00
Total Load Defl.	L/999 (0.1")	n/a	n/a	4	03-08-03
Live Load Defl.	L/999 (0.051")	n/a	n/a	5	03-08-03
Max Defl.	0.1"	n/a	n/a	4	03-08-03
Span / Depth	8.9	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 1-3/4"	2,032 lbs	53.9%	27.2%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	1,961 lbs	52%	26.2%	Spruce Pine Fir

Notes

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

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.

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

S-152720

Boise Cascade

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

Floor Beam\B16

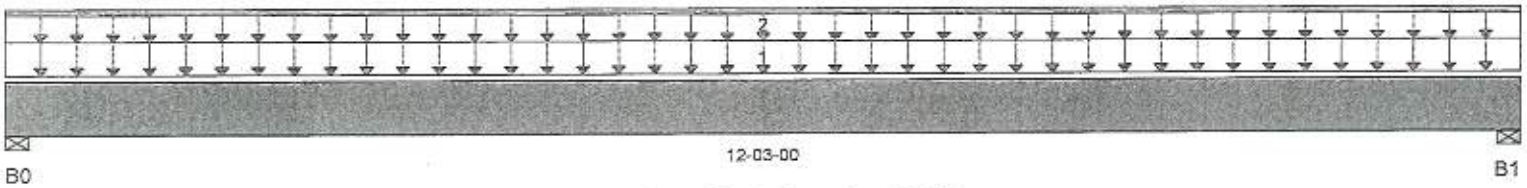
Dry | 1 span | No cantilevers | 0/12 slope (deg)

November 19, 2017 08:23:52

BC CALC® Design Report

Build 6080

Job Name:	45147 (4001)	File Name:	290675.bcc
Address:	Pine Valley	Description:	First Floor Framing
City, Province, Postal Code:	Vaughan, ON	Specifier:	
Customer:	Gold Park	Designer:	NL
Code reports:	CCMC 12472-R	Company:	Alpa Roof Trusses
		Misc:	



Total Horizontal Product Length = 12-03-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	796 / 0	795 / 0		
B1, 3-1/2"	796 / 0	795 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Unf. Area (lb/ft^2)	L	00-00-00	12-03-00	40	20			03-03-00
2		Unf. Lin. (lb/ft)	L	00-00-00	12-03-00		60			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	6,209 ft-lbs	11,610 ft-lbs	53.5%	1	06-01-08
End Shear	1,801 lbs	5,785 lbs	31.1%	1	01-01-00
Total Load Defl.	L/313 (0.452")	0.59"	76.7%	4	06-01-08
Live Load Defl.	L/626 (0.226")	0.393"	57.5%	5	06-01-08
Max Defl.	0.452"	1"	45.2%	4	06-01-08
Span / Depth	14.9	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 1-3/4"	2,188 lbs	58.1%	29.3%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	2,188 lbs	58.1%	29.3%	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

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.

S-152721

NORDIC STRUCTURES

COMPANY
Nov. 17, 2017 15:39

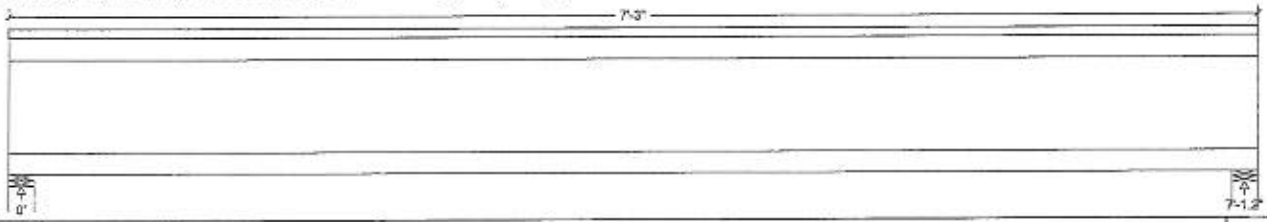
PROJECT
45147(6031)
Gold Park
Pine Valley, Vaughan
2-NI-20-S(1ST[illegible].wwb
beside Stair

Design Check Calculation Sheet
Nordic Sizer – Canada 8.4

Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start	End	Magnitude Start	End	Unit
Load1	Dead	Full Area				20.00		psf
Load2	Live	Full Area				40.00		psf
Load3	Live	Point		3.92		450		lbs
Load4	Dead	Point		3.92		169		lbs
Load5	Dead	Full UDL				60.0		plf
Self-weight	Dead	Full UDL				4.4		plf

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



Unfactored:			
Dead	377		391
Live	349		388
Factored:			
Total	994		1067
Bearing:			
Resistance			
Joist	3269		3269
Support	5450		5530
Dem ratio			
Joist	0.30		0.33
Support	0.18		0.19
Load case	#2		#2
Length	1-3/4		1-3/4
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		1.00
fcp sup	769		769
Kbcp sup	1.03		1.03

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

Nordic 9-1/2" NI-20 2-ply Floor joist @ 12" o.c.
Supports: All - Lumber Wall, No.1/No.2
Total length: 7'-3.0"; 5/8" nailed and glued OSB sheathing
This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 1067	Vr = 3499	lbs	Vf/Vr = 0.31
Moment(-)	Mf = 2600	Mr = 8615	lbs-ft	Mf/Mr = 0.30
Perm. Defl'n	0.02 = <L/999	0.24 = L/360	in	0.09
Live Defl'n	0.02 = <L/999	0.24 = L/360	in	0.10
Total Defl'n	0.05 = <L/999	0.36 = L/240	in	0.13
Bare Defl'n	0.03 = <L/999	0.24 = L/360	in	0.12
Vibration	Lmax = 7'-1	Lv = 17'-3	ft	
Defl'n	= 0.007	= 0.079	in	0.08

Additional Data:

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	175T	0.99	1.00	-	-	-	-	-	#2
Mr+	4307	1.00	1.00	-	1.000	-	-	-	#2
EI	146.0 million			-	-	-	-	-	#2

CRITICAL LOAD COMBINATIONS:
Shear : LC #2 = 1.25D + 1.5L
Moment(+) : LC #2 = 1.25D + 1.5L
Deflection: LC #1 = 1.0D (permanent)
LC #2 = 1.0D + 1.0L (live)
LC #2 = 1.0D + 1.0L (total)
LC #2 = 1.0D + 1.0L (bare joist)
Bearing : Support 1 - LC #2 = 1.25D + 1.5L
Support 2 - LC #2 = 1.25D + 1.5L
Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake
L=live(use,occupancy) Ls=live(storage,equipment) F=fire
All Load Combinations (LCs) are listed in the Analysis output
CALCULATIONS:
Deflection: Eleff = 166e06 lb-in2/ply K= 4.96e06 lbs/ply
"Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

Design Notes:
1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-14 Engineering Design in Wood standard (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. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.

S152722

NORDIC STRUCTURES

COMPANY
Nov. 17, 2017 16:08

PROJECT
45147(4001)
Gold Park
Pine Valley, Vaughan
1-NI-20-12"(1ST under bearing wall).wwb

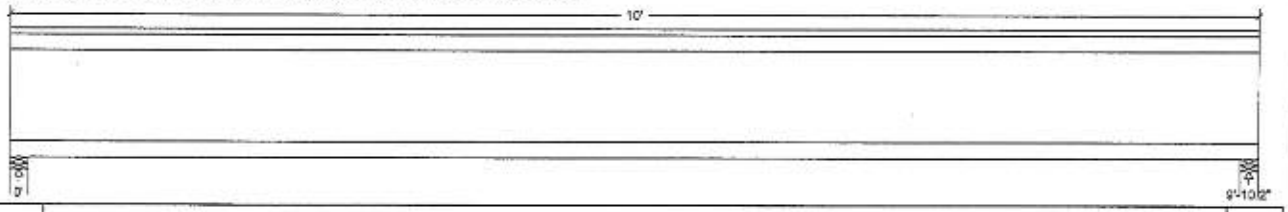
Design Check Calculation Sheet

Nordic Sizer – Canada 6.4

Loads:

Load	Type	Distribution	Pattern	Location (ft) Start	End	Magnitude Start	End	Unit
Load1	Dead	Full Area				20.00		psf
Load2	Live	Full Area				40.00		psf
Load3	Live	Point		1.67		640		lbs
Load4	Dead	Point		1.67		320		lbs
Load5	Dead	Point		1.67		60		lbs
Self-weight	Dead	Full UDL				2.4		plf

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



Unfactored:		
Dead	429	172
Live	734	301
Factored:		
Total	1636	665
Bearing:		
Resistance		
Joist	1965	1965
Support	2798	2798
Des ratio		
Joist	0.83	0.34
Support	0.58	0.24
Load case	#2	#2
Length	1-3/4	1-3/4
Min req'd	1-3/4	1-3/4
Stiffener	No	No
Kz	1.00	1.00
Kb support	1.00	1.00
fcp sup	769	769
Kzcp sup	1.03	1.03

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

Nordic 11-7/8" NI-20 Floor joist @ 12" o.c.
Supports: All - Lumber Wall, No.1/No.2
Total length: 10'; 5/8" nailed and glued OSB sheathing
This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 1838	Vr = 2241	lbs	Vf/Vr = 0.73
Moment(-)	Mf = 2516	Mr = 5580	lbs-ft	Mf/Mr = 0.45
Perm. Defl'n	0.05 = <L/999	0.33 = L/360	in	0.14
Live Defl'n	0.09 = <L/999	0.33 = L/360	in	0.24
Total Defl'n	0.12 = L/960	0.49 = L/240	in	0.25
Bare Defl'n	0.09 = <L/999	0.33 = L/360	in	0.28
Vibration	Lmax = 9'-10	Lv = 17'-2	ft	
Defl'n	= 0.013	= 0.075	in	0.17

Additional Data:

FACTORS:	f/E	KD	KH	KS	KL	KT	KS	KN	LC#
Vr	2241	1.00	1.00	-	-	-	-	-	#2
Mr+	5580	1.00	1.00	-	1.000	-	-	-	#2
EI	253.0 million			-	-	-	-	-	#2

CRITICAL LOAD COMBINATIONS:
- Shear : LC #2 = 1.25D + 1.5L
- Moment(+) : LC #2 = 1.25D + 1.5L
- Deflection: LC #1 = 1.0D (permanent)
  - LC #2 = 1.0D + 1.0L (live)
  - LC #2 = 1.0D + 1.0L (total)
  - LC #2 = 1.0D + 1.0L (bare joist)
- Bearing : Support 1 - LC #2 = 1.25D + 1.5L
  - Support 2 - LC #2 = 1.25D + 1.5L

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake
L=live(use,occupancy) Ls=live(storage,equipment) F=fire
All Load Combinations (LCs) are listed in the Analysis output

CALCULATIONS:
Deflection: EIeff = 309e06 lb-in2 K= 6.18e06 lbs
"Live" deflection = Deflection from all non-dead loads (live, wind, snow..)

REGISTERED PROFESSIONAL ENGINEER
E. FOK
PROVINCE OF ONTARIO

Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-14 Engineering Design in Wood standard (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. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.

S152723