

Products				
PlotID	Length	Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-40x	1	4
J2	16-00-00	11 7/8" NI-40x	1	5
J3	14-00-00	11 7/8" NI-40x	1	38
J4	12-00-00	11 7/8" NI-40x	1	1
J5	10-00-00	11 7/8" NI-40x	1	18
J6	6-00-00	11 7/8" NI-40x	1	10
J7	2-00-00	11 7/8" NI-40x	1	1
J8	20-00-00	11 7/8" NI-80	1	39
B4 DROP	12-00-00	VERSALAM-10 2.0E	2	2
B6 DROP	12-00-00	VERSALAM-10 2.0E	2	2
B11	12-00-00	VERSALAM-12 2.0E	2	2
B9	12-00-00	VERSALAM-12 2.0E	2	2
B1	10-00-00	VERSALAM-12 2.0E	1	1
B2	10-00-00	VERSALAM-12 2.0E	1	1
B2A	10-00-00	VERSALAM-12 2.0E	1	1
B3 DROP	10-00-00	VERSALAM-10 2.0E	2	2
B10	8-00-00	VERSALAM-12 2.0E	1	1
B7	8-00-00	VERSALAM-12 2.0E	1	1
B8	6-00-00	VERSALAM-12 2.0E	1	1
B5 DROP	6-00-00	VERSALAM-10 2.0E	2	2
B12	2-00-00	VERSALAM-12 2.0E	2	2

#### HANGERS SCHEDULE

H1	IUS2.56/11.88
H2	HUS1.81/10
H3	HGUS410
H4	IUS3.56/11.88

#### RIMBOARD

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

SUBFLOOR : 5/8" NAILED & GLUED

BBO— BEAM BY OTHERS

APP—AS PER PLAN

—1 - 2 X 6 SPF # 2 squash block req'd on one side of each joist under interior load bearing walls.  
 —Multiple squash blocks are req'd under concentrated loads.

Do not scale - refer to architectural plans for dimensions

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

**S50-1**

**ELEV. 'A'**

#### SECOND FLOOR FRAMING

JT:38514/84786 Builder: Bayview Wellington  
 File: 263953 Project: Green Valley Estates

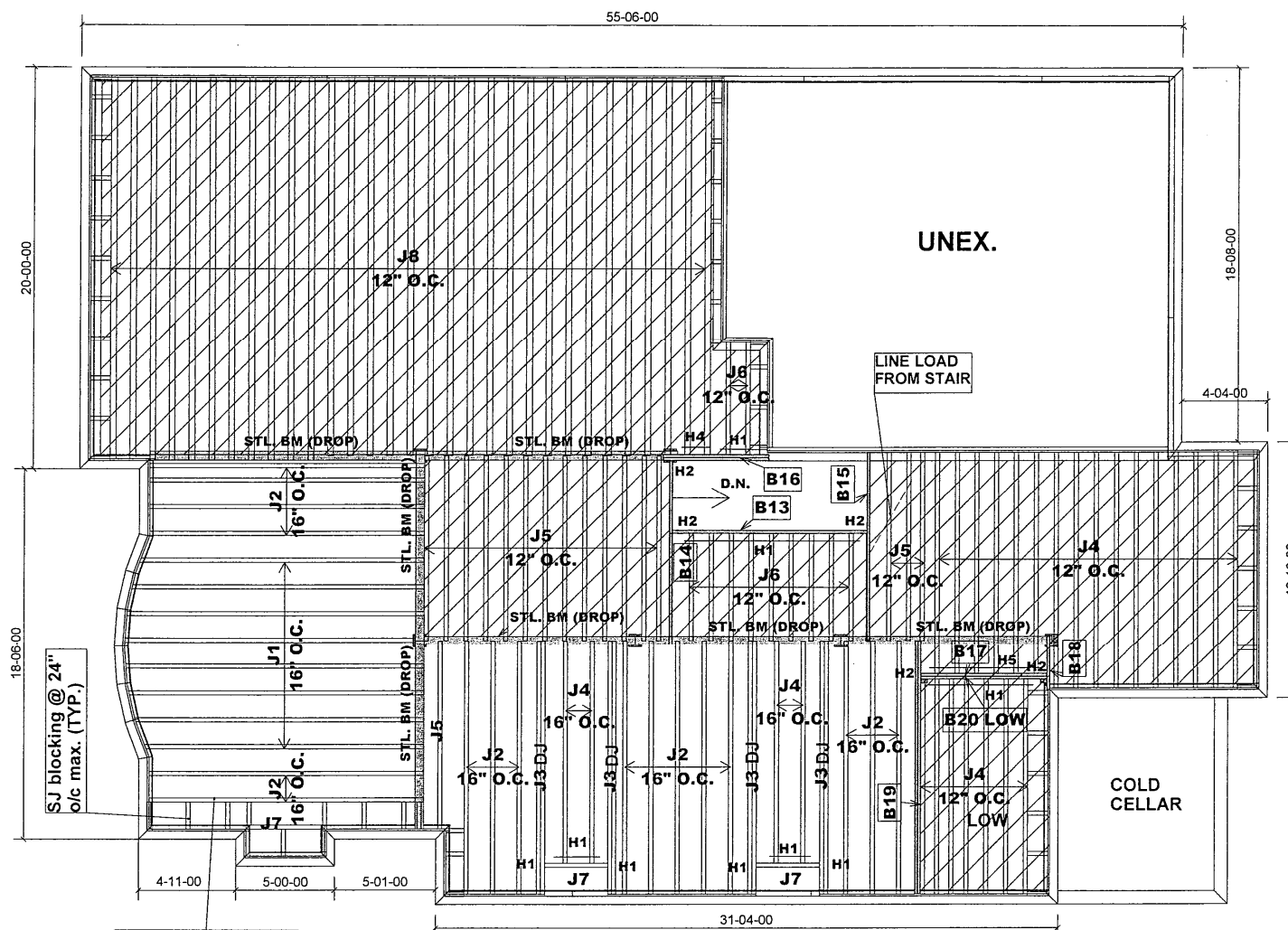
Location: Bradford  
 Date: Jan. 26 / 2016

Designer: MQ  
 Sheet: 1 of 4

Alpa Roof Trusses Inc.  
 Maple, Ontario

Salesperson: Mario  
 Tamarack Lumber

FEB-01-2018  
 PG. 2



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	11 7/8" NI-40x	1	8
J2	14-00-00	11 7/8" NI-40x	1	17
J3	14-00-00	11 7/8" NI-40x	2	8
J4	12-00-00	11 7/8" NI-40x	1	27
J5	10-00-00	11 7/8" NI-40x	1	17
J6	6-00-00	11 7/8" NI-40x	1	11
J7	4-00-00	11 7/8" NI-40x	1	3
J8	20-00-00	11 7/8" NI-80	1	31
B19	14-00-00	VERSALAM-12 2.0E	2	2
B13	10-00-00	VERSALAM-12 2.0E	1	1
B14	10-00-00	VERSALAM-12 2.0E	1	1
B15	10-00-00	VERSALAM-12 2.0E	1	1
B17	8-00-00	VERSALAM-12 2.0E	1	1
B20 LOW	8-00-00	VERSALAM-12 2.0E	1	1
B16	6-00-00	VERSALAM-12 2.0E	2	2
B18	4-00-00	VERSALAM-12 2.0E	1	1

**HANGERS SCHEDULE**

H1-----IUS2.56/11.88  
H2-----HUS1.81/10  
H4-----IUS3.56/11.88  
H5-----HU310

**RIMBOARD**

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

**SUBFLOOR : 5/8" NAILED & GLUED**

BBO---- BEAM BY OTHERS  
APP----AS PER PLAN

1 - 2 X 6 SPF # 2 squash block req'd on one side of each joist under interior load bearing walls.  
Multiple squash blocks are req'd under concentrated loads.

Do not scale - refer to architectural plans for dimensions

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

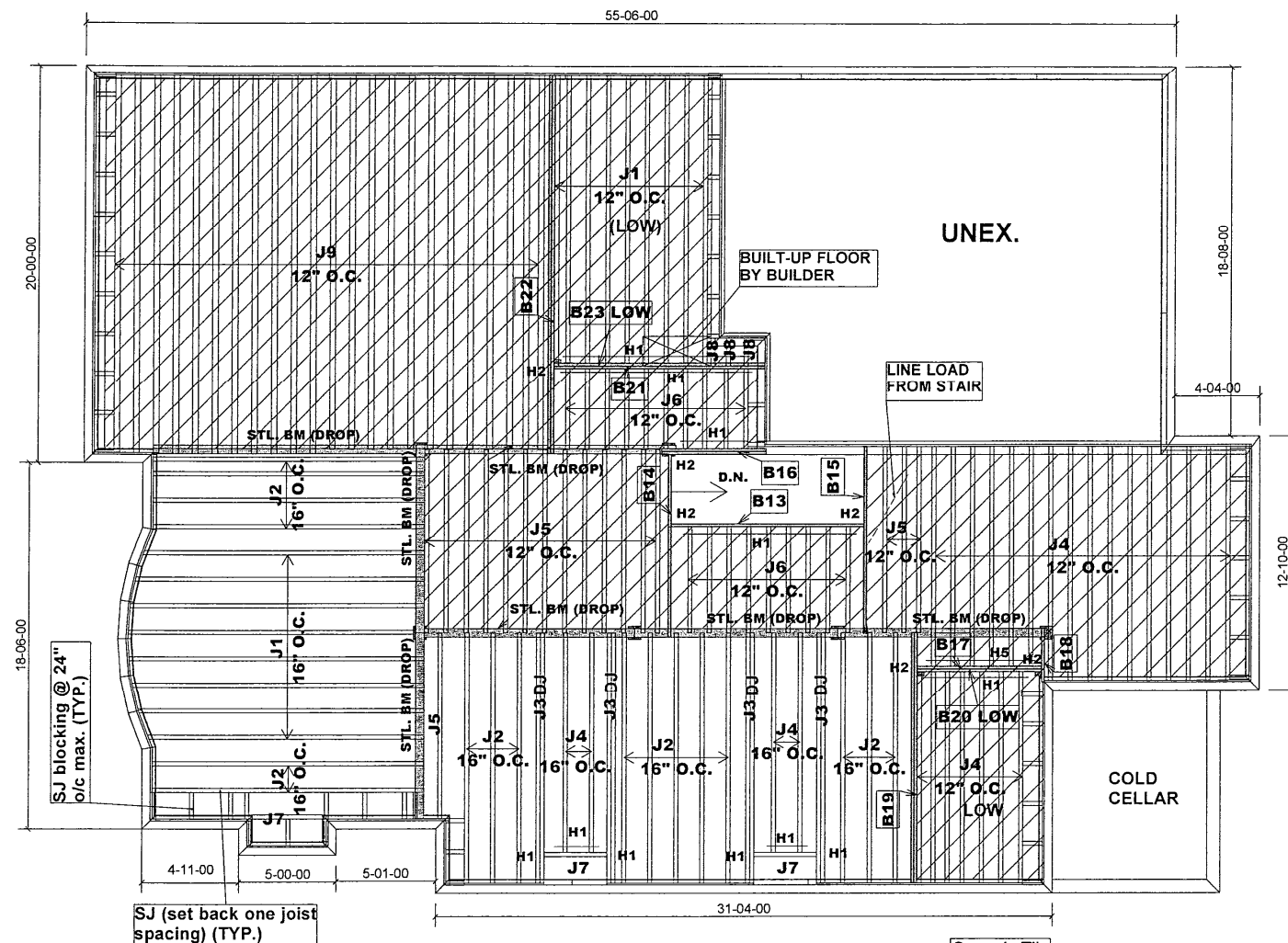
**S50-1** **ELEV. 'A' & 'B'**

**FIRST FLOOR FRAMING**  
**AND W/OPT. W.O.D. COND.**

**DESIGN LOADS:**  
LIVE LOAD : 40 PSF  
DEAD LOAD : 15 PSF  
DEAD LOAD : 20 PSF ( TILED AREA)

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

**SITE COPY**



DESIGN LOADS:  
 LIVE LOAD : 40 PSF  
 DEAD LOAD : 15 PSF  
 DEAD LOAD : 20 PSF ( TILED AREA)

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

1 - 2 X 6 SPF # 2 squash block req'd on one side of each joist under interior load bearing walls.  
 Multiple squash blocks are req'd under concentrated loads.

Do not scale - refer to architectural plans for dimensions

Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	11 7/8" NI-40x	1	17
J2	14-00-00	11 7/8" NI-40x	1	17
J3	14-00-00	11 7/8" NI-40x	2	8
J4	12-00-00	11 7/8" NI-40x	1	27
J5	10-00-00	11 7/8" NI-40x	1	17
J6	6-00-00	11 7/8" NI-40x	1	19
J7	4-00-00	11 7/8" NI-40x	1	3
J8	2-00-00	11 7/8" NI-40x	1	3
J9	20-00-00	11 7/8" NI-80	1	23
B22	20-00-00	VERSALAM-12 2.0E	2	2
B19	14-00-00	VERSALAM-12 2.0E	2	2
B21	12-00-00	VERSALAM-12 2.0E	1	1
B23 LOW	12-00-00	VERSALAM-12 2.0E	1	1
B13	10-00-00	VERSALAM-12 2.0E	1	1
B14	10-00-00	VERSALAM-12 2.0E	1	1
B15	10-00-00	VERSALAM-12 2.0E	1	1
B17	8-00-00	VERSALAM-12 2.0E	1	1
B20 LOW	8-00-00	VERSALAM-12 2.0E	1	1
B16	6-00-00	VERSALAM-12 2.0E	2	2
B18	4-00-00	VERSALAM-12 2.0E	1	1

HANGERS SCHEDULE  
 H1-----IUS2.56/11.88  
 H2-----HUS1.81/10  
 H5-----HU310

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

SUBFLOOR : 5/8" NAILED & GLUED

BBO---- BEAM BY OTHERS  
 APP----AS PER PLAN

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

S50-1 ELEV. 'A' & 'B'

FIRST FLOOR FRAMING

W/OPT. SUNKEN LAUNDRY  
 (-1R)/(-2R) AND MORE

AND W/OPT. W.O.D. COND.

96434  
 P. 38514/84786 Builder: Bayview Wellington  
 File: (263958) Project: Green Valley Estates

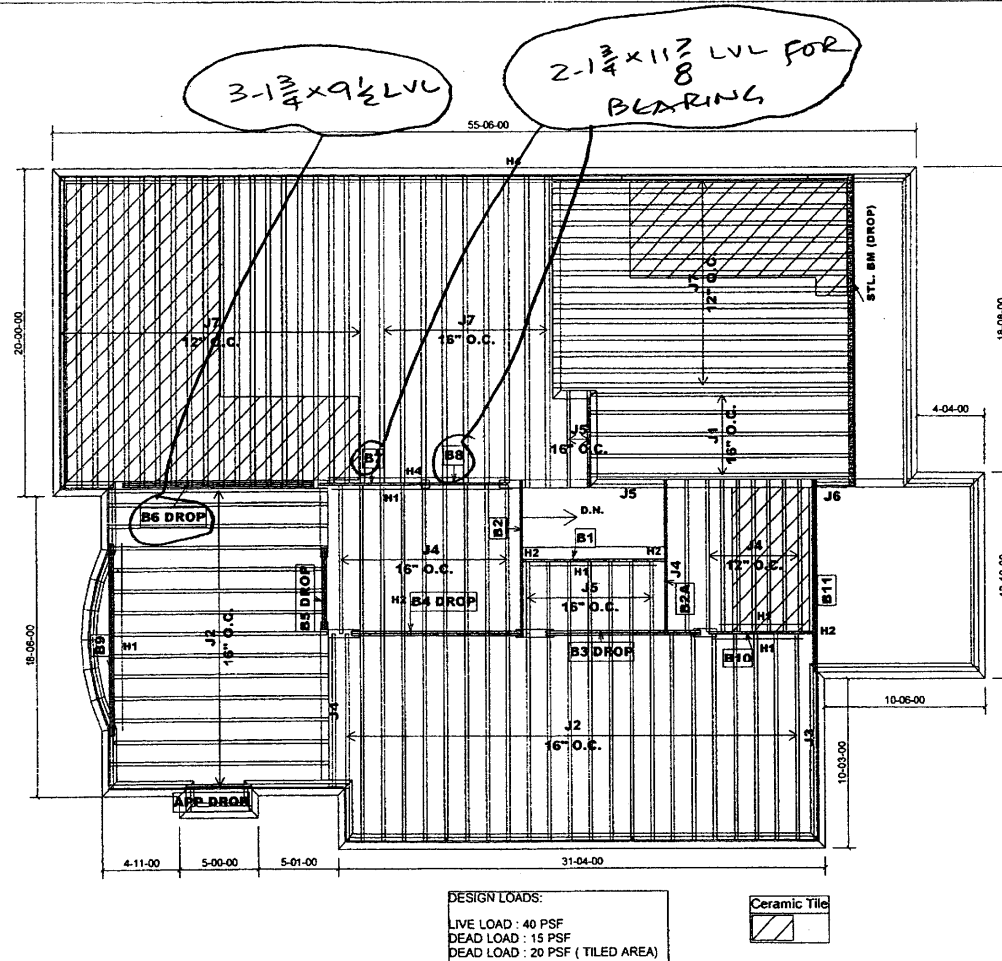
Location: Bradford  
 Date: Jan. 26 / 2016

Designer: MQ  
 Sheet: 3 of 4

Alpa Roof Trusses Inc.  
 Maple, Ontario

Salesperson: Mario  
 Tamarack Lumber

**SITE COPY**



PlotID	Length	Products		
		Product	Plies	Net Qty
J1	18-00-00	11 7/8" NI-40x	1	5
J2	14-00-00	11 7/8" NI-40x	1	38
J3	12-00-00	11 7/8" NI-40x	1	1
J4	10-00-00	11 7/8" NI-40x	1	18
J5	6-00-00	11 7/8" NI-40x	1	10
J6	4-00-00	11 7/8" NI-40x	1	1
J7	20-00-00	11 7/8" NI-80	1	43
B4 DROP	12-00-00	VERSALAM-10 2.0E	2	2
B6 DROP	12-00-00	VERSALAM-10 2.0E	2	2
B11	12-00-00	VERSALAM-12 2.0E	2	2
B9	12-00-00	VERSALAM-12 2.0E	2	2
B1	10-00-00	VERSALAM-12 2.0E	1	1
B2	10-00-00	VERSALAM-12 2.0E	1	1
B2A	10-00-00	VERSALAM-12 2.0E	1	1
B3 DROP	10-00-00	VERSALAM-10 2.0E	2	2
B10	8-00-00	VERSALAM-12 2.0E	1	1
B7	8-00-00	VERSALAM-12 2.0E	1	1
B8	6-00-00	VERSALAM-12 2.0E	1	1
B5 DROP	6-00-00	VERSALAM-10 2.0E	2	2

#### HANGERS SCHEDULE

H1	—	IUS2.56/11.88
H2	—	HUS1.81/10
H3	—	HGUS410
H4	—	IUS3.56/11.88

#### RIMBOARD

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

SURFLOOR : 5/8" NAIL ED & GLUED

BBO— BEAM BY OTHERS

APP—AS PER PLAN

...1 - 2 X 6 SPF # 2 squash block req'd on one side of each joist under interior load bearing walls.  
...Multiple squash blocks are req'd under concentrated loads.

Do not scale - refer to architectural plans for dimensions

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

S50-1

ELEV. 'B'

#### SECOND FLOOR FRAMING

JT:38514/84786 Builder: Bayview Wellington  
File: 263958 Project: Green Valley Estates

Location: Bradford  
Date: Jan. 26 / 2016

Designer: MQ  
Sheet: 4 of 4

Alpa Roof Trusses Inc.  
Maple, Ontario

Salesperson: Mario  
Tamarack Lumber

FEB-01-2018  
PL. 3





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

Floor Beam\01

BC CALC® Design Report



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

January 29, 2016 15:25:06

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

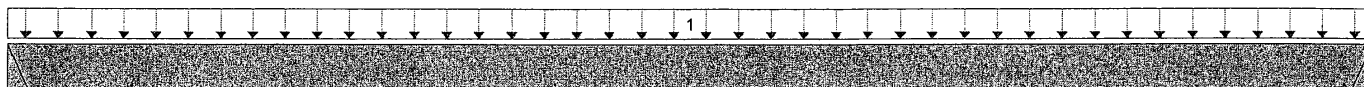
Description: Designs\01

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



B0

09-03-00

B1

Total Horizontal Product Length = 09-03-00

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

Bearing	Live	Dead	Snow	Wind
B0	463 / 0	201 / 0		
B1	463 / 0	201 / 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/ft²)	L	00-00-00	09-03-00	40	15			02-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,089 ft-lbs	19,364 ft-lbs	10.8%	1	04-07-08
End Shear	709 lbs	7,232 lbs	9.8%	1	01-01-14
Total Load Defl.	L/999 (0.044")	n/a	n/a	4	04-07-08
Live Load Defl.	L/999 (0.031")	n/a	n/a	5	04-07-08
Max Defl.	0.044"	n/a	n/a	4	04-07-08
Span / Depth	9.1	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0 Hanger	2" x 1-3/4"	945 lbs	n/a	22.1%	Hanger
B1 Hanger	2" x 1-3/4"	945 lbs	n/a	22.1%	Hanger

## 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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ O.C.. STAGGERED IN TWO ROWS

## 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.

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



T-1801028  
**SITE COPY**



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

Floor Beam\02

BC CALC® Design Report

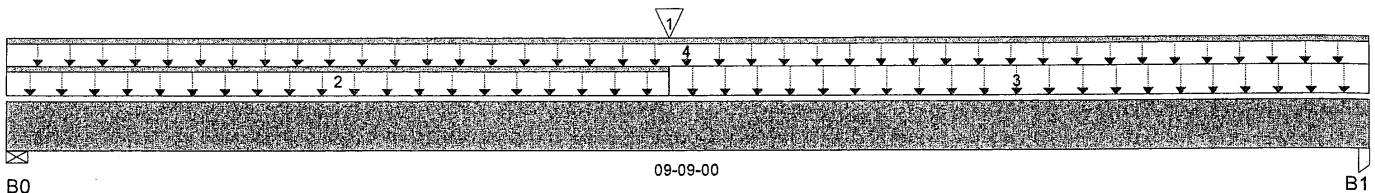


Dry | 1 span | No cantilevers | 0/12 slope (deg)

January 29, 2016 15:25:13

Build 4516  
Job Name: 38514  
Address: GREEN VALLEY ESTATES  
City, Province, Postal Code: BRADFORD, ON  
Customer:  
Code reports: CCMC 12472-R

File Name: 263958.bcc  
Description: Designs\02  
Specifier: S50-1  
Designer: MQ  
Company: ALPA ROOF TRUSSES  
Misc:



Total Horizontal Product Length = 09-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	811 / 0	346 / 0		
B1, 3-1/2"	1,444 / 0	583 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	04-09-00	04-09-00	463	201			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	04-09-00	27	10			n/a
3		Unf. Area (lb/ft^2)	L	04-09-00	09-09-00	40	15			07-00-00
4		Unf. Lin. (lb/ft)	L	00-00-00	09-09-00	27	10			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	6,200 ft-lbs	19,364 ft-lbs	32%	1	04-11-13
End Shear	2,111 lbs	7,232 lbs	29.2%	1	08-05-10
Total Load Defl.	L/863 (0.129")	0.465"	27.8%	4	04-11-13
Live Load Defl.	L/999 (0.091")	n/a	n/a	5	04-11-13
Max Defl.	0.129"	1"	12.9%	4	04-11-13
Span / Depth	9.4	n/a	n/a		00-00-00

## Bearing Supports

B0	Wall/Plate	3-1/2" x 1-3/4"	1,649 lbs	43.8%	22.1%	Spruce Pine Fir
B1	Post	3-1/2" x 1-3/4"	2,895 lbs	27.2%	38.7%	Spruce Pine Fir

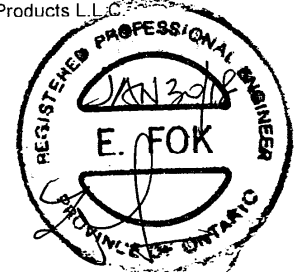
## Notes

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 086.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 4  
Deflections less than 1/8" were ignored in the results.

## 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.

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





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

Floor Beam\02A

BC CALC® Design Report



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

January 29, 2016 15:29:06

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD , ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

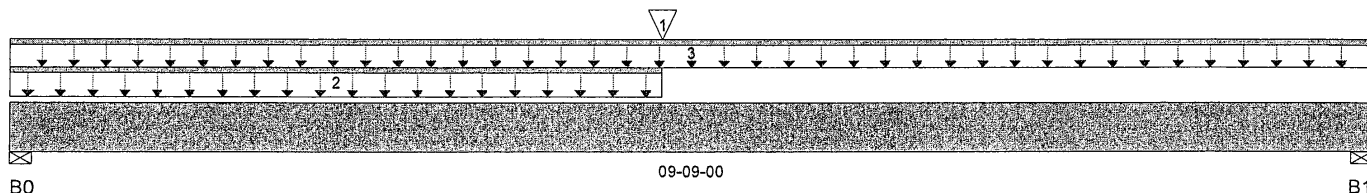
Description: Designs\02A

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 09-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	471 / 0	219 / 0		
B1, 3-1/2"	381 / 0	185 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	04-08-00	04-08-00	463	201			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	04-08-00	27	10			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	09-09-00	27	10			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,117 ft-lbs	19,364 ft-lbs	16.1%	1	04-08-00
End Shear	835 lbs	7,232 lbs	11.5%	1	01-03-06
Total Load Defl.	L/999 (0.06")	n/a	n/a	4	04-09-07
Live Load Defl.	L/999 (0.041")	n/a	n/a	5	04-09-07
Max Defl.	0.06"	n/a	n/a	4	04-09-07
Span / Depth	9.4	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

Label	Support	Dim. (L x W)	Demand	Demand/Resistance	Member	Material
B0	Wall/Plate	3-1/2" x 1-3/4"	980 lbs	26%	13.1%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	803 lbs	21.3%	10.7%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.



T-18011520  
**SITE COPY**



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

Floor Beam\03

BC CALC® Design Report

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

January 29, 2016 16:18:29

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

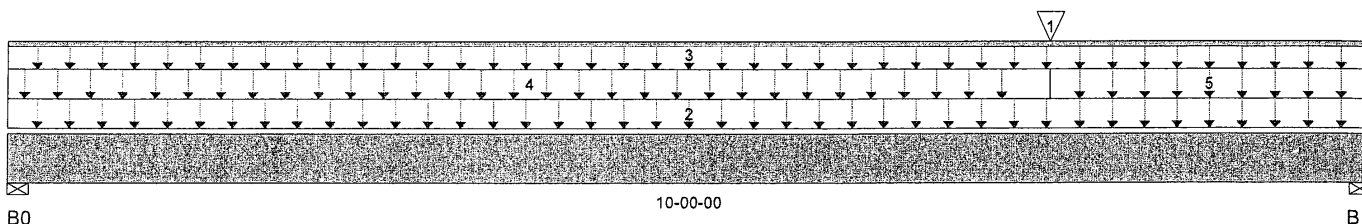
Description: Designs\03

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 10-00-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,926 / 0	1,080 / 0		
B1, 3-1/2"	2,363 / 0	1,267 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	07-08-00	07-08-00	471	219			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	10-00-00	40	15			06-06-00
3		Unf. Lin. (lb/ft)	L	00-00-00	10-00-00	0	60			n/a
4		Unf. Area (lb/ft^2)	L	00-00-00	07-08-00	40	15			02-06-00
5		Unf. Area (lb/ft^2)	L	07-08-00	10-00-00	40	15			04-10-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	10,333 ft-lbs	25,408 ft-lbs	40.7%	1	05-03-10
End Shear	4,068 lbs	11,571 lbs	35.2%	1	08-11-00
Total Load Defl.	L/472 (0.243")	0.477"	50.9%	4	05-01-02
Live Load Defl.	L/732 (0.156")	0.318"	49.2%	5	05-01-02
Max Defl.	0.243"	1"	24.3%	4	05-01-02
Span / Depth	12.1	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0	Wall/Plate 3-1/2" x 3-1/2"	4,238 lbs	56.2%	28.4%	Spruce Pine Fir
B1	Wall/Plate 3-1/2" x 3-1/2"	5,129 lbs	68.1%	34.3%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS

Page 1 of 2

@ 12" O.C., STAGGERED IN 2 ROWS



T-601031  
**SITE COPY**





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

Floor Beam\04

BC CALC® Design Report

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

January 29, 2016 15:29:29

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

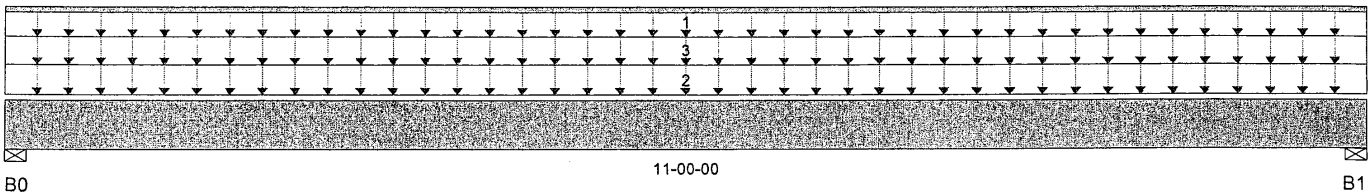
Description: Designs\04

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 11-00-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	2,475 / 0	1,311 / 0		
B1, 3-1/2"	2,475 / 0	1,311 / 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	11-00-00	0	60			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	11-00-00	40	15			06-06-00
3		Unf. Area (lb/ft^2)	L	00-00-00	11-00-00	40	15			04-09-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	13,515 ft-lbs	25,408 ft-lbs	53.2%	1	05-06-00
End Shear	4,297 lbs	11,571 lbs	37.1%	1	01-01-00
Total Load Defl.	L/331 (0.382")	0.527"	72.6%	4	05-06-00
Live Load Defl.	L/506 (0.25")	0.351"	71.1%	5	05-06-00
Max Defl.	0.382"	n/a	n/a	4	05-06-00
Span / Depth	13.3	n/a	n/a		00-00-00

## Bearing Supports

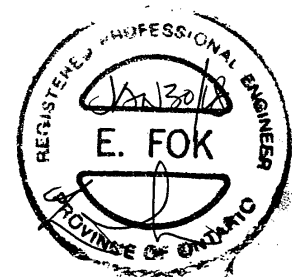
Beam	Supports	Dim. (L x W)	Demand	Support	Resistance	Material
B0	Wall/Plate	3-1/2" x 3-1/2"	5,351 lbs	71%	35.8%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	5,351 lbs	71%	35.8%	Spruce Pine Fir

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume Member is Fully Braced.  
 Resistance Factor phi has been applied to all presented results per CSA 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ (2)' O.C., STAGGERED IN TWO ROWS





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

Floor Beam\05

BC CALC® Design Report



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

January 29, 2016 15:29:29

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

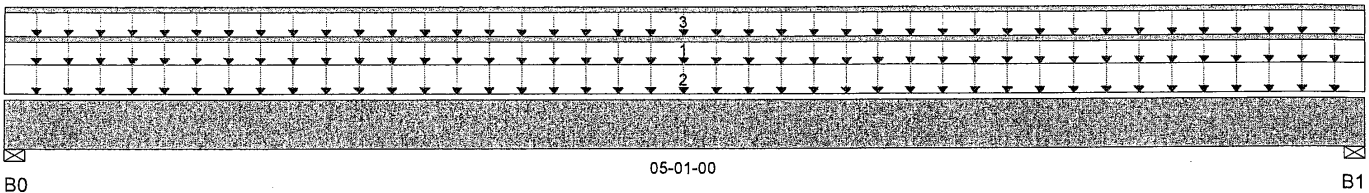
Description: Designs\05

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 05-01-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	780 / 0	469 / 0		
B1, 3-1/2"	780 / 0	469 / 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	05-01-00	0	60			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	05-01-00	40	15			07-00-00
3		Unf. Lin. (lb/ft)	L	00-00-00	05-01-00	27	10			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,848 ft-lbs	25,408 ft-lbs	7.3%	1	02-06-08
End Shear	1,008 lbs	11,571 lbs	8.7%	1	01-01-00
Total Load Defl.	L/999 (0.01")	n/a	n/a	4	02-06-08
Live Load Defl.	L/999 (0.006")	n/a	n/a	5	02-06-08
Max Defl.	0.01"	n/a	n/a	4	02-06-08
Span / Depth	5.8	n/a	n/a		00-00-00

## Bearing Supports

Beam	Support	Dim. (L x W)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0	Wall/Plate	3-1/2" x 3-1/2"	1,757 lbs	23.3%	11.8%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	1,757 lbs	23.3%	11.8%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS

@ 12" O.C., STAGGERED IN 2 ROWS





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

Floor Beam\06

BC CALC® Design Report

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

January 29, 2016 15:29:30

Build 4516

Job Name: 38514

Address: GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports: CCMC 12472-R

File Name: 263958.bcc

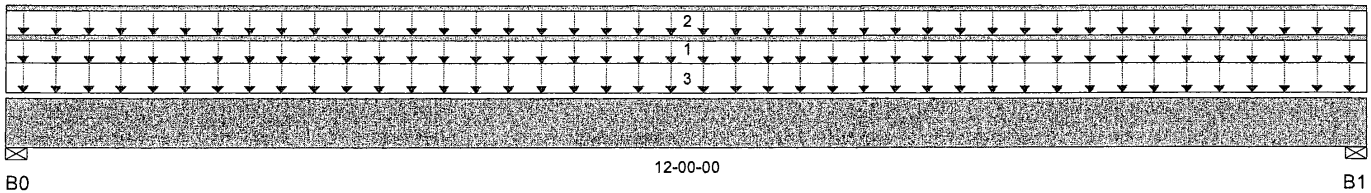
Description: Designs\06

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 12-00-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	2,442 / 0	1,618 / 0		
B1, 3-1/2"	2,442 / 0	1,618 / 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	0	60			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	12-00-00	27	10			n/a
3		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	40	20			09-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	15,778 ft-lbs	25,408 ft-lbs	62.1%	1	06-00-00
End Shear	4,659 lbs	11,571 lbs	40.3%	1	01-01-00
Total Load Defl.	L/256 (0.54")	0.577"	93.6%	4	06-00-00
Live Load Defl.	L/426 (0.325")	0.385"	84.5%	5	06-00-00
Max Defl.	0.54"	n/a	n/a	4	06-00-00
Span / Depth	14.6	n/a	n/a		00-00-00

## Bearing Supports

				Demand/ Resistance Support	Demand/ Resistance Member	
Bearing Supports		Dim. (L x W)	Demand			Material
B0	Wall/Plate	3-1/2" x 3-1/2"	5,685 lbs	75.4%	38%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	5,685 lbs	75.4%	38%	Spruce Pine Fir

## Notes

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets Code minimum (L/360) Live load deflection criteria.  
 Calculations assume Member is Fully Braced.  
 Resistance Factor phi has been applied to all presented results per CSA 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ 12" O.C., STAGGERED IN TWO ROWS (TOP LOADED)





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

Floor Beam\07

BC CALC® Design Report



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

January 29, 2016 15:25:50

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCLC 12472-R

File Name: 263958.bcc

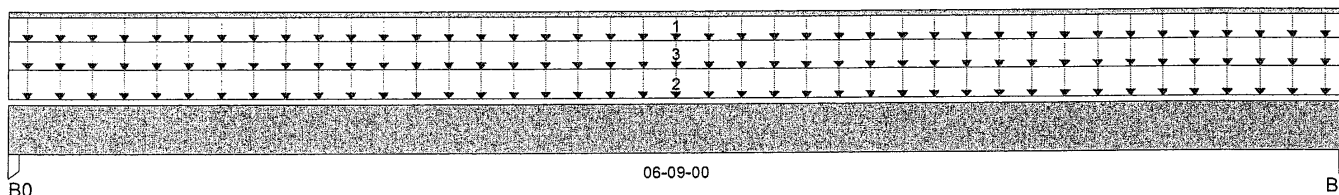
Description: Designs\07

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 06-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,959 / 0	1,125 / 0		
B1, 2"	1,888 / 0	1,084 / 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	06-09-00	0	60			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	06-09-00	40	20			09-06-00
3		Unf. Area (lb/ft^2)	L	00-00-00	06-09-00	40	15			04-09-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	6,506 ft-lbs	19,364 ft-lbs	33.6%	1	03-05-04
End Shear	2,726 lbs	7,232 lbs	37.7%	1	01-03-06
Total Load Defl.	L/999 (0.07")	n/a	n/a	4	03-05-04
Live Load Defl.	L/999 (0.045")	n/a	n/a	5	03-05-04
Max Defl.	0.07"	n/a	n/a	4	03-05-04
Span / Depth	6.5	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0 Post	3-1/2" x 1-3/4"	4,345 lbs	40.9%	58.2%	Spruce Pine Fir
B1 Post	2" x 1-3/4"	4,187 lbs	69%	98.1%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes







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

Floor Beam\08

BC CALC® Design Report

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

January 29, 2016 15:26:01

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

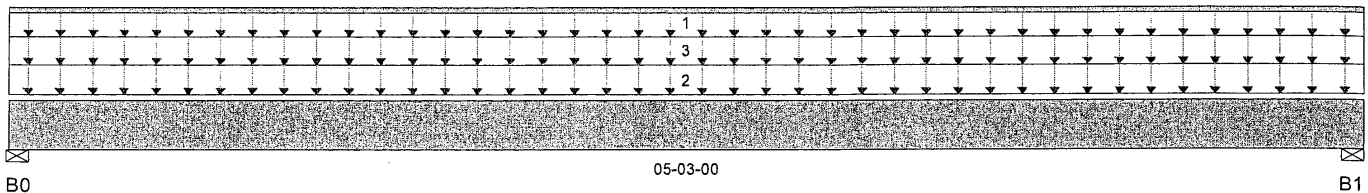
Description: Designs\08

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 05-03-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3"	1,484 / 0	729 / 0		
B1, 3-1/2"	1,508 / 0	740 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
1		Unf. Lin. (lb/ft)	L	00-00-00	05-03-00	0	60			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	05-03-00	40	15			09-06-00
3		Unf. Area (lb/ft^2)	L	00-00-00	05-03-00	40	15			04-09-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,518 ft-lbs	19,364 ft-lbs	18.2%	1	02-07-04
End Shear	1,644 lbs	7,232 lbs	22.7%	1	01-02-14
Total Load Defl.	L/999 (0.021")	n/a	n/a	4	02-07-04
Live Load Defl.	L/999 (0.014")	n/a	n/a	5	02-07-04
Max Defl.	0.021"	n/a	n/a	4	02-07-04
Span / Depth	4.9	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

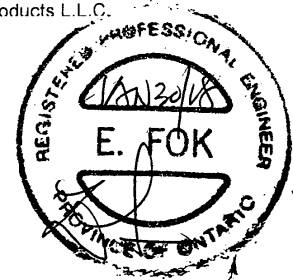
	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0 Wall/Plate	3" x 1-3/4"	3,137 lbs	97.1%	49%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 1-3/4"	3,187 lbs	84.6%	42.7%	Spruce Pine Fir

## 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 and CSA O86.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ O.C.. STAGGERED IN TWO ROWS



T-1801036  
**SITE COPY**



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

Floor Beam\09

BC CALC® Design Report



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

February 1, 2016 08:34:14

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

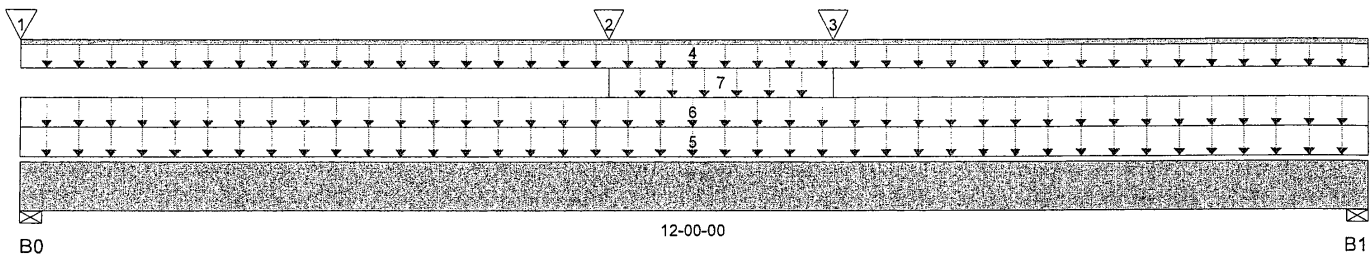
Description: Designs\09

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 12-00-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	2,052 / 0	1,673 / 0	1,098 / 0	
B1, 3-1/2"	1,935 / 0	1,552 / 0	755 / 0	

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	00-00-00	00-00-00	132	137	390		n/a
2		Conc. Pt. (lbs)	L	05-03-00	05-03-00	132	137	390		n/a
3		Conc. Pt. (lbs)	L	07-03-00	07-03-00	132	137	390		n/a
4		Unf. Lin. (lb/ft)	L	00-00-00	12-00-00	0	100			n/a
5		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	40	15			07-00-00
6		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	11	10	32		01-00-00
7		Unf. Area (lb/ft^2)	L	05-03-00	07-03-00	11	10	32		04-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	16,024 ft-lbs	38,727 ft-lbs	41.4%	1	06-00-00
End Shear	4,277 lbs	14,464 lbs	29.6%	1	10-08-10
Total Load Defl.	L/488 (0.284")	0.577"	49.2%	11	06-00-00
Live Load Defl.	L/810 (0.171")	0.385"	44.5%	15	06-00-00
Max Defl.	0.284"	1"	28.4%	11	06-00-00
Span / Depth	11.7	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 3-1/2" x 3-1/2"	5,718 lbs	75.9%	38.3%	Spruce Pine Fir
B1	Wall/Plate 3-1/2" x 3-1/2"	5,220 lbs	69.3%	34.9%	Spruce Pine Fir

## Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS

@ 12" O.C., STAGGERED IN 2 ROWS





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

Floor Beam\10

BC CALC® Design Report



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

January 29, 2016 15:26:30

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

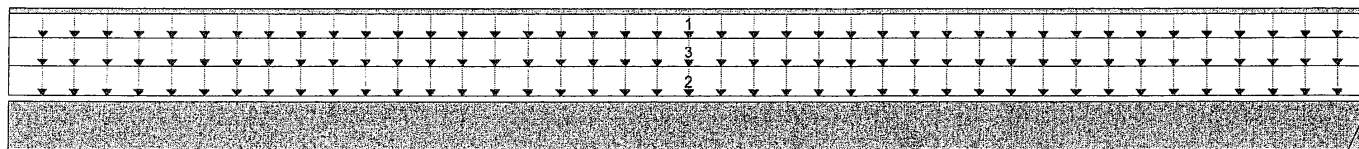
Description: Designs\10

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



B0 06-09-00 B1

Total Horizontal Product Length = 06-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,558 / 0	894 / 0		
B1	1,502 / 0	862 / 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	06-09-00	0	60			n/a
2		Unf. Area (lb/ft^2)	L	00-00-00	06-09-00	40	20			04-10-00
3		Unf. Area (lb/ft^2)	L	00-00-00	06-09-00	40	15			06-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,174 ft-lbs	19,364 ft-lbs	26.7%	1	03-05-04
End Shear	2,168 lbs	7,232 lbs	30%	1	01-03-06
Total Load Defl.	L/999 (0.056")	n/a	n/a	4	03-05-04
Live Load Defl.	L/999 (0.035")	n/a	n/a	5	03-05-04
Max Defl.	0.056"	n/a	n/a	4	03-05-04
Span / Depth	6.5	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

	Dim. (L x W)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	3,455 lbs	91.7%	46.2%	Spruce Pine Fir
B1 Hanger	2" x 1-3/4"	3,330 lbs	n/a	78%	Hanger

## 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 086.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 4  
Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
@ O.C.. STAGGERED IN TWO ROWS



T-180103A  
**SITE COPY**



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

Floor Beam\11

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

January 29, 2016 15:26:46

BC CALC® Design Report



Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD , ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

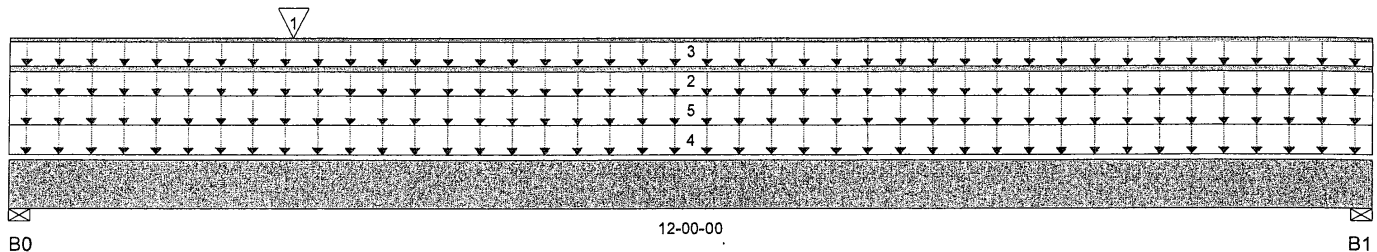
Description: Designs\11

Specifier: S50-1

Designer: MQ

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"	1,732 / 0	1,779 / 0	1,072 / 0	
B1, 3-1/2"	820 / 0	1,256 / 0	1,072 / 0	

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	02-06-00	02-06-00	1,502	862			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	12-00-00	0	100			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	12-00-00	27	14			n/a
4		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	11	10	32		01-00-00
5		Unf. Area (lb/ft^2)	L	00-00-00	12-00-00	11	10	32		04-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	11,703 ft-lbs	38,727 ft-lbs	30.2%	1	04-06-11
End Shear	4,784 lbs	14,464 lbs	33.1%	1	01-03-06
Total Load Defl.	L/635 (0.218")	0.577"	37.8%	11	05-08-08
Live Load Defl.	L/999 (0.117")	n/a	n/a	15	05-08-08
Max Defl.	0.218"	1"	21.8%	11	05-08-08
Span / Depth	11.7	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-1/2" x 3-1/2"	5,357 lbs	71.1%	35.8%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 3-1/2"	3,589 lbs	47.6%	24%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.



## User Notes

Page 1 of 2 NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ (2") O.C., STAGGERED IN 2 ROWS

T-1806039  
**SITE COPY**





Boise Cascade

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****Floor Beam\12**

BC CALC® Design Report



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

January 29, 2016 15:26:57

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

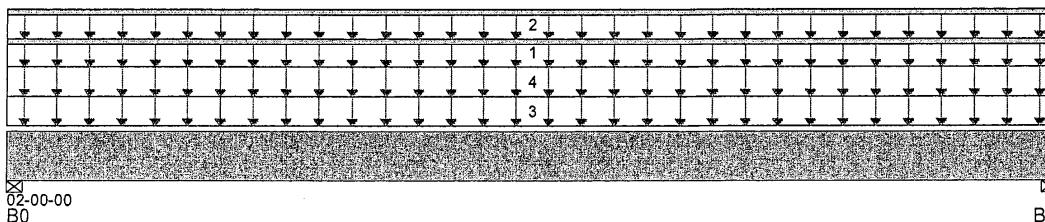
Description: Designs\12

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 02-00-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	106 / 0	198 / 0	233 / 0	
B1, 3-1/2"	106 / 0	198 / 0	233 / 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	02-00-00	0	100			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	02-00-00	27	14			n/a
3		Unf. Area (lb/ft^2)	L	00-00-00	02-00-00	11	10	32		06-02-00
4		Unf. Area (lb/ft^2)	L	00-00-00	02-00-00	11	10	32		01-00-00

**Controls Summary**

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	193 ft-lbs	38,727 ft-lbs	0.5%	5	01-00-00
End Shear	183 lbs	14,464 lbs	1.3%	5	01-03-06
Total Load Defl.	L/999 (0")	n/a	n/a	13	01-00-00
Max Defl.	0"	n/a	n/a	13	01-00-00
Span / Depth	1.6	n/a	n/a		00-00-00

**Bearing Supports**

				Demand/ Resistance Support	Demand/ Resistance Member	Material
Bearing Supports		Dim. (L x W)	Demand			
B0	Wall/Plate	3-1/2" x 3-1/2"	649 lbs	8.6%	4.3%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 3-1/2"	649 lbs	8.6%	4.3%	Spruce Pine Fir

**Notes**

Design meets Code minimum (L/240) Total load deflection criteria.  
 Design meets User specified (1") Maximum total load deflection criteria.  
 Calculations assume Member is Fully Braced.  
 Resistance Factor phi has been applied to all presented results per CSA 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

**User Notes**

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ 6" O.C.. STAGGERED IN TWO ROWS



T-1801040

**SITE COPY**



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

Floor Beam\13

BC CALC® Design Report



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

January 29, 2016 15:27:11

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

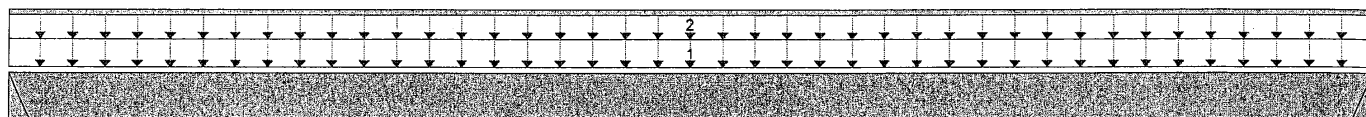
Description: Designs\13

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



B0

09-09-00

B1

Total Horizontal Product Length = 09-09-00

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

Bearing	Live	Dead	Snow	Wind
B0	585 / 0	614 / 0		
B1	585 / 0	614 / 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	09-09-00	40	20			03-00-00
2		Unf. Lin. (lb/ft)	L	00-00-00	09-09-00	0	60			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,841 ft-lbs	19,364 ft-lbs	19.8%	1	04-10-08
End Shear	1,255 lbs	7,232 lbs	17.4%	1	01-01-14
Total Load Defl.	L/999 (0.094")	n/a	n/a	4	04-10-08
Live Load Defl.	L/999 (0.046")	n/a	n/a	5	04-10-08
Max Defl.	0.094"	n/a	n/a	4	04-10-08
Span / Depth	9.6	n/a	n/a		00-00-00

## Bearing Supports

		Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Hanger	2" x 1-3/4"	1,646 lbs	n/a	38.5%	Hanger
B1	Hanger	2" x 1-3/4"	1,646 lbs	n/a	38.5%	Hanger

## 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 and CSA O86.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## 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.

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



T-1801041  
**SITE COPY**



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

Floor Beam\14

BC CALC® Design Report

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

January 29, 2016 15:27:24

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

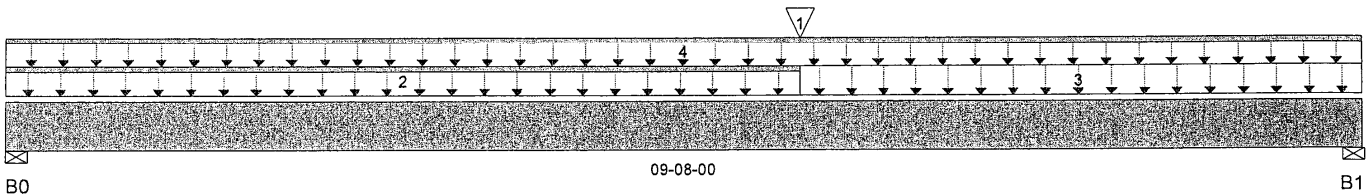
Description: Designs\14

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	702 / 0	490 / 0		
B1, 3"	1,417 / 0	817 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	05-08-00	05-08-00	585	614			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	05-08-00	27	14			n/a
3		Unf. Area (lb/ft^2)	L	05-08-00	09-08-00	40	15			07-00-00
4		Unf. Lin. (lb/ft)	L	00-00-00	09-08-00	27	14			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	7,076 ft-lbs	19,364 ft-lbs	36.5%	1	05-08-00
End Shear	2,382 lbs	7,232 lbs	32.9%	1	08-05-02
Total Load Defl.	L/798 (0.139")	0.462"	30.1%	4	05-01-07
Live Load Defl.	L/999 (0.082")	n/a	n/a	5	05-01-07
Max Defl.	0.139"	1"	13.9%	4	05-01-07
Span / Depth	9.3	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	1,666 lbs	44.2%	22.3%	Spruce Pine Fir
B1 Wall/Plate	3" x 1-3/4"	3,147 lbs	97.4%	49.1%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.



## User Notes



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

Floor Beam\15

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

January 29, 2016 15:27:38

BC CALC® Design Report



Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

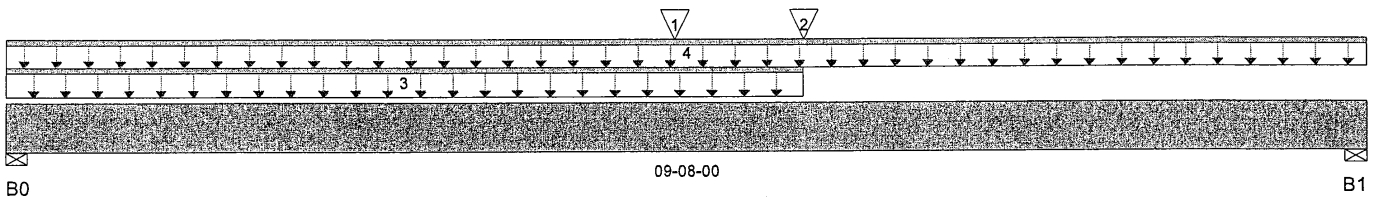
Description: Designs\15

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 09-08-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	765 / 0	512 / 0		
B1, 3-1/2"	794 / 0	585 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	04-09-00	04-09-00	560	210			n/a
2		Conc. Pt. (lbs)	L	05-08-00	05-08-00	585	614			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	05-08-00	27	14			n/a
4		Unf. Lin. (lb/ft)	L	00-00-00	09-08-00	27	14			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	6,729 ft-lbs	19,364 ft-lbs	34.7%	1	05-06-10
End Shear	1,838 lbs	7,232 lbs	25.4%	1	08-04-10
Total Load Defl.	L/822 (0.134")	0.46"	29.2%	4	04-11-12
Live Load Defl.	L/999 (0.079")	n/a	n/a	5	04-10-06
Max Defl.	0.134"	1"	13.4%	4	04-11-12
Span / Depth	9.3	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

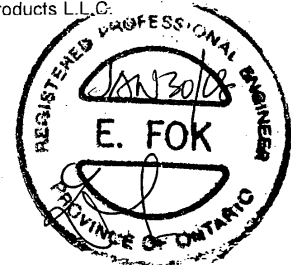
## Bearing Supports

	Dim. (L x W)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	1,787 lbs	47.4%	23.9%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 1-3/4"	1,922 lbs	51%	25.7%	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 086.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 4  
Deflections less than 1/8" were ignored in the results.

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



T-1801042  
**SITE COPY**





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

Floor Beam\16

BC CALC® Design Report



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

January 29, 2016 15:27:57

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

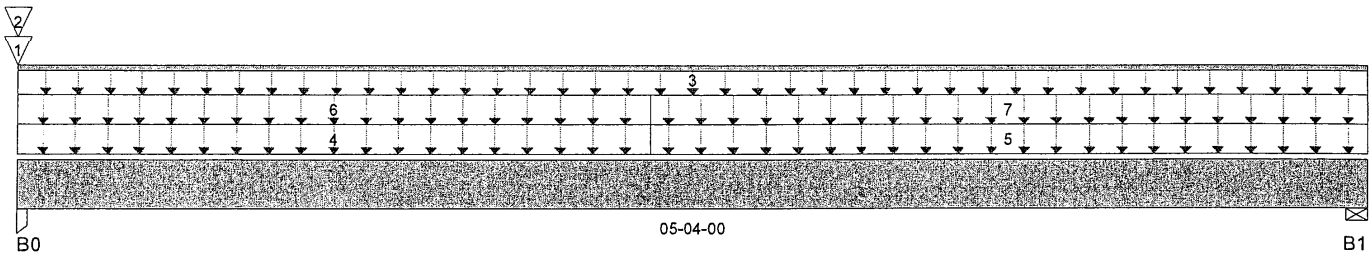
Description: Designs\16

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 05-04-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	4,526 / 0	2,480 / 0		
B1, 3-1/2"	915 / 0	752 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	00-00-00	00-00-00	1,417	817			n/a
2		Conc. Pt. (lbs)	L	00-00-00	00-00-00	1,444	583			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	05-04-00	0	120			n/a
4		Unf. Area (lb/ft^2)	L	00-00-00	02-06-00	40	20			09-06-00
5		Unf. Area (lb/ft^2)	L	02-06-00	05-04-00	40	20			03-00-00
6		Unf. Area (lb/ft^2)	L	00-00-00	02-06-00	40	15			09-06-00
7		Unf. Area (lb/ft^2)	L	02-06-00	05-04-00	40	15			03-00-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,465 ft-lbs	38,727 ft-lbs	8.9%	1	02-03-04
End Shear	1,643 lbs	14,464 lbs	11.4%	1	01-03-06
Total Load Defl.	L/999 (0.011")	n/a	n/a	4	02-07-03
Live Load Defl.	L/999 (0.006")	n/a	n/a	5	02-06-09
Max Defl.	0.011"	n/a	n/a	4	02-07-03
Span / Depth	4.9	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0 Post	3-1/2" x 3-1/2"	9,889 lbs	46.5%	66.2%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 3-1/2"	2,313 lbs	30.7%	15.5%	Spruce Pine Fir

## Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
@ 8" O.C., STAGGERED IN 2 ROWS



7-1801044  
**SITE COPY**



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

Floor Beam\17

BC CALC® Design Report



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

January 29, 2016 15:28:03

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

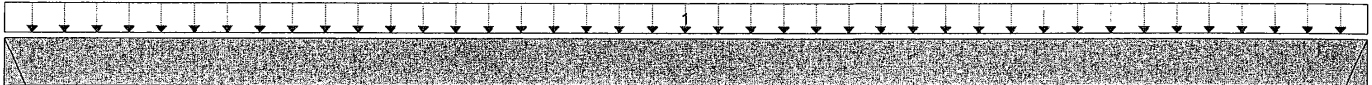
Description: Designs\17

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



B0

06-05-00

B1

Total Horizontal Product Length = 06-05-00

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

Bearing	Live	Dead	Snow	Wind
B0	139 / 0	89 / 0		
B1	139 / 0	89 / 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/ft²)	L	00-00-00	06-05-00	40	20			01-01-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	480 ft-lbs	19,364 ft-lbs	2.5%	1	03-02-08
End Shear	204 lbs	7,232 lbs	2.8%	1	01-01-14
Total Load Defl.	L/999 (0.005")	n/a	n/a	4	03-02-08
Live Load Defl.	L/999 (0.003")	n/a	n/a	5	03-02-08
Max Defl.	0.005"	n/a	n/a	4	03-02-08
Span / Depth	6.3	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0 Hanger	2" x 1-3/4"	320 lbs	n/a	7.5%	Hanger
B1 Hanger	2" x 1-3/4"	320 lbs	n/a	7.5%	Hanger

## 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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.



T-180104T  
**SITE COPY**



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

Floor Beam\18

BC CALC® Design Report



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

January 29, 2016 15:28:08

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

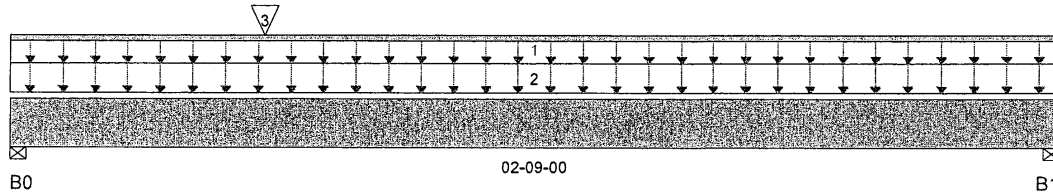
Description: Designs\18

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 02-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	186 / 0	199 / 0		
B1, 3-1/2"	100 / 0	144 / 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	02-09-00	0	60				n/a
2	Unf. Area (lb/ft^2)	L	00-00-00	02-09-00	40	20				01-04-00
3	Conc. Pt. (lbs)	L	00-08-00	00-08-00	139	89				n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	208 ft-lbs	19,364 ft-lbs	1.1%	1	01-00-10
End Shear	79 lbs	7,232 lbs	1.1%	1	01-03-06
Total Load Defl.	L/999 (0")	n/a	n/a	4	01-03-15
Live Load Defl.	L/999 (0")	n/a	n/a	5	01-03-11
Max Defl.	0"	n/a	n/a	4	01-03-15
Span / Depth	2.3	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 3-1/2" x 1-3/4"	528 lbs	14%	7.1%	Spruce Pine Fir
B1	Wall/Plate 3-1/2" x 1-3/4"	330 lbs	8.8%	4.4%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.



T-1801046  
**SITE COPY**



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

Floor Beam\19

BC CALC® Design Report



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

January 29, 2016 15:28:13

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

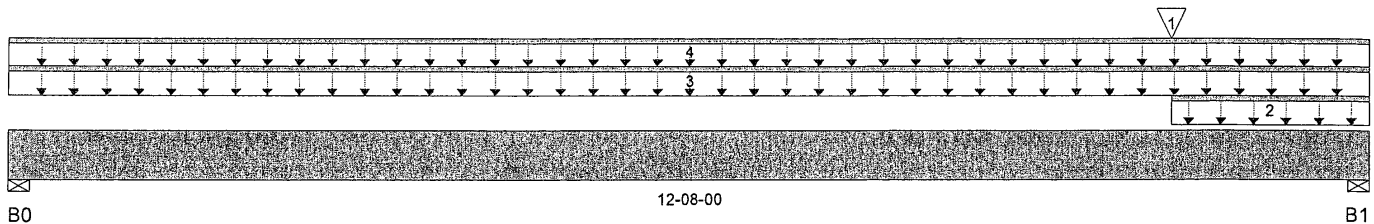
Description: Designs\19

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 12-08-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	192 / 0	558 / 0		
B1, 3-1/2"	338 / 0	646 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	10-10-00	10-10-00	139	89			n/a
2		Unf. Lin. (lb/ft)	L	10-10-00	12-08-00	27	14			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	12-08-00	0	60			n/a
4		Unf. Lin. (lb/ft)	L	00-00-00	12-08-00	27	14			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,358 ft-lbs	25,173 ft-lbs	9.4%	0	06-06-01
End Shear	726 lbs	9,401 lbs	7.7%	0	11-04-10
Total Load Defl.	L/999 (0.065")	n/a	n/a	4	06-04-04
Live Load Defl.	L/999 (0.018")	n/a	n/a	5	06-06-01
Max Defl.	0.065"	n/a	n/a	4	06-04-04
Span / Depth	12.3	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 3-1/2" x 3-1/2"	781 lbs	15.9%	8%	Spruce Pine Fir
B1	Wall/Plate 3-1/2" x 3-1/2"	905 lbs	18.5%	9.3%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

## User Notes

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS  
 @ 12" O.C., STAGGERED IN 2 ROWS



T-1801047  
**SITE COPY**





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

Floor Beam\20

BC CALC® Design Report

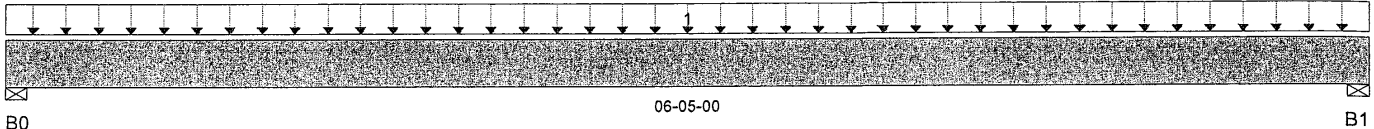


Dry | 1 span | No cantilevers | 0/12 slope (deg)

January 29, 2016 15:28:17

Build 4516  
Job Name: 38514  
Address: GREEN VALLEY ESTATES  
City, Province, Postal Code: BRADFORD, ON  
Customer:  
Code reports: CCMC 12472-R

File Name: 263958.bcc  
Description: Designs\20  
Specifier: S50-1  
Designer: MQ  
Company: ALPA ROOF TRUSSES  
Misc:



Total Horizontal Product Length = 06-05-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	727 / 0	383 / 0		
B1, 3-1/2"	727 / 0	383 / 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	06-05-00	40	20			05-08-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,171 ft-lbs	19,364 ft-lbs	11.2%	1	03-02-08
End Shear	943 lbs	7,232 lbs	13%	1	01-03-06
Total Load Defl.	L/999 (0.02")	n/a	n/a	4	03-02-08
Live Load Defl.	L/999 (0.013")	n/a	n/a	5	03-02-08
Max Defl.	0.02"	n/a	n/a	4	03-02-08
Span / Depth	6	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

	Dim. (L x W)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	1,569 lbs	41.7%	21%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 1-3/4"	1,569 lbs	41.7%	21%	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 086.  
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
Design based on Dry Service Condition.  
Importance Factor : Normal Part code : Part 4  
Deflections less than 1/8" were ignored in the results.



*263958*  
**SITE COPY**



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

Floor Beam\21

BC CALC® Design Report



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

January 29, 2016 15:28:36

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

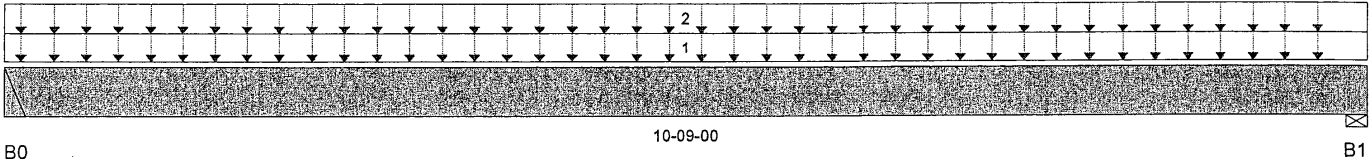
Description: Designs\21

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 10-09-00

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

Bearing	Live	Dead	Snow	Wind
B0	797 / 0	430 / 0		
B1, 3-1/2"	816 / 0	441 / 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	10-09-00	40	20			02-03-00
2		Unf. Area (lb/ft^2)	L	00-00-00	10-09-00	40	20			01-06-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,425 ft-lbs	19,364 ft-lbs	22.9%	1	05-03-12
End Shear	1,356 lbs	7,232 lbs	18.8%	1	01-01-14
Total Load Defl.	L/998 (0.125")	0.521"	24.1%	4	05-03-12
Live Load Defl.	L/999 (0.081")	n/a	n/a	5	05-03-12
Max Defl.	0.125"	1"	12.5%	4	05-03-12
Span / Depth	10.5	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 1-3/4"	1,733 lbs	n/a	40.6%	Hanger
B1 Wall/Plate	3-1/2" x 1-3/4"	1,774 lbs	47.1%	23.7%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

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



Handwritten: 2-18-1049  
**SITE COPY**

**Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****Floor Beam\22**

BC CALC® Design Report

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

January 29, 2016 15:28:33

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

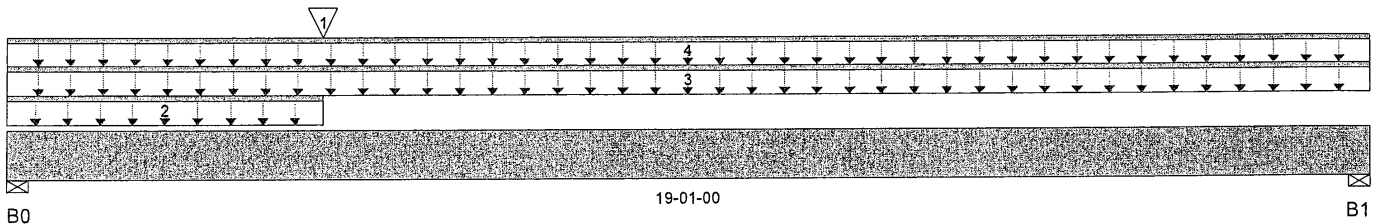
Description: Designs\22

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 19-01-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	982 / 0	1,210 / 0		
B1, 3-1/2"	449 / 0	924 / 0		

**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
1		Conc. Pt. (lbs)	L	04-05-00	04-05-00	797	430			n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	04-05-00	27	14			n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	19-01-00	27	14			n/a
4		Unf. Lin. (lb/ft)	L	00-00-00	19-01-00	0	60			n/a

**Controls Summary**

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	10,888 ft-lbs	38,727 ft-lbs	28.1%	1	06-08-10
End Shear	2,721 lbs	14,464 lbs	18.8%	1	01-03-06
Total Load Defl.	L/437 (0.512")	0.931"	54.9%	4	09-00-04
Live Load Defl.	L/1,093 (0.204")	0.621"	32.9%	5	08-09-11
Max Defl.	0.512"	1"	51.2%	4	09-00-04
Span / Depth	18.8	n/a	n/a		00-00-00

**Bearing Supports**

	Dim. (L x W)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0 Wall/Plate	3-1/2" x 3-1/2"	2,985 lbs	39.6%	20%	Spruce Pine Fir
B1 Wall/Plate	3-1/2" x 3-1/2"	1,294 lbs	26.4%	13.3%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.

**User Notes**

NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS

@ 12" O.C., STAGGERED IN 2 ROWS



T-1801050  
**SITE COPY**



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

Floor Beam\23

BC CALC® Design Report

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

January 29, 2016 15:28:43

Build 4516

Job Name:

38514

Address:

GREEN VALLEY ESTATES

City, Province, Postal Code: BRADFORD, ON

Customer:

Code reports:

CCMC 12472-R

File Name: 263958.bcc

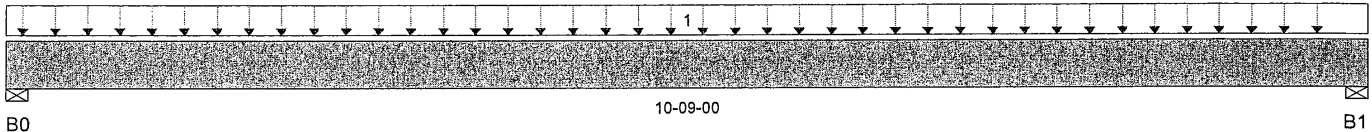
Description: Designs\23

Specifier: S50-1

Designer: MQ

Company: ALPA ROOF TRUSSES

Misc:



Total Horizontal Product Length = 10-09-00

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,577 / 0	821 / 0		
B1, 3-1/2"	1,577 / 0	821 / 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	10-09-00	40	20			07-04-00

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	8,352 ft-lbs	19,364 ft-lbs	43.1%	1	05-04-08
End Shear	2,583 lbs	7,232 lbs	35.7%	1	01-03-06
Total Load Defl.	L/536 (0.231")	0.515"	44.8%	4	05-04-08
Live Load Defl.	L/815 (0.152")	0.343"	44.2%	5	05-04-08
Max Defl.	0.231"	1"	23.1%	4	05-04-08
Span / Depth	10.4	n/a	n/a		00-00-00

## Disclosure

Completeness and accuracy of input must be verified by anyone who would rely on output as evidence of suitability for particular application. Output here based on building code-accepted design properties and analysis methods. Installation of Boise Cascade engineered wood products must be in accordance with current Installation Guide and applicable building codes. To obtain Installation Guide or ask questions, please call 1-800-964-6999 before installation.

## Bearing Supports

B0	Wall/Plate	3-1/2" x 1-3/4"	3,391 lbs	90%	45.4%	Spruce Pine Fir
B1	Wall/Plate	3-1/2" x 1-3/4"	3,391 lbs	90%	45.4%	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 086.  
 BC CALC® analysis is based on Canadian Limit States Design, as per NBCC and CSA 086.  
 Design based on Dry Service Condition.  
 Importance Factor : Normal Part code : Part 4  
 Deflections less than 1/8" were ignored in the results.





# NORDIC STRUCTURES

COMPANY  
ALPART  
MQ  
Jan. 29, 2016 13:17

PROJECT  
38514  
9-6-0.wwb

350-1 elev. A.B.  
J5 @ 1st FL.

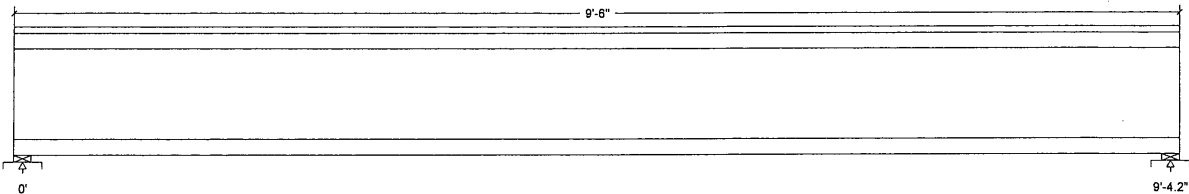
## Design Check Calculation Sheet

Nordic Sizer - Canada 0.3

### Loads:

Load	Type	Distribution	Pat-tern	Location (ft) Start End	Magnitude Start End	Unit
Load2	Live	Full Area			40.00	psf
Load3	Dead	Full Area			20.00	psf
Load4	Live	Point		7.00	560	lbs
Load5	Dead	Point		7.00	210	lbs
Self-weight	Dead	Full UDL			2.9	plf

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



Unfactored:			
Dead	161		262
Live	332		602
Factored:			
Total	700		1231
Bearing:			
Resistance			
Joist	2012		2012
Support	2724		2724
Anal/Des			
Joist	0.35		0.61
Support	0.26		0.45
Load case	#2		#2
Length	1-3/4		1-3/4
Min req'd	1-3/4		1-3/4
Stiffener	No		No
KB support	1.00		1.00
fcp sup	769		769
Kzcp sup	1.00		1.00

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

Supports: All - Lumber Sill plate, No.1/No.2  
Total length: 9'-6.0"; 5/8" nailed and glued OSB sheathing  
This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 1231	Vr = 2336	lbs	Vf/Vr = 0.53
Moment (+)	Mf = 2725	Mr = 6255	lbs-ft	Mf/Mr = 0.44
Perm. Defl'n	0.03 = <L/999	0.31 = L/360	in	0.09
Live Defl'n	0.06 = <L/999	0.31 = L/360	in	0.20
Total Defl'n	0.09 = <L/999	0.47 = L/240	in	0.19
Bare Defl'n	0.07 = <L/999	0.31 = L/360	in	0.22
Vibration	Lmax = 9'-4	Lv = 18'-4	ft	
Defl'n	0.010	0.079	in	0.13

### Additional Data:

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	2336	1.00	1.00	-	-	-	-	-	#2
Mr	6255	1.00	1.00	-	1.000	-	-	-	#2
EI	371.1 million	-	-	-	-	-	-	-	#2

### CRITICAL LOAD COMBINATIONS:

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

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake

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

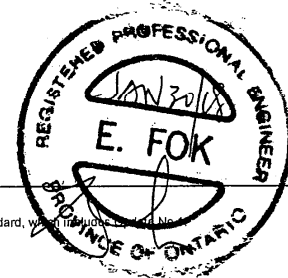
All Load Combinations (LCs) are listed in the Analysis output

CALCULATIONS:  
Deflection: EIComp = 433e06 lb-in2 K= 6.18e06 lbs

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

### Design Notes:

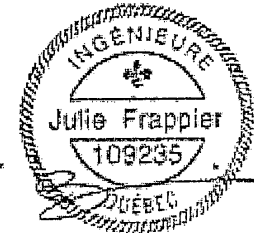
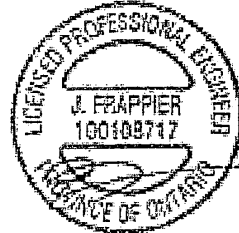
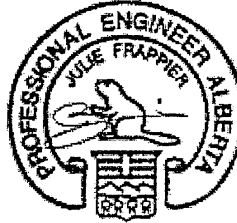
- WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-09 Engineering Design in Wood standard, which includes the use of the Nordic Sizer software.
- NAIL ONE PLY TO ANOTHER WITH 3 1/2" SPIRAL NAILS
- Please verify that the default deflection limits are appropriate for your application.
- Refer to technical documentation for installation guidelines and construction details.
- Nordic joists are listed in CMC evaluation report 13032-R.
- Joists shall be laterally supported at supports and continuously along the compression edge.
- 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.



T-1801052  
**SITE COPY**

## Maximum Floor Spans

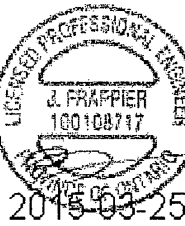
Live Load = 40 psf, Dead Load = 15 psf  
Simple Spans, L/360 Deflection Limit  
5/8" OSB G&N Sheathing



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

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

- Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of  $1.50L + 1.25D$ . The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/360 and a total load deflection limit of L/240.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.
- Minimum bearing length shall be 1-3/4 inches for the end bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.
- Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.



Joist Series	NI-20	NI-40x	NI-60	NI-70	NI-80	NI-90	NI-90x
Span	8'-0"	10'-0"	12'-0"	14'-0"	16'-0"	18'-0"	20'-0"
Depth	2-1/2"	3-1/2"	4-1/2"	5-1/2"	6-1/2"	7-1/2"	8-1/2"
Weight	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

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

## WEB HOLE SPECIFICATIONS

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

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

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

- A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
- All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
- Limit three maximum size holes per span, of which one may be a duct chase opening.
- A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

TABLE 1

## LOCATION OF CIRCULAR HOLES IN JOIST WEBS

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

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

- 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

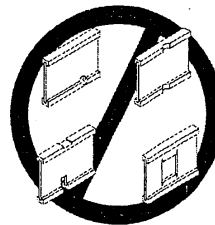
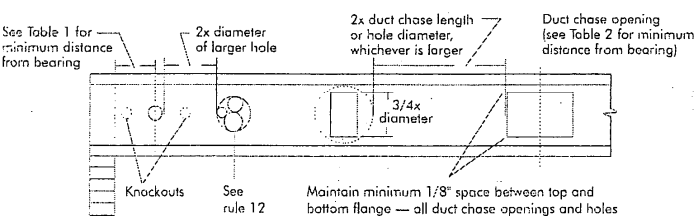
## DUCT CHASE OPENING SIZES AND LOCATIONS

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'-0"	6'-2"	6'-6"	7'-1"	7'-5"	7'-9"	8'-3"	8'-9"	9'-4"						
	NI-40x	6'-8"	7'-2"	7'-6"	8'-1"	8'-6"	9'-1"	9'-6"	10'-1"	10'-9"						
	NI-60	7'-3"	7'-8"	8'-0"	8'-6"	9'-0"	9'-3"	9'-9"	10'-3"	11'-0"						
	NI-70	7'-1"	7'-4"	7'-9"	8'-3"	8'-7"	9'-1"	9'-6"	10'-1"	10'-4"						
	NI-80	7'-2"	7'-7"	8'-0"	8'-5"	8'-10"	9'-3"	9'-8"	10'-2"	10'-8"						
14"	NI-90	7'-6"	7'-11"	8'-4"	8'-9"	9'-2"	9'-7"	10'-1"	10'-7"	11'-2"	11'-11"					
	NI-90x	7'-7"	8'-1"	8'-5"	8'-10"	9'-4"	9'-8"	10'-2"	10'-8"	11'-2"						
	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'-9"						
	NI-70	8'-7"	9'-1"	9'-5"	9'-10"	10'-4"	10'-8"	11'-2"	11'-7"	12'-3"						
16"	NI-80	9'-0"	9'-3"	9'-9"	10'-1"	10'-7"	11'-1"	11'-6"	12'-1"	12'-6"						
	NI-90	9'-2"	9'-8"	10'-0"	10'-6"	10'-11"	11'-5"	11'-9"	12'-4"	12'-11"						
	NI-90x	9'-4"	9'-9"	10'-3"	10'-7"	11'-1"	11'-7"	12'-1"	12'-7"	13'-2"						
	NI-60	10'-3"	10'-8"	11'-2"	11'-6"	12'-1"	12'-6"	13'-2"	14'-1"	14'-10"						
	NI-70	10'-1"	10'-5"	11'-0"	11'-4"	11'-10"	12'-3"	12'-8"	13'-3"	14'-0"						
16"	NI-80	10'-4"	10'-9"	11'-3"	11'-9"	12'-1"	12'-7"	13'-1"	13'-8"	14'-4"						
	NI-90	10'-9"	11'-2"	11'-8"	12'-0"	12'-6"	13'-0"	13'-6"	14'-2"	14'-10"						
	NI-90x	11'-1"	11'-5"	11'-10"	12'-4"	12'-10"	13'-2"	13'-9"	14'-4"	15'-2"						

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

## FIGURE 7 FIELD-CUT HOLE LOCATOR



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

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

Holes in webs should be cut with a sharp saw.

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

## SAFETY AND CONSTRUCTION PRECAUTIONS



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



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

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

### AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

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

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



## PRODUCT WARRANTY

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

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

# SITE COPY



**1a**

NI blocking panel

Attach I-joist to top plate per detail 1b

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

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**

Rim board

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

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

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

Blocking Panel or Rim Joist	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.

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

**1d**

NI or rim board blocking panel per detail 1a

1" for squash blocks

Squash block

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**

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

**1g**

Joist attachment per detail 1b

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

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

NI blocking panel per detail 1a

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

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

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

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

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

**1i** Nordic Lam or Structural Composite Lumber (SCL)

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

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

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

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

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

Top-mount hanger installed per manufacturer's recommendations

**1m** Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.

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

Filler block per detail 1p

Install hanger per manufacturer's recommendations

Maximum support capacity = 1,620 lbs.

**1n** Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 1b

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

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

NI blocking panel

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

**1p** FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Filler block

Offset nails from opposite face by 6"

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

**NOTES:**

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

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

**1s** Rim board

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

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

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

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

One 2-1/2" nail one side only

**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" (0.125" dia.) common spiral nails may be substituted for 2-1/2" (0.125" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.**

## WEB STIFFENERS

### RECOMMENDATIONS:

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

FIGURE 2

## WEB STIFFENER INSTALLATION DETAILS

**CONCENTRATED LOAD (Load stiffener)**

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

Approx. 2" gap

1/8"-1/4" Gap

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

No Gap

**END BEARING (Bearing stiffener)**

Gap

Tight Joint No Gap

Tight Joint No Gap

**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

See the adjacent table for web stiffener size requirements

## CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

**4a** Method 1 — SHEATHING REINFORCEMENT ONE SIDE

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

NI blocking panel or rim board blocking, attach per detail 1g

Attach I-joist to plate per detail 1b

2-1/2" nails

3-1/2" min. bearing required

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 per detail 1b. Verify reinforced I-joist capacity.

## RIM BOARD INSTALLATION DETAILS

**8a** ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

Rim Board Joint Between Floor Joists

2-1/2" nails at 6" o.c. (typical)

(1) 2-1/2" nail top and bottom (typical)

Rim board joint

2-1/2" toe-nails at 6" o.c. (typical)

Rim Board Joint at Corner

2-1/2" nails

Rim board joint

Rim board

Top or sole plate

30°

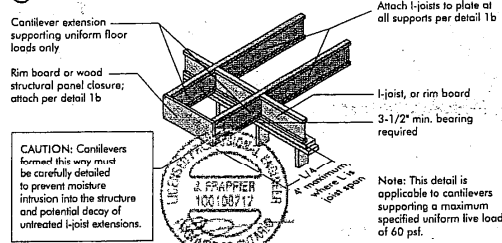
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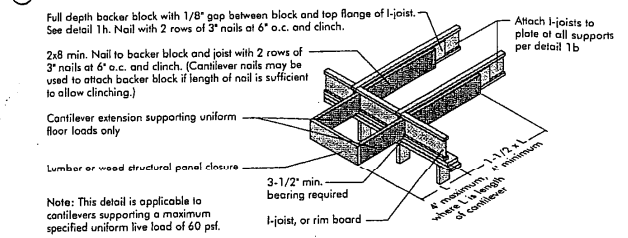


## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

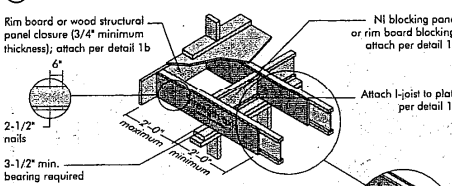


### 3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



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

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

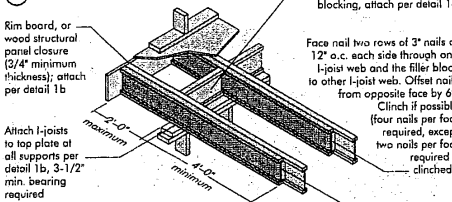


### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- 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".

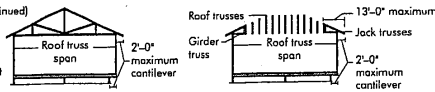
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

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



### FIGURE 4 (continued)

See table below for NI reinforcement requirements of cantilever.



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

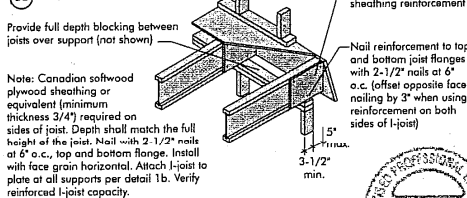
### CANTILEVER REINFORCEMENT METHODS ALLOWED

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

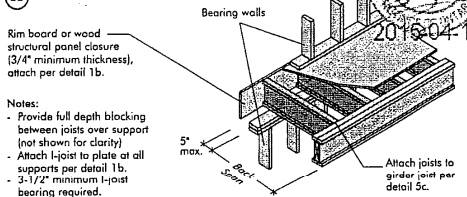
1. N = No reinforcement required.
2. NI = NI reinforced with 3/4" wood structural panel on one side only.
3. NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge beam, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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

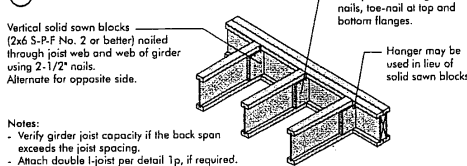
### 5a SHEATHING REINFORCEMENT



### 5b SET-BACK DETAIL

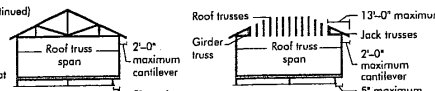


### 5c SET-BACK CONNECTION



### FIGURE 5 (continued)

See table below for NI reinforcement requirements of 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				LL = 40 psf DL = 15 psf				LL = 50 psf DL = 15 psf			
		JOIST SPACING (in.)				JOIST SPACING (in.)				JOIST SPACING (in.)			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
2-1/2"	26	1	X	X	X	2	X	X	X	2	X	X	X
	28	1	X	X	X	2	X	X	X	2	X	X	X
	30	2	X	X	X	2	X	X	X	X	X	X	X
	32	2	X	X	X	2	X	X	X	X	X	X	X
	34	2	X	X	X	2	X	X	X	X	X	X	X
11-7/8"	26	N	2	X	X	1	X	X	X	2	1	X	X
	28	N	2	X	X	1	X	X	X	2	1	X	X
	30	1	2	X	X	1	X	X	X	2	2	X	X
	32	1	2	X	X	1	2	X	X	2	2	X	X
	34	1	2	X	X	2	2	X	X	2	2	X	X
14"	26	N	1	2	X	2	2	X	X	1	1	X	X
	28	N	1	2	X	N	2	X	X	1	1	X	X
	30	N	2	X	X	2	2	X	X	1	1	X	X
	32	N	2	X	X	1	1	X	X	2	2	X	X
	34	N	2	X	X	1	1	X	X	2	2	X	X
16"	26	N	2	X	X	1	1	X	X	2	2	X	X
	28	N	2	X	X	1	1	X	X	2	2	X	X
	30	N	1	2	X	N	2	X	X	1	2	X	X
	32	N	1	2	X	N	2	X	X	1	1	X	X
	34	N	2	X	X	1	1	X	X	2	2	X	X

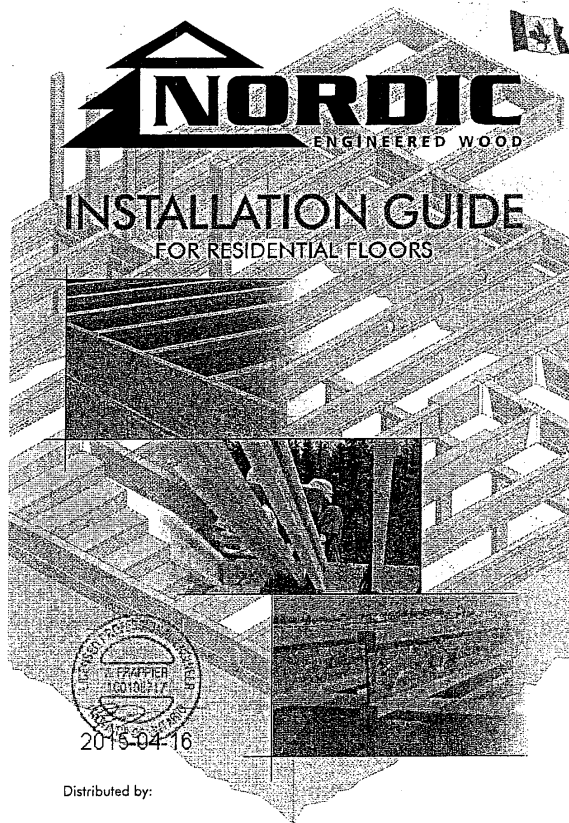
1. N = No reinforcement required.
2. NI = NI reinforced with 3/4" wood structural panel on one side only.
3. NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge beam, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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NCD 1 / November 2014

## SAFETY AND CONSTRUCTION PRECAUTIONS



### WARNING

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

### Avoid Accidents by Following these Important Guidelines:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuously over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
  - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on 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.

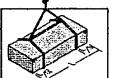
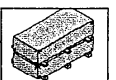
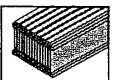


Never stack building materials over unshathed I-joists. Once shathed, do not over-stress I-joist with concentrated loads from building materials.

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

## STORAGE AND HANDLING GUIDELINES

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

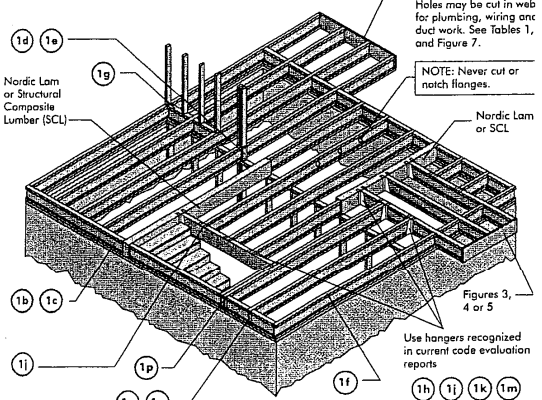


## INSTALLING NORDIC I-JOISTS

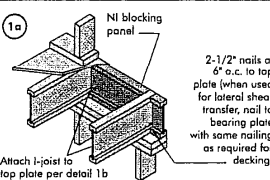
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, contact your supplier.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of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

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

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

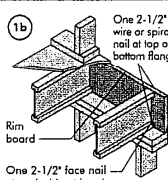


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



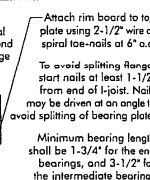
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
Ni Joists	3,300

\*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.



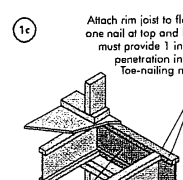
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

\*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.



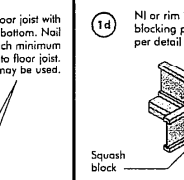
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

\*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.



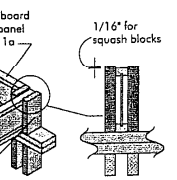
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

\*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.



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)
2x Lumber	5,500
1-1/8" Rim Board Plus	4,300

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

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## MAXIMUM FLOOR SPANS

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

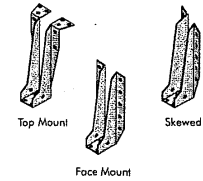
## MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS SIMPLE AND MULTIPLE SPANS

Joist Depth	Joist Series	Simple spans				Multiple spans			
		On center spacing				On center spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15-11"	14-2"	12-9"	10-5"	16-3"	15-0"	14-10"	14-7"
	NI-40	16-11"	15-2"	14-8"	14-9"	17-5"	16-5"	15-10"	15-5"
	NI-60	16-3"	15-4"	14-10"	14-11"	17-7"	16-7"	16-0"	16-11"
	NI-70	17-1"	16-1"	15-6"	15-7"	18-7"	17-6"	16-7"	16-10"
	NI-80	17-5"	16-3"	15-8"	15-9"	18-10"	17-8"	16-11"	17-0"
11-1/2"	NI-20	16-11"	16-0"	15-5"	15-6"	18-4"	17-5"	16-8"	16-7"
	NI-40	18-11"	17-0"	16-5"	16-6"	20-0"	18-6"	17-9"	17-7"
	NI-60	18-4"	17-5"	16-7"	16-9"	20-3"	18-9"	18-0"	18-11"
	NI-70	19-5"	18-0"	17-4"	17-5"	21-4"	19-11"	19-0"	19-1"
	NI-80	19-9"	18-3"	17-6"	17-7"	21-9"	20-2"	19-3"	19-4"
13-1/2"	NI-20	20-2"	18-7"	17-10"	17-11"	22-3"	20-9"	19-8"	19-11"
	NI-40	20-11"	18-7"	17-10"	17-11"	22-2"	20-6"	19-8"	19-4"
	NI-60	20-9"	18-11"	18-11"	18-2"	22-7"	20-11"	20-0"	20-11"
	NI-70	21-7"	20-0"	19-11"	19-2"	23-10"	21-11"	21-2"	21-2"
	NI-80	21-11"	20-5"	19-4"	19-5"	24-3"	22-3"	21-5"	21-6"
15-1/2"	NI-20	22-5"	20-9"	19-9"	19-10"	24-9"	22-10"	21-10"	21-10"
	NI-40	22-7"	20-11"	19-11"	20-0"	25-0"	23-1"	22-0"	22-2"
	NI-60	22-5"	20-9"	19-9"	19-10"	24-9"	22-3"	21-9"	21-10"
	NI-70	23-6"	21-9"	20-9"	20-10"	25-6"	24-0"	23-11"	23-0"
	NI-80	23-11"	22-1"	21-1"	21-2"	26-5"	24-5"	23-9"	23-4"
17-1/2"	NI-20	24-5"	22-6"	21-5"	21-6"	26-11"	24-10"	23-9"	23-9"
	NI-40	24-8"	22-9"	21-9"	21-10"	27-8"	25-2"	24-9"	24-11"

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## I-JOIST HANGERS

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



Top Mount  
Face Mount  
Skewed

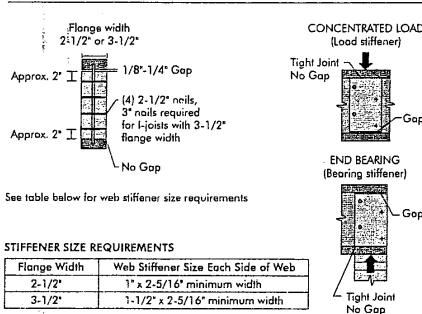
## WEB STIFFENERS

### RECOMMENDATIONS:

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

SI units conversion: 1 inch = 25.4 mm

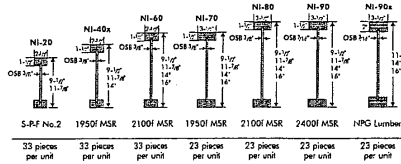
FIGURE 2  
WEB STIFFENER INSTALLATION DETAILS



### STIFFENER SIZE REQUIREMENTS

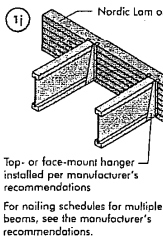
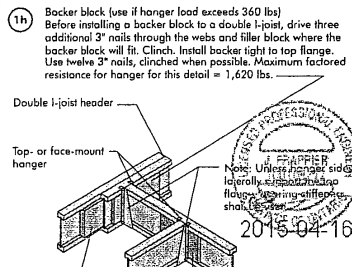
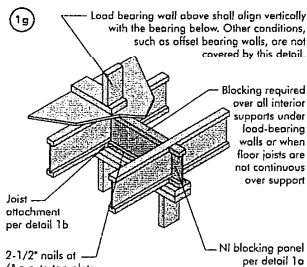
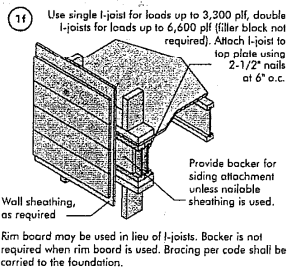
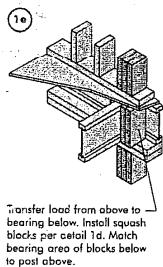
Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

## NORDIC I-JOIST SERIES

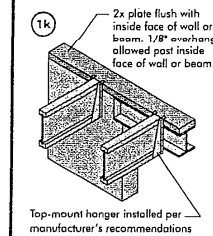


Chambers Chibougoum Ltd. harvests its own trees, which enables Nordic products to adhere to strict quality control procedures throughout the manufacturing process. Every phase of the operation, from the raw timber to the finished product, reflects our commitment to quality.

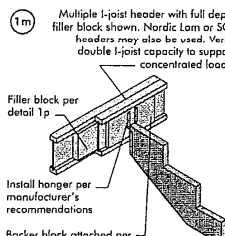
Nordic Engineered Wood I-joists use only finger-jointed stock and kiln-dried lumber in their flanges, ensuring consistent quality, superior strength and longer span carrying capacity.



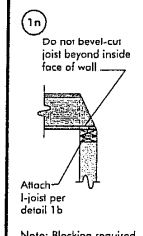
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



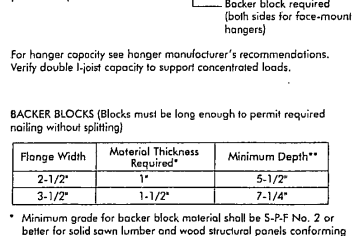
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



Maximum support capacity = 1,620 lbs.



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



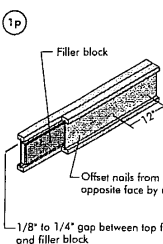
For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

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

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

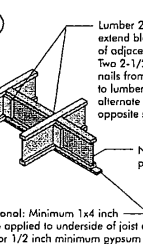
\* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O37 Standard.

\*\* For face-mount hangers use net joist depth minus 1-1/4\"/>

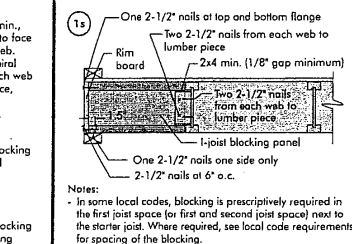


- Support back of I-joist web during nailing to prevent damage to web/flange connection.
- Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
- Filler block is required between joists for full length of span.
- Nail joists together with two rows of 3\"/>

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"



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



Note: 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 16d common nails.

**SITE COPY**