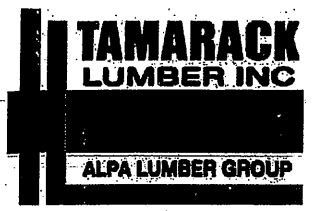


Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	7
J2	14-00-00	9 1/2" NI-40x	1	31
J3	12-00-00	9 1/2" NI-40x	1	7
J3DJ	12-00-00	9 1/2" NI-40x	2	4
J4	10-00-00	9 1/2" NI-40x	1	6
J5	6-00-00	9 1/2" NI-40x	1	1
J6	4-00-00	9 1/2" NI-40x	1	1
J7	2-00-00	9 1/2" NI-40x	1	4
B2	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B4	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B1	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B3	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
26	H1	IUS2.56/9.5
2	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
1	H2	HUS1.81/10
2	H3	HGUS410



FROM PLAN DATED:  
BUILDER: GREENPARK HOMES  
SITE: RUSSEL GARDENS  
MODEL: HIGHGROVE 11  
ELEVATION: 2  
LOT:  
CITY: WATERDOWN  
SALESMAN: M D  
DESIGNER: AJ  
REVISION:

NOTES:  
REFER TO THE NORDIC  
INSTALLATION GUIDE FOR PROPER  
STORAGE AND INSTALLATION.  
SQUASH BLOCKS OF 2x4, 2x6, 2x8 #2  
S.P.F REQ'D UNDER INTERIOR  
UNIFORM LOAD BEARING WALLS.  
MULTIPLE SQUASH BLOCKS REQ'D  
UNDER CONCENTRATED LOADS. SEE  
FIGURE 1. CANTILEVERED JOISTS  
INCLUDING CANT' OVER BRICK REQ.  
I-JOIST BLOCKING ALONG BEARING  
AND RIMBOARD CLOSURE AT ENDS.  
SEE FIGURES 4 & 5 FOR  
REINFORCEMENT REQUIREMENTS.  
FOR HOLES INCLUDING DUCT  
CHASE AND FIELD CUT OPENINGS  
SEE FIGURE 7, TABLES 1 & 2.  
CERAMIC TILE APPLICATION AS PER  
O.B.C 9.30.6.  
LOADING:  
DESIGN LOADS: L/480.000  
LIVE LOAD: 40.0 lb/ft²  
DEAD LOAD: 15.0 lb/ft  
TILED AREAS: 20 lb/ft  
SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 6/7/2017

1st FLOOR

FROM PLAN DATED:

BUILDER: GREENPARK HOMES

SITE: RUSSEL GARDENS

MODEL: HIGHGROVE 11

ELEVATION: 2

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

NOTES:

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

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

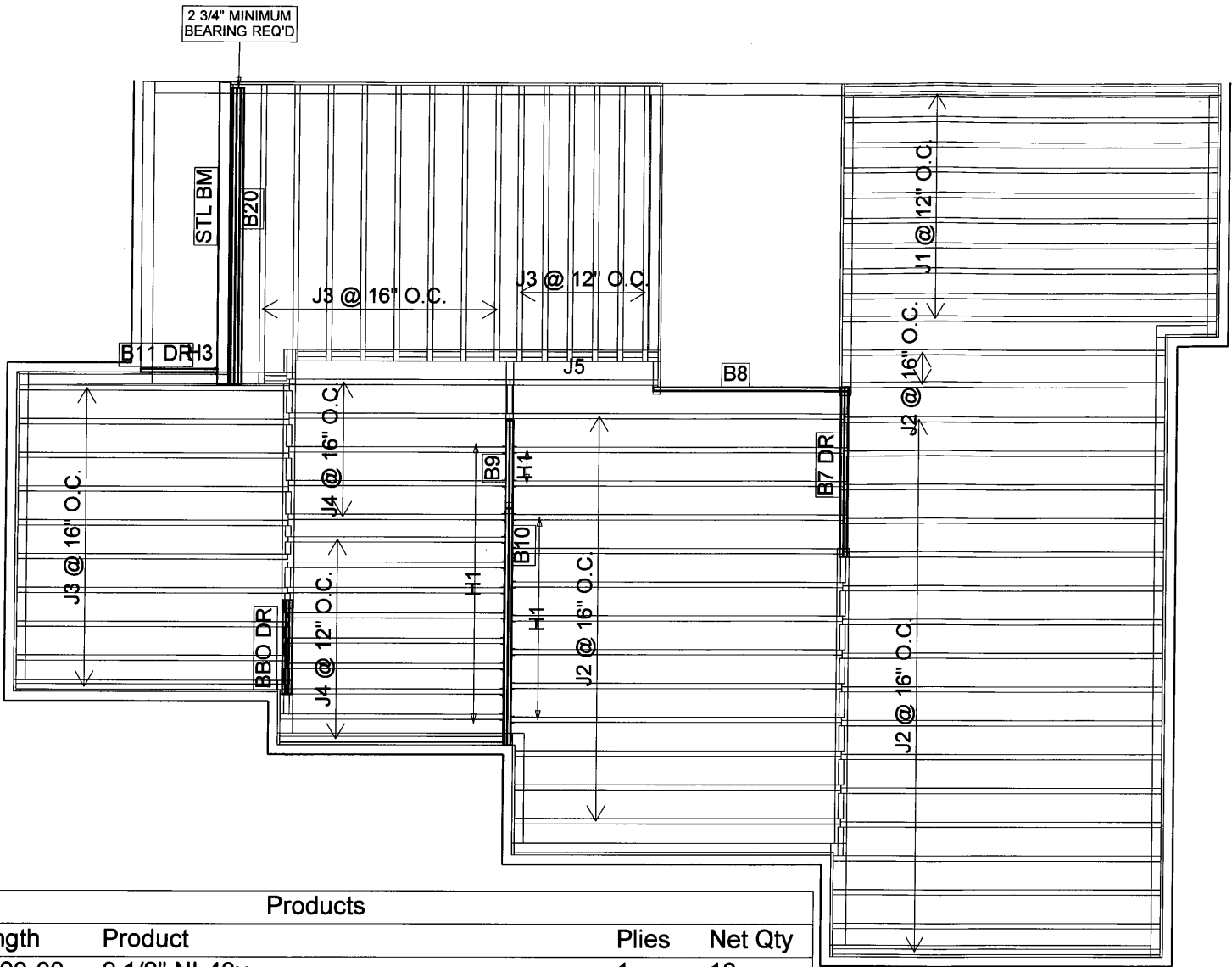
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft

SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 2018-02-20

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	10
J2	14-00-00	9 1/2" NI-40x	1	32
J3	12-00-00	9 1/2" NI-40x	1	24
J4	10-00-00	9 1/2" NI-40x	1	14
J5	6-00-00	9 1/2" NI-40x	1	1
B20	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B10	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B8	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B7 DR	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11 DR	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B9	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
20	H1	IUS2.56/9.5
1	H3	HUS1.81/10

# NORDIC STRUCTURES

**COMPANY**  
TAMARACK LUMBER  
BURLINGTON  
Feb. 20, 2018 15:22

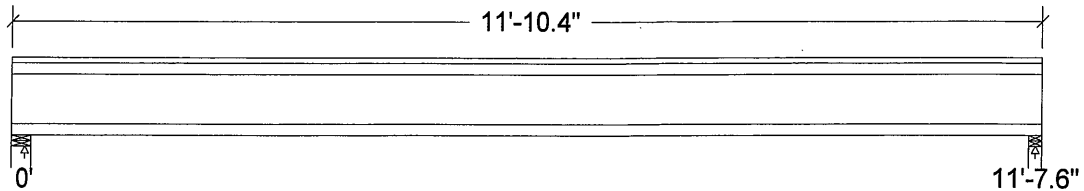
**PROJECT**  
J3 2ND FLR GARAGE

## Design Check Calculation Sheet Nordic Sizer – Canada 6.4

### Loads:

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

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



Unfactored:			
Dead	159		157
Live	319		314
Factored:			
Total	677		668
Bearing:			
Resistance			
Joist	1871		1854
Support	4756		2758
Des ratio			
Joist	0.36		0.36
Support	0.14		0.24
Load case	#2		#2
Length	2-3/4		1-3/4*
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		1.00
fcp sup	769		769
Kzcp sup	1.13		1.02

\*Minimum bearing length for joists is 1-3/4" for exterior supports

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

**Nordic Joist 9-1/2" NI-40x Floor joist @ 16" o.c.**

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

Total length: 11'-10.4"; 5/8" nailed and glued OSB sheathing

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



DWG NO. TAM 9653-18  
STRUCTURAL  
COMPONENT ONLY

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 659	Vr = 1895	lbs	Vf/Vr = 0.35
Moment (+)	Mf = 1919	Mr = 4824	lbs-ft	Mf/Mr = 0.40
Perm. Defl'n	0.05 = <L/999	0.39 = L/360	in	0.13
Live Defl'n	0.10 = <L/999	0.29 = L/480	in	0.34
Total Defl'n	0.15 = L/933	0.58 = L/240	in	0.26
Bare Defl'n	0.12 = <L/999	0.39 = L/360	in	0.31
Vibration	Lmax = 11'-8"	Lv = 15'-4"	ft	
Defl'n	= 0.025	= 0.061	in	0.41

**Additional Data:**

FACTORS:	f/E	KD	KH	KZ	KL	KT	KS	KN	LC#
Vr	1895	1.00	1.00	-	-	-	-	-	#2
Mr+	4824	1.00	1.00	-	1.000	-	-	-	#2
EI	218.1 million	-	-	-	-	-	-	-	#2

**CRITICAL LOAD COMBINATIONS:**

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

Bearing : Support 1 - LC #2 = 1.25D + 1.5L  
               Support 2 - LC #2 = 1.25D + 1.5L

Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake  
               L=live(use,occupancy) Ls=live(storage,equipment) f=fire

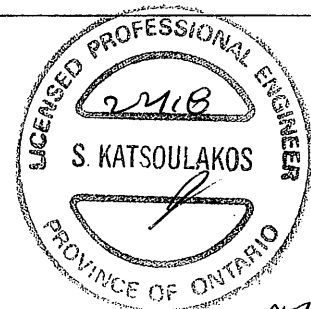
Load Patterns: s=S/2 L=L+Ls \_=no pattern load in this span  
 All Load Combinations (LCs) are listed in the Analysis output

**CALCULATIONS:**

Deflection: E<sub>I</sub>eff = 268e06 lb-in<sup>2</sup> K= 4.94e06 lbs  
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

**Design Notes:**

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-14 Engineering Design in Wood standard (May 2014 edition). **CONFORMS TO OBC 2012**
2. Please verify that the default deflection limits are appropriate for your application.
3. Refer to technical documentation for installation guidelines and construction details.
4. Nordic I-joists are listed in CCMC evaluation report 13032-R.
5. Joists shall be laterally supported at supports and continuously along the compression edge.
6. The design assumptions and specifications have been provided by the client. Any damages resulting from faulty or incorrect information, specifications, and/or designs furnished, and the correctness or accuracy of this information is their responsibility. This analysis does not constitute a record of the structural integrity of the building nor suitability of the design assumptions made. Nordic Structures is responsible only for the structural adequacy of this component based on the design criteria and loadings shown.



DWG NO. TAM 9653-18  
 STRUCTURAL  
 COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B1(i1294)

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

June 7, 2017 09:38:11

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

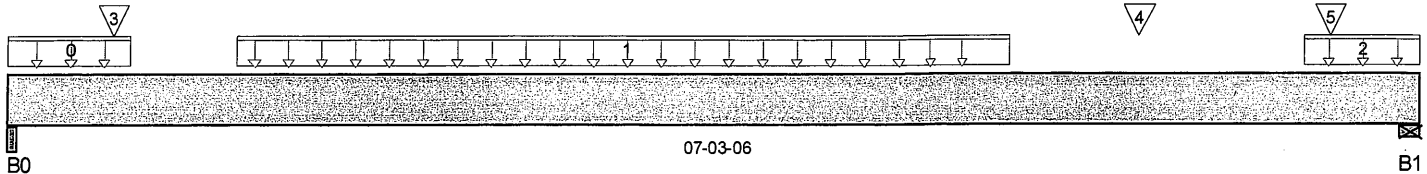
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i1294)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 07-03-06

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

Bearing	Live	Dead	Snow	Wind
B0, 7-1/4"	4,010 / 0	2,125 / 0		
B1, 6-3/4"	4,582 / 0	2,442 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
						1.00	0.65	1.00	1.15	
0	7(i350)	Unf. Lin. (lb/ft)	L	00-00-00	00-07-10		81			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-02-02	05-02-02	521	261			n/a
2	8(i365)	Unf. Lin. (lb/ft)	L	06-08-04	07-03-06	264	212			n/a
3	-	Conc. Pt. (lbs)	L	00-06-08	00-06-08	2,707	1,386			n/a
4	-	Conc. Pt. (lbs)	L	05-10-02	05-10-02	656	329			n/a
5	-	Conc. Pt. (lbs)	L	06-09-14	06-09-14	2,979	1,557			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,431 ft-lbs	25,408 ft-lbs	21.4%	1	03-02-02
End Shear	3,105 lbs	11,571 lbs	26.8%	1	05-11-02
Total Load Defl.	L/999 (0.053")	n/a	n/a	4	03-08-02
Live Load Defl.	L/999 (0.035")	n/a	n/a	5	03-08-02
Max Defl.	0.053"	n/a	n/a	4	03-08-02
Span / Depth	7.9	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	7-1/4" x 3-1/2"	8,672 lbs	80%	28%	Unspecified
B1 Wall/Plate	6-3/4" x 3-1/2"	9,925 lbs	98.3%	34.4%	Unspecified

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

CONFORMS TO UBC 2012

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



9-12-17



Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B1(i1294)**

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

June 7, 2017 09:38:11

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

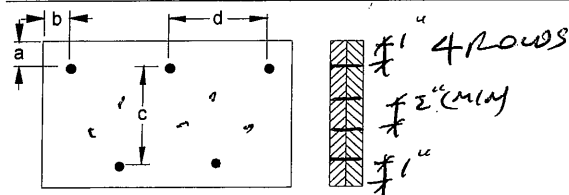
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i129

Specifier:

Designer:

Company:

Misc:

**Connection Diagram**

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

Calculated Side Load = 779.8 lb/ft

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Connectors are: 16d Nails

3 1/2" ARDOX SPIRAL

**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.



DWG NO. TAM 47641-17  
 STRUCTURAL  
 COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B3(i1322)

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

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

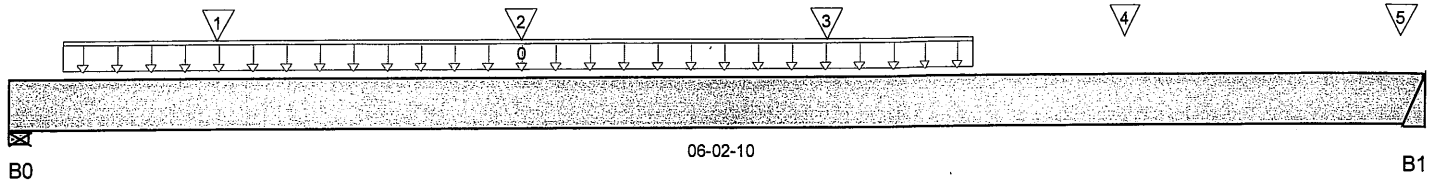
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i1322)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 06-02-10

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

Bearing	Live	Dead	Snow	Wind
B0, 2-3/8"	1,242 / 0	650 / 0		
B1	1,445 / 0	751 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	00-02-14	04-02-14	265	132			n/a
1	J5(i929)	Conc. Pt. (lbs)	L	00-10-14	00-10-14	208	104			n/a
2	J5(i923)	Conc. Pt. (lbs)	L	02-02-14	02-02-14	231	115			n/a
3	J5(i379)	Conc. Pt. (lbs)	L	03-06-14	03-06-14	231	115			n/a
4	-	Conc. Pt. (lbs)	L	04-10-14	04-10-14	586	293			n/a
5	J2(i1301)	Conc. Pt. (lbs)	L	06-01-06	06-01-06	355	177			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,244 ft-lbs	25,408 ft-lbs	16.7%	1	03-06-14
End Shear	2,535 lbs	11,571 lbs	21.9%	1	00-11-14
Total Load Defl.	L/999 (0.038")	n/a	n/a	4	03-01-14
Live Load Defl.	L/999 (0.025")	n/a	n/a	5	03-01-14
Max Defl.	0.038"	n/a	n/a	4	03-01-14
Span / Depth	7.6	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	2-3/8" x 3-1/2"	2,676 lbs	75.3%	26.4%	Unspecified
B1 Hanger	2" x 3-1/2"	3,106 lbs	n/a	36.4%	Hanger

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

CONFORMS TO DBC 2012

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9



DWG NO. TAM 47642-17  
STRUCTURAL  
COMPONENT ONLY



Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B3(i1322)**

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

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

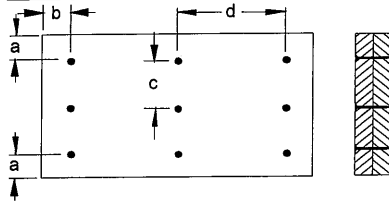
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i1322)

Specifier:

Designer:

Company:

Misc:

**Connection Diagram**

a minimum = 2"    c = 2-3/4"  
 b minimum = 3"    d = 4"

Calculated Side Load = 598.7 lb/ft

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Connectors are: 16d Common Nails

**3 1/2" ARDOX SPIRAL****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 CALO®, 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.



DWG NO. TAM 47642-17  
 STRUCTURAL  
 COMPONENT ONLY





Boise Cascade

## Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B2(i1275)

Dry | 2 spans | Right cantilever | 0/12 slope (deg)

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

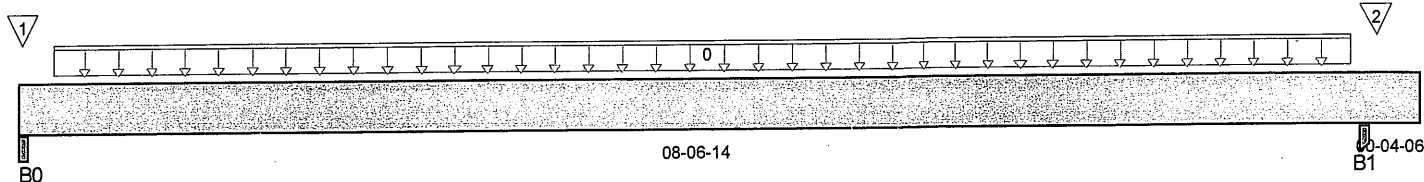
Description: Designs\Flush Beams\Basement\Flush Beams\B2(i1275)

Specifier:

Designer:

Company:

Misc:



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

Bearing	Live	Dead	Snow	Wind
B0, 2-5/8"	221 / 0	180 / 0		
B1, 5-1/4"	4,854 / 0	2,686 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-10	08-06-00	32	16			n/a
1	11(i372)	Conc. Pt. (lbs)	L	00-00-04	00-00-04	80	68			n/a
2	-	Conc. Pt. (lbs)	L	08-07-12	08-07-12	4,721	2,576 + TOP EDGE LOADS			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	710 ft-lbs	25,408 ft-lbs	2.8%	1	04-04-11
End Shear	269 lbs	11,571 lbs	2.3%	1	01-00-02
Cont. Shear	257 lbs	11,571 lbs	2.2%	1	07-06-12
Total Load Defl.	L/999 (0.013")	n/a	n/a	4	04-04-11
Live Load Defl.	L/999 (0.007")	n/a	n/a	5	04-04-11
Total Neg. Defl.	2xL/1,998 (-0.002")	n/a	n/a	4	08-11-04
Max Defl.	0.013"	n/a	n/a	4	04-04-11
Span / Depth	10.6	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	2-5/8" x 3-1/2"	556 lbs	14.2%	5%	Unspecified
B1 Post	5-1/4" x 3-1/2"	10,638 lbs	89.1%	47.5%	Unspecified

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

CONFORMS TO CBC 2012

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

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



P6 1/2

DWG NO. YAM 47643-17

STRUCTURAL  
COMPONENT ONLY



Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B2(i1275)**

Dry | 2 spans | Right cantilever | 0/12 slope (deg)

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

Description: Designs\Flush Beams\Basement\Flush Beams\B2(i1275)

Specifier:

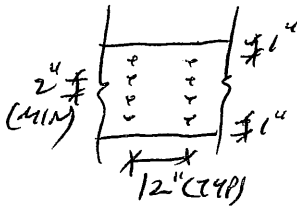
Designer:

Company:

Misc:

**Connection Diagram**

Concentrated side-load exceeds allowable magnitude for connection design. Please consult a technical representative or Professional Engineer for the design of the connection. *OK with nailing*



PROVIDE 4 ROWS OF 3½" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING. MAINTAIN A MIN. 1" LUMBER EDGE/END DISTANCE. DO NOT USE AIR NAILS

**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.

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*ps*  
DWG NO. TAM 47643-17  
STRUCTURAL  
COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i1306)

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

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

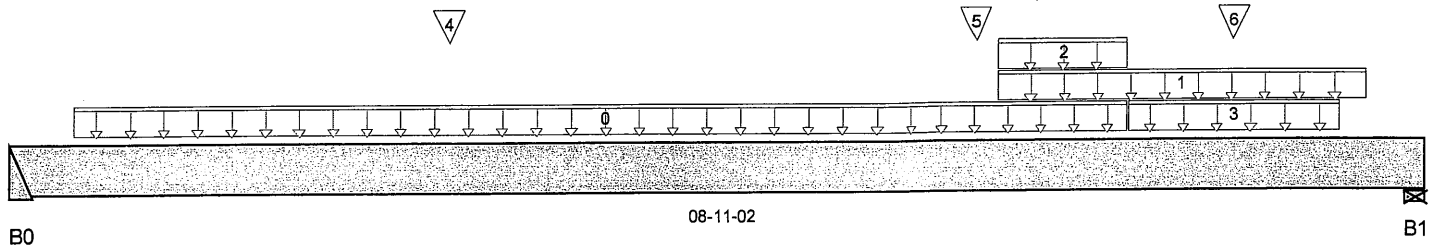
Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1306)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 08-11-02

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

Bearing	Live	Dead	Snow	Wind
B0	3,335 / 0	1,859 / 0		
B1, 4-3/8"	2,875 / 0	1,724 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	00-04-12	07-00-12	272	136			n/a
1	12(i481)	Unf. Lin. (lb/ft)	L	06-02-12	08-06-12		65			n/a
2	12(i481)	Unf. Lin. (lb/ft)	L	06-02-12	07-00-12	692	346			n/a
3	12(i481)	Unf. Lin. (lb/ft)	L	07-00-12	08-04-12	208	104			n/a
4	PBO4(i408)	Conc. Pt. (lbs)	L	02-09-00	02-09-00	2,798	1,541			n/a
5	PBO3(i407)	Conc. Pt. (lbs)	L	06-01-00	06-01-00	571	385			n/a
6	J6(i1183)	Conc. Pt. (lbs)	L	07-08-12	07-08-12	158	79			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	17,679 ft-lbs	25,408 ft-lbs	69.6%	1	02-09-00
End Shear	7,301 lbs	11,571 lbs	63.1%	1	00-11-08
Total Load Defl.	L/321 (0.319")	0.426"	74.9%	4	04-02-12
Live Load Defl.	L/502 (0.204")	0.284"	71.7%	5	04-02-12
Max Defl.	0.319"	n/a	n/a	4	04-02-12
Span / Depth	10.8	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 3-1/2"	7,326 lbs	n/a	85.8%	Hanger
B1 Wall/Plate	4-3/8" x 3-1/2"	6,468 lbs	98.9%	34.6%	Unspecified

## Notes



DWG NO. TAM 47644-17  
STRUCTURAL  
COMPONENT ONLY



Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i1306)**

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

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mxd

Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1306)

Specifier:

Designer:

Company:

Msc:

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

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

Calculations assume member is fully braced.

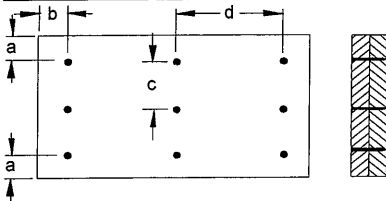
Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

**CONFORMS TO OBC 2012**

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

**Connection Diagram**

a minimum = 2"      c = 2-3/4" <sup>1/2</sup>  
 b minimum = 3"      d = 4"

Calculated Side Load = 468.2 lb/ft

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Connectors are: 16d Nails

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

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DWG NO. TAM 4764417  
 STRUCTURAL  
 COMPONENT ONLY



# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B5(i1282)

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

June 7, 2017 09:38:12

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

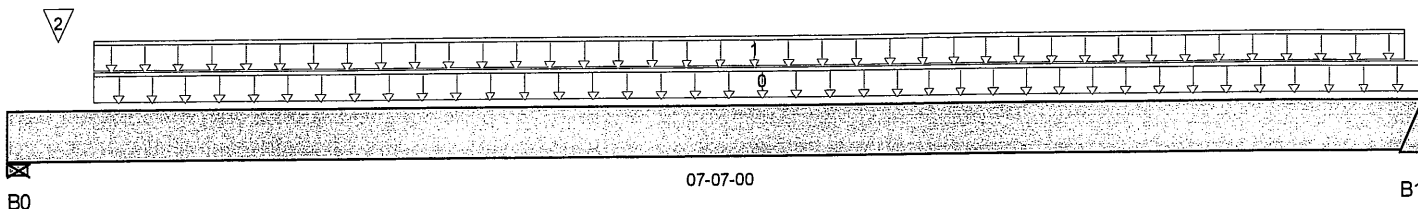
Description: Designs\Flush Beams\Basement\Flush Beams\B5(i1282)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 07-07-00

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

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	1,154 / 0	617 / 0		
B1	948 / 0	491 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	User Load	Unf. Lin. (lb/ft)	L	00-05-08	07-07-00	240	120			n/a
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-05-08	07-06-00	20	10			n/a
2	9(i368)	Conc. Pt. (lbs)	L	00-03-04	00-03-04	236	139			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,508 ft-lbs	12,704 ft-lbs	27.6%	1	03-11-04
End Shear	1,504 lbs	5,785 lbs	26%	1	01-03-00
Total Load Defl.	L/999 (0.09")	n/a	n/a	4	03-11-04
Live Load Defl.	L/999 (0.059")	n/a	n/a	5	03-11-04
Max Defl.	0.09"	n/a	n/a	4	03-11-04
Span / Depth	8.9	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	5-1/2" x 1-3/4"	2,503 lbs	60.9%	21.3%	Unspecified
B1 Hanger	2" x 1-3/4"	2,036 lbs	n/a	47.7%	Hanger

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

CONFORMS TO OBC 2012

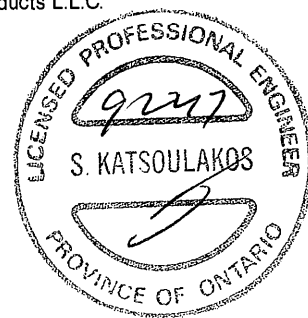
Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

## 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.

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**BC CALC® Design Report**


Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

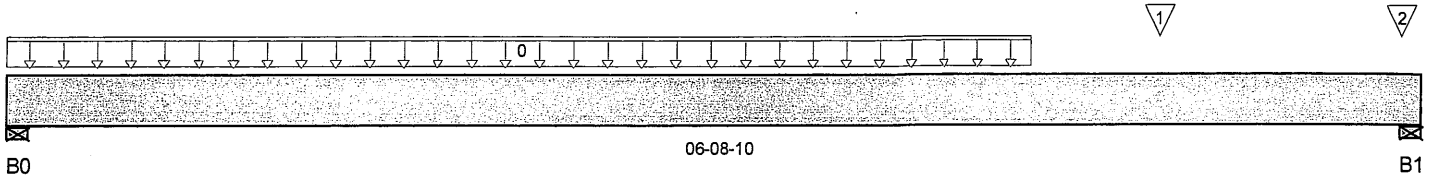
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B7 D

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 06-08-10

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

Bearing	Live	Dead	Snow	Wind
B0, 4"	2,005 / 0	1,034 / 0		
B1, 4"	1,714 / 0	908 / 0		

**Load Summary**

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	00-00-00	04-10-08	564	281			n/a
1	-	Conc. Pt. (lbs)	L	05-05-12	05-05-12	675	338			n/a
2	B8(i1200)	Conc. Pt. (lbs)	L	06-07-08	06-07-08	288	163			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,230 ft-lbs	25,408 ft-lbs	20.6%	1	02-10-08
End Shear	3,052 lbs	11,571 lbs	26.4%	1	05-07-02
Total Load Defl.	L/999 (0.051")	n/a	n/a	4	03-03-15
Live Load Defl.	L/999 (0.033")	n/a	n/a	5	03-03-15
Max Defl.	0.051"	n/a	n/a	4	03-03-15
Span / Depth	7.8	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	4" x 3-1/2"	4,301 lbs	47.3%	25.2%	Unspecified
B1 Wall/Plate	4" x 3-1/2"	3,706 lbs	40.7%	21.7%	Unspecified

**Notes**

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

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

Calculations assume unbraced length of Top: 00-02-05, Bottom: 00-02-05.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

**CONFORMS TO OBC 2012**

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



P6 1/2

 DWG NO. TAM 4764617  
 STRUCTURAL  
 COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmd

Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B7

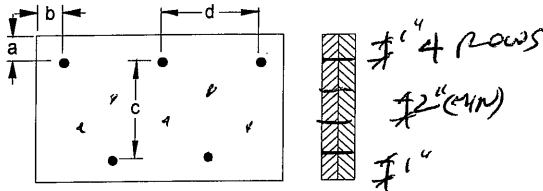
Specifier:

Designer:

Company:

Misc:

Connection Diagram



a minimum = 1" c = 1-1/2"  
b minimum = 3" d = 4"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Member has no side loads.

Connectors are: 16d Nails

3 1/2" ARDOX SPIRAL

Disclosure

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DWG NO. TAM 47646-17  
STRUCTURAL  
COMPONENT ONLY



# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B8(i1200)

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

June 7, 2017 09:38:13

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

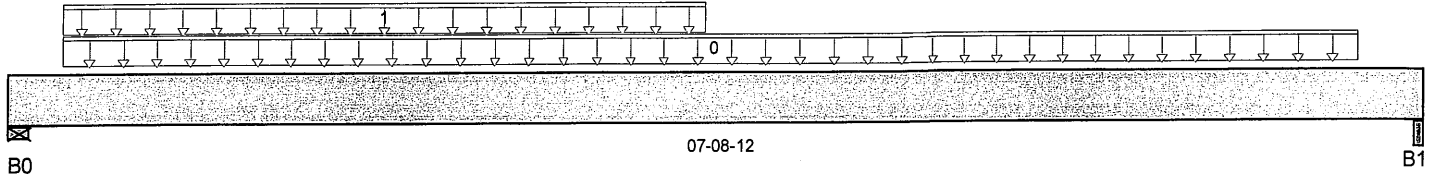
Description: Designs\Flush Beams\1st Floor\Flush Beams\B8(i1200)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 07-08-12

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

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	721 / 0	379 / 0		
B1, 3-1/2"	291 / 0	164 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-03-08	07-04-08	23	12			n/a
1	User Load	Unf. Lin. (lb/ft)	L	00-03-08	03-09-08	240	120			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,187 ft-lbs	12,704 ft-lbs	17.2%	1	03-00-06
End Shear	1,089 lbs	5,785 lbs	18.8%	1	01-01-00
Total Load Defl.	L/999 (0.054")	n/a	n/a	4	03-07-07
Live Load Defl.	L/999 (0.035")	n/a	n/a	5	03-07-07
Max Defl.	0.054"	n/a	n/a	4	03-07-07
Span / Depth	9.2	n/a	n/a		00-00-00

## Disclosure

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## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	1,556 lbs	59.4%	20.8%	Unspecified
B1 Beam	3-1/2" x 1-3/4"	642 lbs	12%	8.6%	Unspecified

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 2012



DWG NO. YAM47647-17  
STRUCTURAL  
COMPONENT ONLY





# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B9(i1273)

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

June 7, 2017 09:38:13

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

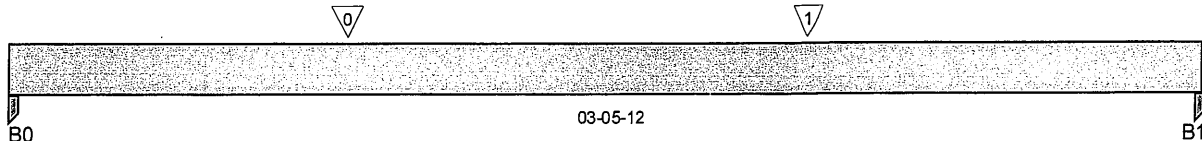
Description: Designs\Flush Beams\1st Floor\Flush Beams\B9(i1273)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 03-05-12

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

Bearing	Live	Dead	Snow	Wind
B0, 2-5/8"	615 / 0	324 / 0		
B1, 3-1/2"	571 / 0	303 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	-	Conc. Pt. (lbs)	L	00-11-12	00-11-12	593	297			n/a
1	-	Conc. Pt. (lbs)	L	02-03-12	02-03-12	593	297			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,151 ft-lbs	25,408 ft-lbs	4.5%	1	02-03-12
End Shear	1,266 lbs	11,571 lbs	10.9%	1	01-00-02
Total Load Defl.	L/999 (0.003")	n/a	n/a	4	01-08-07
Live Load Defl.	L/999 (0.002")	n/a	n/a	5	01-08-07
Max Defl.	0.003"	n/a	n/a	4	01-08-07
Span / Depth	3.9	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Post	2-5/8" x 3-1/2"	1,328 lbs	22.3%	11.8%	Unspecified
B1 Post	3-1/2" x 3-1/2"	1,235 lbs	15.5%	8.3%	Unspecified

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

CONFORMS TO DBC 2012



P6 1/2

DWG NO. TAM 47648.17  
STRUCTURAL  
COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B9(i1273)

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

June 7, 2017 09:38:13

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B9(i1273)

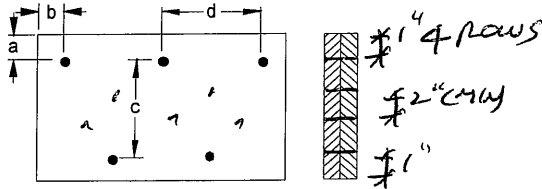
Specifier:

Designer:

Company:

Misc:

## Connection Diagram



a minimum = 1" c = 1-1/2"  
b minimum = 3" d = 4"

Calculated Side Load = 434.9 lb/ft

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

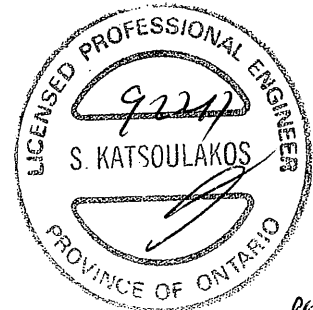
Connectors are: 16d Nails

**3 1/2" ARDOX SPIRAL**

## Disclosure

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DWG NO. TAM 47648-17  
STRUCTURAL  
COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B10(i1279)

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

June 7, 2017 09:38:13

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

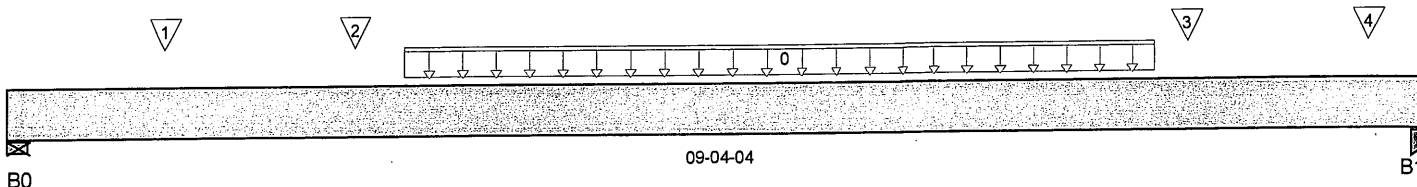
Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i1279)

Specifier:

Designer:

Company:

Misc:



Total Horizontal Product Length = 09-04-04

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

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	1,927 / 0	1,009 / 0		
B1, 2-5/8"	2,155 / 0	1,121 / 0		

## Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	02-07-04	07-07-04	390	195			n/a
1	-	Conc. Pt. (lbs)	L	01-00-08	01-00-08	595	297			n/a
2	-	Conc. Pt. (lbs)	L	02-03-07	02-03-07	447	224			n/a
3	-	Conc. Pt. (lbs)	L	07-09-11	07-09-11	525	262			n/a
4	-	Conc. Pt. (lbs)	L	09-00-00	09-00-00	554	277			n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	9,243 ft-lbs	25,408 ft-lbs	36.4%	1	05-00-00
End Shear	3,798 lbs	11,571 lbs	32.8%	1	01-03-00
Total Load Defl.	L/585 (0.18")	0.44"	41%	4	04-09-05
Live Load Defl.	L/999 (0.119")	n/a	n/a	5	04-09-05
Max Defl.	0.18"	n/a	n/a	4	04-09-05
Span / Depth	11.1	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	5-1/2" x 3-1/2"	4,152 lbs	50.5%	17.7%	Unspecified
B1 Post	2-5/8" x 3-1/2"	4,634 lbs	77.7%	41.3%	Unspecified

## Notes

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

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

Calculations assume member is fully braced.

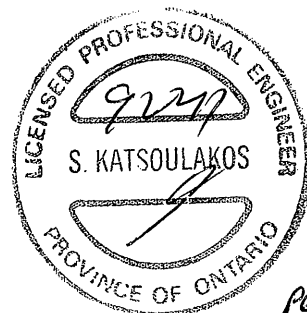
Resistance Factor phi has been applied to all presented results per CSA O86.

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012



P6 1/2

DWG NO. TAM 47649-17  
STRUCTURAL  
COMPONENT ONLY



# Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor...\B10(i1279)

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

June 7, 2017 09:38:13

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i127

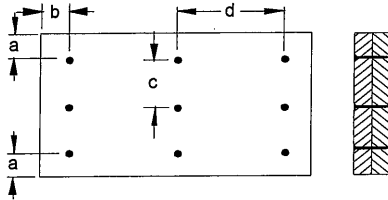
Specifier:

Designer:

Company:

Misc:

## Connection Diagram



a minimum = 2"    c = 2-3/4"  
b minimum = 3"    d = 4"

Calculated Side Load = 562.6 lb/ft

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Connectors are: 16d ~~16d~~ Nails

3 1/2" ARDOX SPIRAL

## 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.

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DWG NO. TAM 47649-17  
STRUCTURAL  
COMPONENT ONLY



# Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B11 DR(i1372)

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

September 18, 2017 10:47:01

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

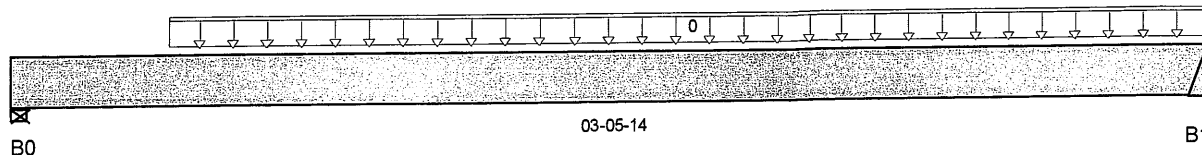
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B11

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-05-14

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

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"		152 / 0		
B1		168 / 0		

## Load Summary

Tag Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0 User Load	Unf. Lin. (lb/ft)	L	00-05-08	03-05-14	1.00	0.65	1.00	1.15	n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	164 ft-lbs	8,258 ft-lbs	2%	0	01-10-11
End Shear	94 lbs	3,761 lbs	2.5%	0	01-03-00
Total Load Defl.	L/999 (0.001")	n/a	n/a	1	01-10-11
Max Defl.	0.001"	n/a	n/a	1	01-10-11
Span / Depth	3.8	n/a	n/a		00-00-00

## Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	5-1/2" x 1-3/4"	213 lbs	4.2%	2.8%	Unspecified
B1 Hanger	2" x 1-3/4"	235 lbs	n/a	8.5%	HUS1.81/10

## Notes

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 2012

## Disclosure

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.





Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 11 EL-2.mmdl

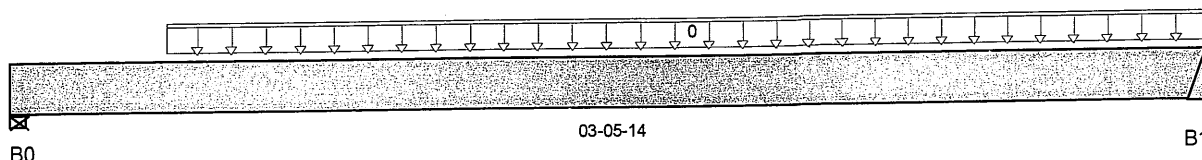
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B11

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-05-14

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

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	47 / 0	195 / 0	99 / 0	
B1	53 / 0	215 / 0	110 / 0	

## Load Summary

Tag Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0 User Load	Unf. Lin. (lb/ft)	L	00-05-08	03-05-14	33	130	69		n/a

## Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	211 ft-lbs	8,258 ft-lbs	2.6%	0	01-10-11
End Shear	121 lbs	3,761 lbs	3.2%	0	01-03-00
Total Load Defl.	L/999 (0.002")	n/a	n/a	45	01-10-11
Live Load Defl.	L/999 (0.001")	n/a	n/a	61	01-10-11
Max Defl.	0.002"	n/a	n/a	45	01-10-11
Span / Depth	3.8	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	5-1/2" x 1-3/4"	274 lbs	5.4%	3.6%	Unspecified
B1 Hanger	2" x 1-3/4"	461 lbs	n/a	10.9%	HUS1.81/10

## Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9



BC CALC® Design Report

Dry | 1 span | No cant.

February 20, 2018 15:18:19

Build 6215

Job name:

File name: HIGHGROVE 11 EL-2.mmdl

Address:

Description: 1st Floor\Flush Beams\B20(i2175)

City, Province, Postal Code: WAT...WN

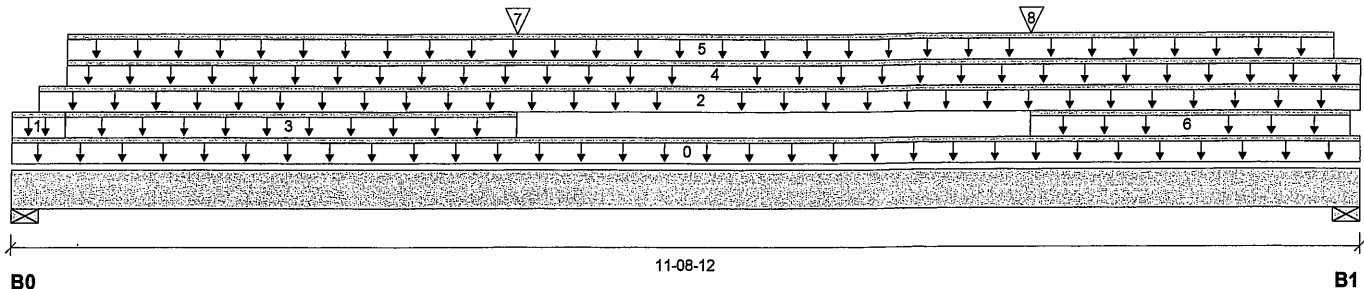
Specifier:

Customer:

Designer: AJ

Code reports: CCMC 12472-R

Company:



Total Horizontal Product Length = 11-08-12

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

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	1,359 / 0	2,484 / 0	2,395 / 0	
B1, 2-3/4"	1,287 / 0	2,645 / 0	2,292 / 0	

### Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	11-08-12		14			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	00-05-07	174				n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	11-08-12	20	10			n/a
3	ROOF	Unf. Lin. (lb/ft)	L	00-05-08	04-04-08	200	206	562		n/a
4	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-05-09	11-08-12	6				n/a
5	WALL	Unf. Lin. (lb/ft)	L	00-05-09	11-06-00		77			n/a
6	ROOF	Unf. Lin. (lb/ft)	L	08-10-08	11-07-12	200	206	562		n/a
7	User Load	Conc. Pt. (lbs)	L	04-04-08	04-04-08	450	1,265	464		n/a
8	User Load	Conc. Pt. (lbs)	L	08-10-08	08-10-08	450	1,265	464		n/a

### Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	18,529 ft-lbs	36,222 ft-lbs	51.2%	13	04-04-08
End Shear	6,179 lbs	17,356 lbs	35.6%	13	01-03-00
Total Load Deflection	L/315 (0.425")	n/a	76.1%	45	05-11-01
Live Load Deflection	L/653 (0.205")	n/a	55.2%	61	05-11-01
Max Defl.	0.425"	n/a	n/a	45	05-11-01
Span / Depth	14.1				

### Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 5-1/2" x 5-1/4"	7,377 lbs	47.8%	20.9%	Unspecified
B1	Wall/Plate 2-3/4" x 5-1/4"	7,388 lbs	95.8%	41.9%	Unspecified


DWG NO. TAM 9654-18  
STRUCTURAL  
COMPONENT ONLY

1st Floor\Flush Beams\B20(i2175)

Dry | 1 span | No cant.

February 20, 2018 15:18:19

BC CALC® Design Report

Build 6215

Job name:

Address:

City, Province, Postal Code: WAT...WN

Customer:

Code reports: CCMC 12472-R

File name: HIGHGROVE 11 EL-2.mmdl

Description: 1st Floor\Flush Beams\B20(i2175)

Specifier:

Designer: AJ

Company:

## Notes

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

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

Calculations assume member is fully braced.

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

BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

Unbalanced snow loads determined from building geometry were used in selected product's verification.

**CONFORMS TO OBC 2012**

Design based on Dry Service Condition.

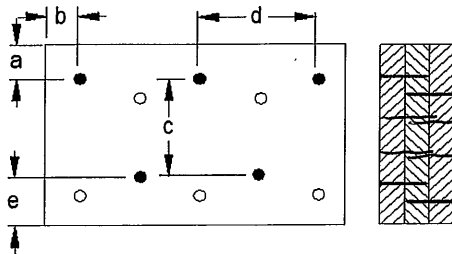
Importance Factor : Normal Part code : Part 9

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Nailing schedule applies to both sides of the member.

Member has no side loads.

## Connection Diagram



4 rows

a minimum = 0"

b minimum = 3"

c = 6 1/2"

d = 4"

e minimum = 2"

Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Nailing schedule applies to both sides of the member.

Member has no side loads.

Connectors are: 16d Nails

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

## Disclosure

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

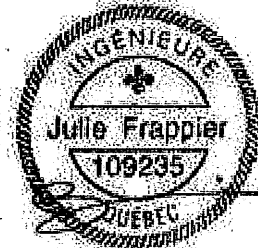
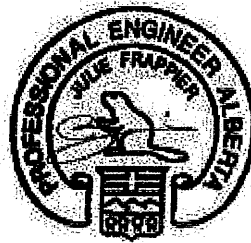


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DWG NO. TAM 9654-18

**STRUCTURAL  
COMPONENT ONLY**





## Maximum Floor Spans

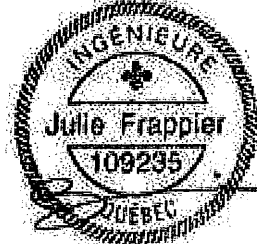
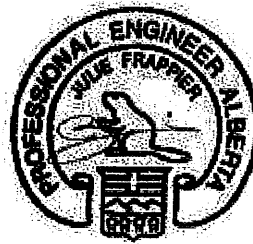
Live Load = 40 psf, Dead Load = 15 psf  
Simple Spans, L/480 Deflection Limit  
5/8" OSB G&N Sheathing

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

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

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



## Maximum Floor Spans

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

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

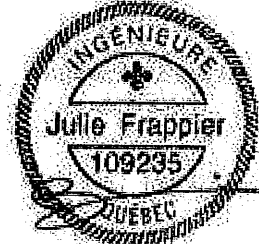
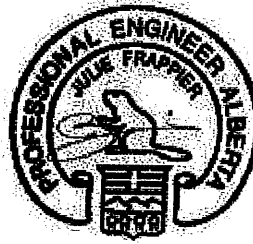
  

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-10"	15'-5"	14'-6"	13'-5"	16'-10"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-8"	17'-2"	16'-3"	15'-2"	18'-10"	17'-2"	16'-3"	15'-2"
	NI-60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

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

## Maximum Floor Spans

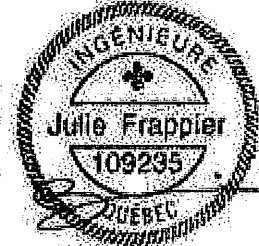
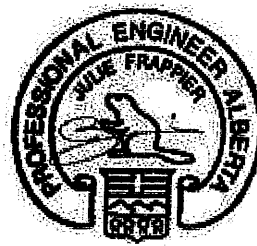
Live Load = 40 psf, Dead Load = 30 psf  
Simple Spans, L/480 Deflection Limit  
5/8" OSB G&N Sheathing



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

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

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



## Maximum Floor Spans

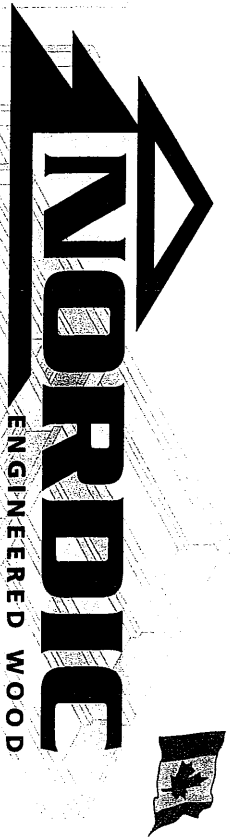
Live Load = 40 psf, Dead Load = 30 psf  
Simple Spans, L/480 Deflection Limit  
3/4" OSB G&N Sheathing

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

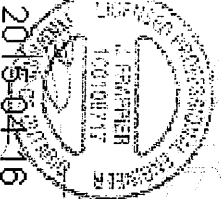
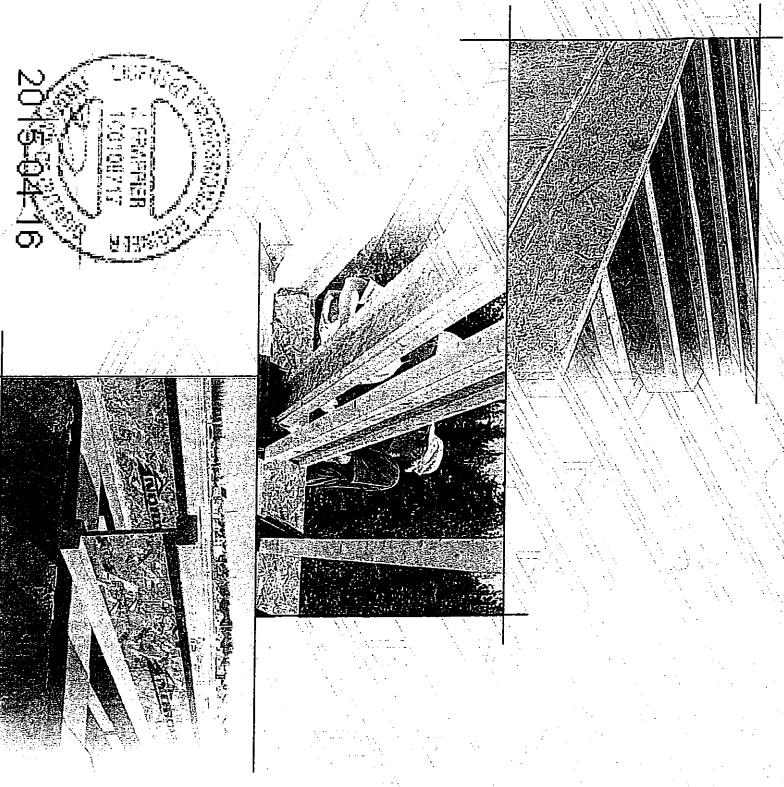
  

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-2"	13'-4"	12'-4"	15'-7"	14'-2"	13'-4"	12'-4"
	NI-40x	17'-9"	16'-1"	15'-1"	13'-11"	17'-9"	16'-1"	15'-1"	13'-11"
	NI-60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

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



# INSTALLATION GUIDE FOR RESIDENTIAL FLOORS



Distributed by:

N-C301 / 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 continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
  - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on center, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
  - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. Never install a damaged I-joist.

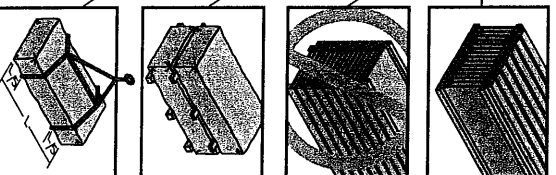
Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to follow allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines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



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

## 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 stock 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 5<sup>th</sup> 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.



The mark of responsible forestry

1. Maximum **clear** spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate

1. Maximum **clear** spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS8-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
6. Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
7. SI units conversion: 1 inch = 25.4 mm  
1 foot = 0.305 m

Joint Depth	Joint Series	Simple spars				Multiple spars			
		On centre spacing				On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
1-10	1-10	15.1	14.2	13.9	13.5	16.3	15.4	14.10	14.2
11-20	11-20	16.1	15.2	14.8	14.5	17.5	16.5	15.10	15.5
21-30	21-30	16.5	15.4	14.10	14.0	17.7	16.7	15.0	16.1
31-40	31-40	16.7	16.1	15.0	14.9	18.7	17.4	16.0	16.10
41-50	41-50	17.5	16.5	15.8	15.7	19.4	17.9	16.11	17.0
51-60	51-60	18.1	17.0	16.5	16.4	20.0	18.6	17.5	17.7
61-70	61-70	18.4	17.5	16.7	16.8	20.8	19.0	18.0	18.1
71-80	71-80	19.4	18.0	17.4	17.5	21.6	19.1	18.4	19.1
81-90	81-90	19.9	18.6	17.6	17.7	21.9	20.2	19.5	19.4
91-100	91-100	20.2	18.9	17.10	17.3	22.5	20.7	19.8	19.4
101-110	101-110	20.4	19.2	17.11	18.0	22.5	20.9	19.10	19.41
111-120	111-120	20.4	19.7	17.10	17.1	22.5	20.9	19.5	19.4
121-130	121-130	20.9	18.1	16.1	16.2	22.7	20.1	20.0	20.5
131-140	131-140	21.7	20.0	19.1	19.2	23.10	22.1	21.10	21.2
141-150	141-150	21.1	20.3	19.4	19.4	23.1	22.5	21.5	21.6
151-160	151-160	20.5	20.0	19.0	19.10	23.0	22.10	21.10	21.10
161-170	161-170	22.1	20.1	18.11	20.4	24.0	23.1	22.10	22.2
171-180	171-180	22.1	20.9	19.0	19.10	24.0	22.5	21.9	21.10
181-190	181-190	23.6	21.5	20.0	20.10	24.0	23.0	22.1	23.0
191-200	191-200	23.1	22.1	21.5	21.5	24.5	23.5	23.5	23.6
201-210	201-210	24.5	22.6	21.5	21.5	24.5	24.10	23.9	23.9
211-220	211-220	24.8	22.9	21.9	21.10	27.5	26.2	24.0	24.1

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



## RECOMMENDATIONS:

- A **bearing stiffener** is required in all engineered applications with factored reactions greater than shown in the I-Ioist properties table found in the *I-Ioist Construction Guide* (C101). The gap between the stiffener and the flange is at the top.
- A **bearing stiffener** is required when the I-Ioist 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.

The diagram illustrates the required number of nails for different loading conditions on a beam-to-column joint. It is divided into two main sections: **CONCENTRATED LOAD** and **END BEARING**.

**CONCENTRATED LOAD (Load stiffener)**: This section shows a beam with a load stiffener. The required number of nails is indicated as **(4) 2-1/2" nails, 3" nails required for I-joists with 3-1/2" flange width**. The diagram also shows a **Tight Joint** and a **Gap** between the beam and the column.

**END BEARING (Reaction stiffener)**: This section shows a beam with a reaction stiffener. The required number of nails is indicated as **(4) 2-1/2" nails, 3" nails required for I-joists with 3-1/2" flange width**. The diagram also shows a **Tight Joint** and a **Gap** between the beam and the column.

**Flange width**: The flange width is specified as **2-1/2" or 3-1/2"**.

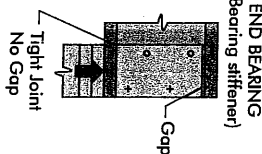
**Approx. 2" I**: The beam is labeled as **Approx. 2" I**.

**Approx. 2" I**: The column is labeled as **Approx. 2" I**.

**1/8"-1/4" Gap**: The gap between the beam and the column is labeled as **1/8"-1/4" Gap**.

**No Gap**: The diagram also indicates **No Gap** between the beam and the column.

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

[illegible]

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

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

2015-04-16

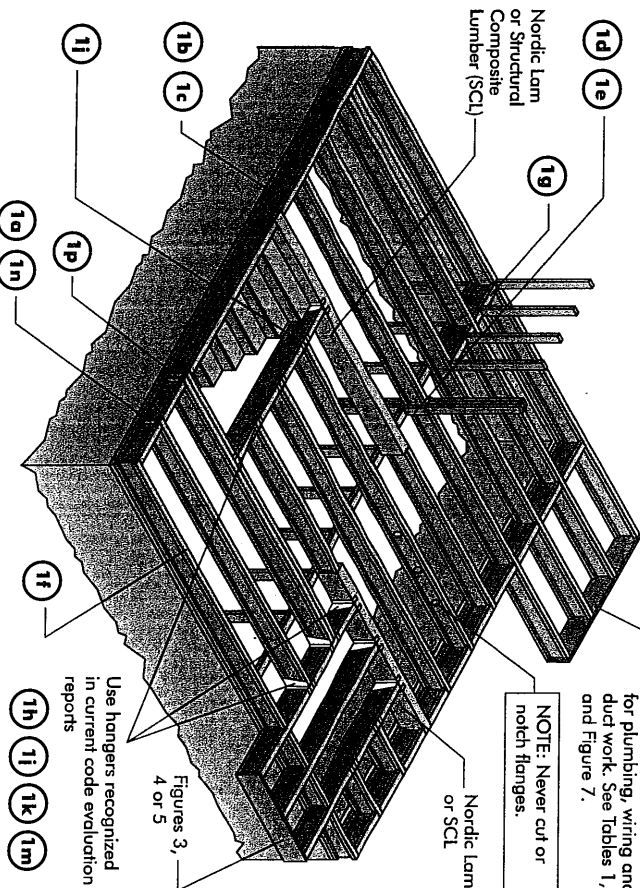
# INSTALLING NORDIC I-JOISTS

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

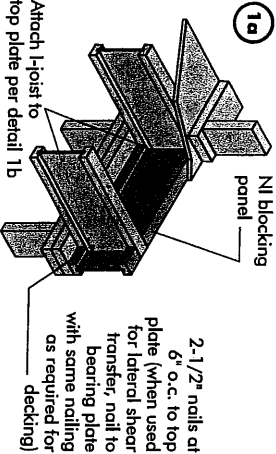
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FIGURE 1  
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

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

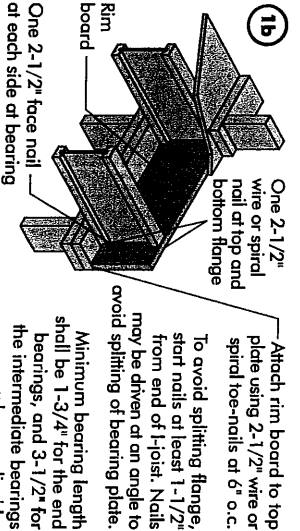


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir, No. 2 or better. Individual components not shown to scale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



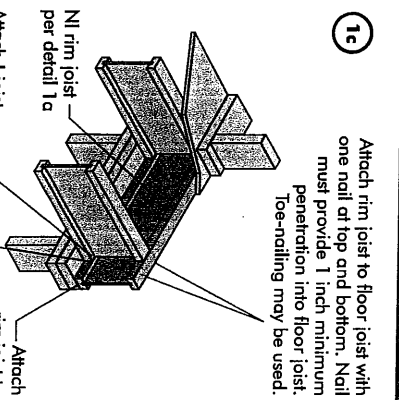
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
NI Joists	3,300

\*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.



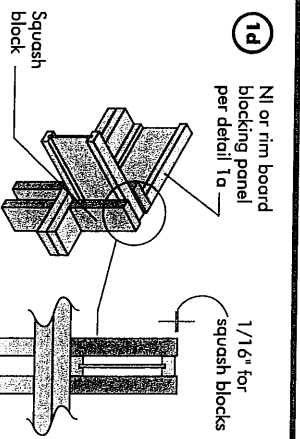
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

\*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)
NI rim joist	per detail 1a

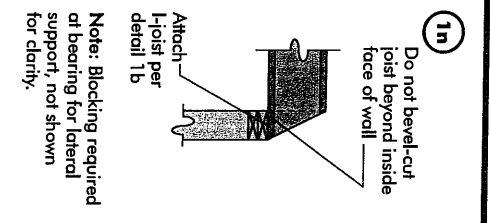
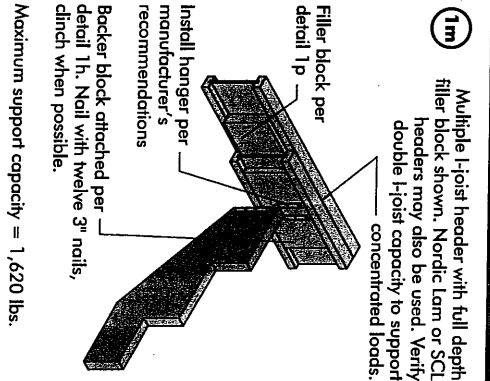
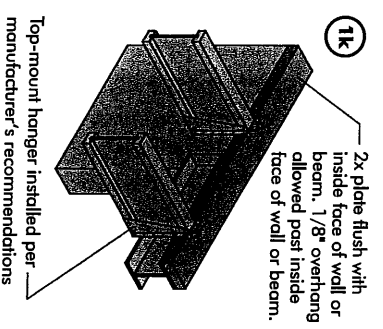
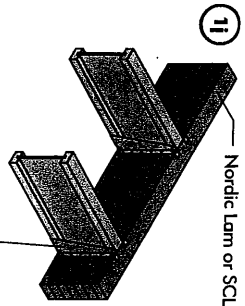
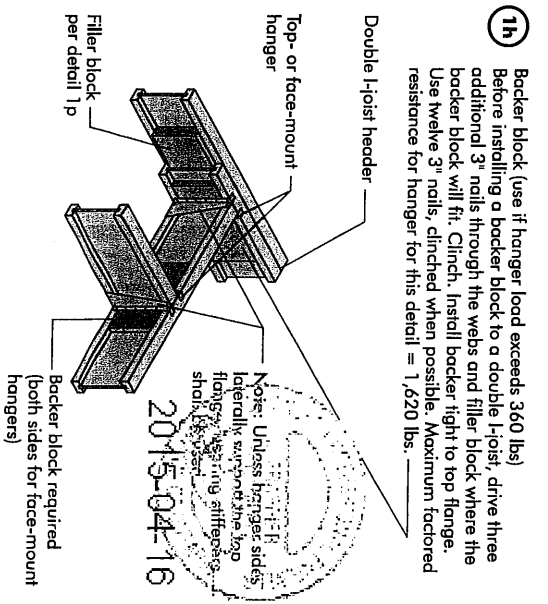
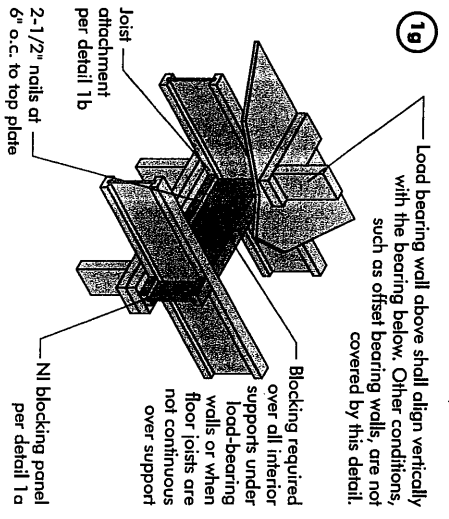
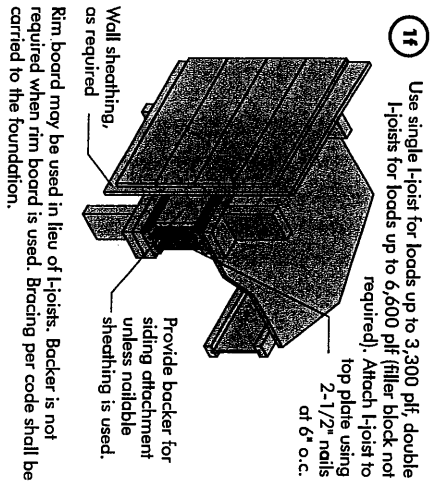
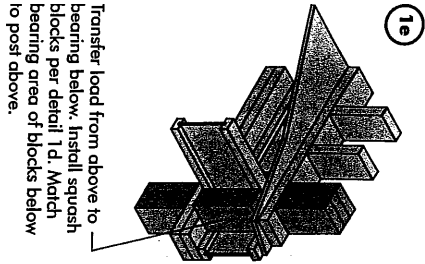
Attach I-joist per detail 1b



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

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





**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-Q325 or CAN/CSA-Q437 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".

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

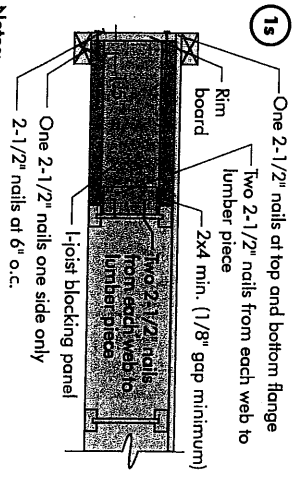
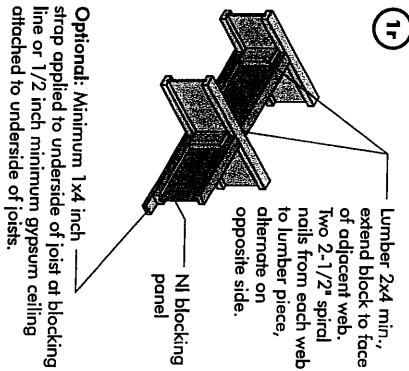
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

**Notes:**

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

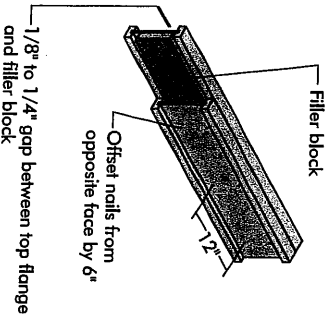
**FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION**

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



**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.



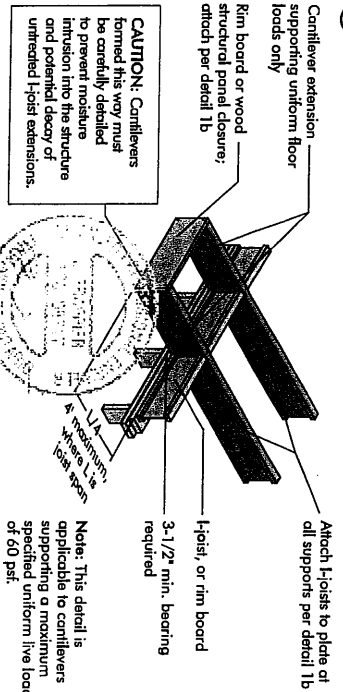
1/8" to 1/4" gap between top flange and filler block

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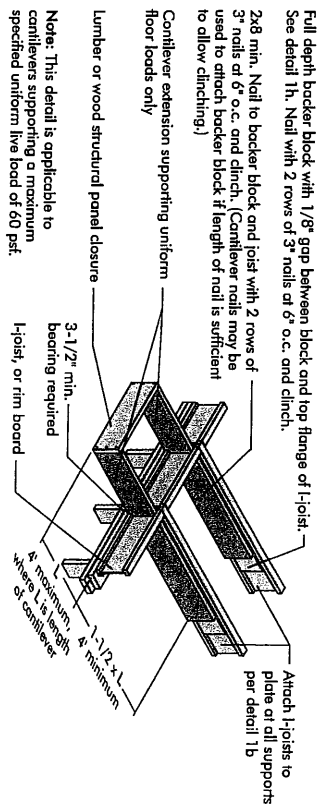


## CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

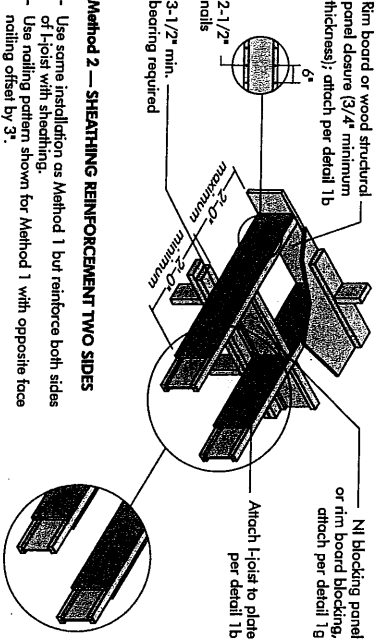


### 3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



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

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

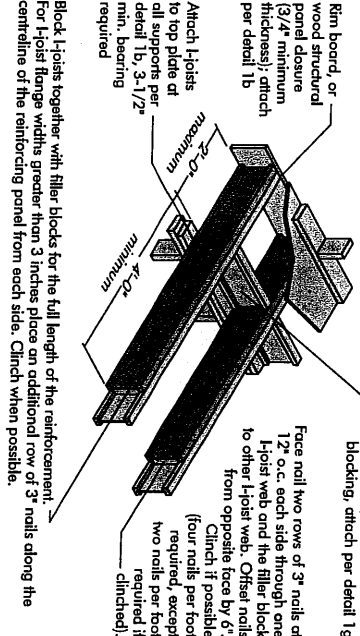


### Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- 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



### CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	ROOF LOADING (UNFACTORED)			
		LL = 30 psf, DL = 15 psf JOIST SPACING (in.)	LL = 40 psf, DL = 15 psf JOIST SPACING (in.)	LL = 50 psf, DL = 15 psf JOIST SPACING (in.)	LL = 60 psf, DL = 15 psf JOIST SPACING (in.)
9 1/2	25	12	16	19.2	24
12	28	12	16	19.2	24
14	30	12	16	19.2	24
16	32	12	16	19.2	24
18	34	12	16	19.2	24
20	36	12	16	19.2	24
22	38	12	16	19.2	24
24	40	12	16	19.2	24
26	42	12	16	19.2	24
28	44	12	16	19.2	24
30	46	12	16	19.2	24
32	48	12	16	19.2	24
34	50	12	16	19.2	24
36	52	12	16	19.2	24
38	54	12	16	19.2	24
40	56	12	16	19.2	24
42	58	12	16	19.2	24
44	60	12	16	19.2	24
46	62	12	16	19.2	24
48	64	12	16	19.2	24
50	66	12	16	19.2	24
52	68	12	16	19.2	24
54	70	12	16	19.2	24
56	72	12	16	19.2	24
58	74	12	16	19.2	24
60	76	12	16	19.2	24
62	78	12	16	19.2	24
64	80	12	16	19.2	24
66	82	12	16	19.2	24
68	84	12	16	19.2	24
70	86	12	16	19.2	24
72	88	12	16	19.2	24
74	90	12	16	19.2	24
76	92	12	16	19.2	24
78	94	12	16	19.2	24
80	96	12	16	19.2	24
82	98	12	16	19.2	24
84	100	12	16	19.2	24
86	102	12	16	19.2	24
88	104	12	16	19.2	24
90	106	12	16	19.2	24
92	108	12	16	19.2	24
94	110	12	16	19.2	24
96	112	12	16	19.2	24
98	114	12	16	19.2	24
100	116	12	16	19.2	24
102	118	12	16	19.2	24
104	120	12	16	19.2	24
106	122	12	16	19.2	24
108	124	12	16	19.2	24
110	126	12	16	19.2	24
112	128	12	16	19.2	24
114	130	12	16	19.2	24
116	132	12	16	19.2	24
118	134	12	16	19.2	24
120	136	12	16	19.2	24
122	138	12	16	19.2	24
124	140	12	16	19.2	24
126	142	12	16	19.2	24
128	144	12	16	19.2	24
130	146	12	16	19.2	24
132	148	12	16	19.2	24
134	150	12	16	19.2	24
136	152	12	16	19.2	24
138	154	12	16	19.2	24
140	156	12	16	19.2	24
142	158	12	16	19.2	24
144	160	12	16	19.2	24
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148	164	12	16	19.2	24
150	166	12	16	19.2	24
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154	170	12	16	19.2	24
156	172	12	16	19.2	24
158	174	12	16	19.2	24
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164	180	12	16	19.2	24
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170	186	12	16	19.2	24
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174	190	12	16	19.2	24
176	192	12	16	19.2	24
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180	196	12	16	19.2	24
182	198	12	16	19.2	24
184	200	12	16	19.2	24
186	202	12	16	19.2	24
188	204	12	16	19.2	24
190	206	12	16	19.2	24
192	208	12	16	19.2	24
194	210	12	16	19.2	24
196	212	12	16	19.2	24
198	214	12	16	19.2	24
200	216	12	16	19.2	24
202	218	12	16	19.2	24
204	220	12	16	19.2	24
206	222	12	16	19.2	24
208	224	12	16	19.2	24
210	226	12	16	19.2	24
212	228	12	16	19.2	24
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220	236	12	16	19.2	24
222	238	12	16	19.2	24
224	240	12	16	19.2	24
226	242	12	16	19.2	24
228	244	12	16	19.2	24
230	246	12	16	19.2	24
232	248	12	16	19.2	24
234	250	12	16	19.2	24
236	252	12	16	19.2	24
238	254	12	16	19.2	24
240	256	12	16	19.2	24
242	258	12	16	19.2	24
244	260	12	16	19.2	24
246	262	12	16	19.2	24
248	264	12	16	19.2	24
250	266	12	16	19.2	24
252	268	12	16	19.2	24
254	270	12	16	19.2	24
256	272	12	16	19.2	24
258	274	12	16	19.2	24
260	276	12	16	19.2	24
262	278	12	16	19.2	24
264	280	12	16	19.2	24
266	282	12	16	19.2	24
268	284	12	16	19.2	24
270	286	12	16	19.2	24
272	288	12	16	19.2	24
274	290	12	16	19.2	24
276	292	12	16	19.2	24
278	294	12	16	19.2	24
280	296	12	16	19.2	24
282	298	12	16	19.2	24
284	300	12	16	19.2	24
286	302	12	16	19.2	24
288	304	12	16	19.2	24
290	306	12	16	19.2	24
292	308	12	16	19.2	24
294	310	12	16	19.2	24
296	312	12	16	19.2	24
298	314	12	16	19.2	24
300	316	12	16	19.2	24
302	318	12	16	19.2	24
304	320	12	16	19.2	24
306	322	12	16	19.2	24
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312	328	12	16	19.2	24
314	330	12	16	19.2	24
316	332	12	16	19.2	24
318	334	12	16	19.2	24
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322	338	12	16	19.2	24
324	340	12	16	19.2	24
326	342	12	16	19.2	24
328	344	12	16	19.2	24
330	346	12	16	19.2	24
332	348	12	16	19.2	24
334	350	12	16	19.2	24
336	352	12	16	19.2	24
338	354	12	16	19.2	24
340	356	12	16	19.2	24
342	358	12	16	19.2	24
344	360	12	16	19.2	24
346	362	12	16	19.2	24
348	364	12	16	19.2	24
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352	368	12	16	19.2	24
354	370	12	16	19.2	24
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370	386	12	16	19.2	24
372	388	12	16	19.2	24
374	390	12	16	19.2	24
376	392	12	16	19.2	24
378	394	12	16	19.2	24
380	396	12	16	19.2	24
382	398	12	16	19.2	24
384	400	12	16	19.2	24
386	402	12	16	19.2	24
388	404	12	16	19.2	24
390	406	12	16	19.2	24
392	408	12	16	19.2	24
394	410	12	16	19.2	24
396	412	12	16	19.2	24
398	414	12	16	19.2	24
400	416	12	16	19.2	24
402	418	12	16	19.2	24
404	420	12	16	19.2	24
406	422	12	16	19.2	24
408	424	12	16	19.2	24
410	426	12	16	19.2	24
412	428	12	16	19.2	24
414	430	12	16	19.2	24
416	432	12	16	19.2	24
418	434	12	16	19.2	24
420	436	12	16	19.2	24
422	438	12	16	19.2	24
424	440	12	16	19.2	24
426	442	12	16	19.2	24
428	444	12	16	19.2	24
430	446	12	16	19.2	24
432	448	12	16	19.2	24
434	450	12	16	19.2	24
436	452	12	16	19.2	24
438	454	12	16	19.2	24
440	456	12	16	19.2	24
442	458	12	16	19.2	24
444	460	12	16	19.2	24
446	462	12	16	19.2	24
448	464	12	16	19.2	24
450	466	12	16	19.2	24
452	468	12	16	19.2	24
454	470	12	16	19.2	24
456	472	12	16	19.2	24
458	474	12	16	19.2	24
460	476	12	16	19.2	24
462	478	12	16	19.2	24
464	480	12	16	19.2	24
466	482	12	16	19.2	24
468	484	12	16	19.2	24
470	486	12	16	19.2	24
472	488	12	16	19.2	24
474	490	12	16	19.2	24
476	492	12	16	19.2	24
478	494	12	16	19.2	24
480	496	12	16	19.2	24
482	498	12	16	19.2	24
484	500	12	16	19.2	24
486	502	12	16	19.2	24
488	504	12	16	19.2	24
490	506	12	16	19.2	24
492	508	12	16	19.2	24
494	510	12	16	19.2	24
496	512	12	16	19.2	24
498	514	12	16	19.2	24
500	516	12	16	19.2	

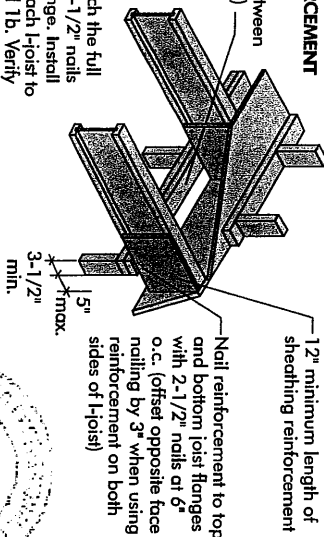


# BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

## 5d SHEATHING REINFORCEMENT

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

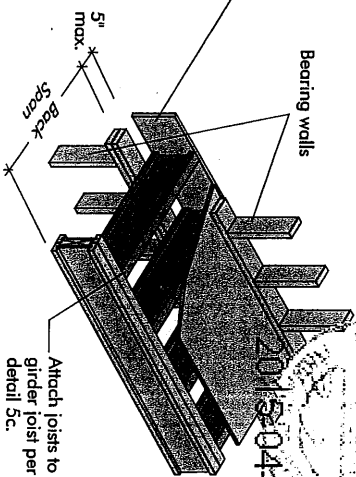
**Note:** Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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



## 5b SET-BACK DETAIL

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

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



## 5c SET-BACK CONNECTION

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

Alternate for opposite side.

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

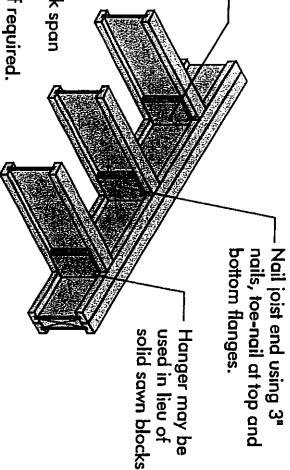
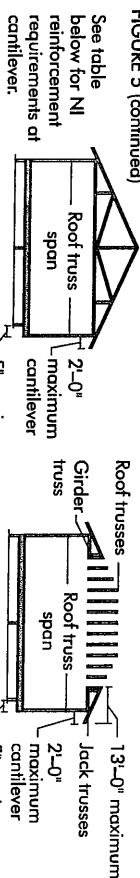


FIGURE 5 (continued)



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)				ROOF LOADING (UNFACTORED)			
		LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf			
		JOIST SPACING (in.)				JOIST SPACING (in.)			
		12	16	19.2	24	12	16	19.2	24
2 1/2"	26	X	X	X	X	X	X	X	X
	28	X	X	X	X	X	X	X	X
	30	X	X	X	X	X	X	X	X
	32	X	X	X	X	X	X	X	X
	34	X	X	X	X	X	X	X	X
	36	X	X	X	X	X	X	X	X
	38	X	X	X	X	X	X	X	X
	40	X	X	X	X	X	X	X	X
	42	X	X	X	X	X	X	X	X
3 1/2"	26	X	X	X	X	X	X	X	X
	28	X	X	X	X	X	X	X	X
	30	X	X	X	X	X	X	X	X
	32	X	X	X	X	X	X	X	X
	34	X	X	X	X	X	X	X	X
	36	X	X	X	X	X	X	X	X
	38	X	X	X	X	X	X	X	X
	40	X	X	X	X	X	X	X	X
	42	X	X	X	X	X	X	X	X
4"	26	X	X	X	X	X	X	X	X
	28	X	X	X	X	X	X	X	X
	30	X	X	X	X	X	X	X	X
	32	X	X	X	X	X	X	X	X
	34	X	X	X	X	X	X	X	X
	36	X	X	X	X	X	X	X	X
	38	X	X	X	X	X	X	X	X
	40	X	X	X	X	X	X	X	X
	42	X	X	X	X	X	X	X	X
6"	26	X	X	X	X	X	X	X	X
	28	X	X	X	X	X	X	X	X
	30	X	X	X	X	X	X	X	X
	32	X	X	X	X	X	X	X	X
	34	X	X	X	X	X	X	X	X
	36	X	X	X	X	X	X	X	X
	38	X	X	X	X	X	X	X	X
	40	X	X	X	X	X	X	X	X
	42	X	X	X	X	X	X	X	X

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

## RIM BOARD INSTALLATION DETAILS

- ## FASTENERS FOR SHEATHING AND SUBFLOORING<sup>(1)</sup>

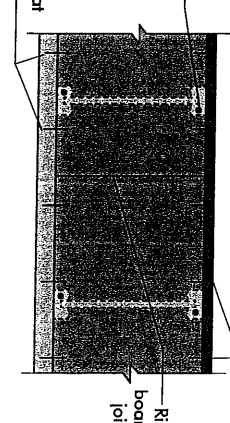
1. Fasteners of sheathing and subflooring shall conform to the above table.
2. Staples shall not be less than 1/1.6-inch in diameter or thickness, with not less than a 3/8-inch crown driven with the crown parallel to framing.
3. Flooring screws shall not be less than 1/8-inch in diameter.
4. Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.
5. Use only adhesives conforming to CAN/CGSB-71.26 Standard, Adhesives for Field-Gluing Plywood to Lumber Framing for Floor System, applied in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.

**IMPORTANT NOTE:**

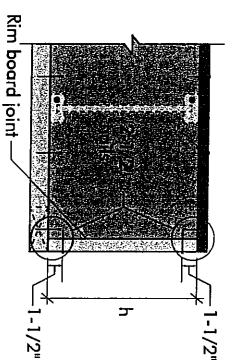
spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.

### Rim board Joint Between Floor Joists

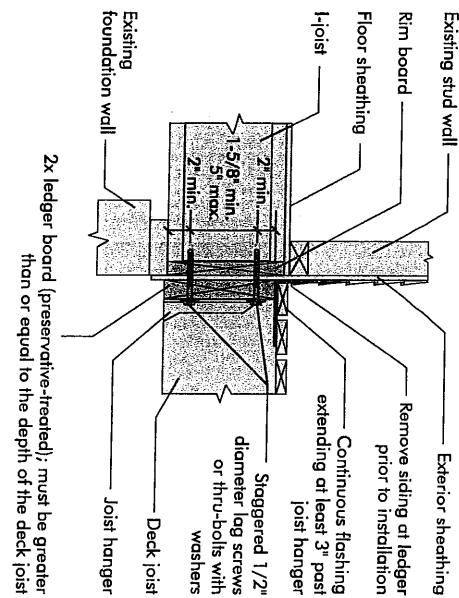
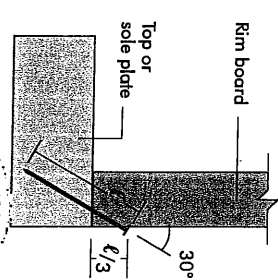
(1) 2-1/2" nail  
top and bottom  
(typical)



1-1/2"



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



*Chamber's Chibogamas guarantees that, in accordance with our specifications, Nordic products are free from manufacturing defects in material and workmanship.*

Furthermore, Chemiers Chibrogama 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.



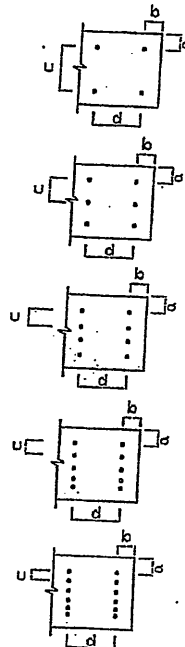


# MICRO CITY ENGINEERING SERVICES INC.

TEL: (519) 287 - 2242

R.R. #1, P.O. BOX 61, GLENCOE, ONTARIO, N0L 1M0

LVL HEADER AND CONVENTIONAL LUMBER NAILING DETAILS		
DETAIL NUMBER	NUMBER OF ROWS	SPACING (INCHES o/c) "d"
A	2	12
B	2	8
C	2	6
D	2	4
1A	3	12
1B	3	8
1C	3	6
1D	3	4
2A	4	12
2B	4	8
2C	4	6
2D	4	4
3A	5	12
3B	5	8
3C	5	6
3D	5	4
4A	6	12
4B	6	8
4C	6	6
4D	6	4



## NOTES:

- (1) MINIMUM LUMBER EDGE DISTANCE "a" = 1"
- (2) MINIMUM LUMBER END DISTANCE "b" = 2"
- (3) MINIMUM NAIL ROW SPACING "c" = 2"
- (4) STAGGER NAILS "d/2" BETWEEN PLYS FOR MULTI-PLY MEMBERS (3 PLY OR MORE)
- (5) ALL NAILS ARE 3-1/2" ARDOX SPIRAL NAILS
- (6) DO NOT USE AIR-DRIVEN NAILS



DWG NO TAMN1001-14

STRUCTURAL  
COMPONENT ONLY

TO BE USED ONLY  
WITH BEAM CALCS  
BEARING THE  
STAMP BELOW

PROVIDE NAILING  
DETAIL # X SEE  
DWG #TAMN1001-14