

FROM PLAN DATED: OCT 2017

BUILDER: GREEN PARK HOMES

SITE: SECONDO VALES ESTATES

MODEL: HOLLAND 3A

ELEVATION: 1, 2

LOT:

CITY: EAST GWILLIMBURY

SALESMAN: M D

DESIGNER: AJ

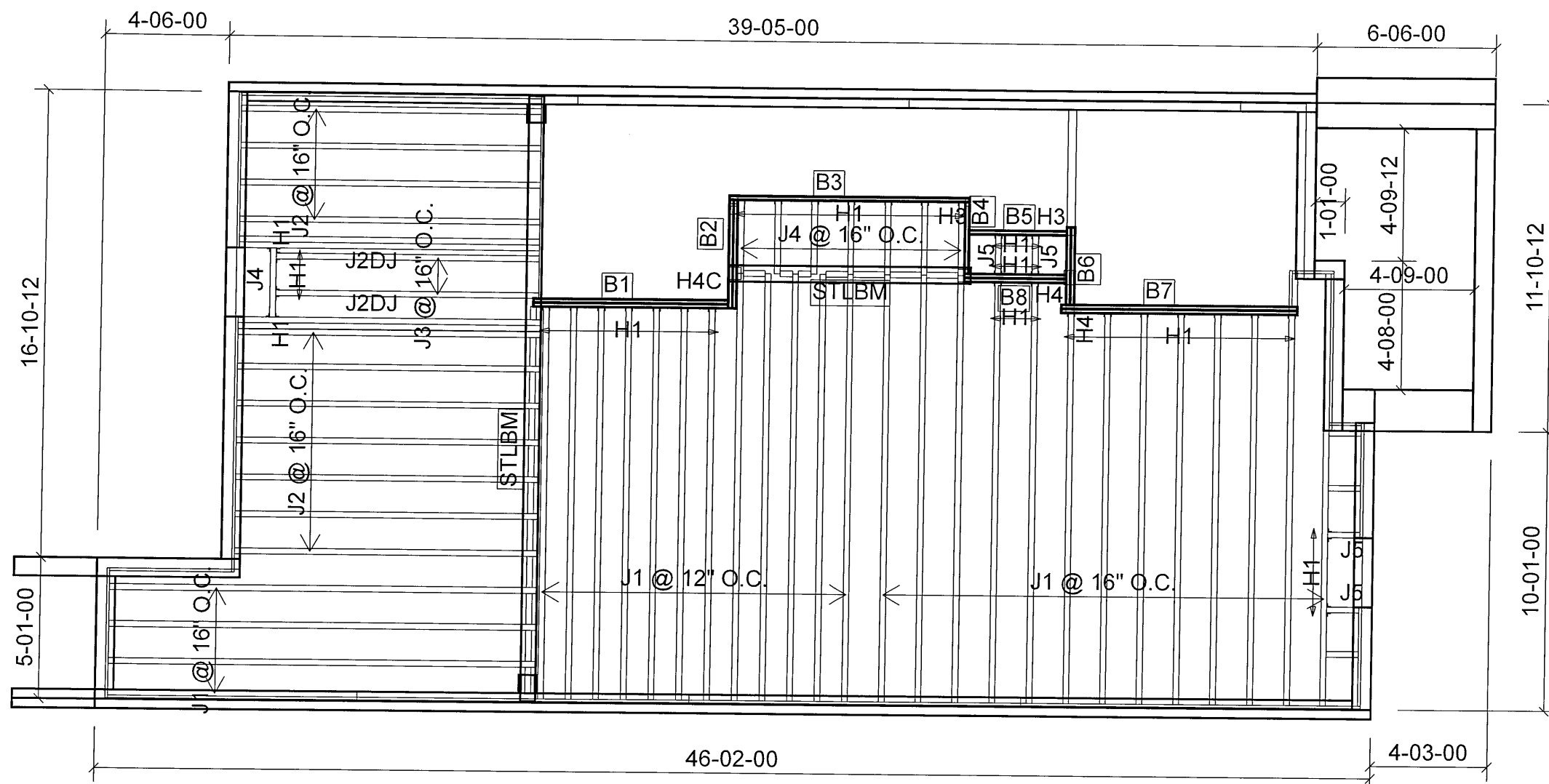
REVISION: lbv

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

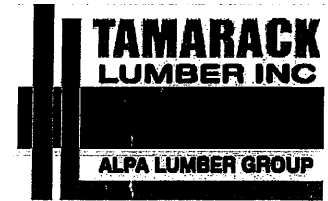
LOADING:
DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²
SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 2018-01-29

1st FLOOR



Products					Connector Summary		
PlotID	Length	Product	Plies	Net Qty	Qty	Manuf	Product
J1	16-00-00	9 1/2" NI-40x	1	29	9	H1	IUS2.56/9.5
J2	12-00-00	9 1/2" NI-40x	1	11	18	H1	IUS2.56/9.5
J2DJ	12-00-00	9 1/2" NI-40x	2	4	2	H1	IUS2.56/9.5
J3	10-00-00	9 1/2" NI-40x	1	2	4	H1	IUS2.56/9.5
J4	4-00-00	9 1/2" NI-40x	1	8	1	H3	HUS1.81/10
J5	2-00-00	9 1/2" NI-40x	1	4	1	H3	HUS1.81/10
B3	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1	1	H4C	HUC410
B7	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2	2	H4	HGUS410
B1	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			
B4	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1			
B5	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1			
B2	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			
B6	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			
B8	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			



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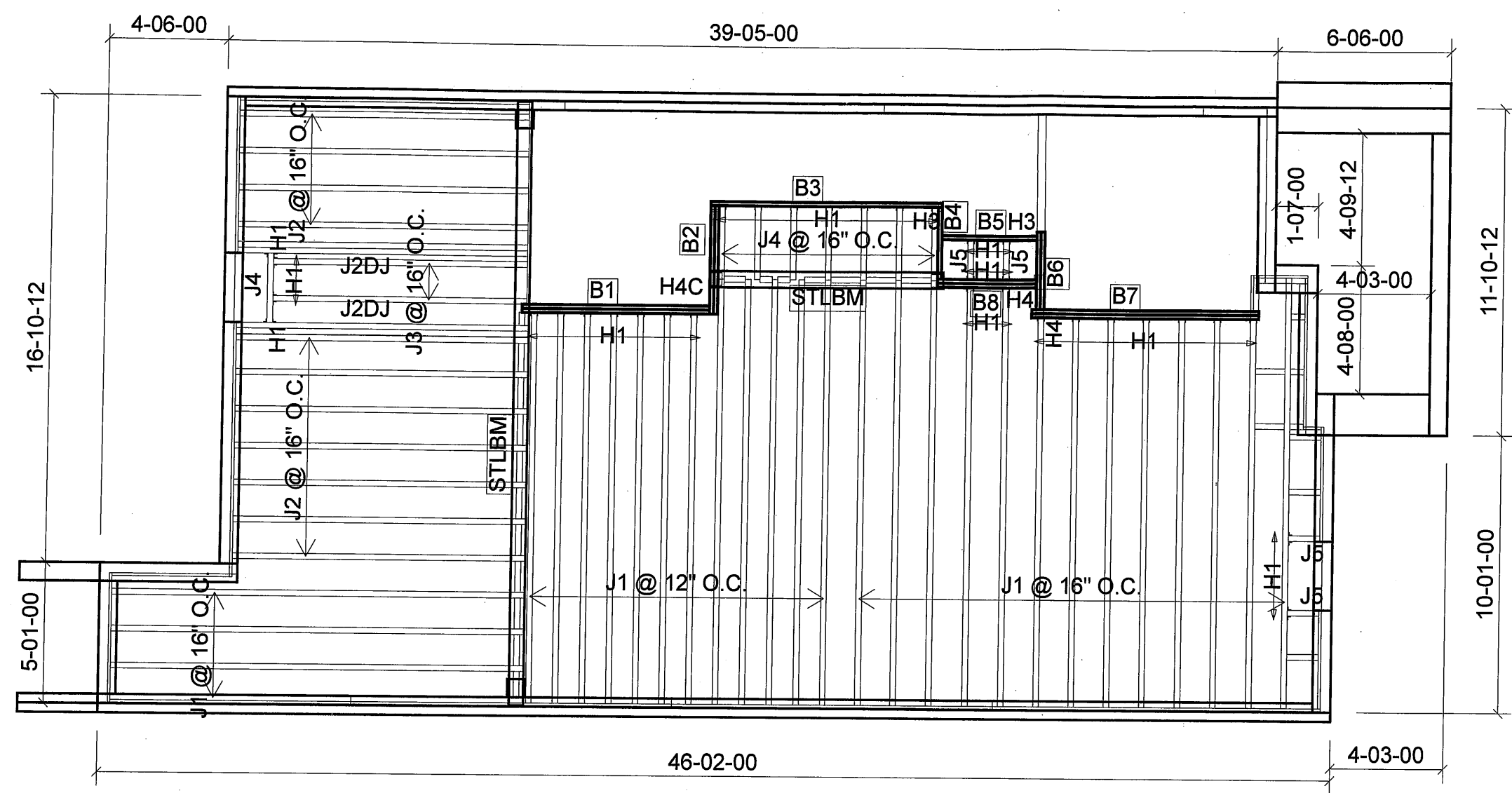
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SQUASH BLOCKS OF 2x4, 2x6, 2x8 #2 S.P.F
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LOADS. SEE FIGURE 1. **CANTILEVERED**
JOISTS INCLUDING **CANT' OVER BRICK** REQ.
I-JOIST BLOCKING ALONG BEARING AND
RIMBOARD CLOSURE AT ENDS. SEE
FIGURES 4 & 5 FOR REINFORCEMENT
REQUIREMENTS. FOR **HOLES** INCLUDING
DUCT CHASE AND **FIELD CUT OPENINGS**
SEE FIGURE 7, TABLES 1 & 2. **CERAMIC TILE**
APPLICATION AS PER O.B.C 9.30.6.

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

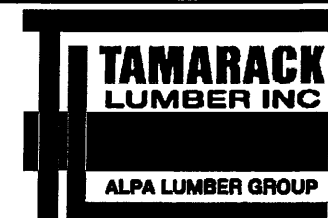
SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 2018-01-20

1st FLOOR



Products					Connector Summary		
PlotID	Length	Product	Plies	Net Qty	Qty	Manuf	Product
J1	16-00-00	9 1/2" NI-40x	1	29	9	H1	IUS2.56/9.5
J2	12-00-00	9 1/2" NI-40x	1	11	18	H1	IUS2.56/9.5
J2DJ	12-00-00	9 1/2" NI-40x	2	4	2	H1	IUS2.56/9.5
J3	10-00-00	9 1/2" NI-40x	1	2	4	H1	IUS2.56/9.5
J4	4-00-00	9 1/2" NI-40x	1	8	1	H3	HUS1.81/10
J5	2-00-00	9 1/2" NI-40x	1	4	1	H3	HUS1.81/10
B3	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1	1	H4C	HUC410
B7	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2	2	H4	HGUS410
B1	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			
B4	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1			
B5	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1			
B2	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2			
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ELEVATION: 1

LOT:

CITY: EAST GWILLIMBURY

SALESMAN: M D

DESIGNER: AJ

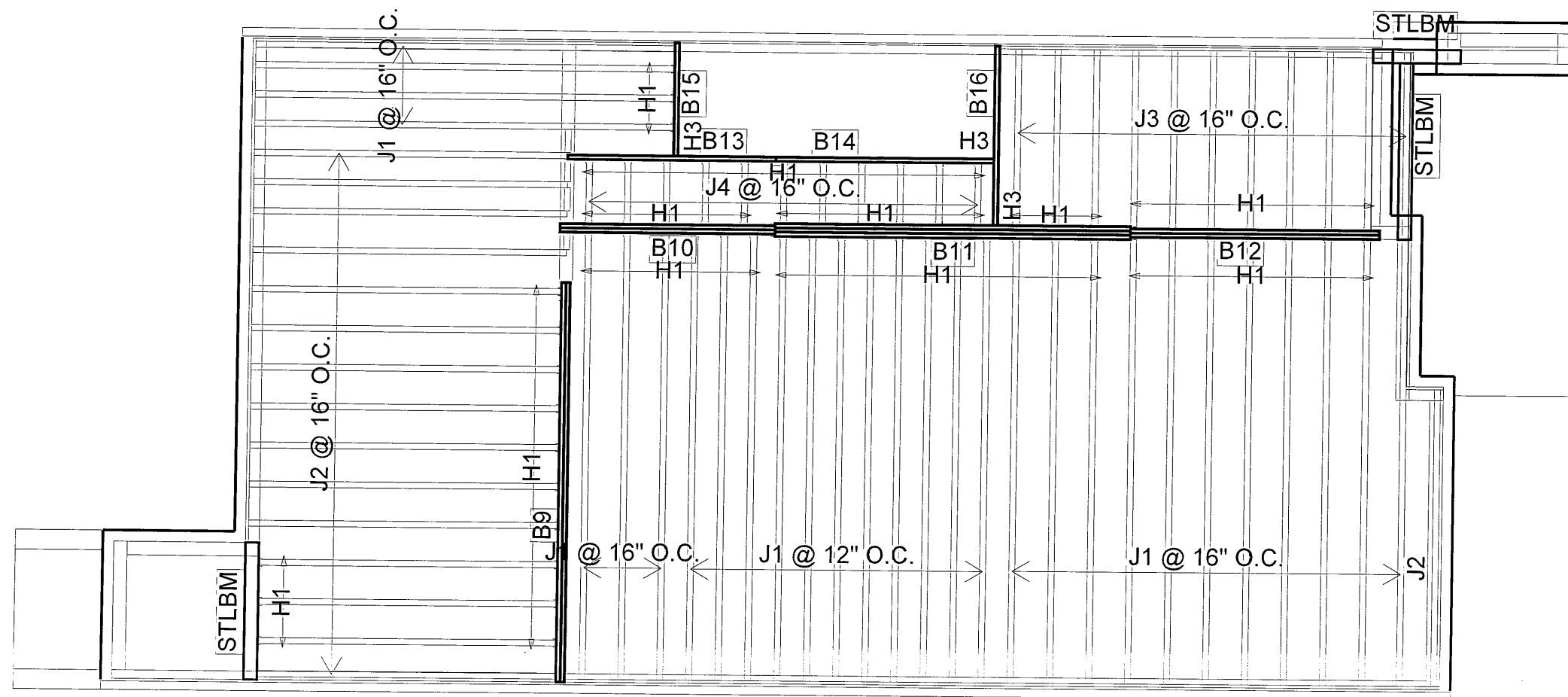
REVISION: lbv

NOTES:
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LOADING:
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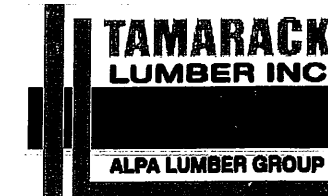
DATE: 2017-11-23

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	29
J2	12-00-00	9 1/2" NI-40x	1	16
J3	8-00-00	9 1/2" NI-40x	1	11
J4	4-00-00	9 1/2" NI-40x	1	11
B9	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B12	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B13	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B14	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B16	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B10	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B15	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1

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



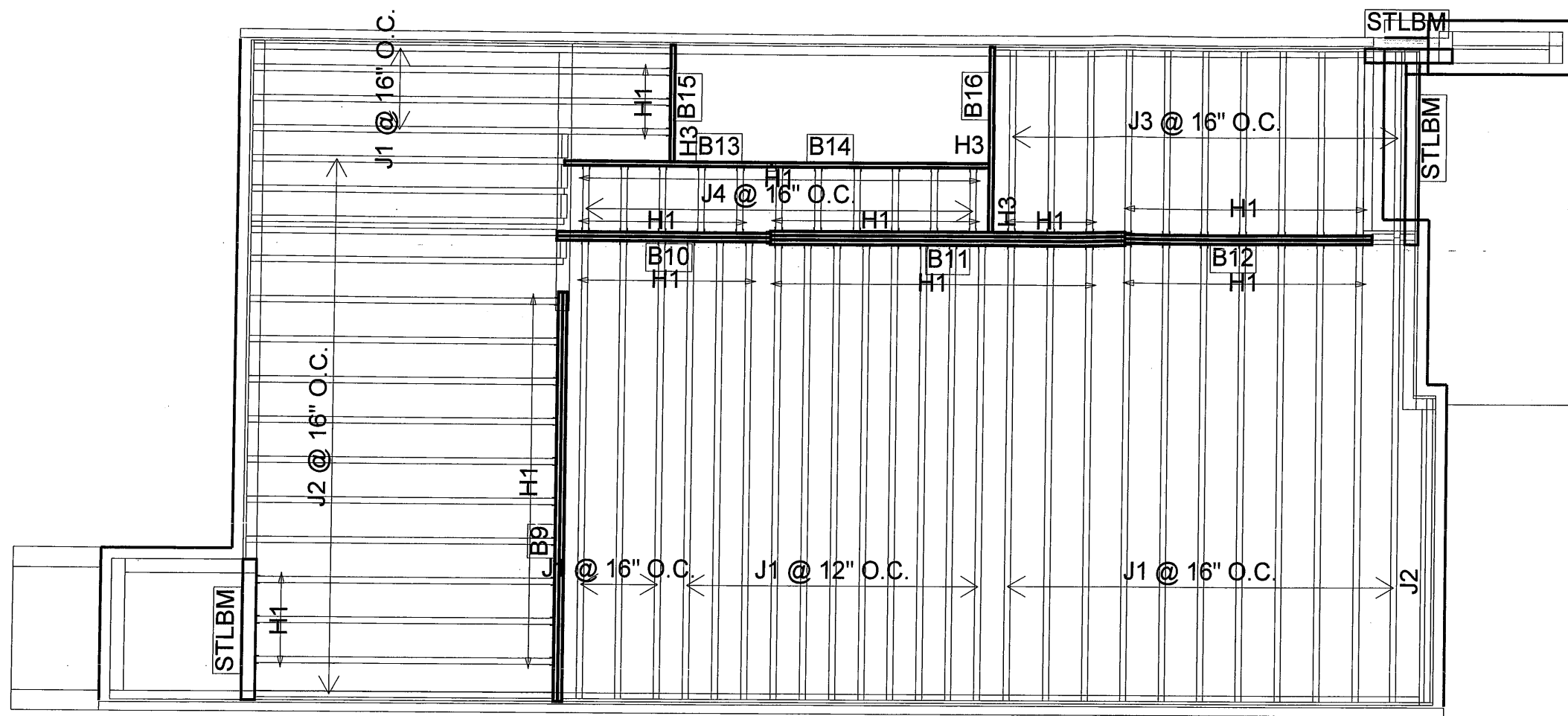
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DESIGN LOADS: L/480.000
LIVE LOAD: 40.0 lb/ft²
DEAD LOAD: 15.0 lb/ft²
TILED AREAS: 20 lb/ft²
SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 2017-11-23

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	29
J2	12-00-00	9 1/2" NI-40x	1	16
J3	8-00-00	9 1/2" NI-40x	1	11
J4	4-00-00	9 1/2" NI-40x	1	11
B9	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B12	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B13	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B14	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B16	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B10	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B15	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1

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

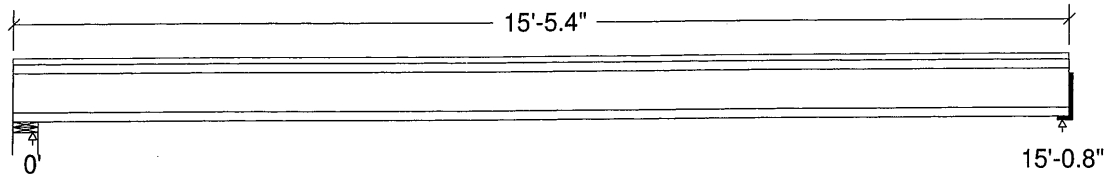
Design Check Calculation Sheet

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	209		203
Live	417		407
Factored:			
Total	887		864
Bearing:			
Resistance			
Joist	1893		1859
Support	7735		-
Des ratio			
Joist	0.47		0.46
Support	0.11		-
Load case	#2		#2
Length	4-3/8		2*
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		-
fcp sup	769		-
Kzcp sup	1.15		-

*Minimum bearing length for joists is 2" 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.

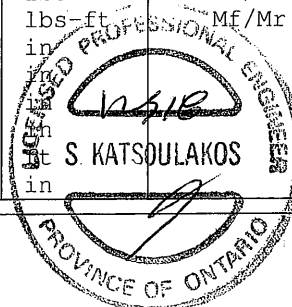
Supports: 1 - Lumber Wall, No.1/No.2; 2 - Hanger;

Total length: 15'-5.4"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 854	Vr = 1895	lbs	Vf/Vr = 0.45
Moment (+)	Mf = 3215	Mr = 4824	lbs-ft	Mf/Mr = 0.67
Perm. Defl'n	0.13 = <L/999	0.50 = L/360	in	0.26
Live Defl'n	0.26 = L/694	0.38 = L/480	in	0.69
Total Defl'n	0.39 = L/463	0.75 = L/240	in	0.52
Bare Defl'n	0.31 = L/578	0.50 = L/360	in	0.62
Vibration	Lmax = 15'-1	Lv = 15'-9	ft	
Defl'n	= 0.038	= 0.043	in	0.86



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_Ieff = 268e06 lb-in² 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 5354
STRUCTURAL
COMPONENT ONLY

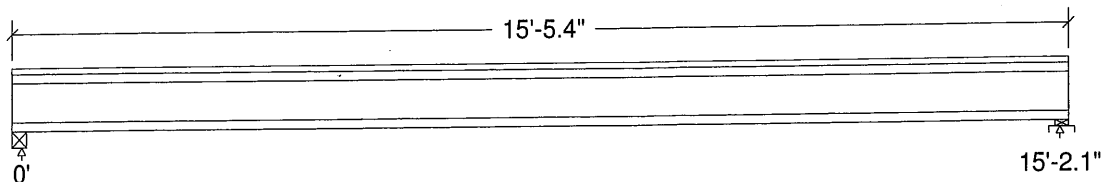
Design Check Calculation Sheet

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) :



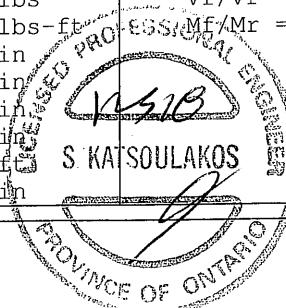
Unfactored:			
Dead	206		206
Live	413		411
Factored:			
Total	877		874
Bearing:			
Resistance			
Joist	1869		1865
Support	-		3651
Des ratio			
Joist	0.47		0.47
Support	-		0.24
Load case	#2		#2
Length	2-5/8		2-3/8
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	-		1.00
fcp sup	-		769
Kzcp sup	-		1.00

*Minimum bearing length for joists is 2" for exterior supports

Nordic Joist 9-1/2" NI-40x Floor joist @ 16" o.c.
Supports: 1 - Steel Beam, W; 2 - Lumber Sill plate, No.1/No.2;
Total length: 15'-5.4"; 3/4" nailed and glued OSB sheathing
This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 860	Vr = 1895	lbs	Vf/Vr = 0.45
Moment (+)	Mf = 3264	Mr = 4824	lbs-ft	Mf/Mr = 0.68
Perm. Defl'n	0.13 = <L/999	0.51 = L/360	in	0.26
Live Defl'n	0.26 = L/698	0.38 = L/480	in	0.69
Total Defl'n	0.39 = L/465	0.76 = L/240	in	0.52
Bare Defl'n	0.32 = L/565	0.51 = L/360	in	0.64
Vibration	Lmax = 15'-2	Lv = 16'-2	in	0.82
Defl'n	= 0.035	= 0.043		



J1 GRD FLR

Nordic Sizer – Canada 6.4

Page 2

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

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Shear : LC #2 = 1.25D + 1.5L

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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

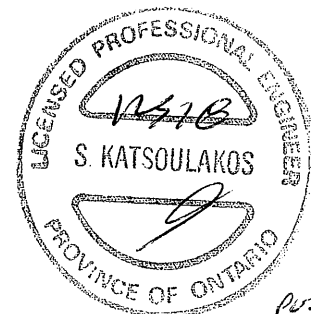
CALCULATIONS:Deflection: E_Ieff = 276e06 lb-in² K= 4.94e06 lbs

"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).
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.

CONFORMS TO OBC 2012



DWG NO. TAM 5355 -18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B1(i2253)

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

November 23, 2017 14:11:32

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

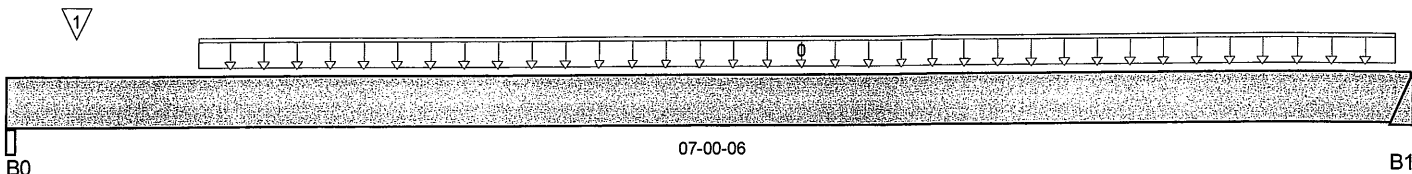
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i2253)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-00-06

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/4"	1,032 / 0	573 / 0		
B1	996 / 0	530 / 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	00-11-08	06-11-08	292	146			n/a
1	-	Conc. Pt. (lbs)	L	00-04-02	00-04-02	263	155			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,616 ft-lbs	25,408 ft-lbs	14.2%	1	03-05-08
End Shear	1,840 lbs	11,571 lbs	15.9%	1	06-00-14
Total Load Defl.	L/999 (0.041")	n/a	n/a	4	03-07-00
Live Load Defl.	L/999 (0.027")	n/a	n/a	5	03-07-00
Max Defl.	0.041"	n/a	n/a	4	03-07-00
Span / Depth	8.5	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	3-1/4" x 3-1/2"	2,264 lbs	37.3%	16.3%	Unspecified
B1 Hanger	2" x 3-1/2"	2,156 lbs	n/a	25.2%	HGUS410

Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

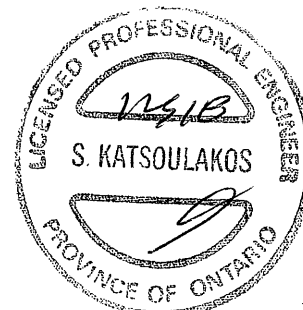
Resistance Factor phi has been applied to all presented results per CSA O86.

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012





Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B1(i2253)

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

November 23, 2017 14:11:32

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mxd

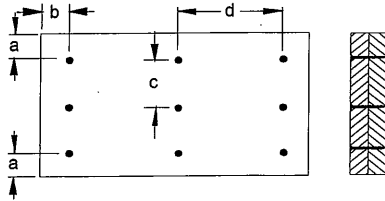
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i2253)

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

a minimum = 2" c = 2-3/4"
 b minimum = 3" d = 6"

Calculated Side Load = 589.2 lb/ft

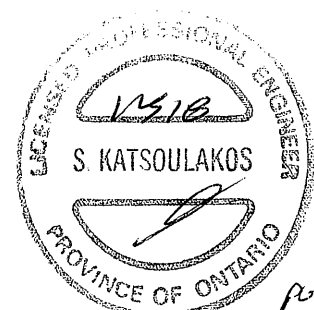
Connection design assumes point load is top-loaded. For connection design of side-loaded point loads, please consult a technical representative or professional of Record.

Connectors are: 16d Nails

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

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 5356
 STRUCTURAL
 COMPONENT ONLY



Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B3(i2078)

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

November 23, 2017 14:11:42

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

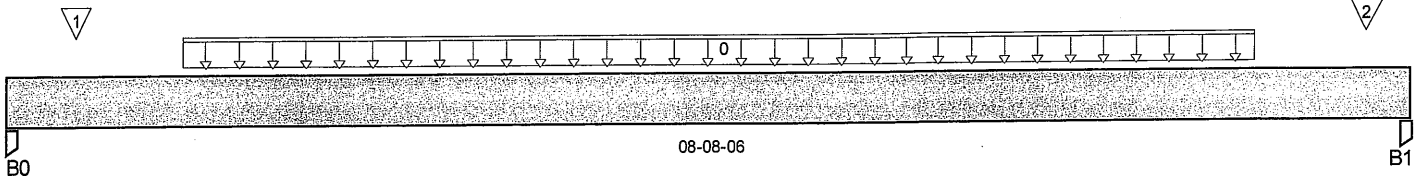
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i2078)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 08-08-06

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	230 / 0	135 / 0		
B1, 1-3/4"	226 / 0	133 / 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	01-01-02	07-09-02	55	27			n/a
1	J4(i2077)	Conc. Pt. (lbs)	L	00-05-02	00-05-02	48	24			n/a
2	J4(i2090)	Conc. Pt. (lbs)	L	08-05-02	08-05-02	43	22			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,073 ft-lbs	12,704 ft-lbs	8.4%	1	04-05-02
End Shear	423 lbs	5,785 lbs	7.3%	1	01-01-00
Total Load Defl.	L/999 (0.038")	n/a	n/a	4	04-05-02
Live Load Defl.	L/999 (0.024")	n/a	n/a	5	04-05-02
Max Defl.	0.038"	n/a	n/a	4	04-05-02
Span / Depth	10.6	n/a	n/a		00-00-00

Disclosure

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

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Post	3-1/2" x 1-3/4"	514 lbs	10.3%	6.9%	Unspecified
B1 Post	1-3/4" x 1-3/4"	505 lbs	20.3%	13.5%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

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





Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i2111)

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

November 23, 2017 14:11:37

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

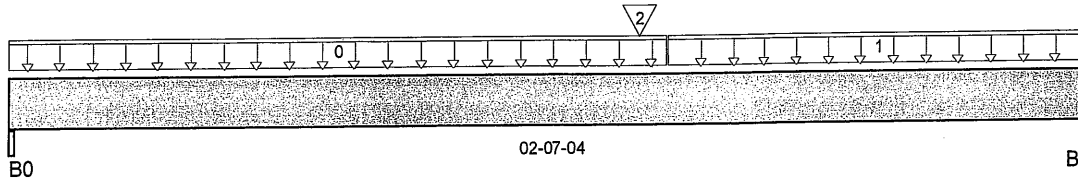
Description: Designs\Flush Beams\Basement\Flush Beams\B4(i2111)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 02-07-04

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 2-3/4"	234 / 0	127 / 0		
B1, 1-3/4"	285 / 0	153 / 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	00-00-00	01-07-00	27	13			n/a
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	01-07-00	02-07-04		3			n/a
2	B5(i2132)	Conc. Pt. (lbs)	L	01-06-02	01-06-02	471	244			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	614 ft-lbs	12,704 ft-lbs	4.8%	1	01-06-02
End Shear	603 lbs	5,785 lbs	10.4%	1	01-08-00
Total Load Defl.	L/999 (0.001")	n/a	n/a	6	01-04-10
Live Load Defl.	L/999 (0.001")	n/a	n/a	8	01-04-10
Max Defl.	0.001"	n/a	n/a	6	01-04-10
Span / Depth	3	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	2-3/4" x 1-3/4"	509 lbs	19.8%	8.7%	Unspecified
B1 Post	1-3/4" x 1-3/4"	619 lbs	24.9%	16.6%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

Disclosure

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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Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B5(i2132)

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

November 23, 2017 14:11:34

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

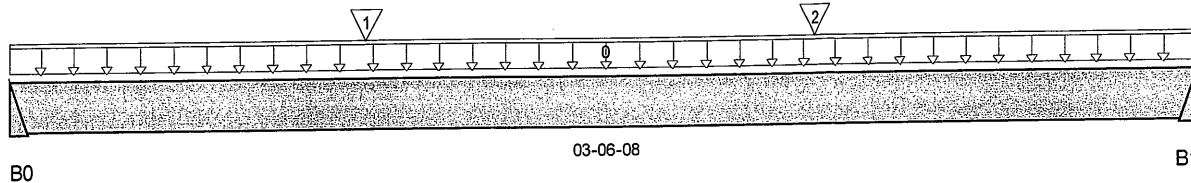
Description: Designs\Flush Beams\Basement\Flush Beams\B5(i2132)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-06-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	471 / 0	243 / 0		
B1	470 / 0	244 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	STAIR	Unf. Lin. (lb/ft)	L	00-00-00	03-06-08	240	120			n/a
1	J5(i2137)	Conc. Pt. (lbs)	L	01-00-12	01-00-12	43	21			n/a
2	J5(i2150)	Conc. Pt. (lbs)	L	02-04-12	02-04-12	48	24			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	813 ft-lbs	12,704 ft-lbs	6.4%	1	01-09-04
End Shear	516 lbs	5,785 lbs	8.9%	1	00-11-08
Total Load Defl.	L/999 (0.005")	n/a	n/a	4	01-09-04
Live Load Defl.	L/999 (0.003")	n/a	n/a	5	01-09-04
Max Defl.	0.005"	n/a	n/a	4	01-09-04
Span / Depth	4.2	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 1-3/4"	1,010 lbs	n/a	23.7%	HUS1.81/10
B1 Hanger	2" x 1-3/4"	1,010 lbs	n/a	23.7%	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.

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.

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DWG NO. TAM 5359-18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basment\Flush Beams\B6(i2254)

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

November 23, 2017 14:11:38

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mmdl

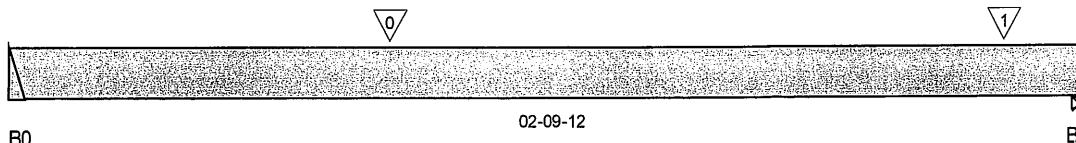
Description: Designs\Flush Beams\Basment\Flush Beams\B6(i2254)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 02-09-12

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	3,151 / 0	1,742 / 0		
B1, 3-1/2"	2,238 / 0	1,228 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0	-	Conc. Pt. (lbs)	L	00-11-14	00-11-14	4,850	2,664	1.00	1.15	n/a
1	B5(i2132)	Conc. Pt. (lbs)	L	02-07-02	02-07-02	470	244	1.00	1.15	n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	6,042 ft-lbs	25,408 ft-lbs	23.8%	1	01-00-00
End Shear	6,838 lbs	11,571 lbs	59.1%	1	00-11-08
Total Load Defl.	L/999 (0.007")	n/a	n/a	4	01-02-12
Live Load Defl.	L/999 (0.005")	n/a	n/a	5	01-02-12
Max Defl.	0.007"	n/a	n/a	4	01-02-12
Span / Depth	3.1	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 3-1/2"	6,905 lbs	n/a	80.9%	HGUS410
B1 Wall/Plate	3-1/2" x 3-1/2"	4,892 lbs	74.8%	32.7%	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: 00-01-12, Bottom: 00-01-12.

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.

CONFORMS TO OBC 2012

Importance Factor: Normal Part code: Part 9





Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B6(i2254)

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

November 23, 2017 14:11:38

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mxd

Description: Designs\Flush Beams\Basement\Flush Beams\B6(i2254)

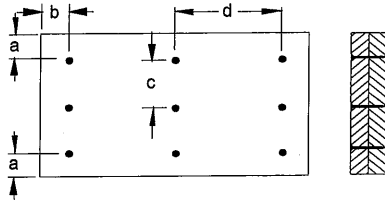
Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram



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

Calculated Side Load = 1,007.3 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.

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DWG NO. TAM 5360
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B7(i2257)

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

November 23, 2017 14:11:35

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

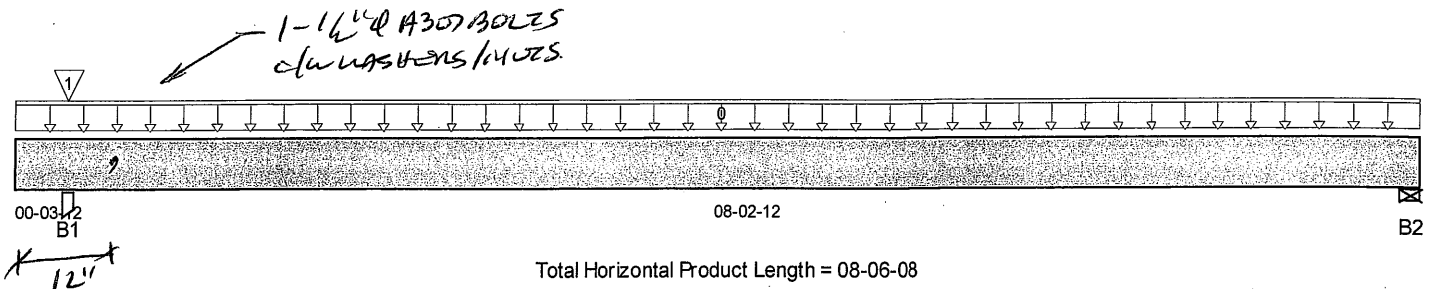
Description: Designs\Flush Beams\Basement\Flush Beams\B7(i2257)

Specifier:

Designer: AJ

Company:

Misc:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	4,481 / 0	2,448 / 0		
B2, 3-1/2"	1,369 / 0	727 / 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	08-06-08	316	158			n/a
1	B6(i2254)	Conc. Pt. (lbs)	L	00-03-12	00-03-12	3,136	1,733			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,079 ft-lbs	25,408 ft-lbs	20%	1	04-04-04
End Shear	2,130 lbs	11,571 lbs	18.4%	1	07-05-08
Cont. Shear	2,075 lbs	11,571 lbs	17.9%	1	01-03-00
Total Load Defl.	L/999 (0.081")	n/a	n/a	4	04-04-04
Live Load Defl.	L/999 (0.053")	n/a	n/a	5	04-04-04
Total Neg. Defl.	2xL/1,998 (-0.01")	n/a	n/a	4	00-00-00
Max Defl.	0.081"	n/a	n/a	4	04-04-04
Span / Depth	10.1	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B1 Post	3-1/2" x 3-1/2"	9,782 lbs	98.3%	65.5%	Unspecified
B2 Wall/Plate	3-1/2" x 3-1/2"	2,963 lbs	45.3%	19.8%	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 OBC 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



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B7(i2257)

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

November 23, 2017 14:11:35

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3Ammdl

Description: Designs\Flush Beams\Basement\Flush Beams\B7(i225

Specifier:

Designer: AJ

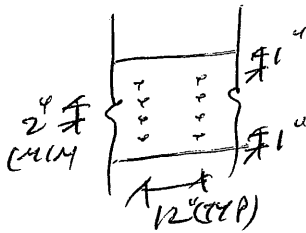
Company:

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
+
BOLTING



PROVIDE 4 ROWS OF 3-1/2" ARDOX SPIRAL NAILS @ 12" O/C FOR MULTI-PLY NAILING. MAINTAIN A MIN. 1" LUMBER EDGE / END DISTANCE. DO NOT USE AIR NAILS.

+
BOLTS

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.

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DWG NO. TAM 5361-18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B8(i2249)

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

November 23, 2017 14:11:43

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code:EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mmdl

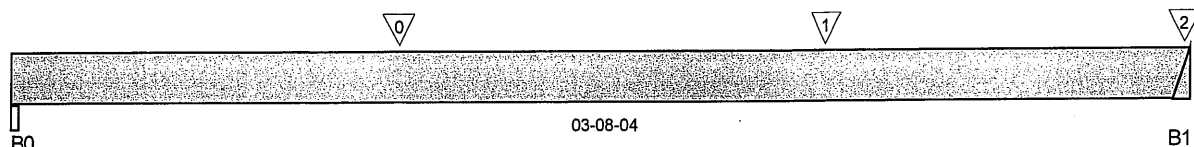
Description: Designs\Flush Beams\Basement\Flush Beams\B8(i2249)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-08-04

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 2-3/4"	459 / 0	247 / 0		
B1	848 / 0	461 / 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	01-02-08	01-02-08	453	226			n/a
1	-	Conc. Pt. (lbs)	L	02-06-08	02-06-08	472	236			n/a
2	PBO8(i474)	Conc. Pt. (lbs)	L	03-08-00	03-08-00	382	210			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,047 ft-lbs	25,408 ft-lbs	4.1%	1	02-06-08
End Shear	1,001 lbs	11,571 lbs	8.7%	1	02-08-12
Total Load Defl.	L/999 (0.003")	n/a	n/a	4	01-10-08
Live Load Defl.	L/999 (0.002")	n/a	n/a	5	01-10-08
Max Defl.	0.003"	n/a	n/a	4	01-10-08
Span / Depth	4.3	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	2-3/4" x 3-1/2"	997 lbs	19.4%	8.5%	Unspecified
B1 Hanger	2" x 3-1/2"	1,848 lbs	n/a	21.6%	HGUS410

Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012



p6 12

DWG NO. TAM 5362-18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B8(i2249)

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

November 23, 2017 14:11:43

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mxd

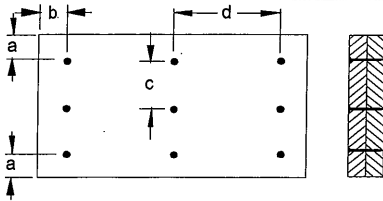
Description: Designs\Flush Beams\Basement\Flush Beams\B8(i2249)

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

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

Calculated Side Load = 480.6 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 Spiral 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 5362-18
 STRUCTURAL
 COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B9(i2005)

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

November 23, 2017 14:11:48

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mdi

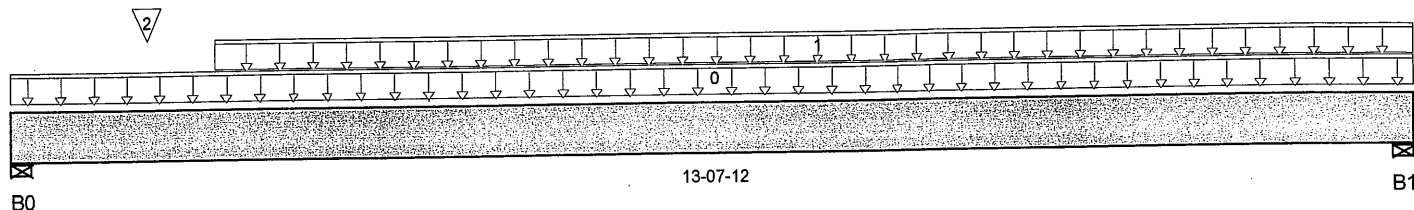
Description: Designs\Flush Beams\1st Floor\Flush Beams\B9(i2005)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 13-07-12

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,346 / 0	736 / 0		
B1, 7-1/2"	1,656 / 0	895 / 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	00-00-00	13-07-12	15	7			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	02-00-00	13-07-12	218	108			n/a
2	J2(i1991)	Conc. Pt. (lbs)	L	01-04-00	01-04-00	260	130			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	10,218 ft-lbs	25,408 ft-lbs	40.2%	1	06-08-00
End Shear	2,941 lbs	11,571 lbs	25.4%	1	12-02-12
Total Load Defl.	L/361 (0.427")	0.643"	66.5%	4	06-08-00
Live Load Defl.	L/557 (0.277")	0.428"	64.7%	5	06-08-00
Max Defl.	0.427"	n/a	n/a	4	06-08-00
Span / Depth	16.2	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-1/2" x 3-1/2"	2,938 lbs	44.9%	19.7%	Unspecified
B1 Wall/Plate	7-1/2" x 3-1/2"	3,602 lbs	25.7%	11.2%	Unspecified

Notes

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

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

Calculations assume 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



P64



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B9(i2005)

BC CALC® Design Report



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

November 23, 2017 14:11:48

Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mxd

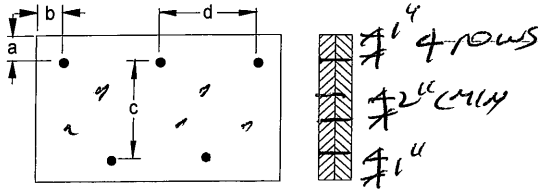
Description: Designs\Flush Beams\1st Floor\Flush Beams\B9(i2005)

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

a minimum = 0" c = 1-1/2"
 b minimum = 3" d = 12"

Calculated Side Load = 435.4 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 ¹/₂" 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 5363-18
 STRUCTURAL
 COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mxd

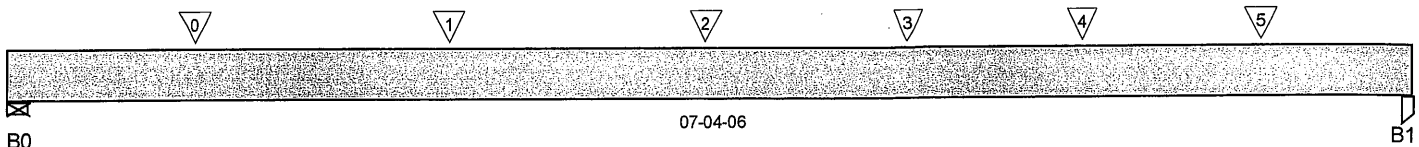
Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i2025)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-04-06

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	1,196 / 0	634 / 0		
B1, 1-3/4"	1,179 / 0	623 / 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	407	203			n/a
1 -	Conc. Pt. (lbs)	L	02-03-12	02-03-12	479	239			n/a
2 -	Conc. Pt. (lbs)	L	03-07-12	03-07-12	428	213			n/a
3 -	Conc. Pt. (lbs)	L	04-08-07	04-08-07	376	188			n/a
4 J1(1989)	Conc. Pt. (lbs)	L	05-07-12	05-07-12	309	155			n/a
5 -	Conc. Pt. (lbs)	L	06-07-01	06-07-01	376	188			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,667 ft-lbs	25,408 ft-lbs	18.4%	1	03-07-12
End Shear	2,354 lbs	11,571 lbs	20.3%	1	06-05-02
Total Load Defl.	L/999 (0.055")	n/a	n/a	4	03-10-12
Live Load Defl.	L/999 (0.036")	n/a	n/a	5	03-10-12
Max Defl.	0.055"	n/a	n/a	4	03-10-12
Span / Depth	8.7	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	5-1/2" x 3-1/2"	2,587 lbs	25.2%	11%	Unspecified
B1 Post	1-3/4" x 3-1/2"	2,547 lbs	51.2%	34.1%	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 OBC 2012

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



P6 1/2



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor...\B10(i2025)

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

November 23, 2017 14:11:52

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i2025)

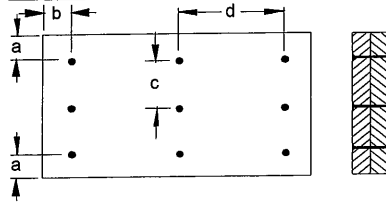
Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram



a minimum = 2" c = 2-3/4"
b minimum = 3" d = 6"

Calculated Side Load = 591.3 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.

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Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B11(i2248)

BC CALC® Design Report



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

November 23, 2017 14:11:45

Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

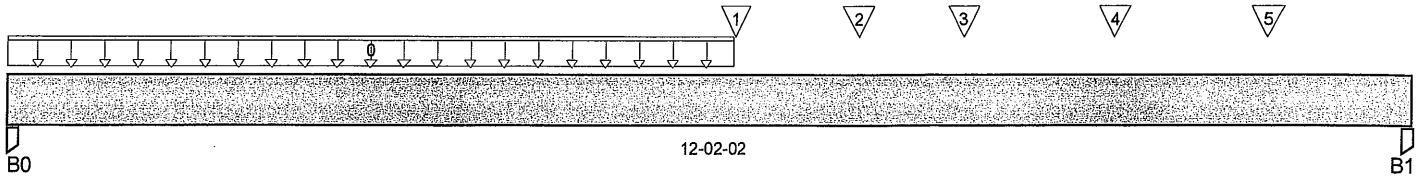
Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i2248)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 12-02-02

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 1-3/4"	2,410 / 0	1,298 / 0		
B1, 1-1/2"	2,313 / 0	1,258 / 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	06-03-06	352	175			n/a
1	J1(i2014)	Conc. Pt. (lbs)	L	06-03-06	06-03-06	311	155			n/a
2	-	Conc. Pt. (lbs)	L	07-04-03	07-04-03	538	294			n/a
3	-	Conc. Pt. (lbs)	L	08-03-06	08-03-06	495	247			n/a
4	-	Conc. Pt. (lbs)	L	09-07-06	09-07-06	584	292			n/a
5	-	Conc. Pt. (lbs)	L	10-11-06	10-11-06	584	292			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	15,809 ft-lbs	39,636 ft-lbs	39.9%	1	06-03-06
End Shear	5,025 lbs	17,356 lbs	29%	1	11-03-02
Total Load Defl.	L/372 (0.388")	0.602"	64.5%	4	06-01-06
Live Load Defl.	L/574 (0.251")	0.401"	62.7%	5	06-01-06
Max Defl.	0.388"	n/a	n/a	4	06-01-06
Span / Depth	15.2	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Post	1-3/4" x 5-1/4"	5,238 lbs	70.2%	46.7%	Unspecified
B1 Post	1-1/2" x 5-1/4"	5,042 lbs	78.8%	52.5%	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 OBC 2012

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9





Boise Cascade

Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B11(i2248)

BC CALC® Design Report



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

November 23, 2017 14:11:45

Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

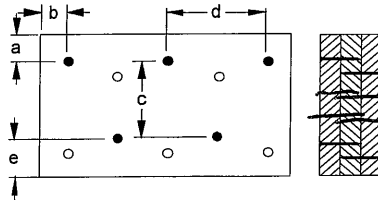
Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i224

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

4 rows

a minimum = 4" c = 6 1/2"
 b minimum = 3" d = 6"
 e minimum = 2"

Calculated Side Load = 641.4 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.

Nailing schedule applies to both sides of the member.

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.

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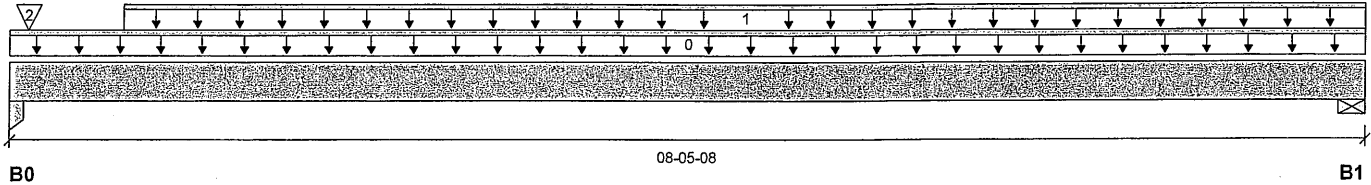


BC CALC® Design Report
Build 6215

Dry | 1 span | No cant.

January 9, 2018 11:33:05

Job name:
Address:
City, Province, Postal Code: EAS...URY
Customer:
Code reports: CCMC 12472-R

File name: HOLLAND 3A EL 1A.mmdl
Description: 1st Floor/Flush Beams\B12(i2801)
Specifier:
Designer: AJ
Company:


Total Horizontal Product Length = 08-05-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 1-3/4"	2,069 / 0	1,074 / 0		
B1, 3-1/2"	1,966 / 0	1,023 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	08-05-08	10	0.65	1.00	1.15	00-00-00
1	Smoothed Load	Unf. Lin. (lb/ft)	L	00-08-08	08-05-08	446	222			n/a
2	-	Conc. Pt. (lbs)	L	00-01-06	00-01-06	580	290			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	7,818 ft-lbs	23,220 ft-lbs	33.7 %	1	04-00-08
End Shear	3,202 lbs	11,571 lbs	27.7 %	1	00-11-04
Total Load Deflection	L/754 (0.13")	n/a	31.8 %	4	04-01-08
Live Load Deflection	L/999 (0.085")	n/a	n/a	5	04-01-08
Max Defl.	0.13"	n/a	n/a	4	04-01-08
Span / Depth	10.3				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Column 1-3/4" x 3-1/2"	4,446 lbs	89.4 %	59.5 %	Unspecified
B1	Wall/Plate 3-1/2" x 3-1/2"	4,228 lbs	64.6 %	28.3 %	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
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.



BC CALC® Design Report

Build 6215

Job name:

Address:

City, Province, Postal Code: EAS...URY

Customer:

Code reports: CCMC 12472-R

File name: HOLLAND 3A EL 1A.mmdl

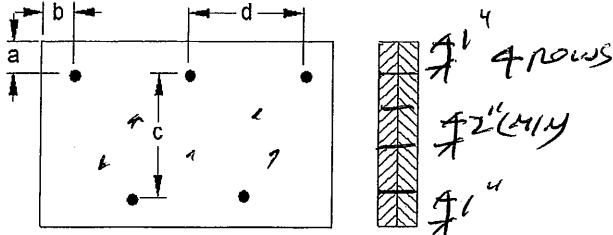
Description: 1st Floor\Flush Beams\B12(i2801)

Specifier:

Designer: AJ

Company:

Connection Diagram



a minimum = 1"
b minimum = 3"

c = 1-1/2"
d = 6"

Calculated Side Load = 719.9 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 Sinker 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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Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B13(i1987)

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

November 23, 2017 14:11:56

BC CALC® Design Report

Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

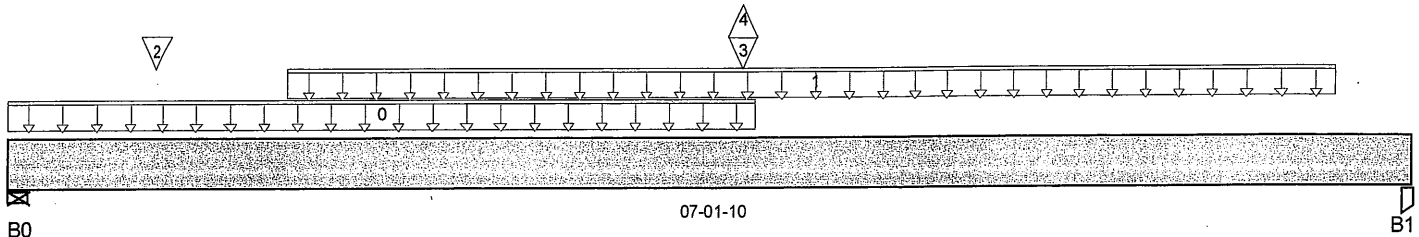
Description: Designs\Flush Beams\1st Floor\Flush Beams\B13(i1987)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-01-10

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 2-3/4"	483 / 73	226 / 0		
B1, 1-3/4"	453 / 77	208 / 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	00-00-00	03-09-08	21	11			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-05-00	06-09-00	48	24			n/a
2	J4(i2020)	Conc. Pt. (lbs)	L	00-09-00	00-09-00	56	28			n/a
3	B15(i2038)	Conc. Pt. (lbs)	L	03-08-10	03-08-10	540	203			n/a
4	B15(i2038)	Conc. Pt. (lbs)	L	03-08-10	03-08-10	-150				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,616 ft-lbs	12,704 ft-lbs	20.6%	1	03-08-10
End Shear	934 lbs	5,785 lbs	16.1%	1	06-02-06
Total Load Defl.	L/999 (0.054")	n/a	n/a	6	03-07-11
Live Load Defl.	L/999 (0.037")	n/a	n/a	8	03-07-11
Max Defl.	0.054"	n/a	n/a	6	03-07-11
Span / Depth	8.7	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	2-3/4" x 1-3/4"	1,007 lbs	39.2%	17.2%	Unspecified
B1 Post	1-3/4" x 1-3/4"	940 lbs	37.8%	25.2%	Unspecified

Notes

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

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

Calculations assume 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



p6 4

DWG NO. TAM 5367-18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B13(i1987)

BC CALC® Design Report



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

November 23, 2017 14:11:56

Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mxd

Description: Designs\Flush Beams\1st Floor\Flush Beams\B13(i1987)

Specifier:

Designer: AJ

Company:

Misc:

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 5367-18
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

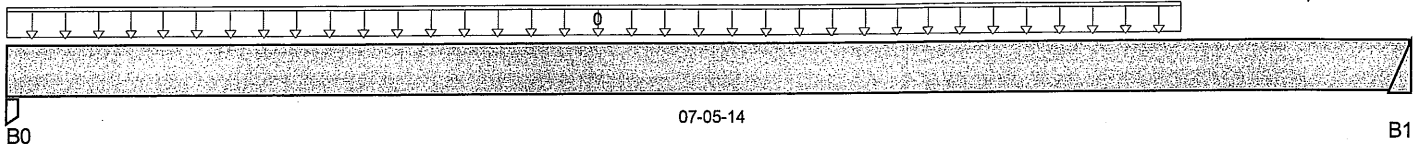
Description: Designs\Flush Beams\1st Floor\Flush Beams\B14(i1974)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-05-14

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 1-3/4"	200 / 0	117 / 0		
B1	172 / 0	103 / 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	06-03-06	52	25			n/a
1	J4(2008)	Conc. Pt. (lbs)	L	06-11-06	06-11-06	47	24			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	718 ft-lbs	12,704 ft-lbs	5.7%	1	04-03-06
End Shear	328 lbs	5,785 lbs	5.7%	1	06-06-06
Total Load Defl.	L/999 (0.02")	n/a	n/a	4	03-08-06
Live Load Defl.	L/999 (0.012")	n/a	n/a	5	03-08-06
Max Defl.	0.02"	n/a	n/a	4	03-08-06
Span / Depth	9.2	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Post	1-3/4" x 1-3/4"	446 lbs	17.9%	11.9%	Unspecified
B1 Hanger	2" x 1-3/4"	387 lbs	n/a	9.1%	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.

Design based on Dry Service Condition.

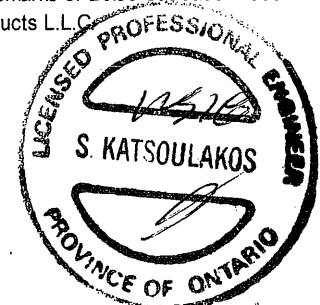
Importance Factor: Normal Part code: Part 9

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.

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Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B16(i2258)

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

November 23, 2017 14:11:47

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3A.mmdl

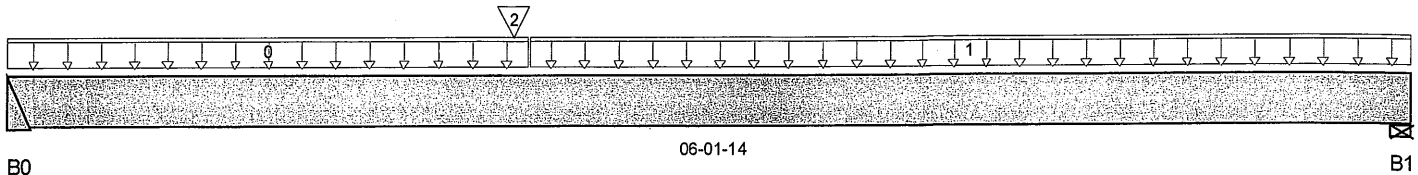
Description: Designs\Flush Beams\1st Floor\Flush Beams\B16(i2258)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 06-01-14

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	176 / 0	114 / 0		
B1, 3-1/2"	115 / 0	79 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	02-03-06	27	13			n/a
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	02-03-06	06-01-14	16	8			n/a
2	B14(i1974)	Conc. Pt. (lbs)	L	02-02-08	02-02-08	169	102			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	702 ft-lbs	12,704 ft-lbs	5.5%	1	02-02-08
End Shear	346 lbs	5,785 lbs	6%	1	00-11-08
Total Load Defl.	L/999 (0.01")	n/a	n/a	4	02-09-11
Live Load Defl.	L/999 (0.006")	n/a	n/a	5	02-09-11
Max Defl.	0.01"	n/a	n/a	4	02-09-11
Span / Depth	7.4	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 Hanger	2" x 1-3/4"	406 lbs	n/a	9.5%	HUS1.81/10
B1 Wall/Plate	3-1/2" x 1-3/4"	272 lbs	8.3%	3.6%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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.

CONFORMS TO OBC 2012

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

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DWG NO. TAM 5369-18
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B15(i2038)

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

November 23, 2017 14:11:51

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports:

CCMC 12472-R

File Name: HOLLAND 3A.mmdl

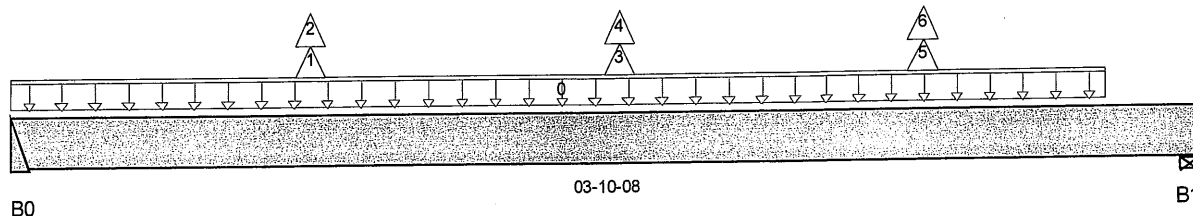
Description: Designs\Flush Beams\1st Floor\Flush Beams\B15(i2038)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-10-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	554 / 154	209 / 0		
B1, 3-1/2"	519 / 162	188 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	STAIR	Unf. Lin. (lb/ft)	L	00-00-00	03-07-00	240	120			n/a
1	J1(i1986)	Conc. Pt. (lbs)	L	00-11-12	00-11-12	76	-18			n/a
2	J1(i1986)	Conc. Pt. (lbs)	L	00-11-12	00-11-12	-111				n/a
3	J1(i2040)	Conc. Pt. (lbs)	L	01-11-12	01-11-12	74	-18			n/a
4	J1(i2040)	Conc. Pt. (lbs)	L	01-11-12	01-11-12	-111				n/a
5	J1(i1998)	Conc. Pt. (lbs)	L	02-11-12	02-11-12	63	-16			n/a
6	J1(i1998)	Conc. Pt. (lbs)	L	02-11-12	02-11-12	-94				n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	948 ft-lbs	12,704 ft-lbs	7.5%	1	01-11-06
Neg. Moment	-116 ft-lbs	-12,704 ft-lbs	0.9%	4	01-11-12
End Shear	597 lbs	5,785 lbs	10.3%	1	00-11-08
Uplift	75 lbs	n/a	n/a	4	03-10-08
Total Load Defl.	L/999 (0.006")	n/a	n/a	6	01-10-10
Live Load Defl.	L/999 (0.004")	n/a	n/a	8	01-10-10
Max Defl.	0.006"	n/a	n/a	6	01-10-10
Span / Depth	4.5	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 1-3/4"	1,092 lbs	n/a	25.6%	HUS1.81/10
B0 Hanger Uplift	2" x 1-3/4"	42 lbs	n/a	0.01	HUS1.81/10
B1 Wall/Plate	3-1/2" x 1-3/4"	1,013 lbs	31%	13.6%	Unspecified

Cautions

Uplift of 75 lbs found at span 1 - Right. *SIMPSON 1-HSA @ 0.31*

Notes

*pb 1/2*



Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B15(i2038)

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

November 23, 2017 14:11:51

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: EAST GWILLIMBURY,

Customer:

Code reports: CCMC 12472-R

File Name: HOLLAND 3Ammdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B15(i2038)

Specifier:

Designer: AJ

Company:

Misc:

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

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

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

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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CONFORMS TO OBC 2012

BC CALC® Design Report

Dry | 2 spans | L cant.

January 20, 2018 10:36:51

Build 6215

Job name:

File name: HOLLAND 3A.mmdl

Address:

Description: Basement\Flush Beams\B2(i2486)

City, Province, Postal Code: EAS...URY

Specifier:

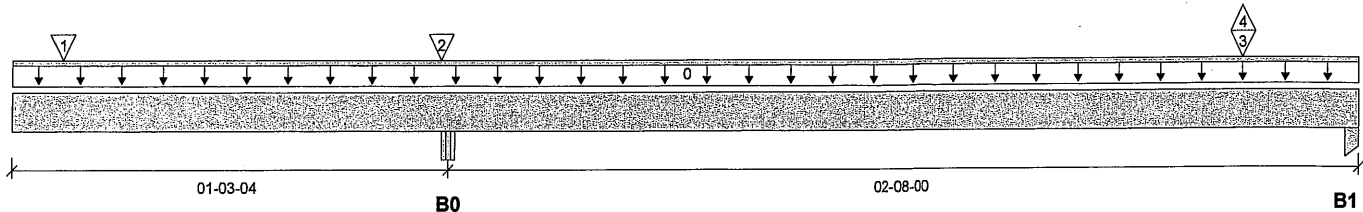
Customer:

Designer: AJ

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 03-11-04

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 7"	5,085 / 5	2,829 / 0		
B1, 2-3/4"	633 / 541	151 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-11-04		10			00-00-00
1	B1(i2484)	Conc. Pt. (lbs)	L	00-01-12	00-01-12	967	514			n/a
2	PBO10(i476)	Conc. Pt. (lbs)	L	01-03-00	01-03-00	3,587	2,001			n/a
3	PBO9(i475)	Conc. Pt. (lbs)	L	03-07-04	03-07-04	665	411			n/a
4	PBO9(i475)	Conc. Pt. (lbs)	L	03-07-04	03-07-04	-79				n/a

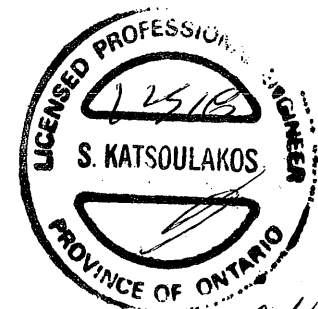
Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	189 ft-lbs	23,220 ft-lbs	0.8%	4	03-07-04
Neg. Moment	-2,540 ft-lbs	-23,220 ft-lbs	10.9%	1	01-03-04
End Shear	906 lbs	11,571 lbs	7.8%	1	02-11-00
Cont. Shear	2,108 lbs	11,571 lbs	18.2%	1	00-02-04
Total Load Deflection	2xL/1,998 (0.009")	n/a	n/a	12	00-00-00
Live Load Deflection	2xL/1,998 (0.006")	n/a	n/a	16	00-00-00
Total Neg. Defl.	L/999 (-0.002")	n/a	n/a	12	02-03-13
Max Defl.	-0.002"	n/a	n/a	12	02-03-13
Span / Depth	3.2				

Bearing Supports	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0	Beam 7" x 3-1/2"	11,163 lbs	85.3%	37.3%	Unspecified
B1	Column 2-3/4" x 3-1/2"	1,138 lbs	14.6%	9.7%	Unspecified
B1	Uplift	676 lbs			

Cautions

Uplift of 676 lbs found at span 2 - Right.



BC CALC® Design Report

Build 6215

Job name:

Address:

City, Province, Postal Code: EAS...URY

Customer:

Code reports: CCMC 12472-R

File name: HOLLAND 3A.mmdl

Description: Basement\Flush Beams\B2(i2486)

Specifier:

Designer: AJ

Company:

Notes

Design meets User specified (2xL/240) Total load deflection criteria.

Design meets User specified (2xL/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.

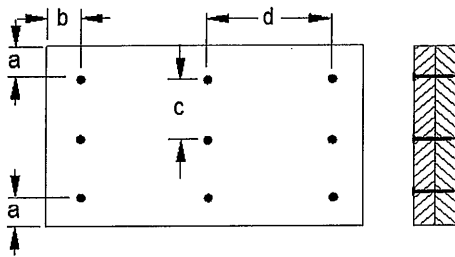
CONFORMS TO OBC 2012

Importance Factor : Normal Part code : Part 9

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

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

Connection Diagram



a minimum = 2"


c = 2-3/4"

b minimum = 3"

d = 6"

Calculated Side Load = 531.6 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  Nails

3-1/2" ARDOX SPIRAL

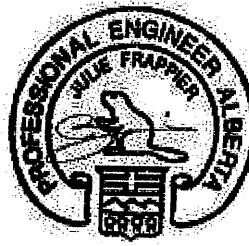
Disclosure

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

DWG NO. TAM 5371-18
STRUCTURAL
COMPONENT ONLY



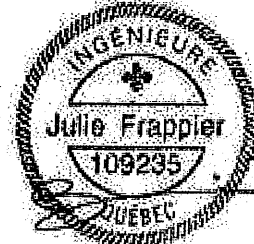
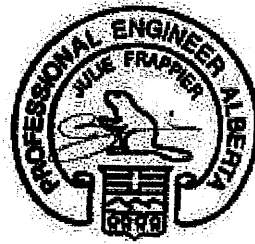
Maximum Floor Spans

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.



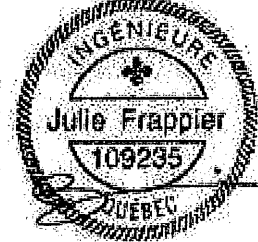
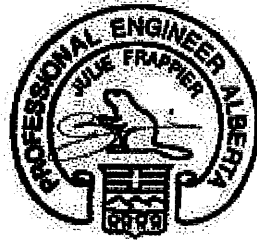
Maximum Floor Spans

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.



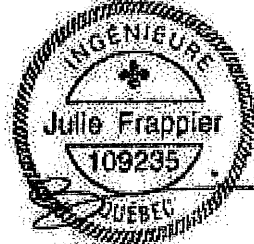
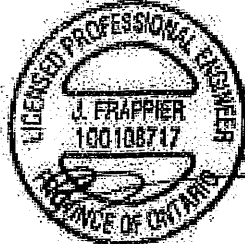
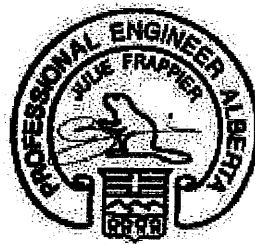
Maximum Floor Spans

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
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	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
14"	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
	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
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"	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.



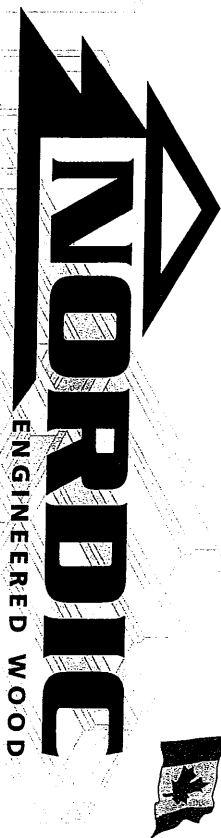
Maximum Floor Spans

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

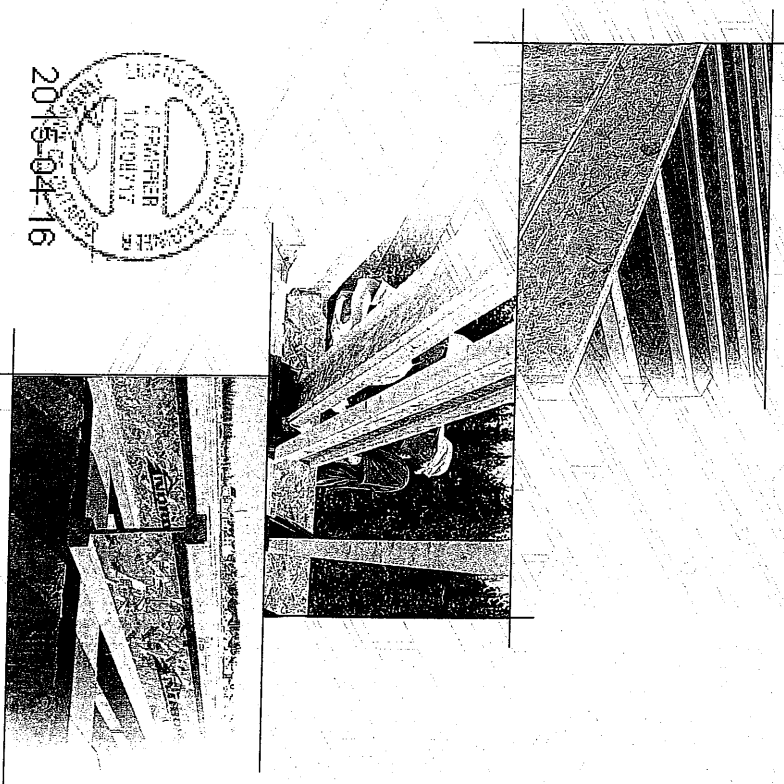
Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-2"	13'-4"	12'-4"	15'-7"	14'-2"	13'-4"	12'-4"
	NI-40x	17'-0"	16'-0"	15'-1"	13'-11"	17'-5"	16'-1"	15'-1"	13'-11"
	NI-60	17'-2"	16'-2"	15'-5"	14'-3"	17'-6"	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



2015-04-16

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.



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

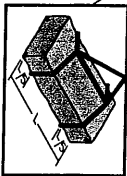
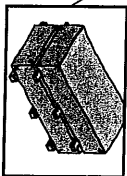
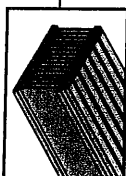


Never stack building materials over unsheathed I-joists. Once sheathed, do not over-stress I-joist with concentrated loads from building materials.

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

STORAGE AND HANDLING GUIDELINES

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



MAXIMUM FLOOR SPANS

1. Maximum clear spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of $L/480$. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
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 C08-09 Standard, and NBC 2010.
7. SI units conversion: 1 inch = 25.4 mm
1 foot = 0.305 m

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

Joist Depth	Joist Series	Simple spans				Multiple spans			
		On centre spacing				On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
12"	120	15.1	14.2	13.9	13.5	16.3	15.4	15.0	14.7
12"	125	16.1	15.2	14.8	14.5	17.5	16.5	16.0	15.5
12"	130	16.8	15.8	15.4	15.0	18.7	17.7	17.2	16.6
12"	135	17.1	16.1	15.6	15.2	18.7	17.7	17.2	16.6
12"	140	17.3	16.3	15.8	15.5	19.1	17.6	17.3	16.7
12"	145	18.1	17.0	16.5	16.2	19.6	18.1	17.9	17.7
12"	150	18.4	17.3	16.7	16.4	20.3	18.9	18.7	18.1
12"	155	19.6	18.0	17.4	17.5	21.6	19.7	19.4	19.1
12"	160	19.9	18.5	17.6	17.7	22.3	20.2	19.9	19.4
12"	165	20.2	18.7	17.7	17.9	22.9	20.7	19.8	19.9
12"	170	20.4	18.9	17.8	18.0	22.5	20.3	19.5	19.1
12"	175	20.7	19.1	18.0	18.1	23.2	20.9	20.1	19.4
12"	180	20.9	19.3	18.2	18.2	23.7	21.1	20.4	20.0
12"	185	21.1	19.5	18.4	18.5	24.5	22.5	21.5	21.2
12"	190	22.5	20.8	19.7	19.5	26.1	24.5	23.5	23.4
12"	195	22.7	20.9	19.8	19.6	26.5	24.7	23.9	23.9
12"	200	22.9	21.0	19.9	19.7	26.7	24.8	24.0	24.1
12"	205	23.6	21.7	20.6	20.1	27.4	25.5	24.7	24.7
12"	210	24.5	22.6	21.5	21.4	28.1	26.2	25.4	25.4
12"	215	24.8	22.9	21.9	21.7	28.3	26.3	25.5	25.5

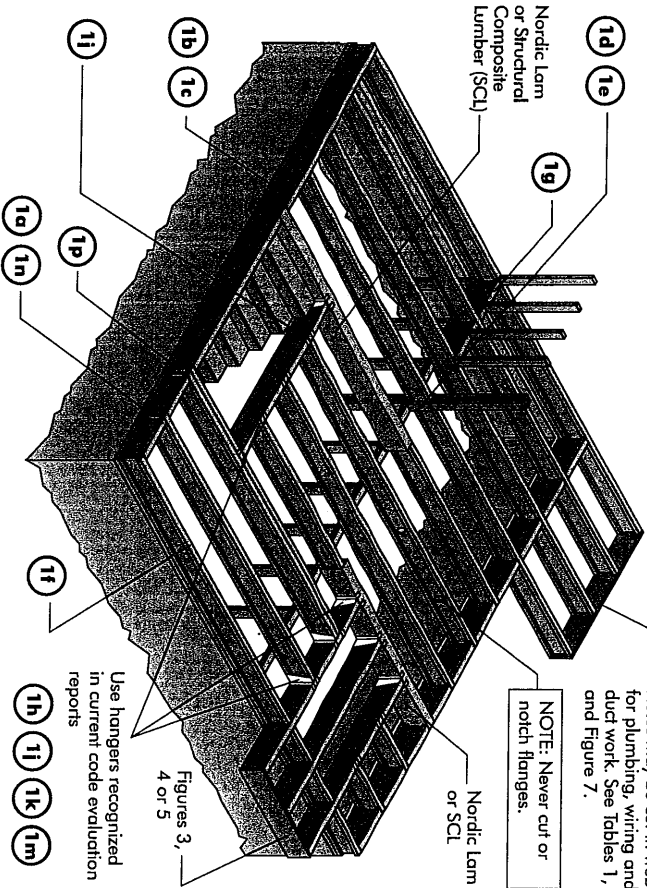
INSTALLING NORDIC I-JOISTS

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 I-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 (criple members) to transfer gravity loads through the floor system to the wall or foundation below.
12. Due to shrinkage, common framing lumber set on edge **may never** be used as blocking or rim boards. I-joist blocking panels or other engineered wood products – such as rim board – must be cut to fit between the I-joists, and an I-joist-compatible depth selected.
13. Provide permanent lateral support of the bottom flange of all I-joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered I-joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
14. If square-edge panels are used, edges must be supported between I-joists with 2x4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
15. Nail spacing: Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.

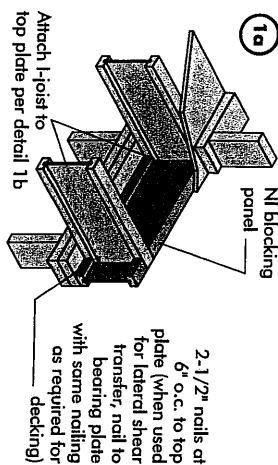


FIGURE 1
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

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

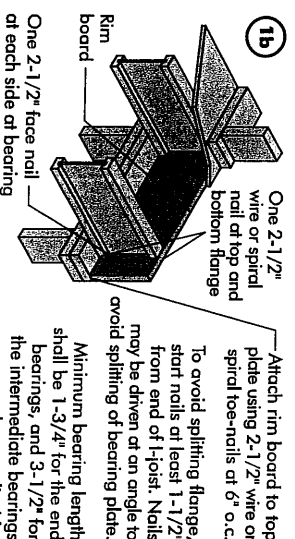


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



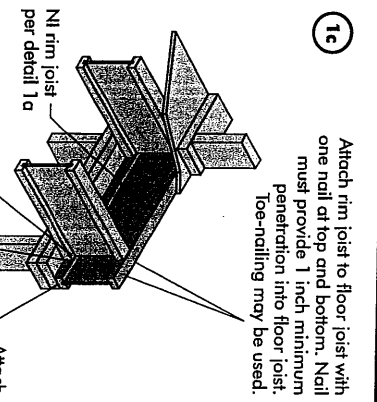
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
NI Joists	3,300

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



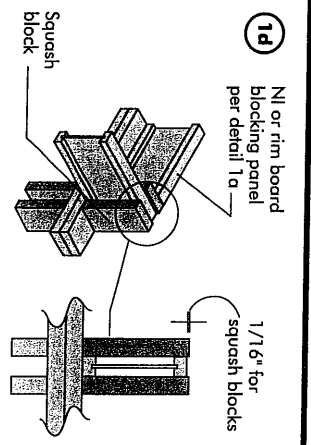
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

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



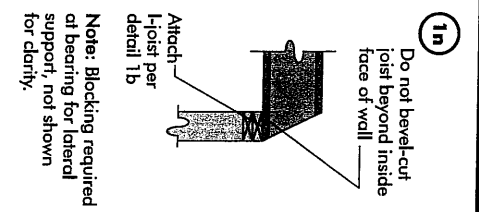
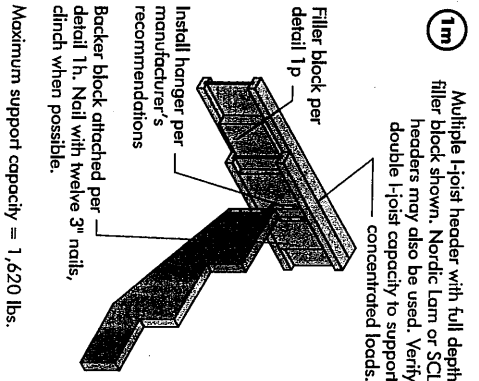
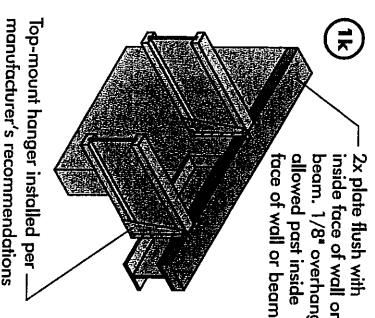
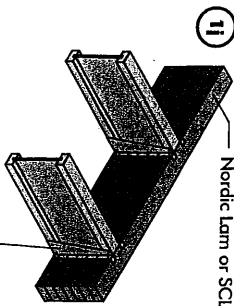
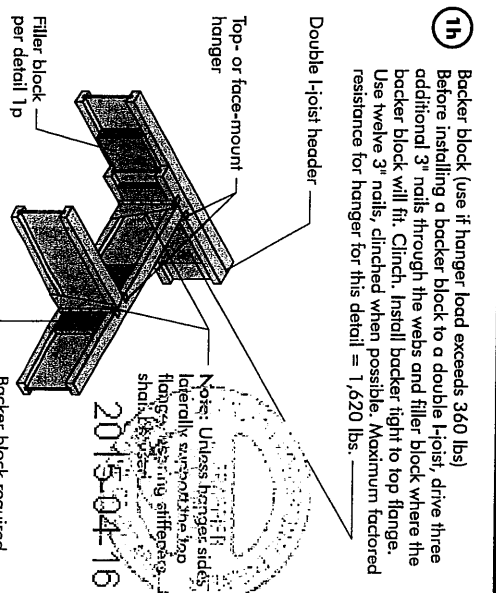
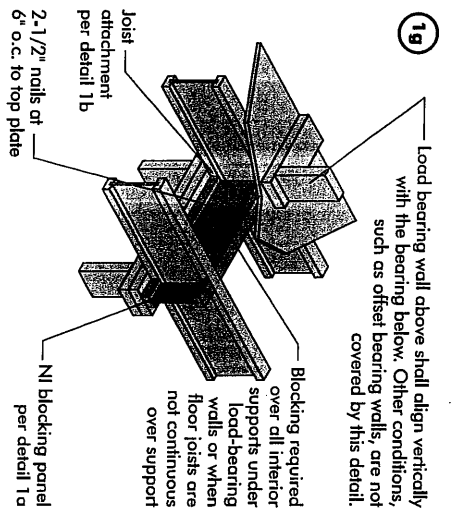
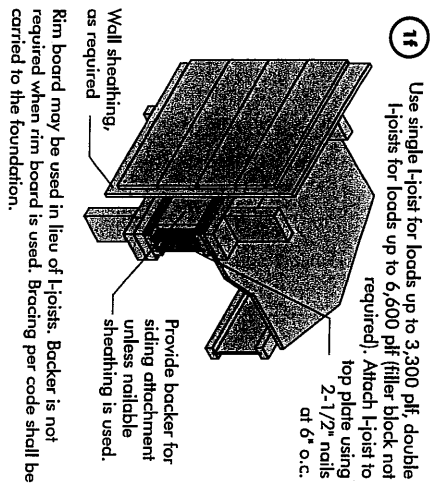
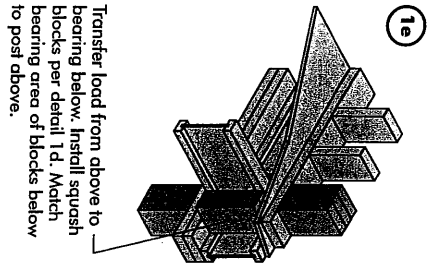
Pair of Squash Blocks	Maximum Factored Vertical per Pair of Squash Blocks (lbs)
2x Lumber	5,500
1-1/8" Rim Board Plus	4,300

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



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

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

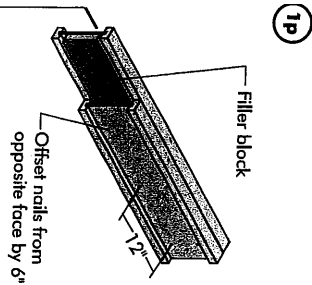


BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

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

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

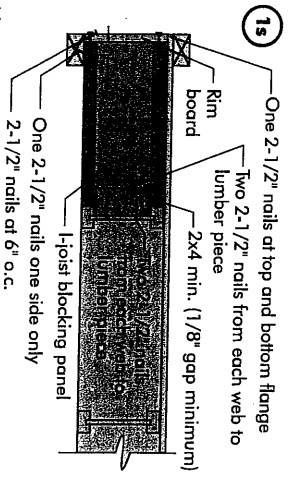
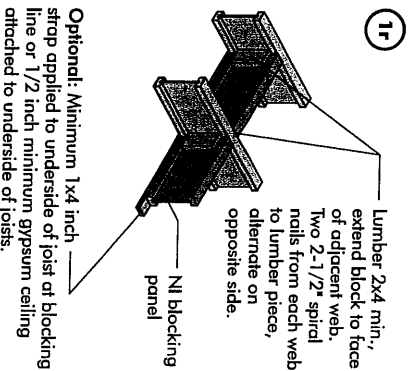
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.



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

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

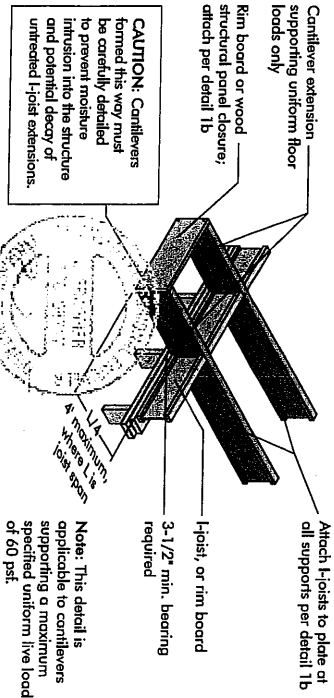
Flange Size	Joist Depth	Filler Block Size
2-1/2" x 1-1/2"	9-1/2" x 11-7/8" x 14"	2-1/8" x 6" x 8"
2-1/2" x 1-1/2"	14"	2-1/8" x 8" x 10"
3-1/2" x 1-1/2"	14"	2-1/8" x 12" x 12"
3-1/2" x 2"	11-7/8" x 14"	3" x 6" x 8"
	14"	3" x 8" x 10"
	16"	3" x 12" x 12"
	11-7/8" x 14"	3" x 7" x 9"
	16"	3" x 11" x 11"



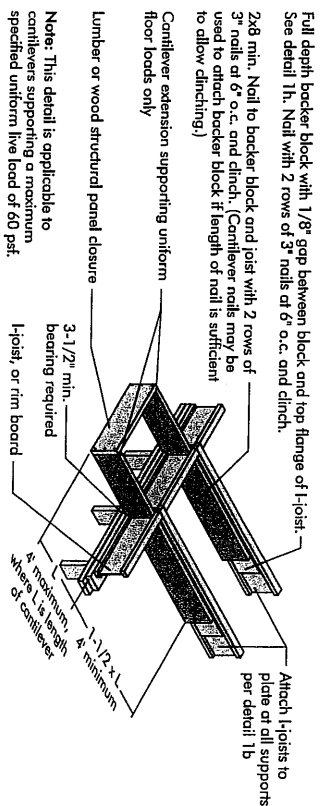
- Notes:**
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
 - All nails are common spiral in this detail.

CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

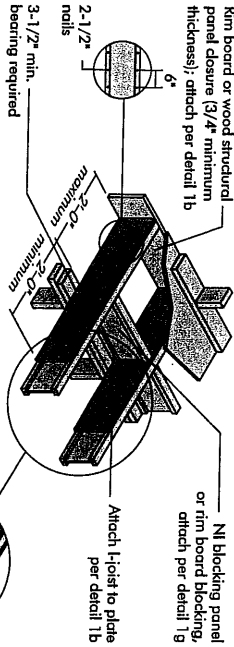


39 LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

40 Method 1 — SHEATHING REINFORCEMENT ONE SIDE

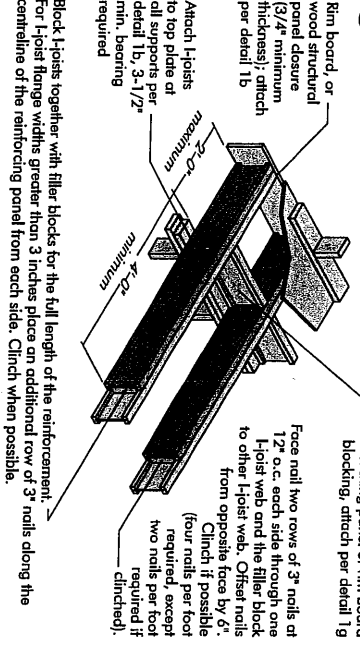


Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- 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: Condition 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.

40 Alternate Method 2 — DOUBLE I-JOIST

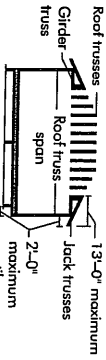
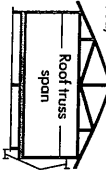


CANTILEVER REINFORCEMENT METHODS ALLOWED

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.)
24	12	2	2	2	2
24	16	2	2	2	2
24	19.2	2	2	2	2
24	24	2	2	2	2
30	12	2	2	2	2
30	16	2	2	2	2
30	19.2	2	2	2	2
30	24	2	2	2	2
36	12	2	2	2	2
36	16	2	2	2	2
36	19.2	2	2	2	2
36	24	2	2	2	2
42	12	2	2	2	2
42	16	2	2	2	2
42	19.2	2	2	2	2
42	24	2	2	2	2

1. N = No reinforcement required.
2. N = NI reinforced with 3/4" wood structural panel on one side only.
3. X = Try a deeper joist or closer spacing. 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.
4. For larger openings, or multiple 3'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
5. Cantilevered joist supporting girder trusses or roof beams may require additional reinforcing.

FIGURE 4 (continued)
See table below for NI reinforcement requirements at cantilever.



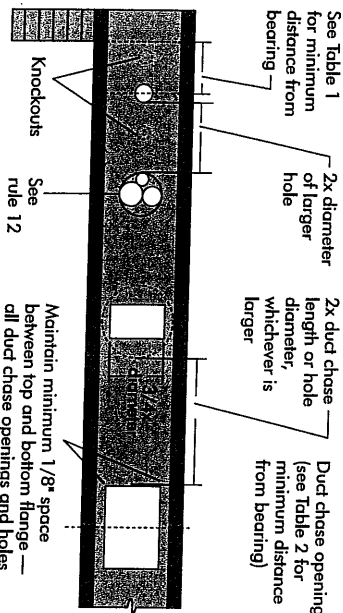
For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

WEB HOLES

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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

FIGURE 7
FIELD-CUT HOLE LOCATOR



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

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

Joist Depth	Joist Series	2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4	Span adjustment Factor
10	20	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.0
12	24	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	1.1
14	28	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	1.2
16	32	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	1.3
18	36	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	1.4
20	40	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	1.5
22	44	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	1.6
24	48	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	1.7
26	52	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	1.8
28	56	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	1.9
30	60	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	2.0
32	64	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	2.1
34	68	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	2.2
36	72	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	2.3
38	76	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	2.4
40	80	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	2.5
42	84	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	2.6
44	88	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	2.7
46	92	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	2.8
48	96	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	2.9
50	100	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	3.0

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

OPTIONAL:

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

Reduced = $\frac{\text{Actual} \times D}{\text{Span}}$

Where:

- Reduced = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft). The reduced distance shall not be less than 6 inches from the face of the support to edge of the hole.
- Actual = The actual measured span distance between the inside faces of supports (ft).
- D = Span Adjustment Factor given in this table.
- D = The minimum distance from the inside face of any support to centre of hole from this table.

If Actual is greater than 1, use 1 in the above calculation for Actual.

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

Joist Depth	Joist Series	8	10	12	14	16	18	20	22	24
10	20	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
12	24	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
14	28	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7
16	32	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
18	36	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
20	40	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
22	44	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1
24	48	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2
26	52	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
28	56	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4
30	60	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
32	64	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6
34	68	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
36	72	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
38	76	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
40	80	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0
42	84	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
44	88	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2
46	92	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3
48	96	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4
50	100	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5

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

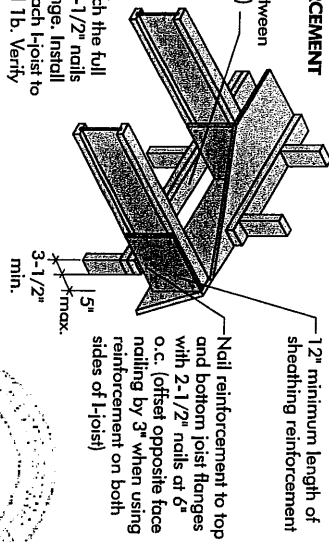
2015-04-16

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

5a SHEATHING REINFORCEMENT

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

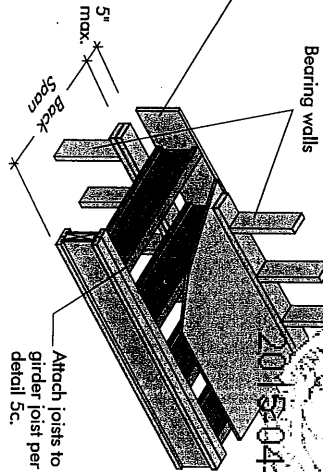
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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



5b SET-BACK DETAIL

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

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



5c SET-BACK CONNECTION

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

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

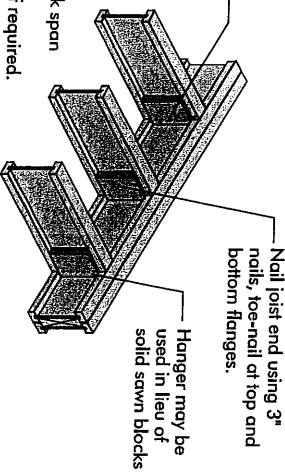
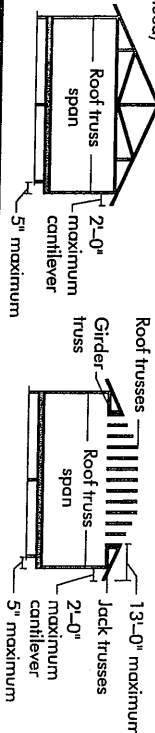


FIGURE 5 (continued)
See table below for NI reinforcement requirements of cantilever.



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

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)				ROOF LOADING (UNFACTORED)				LL = 50 psf, DL = 15 psf			
	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2"	26	29	30	32	1	1	1	1	1	1	1	1
12"	26	29	30	32	1	1	1	1	1	1	1	1
14"	26	29	30	32	1	1	1	1	1	1	1	1
16"	26	29	30	32	1	1	1	1	1	1	1	1
18"	26	29	30	32	1	1	1	1	1	1	1	1
20"	26	29	30	32	1	1	1	1	1	1	1	1
22"	26	29	30	32	1	1	1	1	1	1	1	1
24"	26	29	30	32	1	1	1	1	1	1	1	1
26"	26	29	30	32	1	1	1	1	1	1	1	1
28"	26	29	30	32	1	1	1	1	1	1	1	1
30"	26	29	30	32	1	1	1	1	1	1	1	1
32"	26	29	30	32	1	1	1	1	1	1	1	1
34"	26	29	30	32	1	1	1	1	1	1	1	1
36"	26	29	30	32	1	1	1	1	1	1	1	1
38"	26	29	30	32	1	1	1	1	1	1	1	1
40"	26	29	30	32	1	1	1	1	1	1	1	1
42"	26	29	30	32	1	1	1	1	1	1	1	1

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

INSTALLING THE GLUED FLOOR SYSTEM

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

FASTENERS FOR SHEATHING AND SUBFLOORING(1)

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

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

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

IMPORTANT NOTE:

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

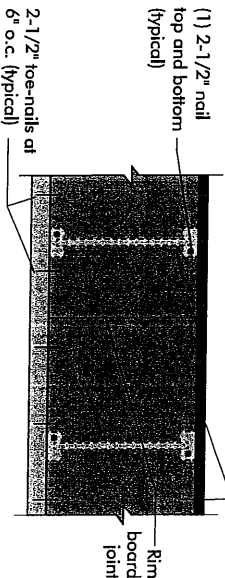
RIM BOARD INSTALLATION DETAILS

8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

Rim board Joint Between Floor Joists

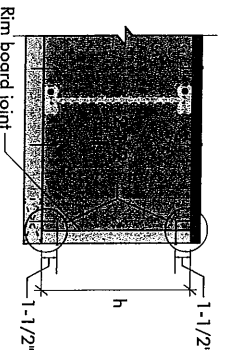
2-1/2" nails at 6" o.c. (typical)

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

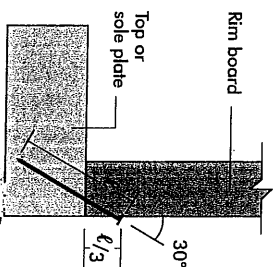


Rim board Joint at Corner

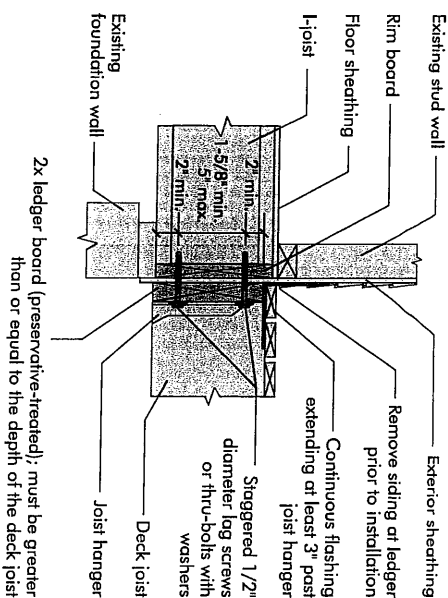
1-1/2"



8b TOE-NAIL CONNECTION AT RIM BOARD



8c 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL

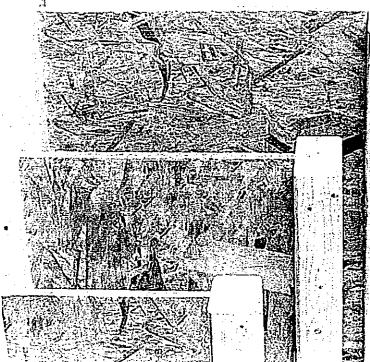


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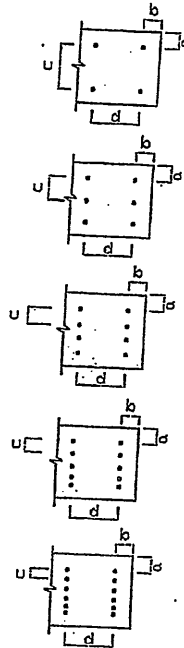
PRODUCT WARRANTY

Customer: *Chilipeague* guarantees that, in accordance with our specifications, *Weld* products are free from manufacturing defects in material and workmanship.

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



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