

FROM PLAN DATED: MAR 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: FLEMING 1

ELEVATION: 1 2 3

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: LBV

REVISION:

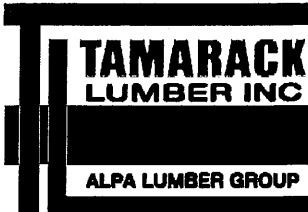
NOTES:
REFER TO THE **NORDIC INSTALLATION** GUIDE FOR PROPER STORAGE AND INSTALLATION.
SQUASH BLOCKS OF 2x4, 2x6, 2x8 #2 S.P.F REQ'D UNDER INTERIOR UNIFORM LOAD BEARING WALLS. **MULTIPLE SQUASH BLOCKS** REQ'D UNDER CONCENTRATED LOADS. SEE FIGURE 1. **CANTILEVERED JOISTS** INCLUDING **CANT' OVER BRICK**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

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

DATE: 2017-03-28

1st FLOOR

Products					Connector Summary		
PlotID	Length	Product	Plies	Net Qty	Qty	Manuf	Product
J1	18-00-00	11 7/8" NI-40x	1	16	16	H1	IUS2.56/11.88
J1DJ	18-00-00	11 7/8" NI-40x	2	8	6	H1	IUS2.56/11.88
J2	16-00-00	11 7/8" NI-40x	1	4	5	H1	IUS2.56/11.88
J3	12-00-00	11 7/8" NI-40x	1	15	2	H2	HU310-2
J3DJ	12-00-00	11 7/8" NI-40x	2	4	2	H3	HUS1.81/10
J4	10-00-00	11 7/8" NI-40x	1	7			
J5	8-00-00	11 7/8" NI-40x	1	10			
J6	4-00-00	11 7/8" NI-40x	1	3			
B6	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B2	10-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B5	10-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B3	8-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B1	4-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B4	4-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			



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ELEVATION: 3

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: LBV

REVISION: PL

NOTES:
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LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

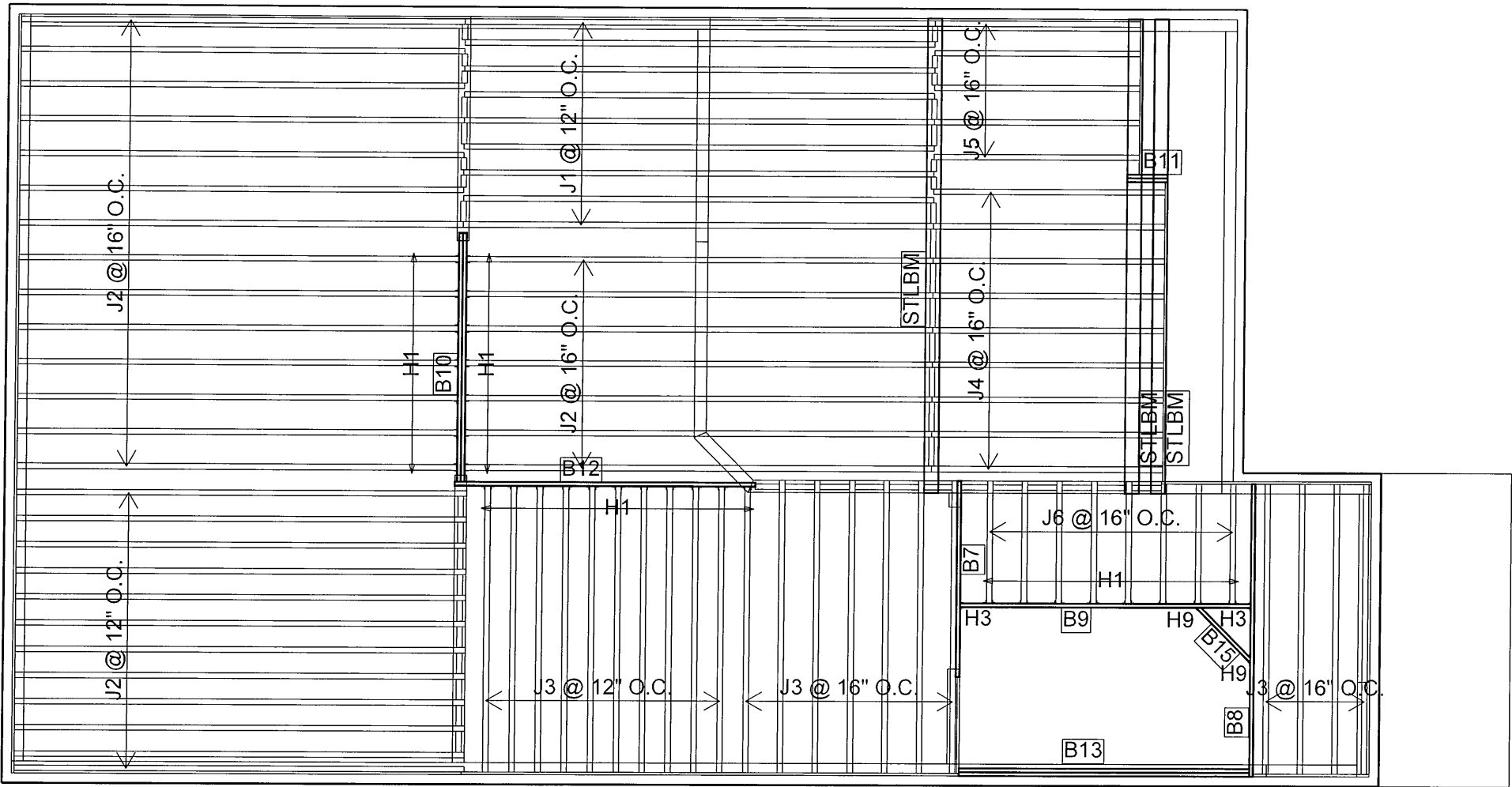
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft

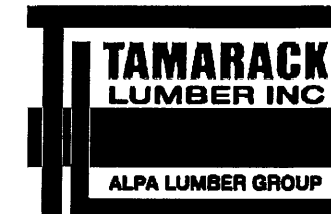
SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 6/25/2018

2nd FLOOR



Products					Connector Summary		
PlotID	Length	Product	Plies	Net Qty	Qty	Manuf	Product
J1	20-00-00	11 7/8" NI-40x	1	9	19	H1	IUS2.56/11.88
J2	18-00-00	11 7/8" NI-40x	1	33	14	H1	IUS2.56/11.88
J3	12-00-00	11 7/8" NI-40x	1	21	2	H3	HUS1.81/10
J4	10-00-00	11 7/8" NI-40x	1	9	1	H9	LS90
J5	8-00-00	11 7/8" NI-40x	1	5	1	H9	LS90
J6	6-00-00	11 7/8" NI-40x	1	8			
B12	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B8	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B9	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B13	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			
B10	10-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			
B7	8-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B15	4-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1			
B11	2-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			



FROM PLAN DATED: MAR 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: FLEMING 1

ELEVATION: 1 & 2

LOT:

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SALESMAN: M D

DESIGNER: LBV

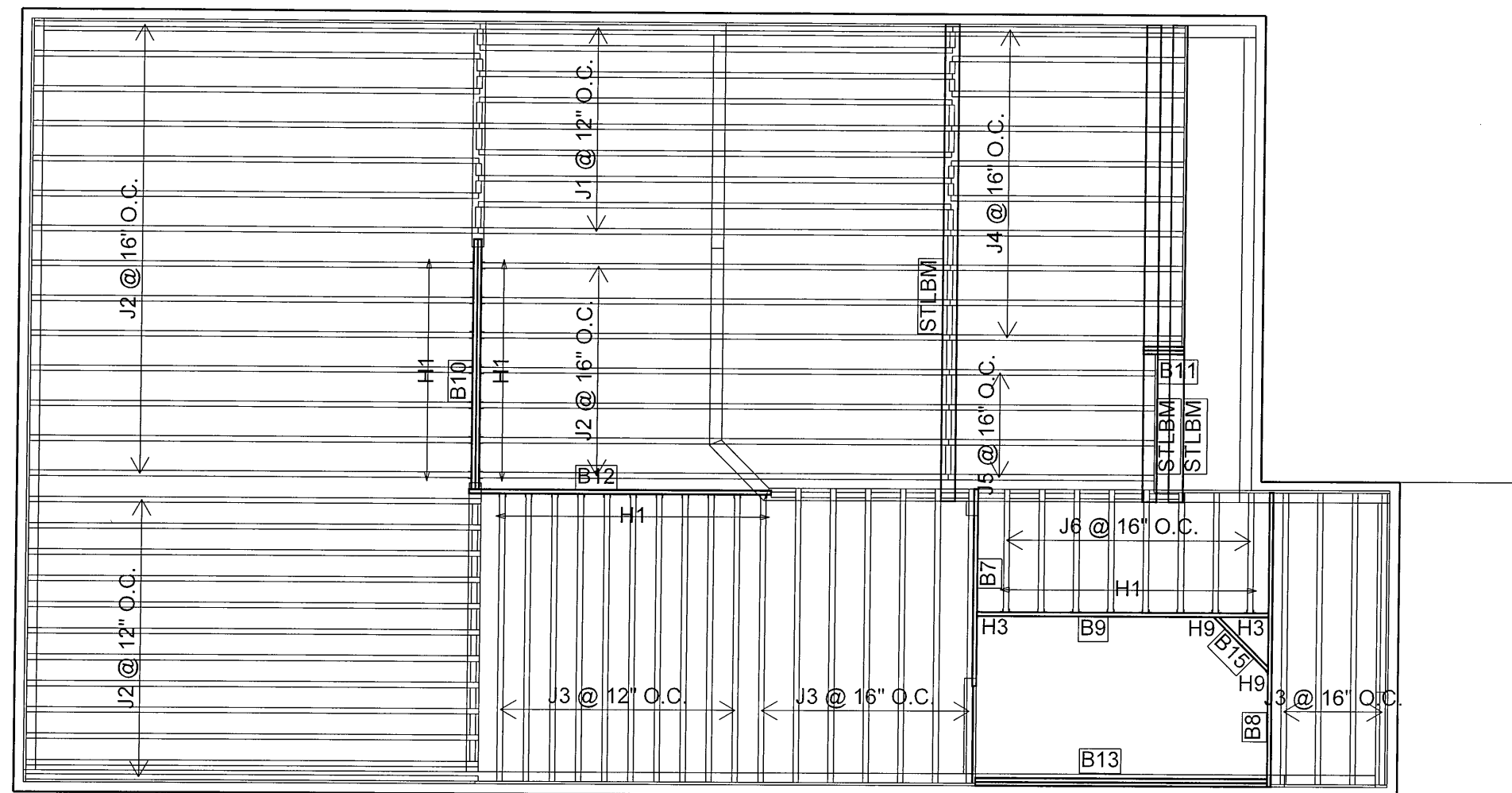
REVISION: PL

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DATE: 6/25/2018

2nd FLOOR



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J3	12-00-00	11 7/8" NI-40x	1	21	2	H3	HUS1.81/10
J4	10-00-00	11 7/8" NI-40x	1	10	1	H9	LS90
J5	8-00-00	11 7/8" NI-40x	1	4	1	H9	LS90
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B13	12-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			
B10	10-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			
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B11	2-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2			

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER
BURLINGTON
Mar. 27, 2017 09:06

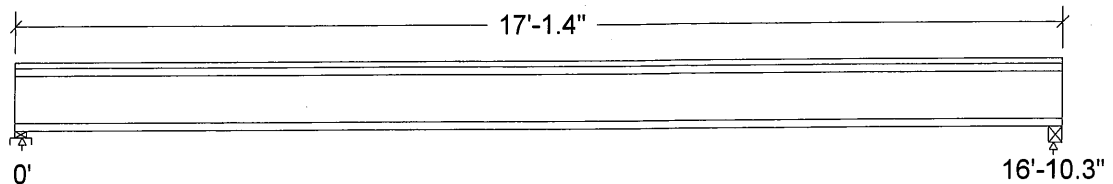
PROJECT
J1 1ST FLR

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
Self-weight	Dead	Full UDL			2.9	plf

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



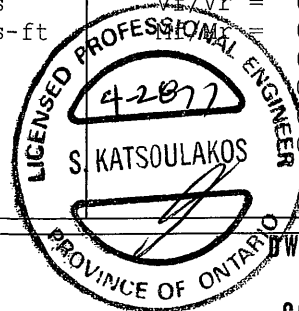
Unfactored:			
Dead	252		252
Live	456		457
Factored:			
Total	999		1000
Bearing:			
Resistance			
Joist	2099		2117
Support	3651		-
Des ratio			
Joist	0.48		0.47
Support	0.27		-
Load case	#2		#2
Length	2-3/8		2-1/2
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		-
fcp sup	769		-
Kzcp sup	1.00		-

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

Nordic Joist 11-7/8" NI-40x Floor joist @ 16" o.c.
Supports: 1 - Lumber Sill plate, No.1/No.2; 2 - Steel Beam, W;
Total length: 17'-1.4"; 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 = 985	Vr = 2336	lbs	Vf/Vr = 0.42
Moment (+)	Mf = 4152	Mr = 6255	lbs-ft	Mf/Mr = 0.66
Perm. Defl'n	0.13 = <L/999	0.56 = L/360	in	0.24
Live Defl'n	0.24 = L/842	0.42 = L/480	in	0.57
Total Defl'n	0.37 = L/542	0.84 = L/240	in	0.44
Bare Defl'n	0.29 = L/696	0.56 = L/360	in	0.52
Vibration	Lmax = 16'-10	Lv = 18'-1	ft	
Defl'n	= 0.030	= 0.038	in	0.80



DWG NO. TAM19764-11
STRUCTURAL
COMPONENT ONLY

Additional Data:

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

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L

Moment(+) : LC #2 = 1.25D + 1.5L

Deflection: LC #1 = 1.0D (permanent)

LC #2 = 1.0D + 1.0L (live)

LC #2 = 1.0D + 1.0L (total)

LC #2 = 1.0D + 1.0L (bare joist)

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

Support 2 - LC #2 = 1.25D + 1.5L

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

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

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 = 460e06 lb-in² K= 6.18e06 lbs

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

CONFORMS TO OBC 2012**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.



DWG NO. TAM 19764-17
STRUCTURAL
COMPONENT ONLY

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER
BURLINGTON
Mar. 27, 2017 09:08

PROJECT
J1 2ND FLR

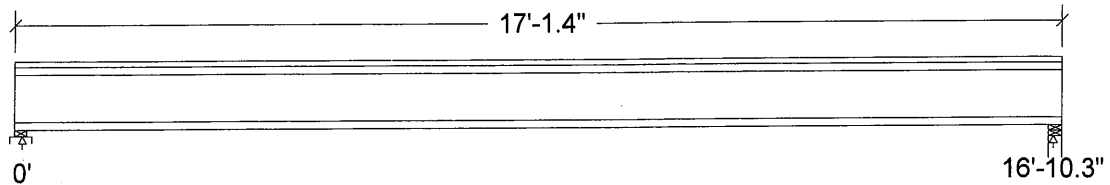
Design Check Calculation Sheet

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
Self-weight	Dead	Full UDL			2.9	plf

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



Unfactored:			
Dead	252		252
Live	456		457
Factored:			
Total	999		1000
Bearing:			
Resistance			
Joist	2099		2117
Support	3651		4228
Des ratio			
Joist	0.48		0.47
Support	0.27		0.24
Load case	#2		#2
Length	2-3/8		2-1/2
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		1.00
fcp sup	769		769
Kzcp sup	1.00		1.10

*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 11-7/8" NI-40x Floor joist @ 16" o.c.

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

Total length: 17'-1.4"; 5/8" nailed and glued OSB sheathing with 1/2" gypsum ceiling

This section PASSES the design code check.



DWG NO. TAM19765-17
STRUCTURAL
COMPONENT ONLY

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	$V_f = 985$	$V_r = 2336$	lbs	$V_f/V_r = 0.42$
Moment (+)	$M_f = 4152$	$M_r = 6255$	lbs-ft	$M_f/M_r = 0.66$
Perm. Defl'n	$0.14 = < L/999$	$0.56 = L/360$	in	0.24
Live Defl'n	$0.25 = L/822$	$0.42 = L/480$	in	0.58
Total Defl'n	$0.38 = L/529$	$0.84 = L/240$	in	0.45
Bare Defl'n	$0.29 = L/696$	$0.56 = L/360$	in	0.52
Vibration	$L_{max} = 16'-10$	$L_v = 17'-8$	ft	
Defl'n	$= 0.032$	$= 0.038$	in	0.86

Additional Data:

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

CRITICAL LOAD COMBINATIONS:

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

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

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

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: $EI_{eff} = 448e06 \text{ lb-in}^2$ $K = 6.18e06 \text{ lbs}$
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow...)

CONFORMS TO OBC 2012

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.
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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.
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DWG NO. TAM19765-17
 STRUCTURAL
 COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1 EL 1 EL 2 EL 3 1ST FLR.mmdl

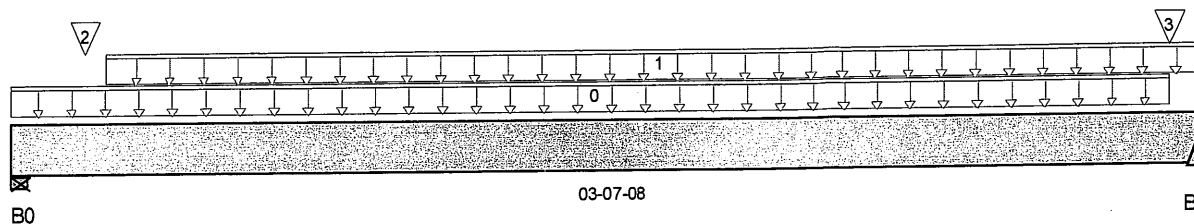
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i1844)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 03-07-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	443 / 0	245 / 0		
B1	633 / 0	327 / 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	03-06-04	26	13			n/a
1	User Load	Unf. Lin. (lb/ft)	L	00-03-08	03-07-08	240	120			n/a
2	E10(i312)	Conc. Pt. (lbs)	L	00-02-12	00-02-12	14	19			n/a
3	-	Conc. Pt. (lbs)	L	03-06-03	03-06-03	170	86			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	776 ft-lbs	19,364 ft-lbs	4%	1	01-10-08
End Shear	341 lbs	7,232 lbs	4.7%	1	01-03-06
Total Load Defl.	L/999 (0.002")	n/a	n/a	4	01-10-08
Live Load Defl.	L/999 (0.001")	n/a	n/a	5	01-10-08
Max Defl.	0.002"	n/a	n/a	4	01-10-08
Span / Depth	3.3	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-1/2" x 1-3/4"	970 lbs	29.7%	13%	Unspecified
B1 Hanger	2" x 1-3/4"	1,358 lbs	n/a	31.8%	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 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.

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BC®, 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.

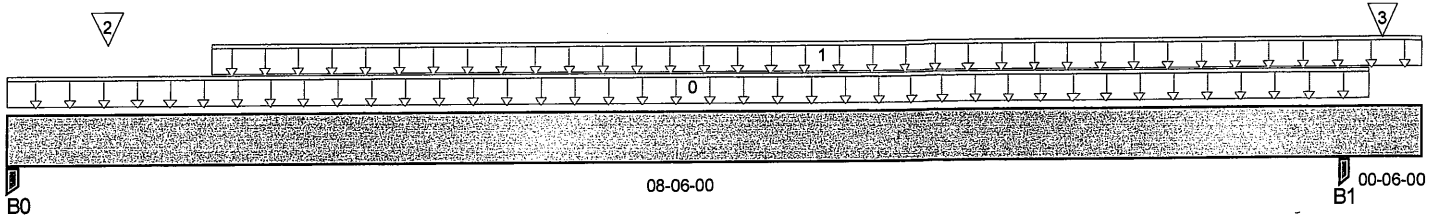
CONFORMS TO OBC 2012



DWG NO. TAM 19777-17
STRUCTURAL
COMPONENT ONLY

Build 5033
Job Name:
Address:
City, Province, Postal Code: WATERDOWN,
Customer:
Code reports: CCMC 12472-R

File Name: FLEMING 1 EL 1 EL 2 EL 3 1ST FLR.mmdl
Description: Designs\Flush Beams\Basment\Flush Beams\B2(i1598)
Specifier:
Designer: LBV
Company:
Misc:



Total Horizontal Product Length = 09-00-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4"	602 / 0	590 / 0		
B1, 4"	1,342 / 0	966 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	User Load	Unf. Lin. (lb/ft)	L	00-00-00	08-08-00		60			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-03-08	09-00-00	154	76			n/a
2	J5(i1639)	Conc. Pt. (lbs)	L	00-07-08	00-07-08	142	71			n/a
3	B1(i1844)	Conc. Pt. (lbs)	L	08-08-14	08-08-14	612	316			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,375 ft-lbs	19,364 ft-lbs	17.4%	2	04-07-08
Neg. Moment	-3 ft-lbs	n/a	n/a	0	08-06-00
End Shear	1,319 lbs	7,232 lbs	18.2%	1	01-03-14
Cont. Shear	1,371 lbs	7,232 lbs	19%	1	07-04-02
Total Load Defl.	L/999 (0.06")	n/a	n/a	9	04-04-08
Live Load Defl.	L/999 (0.031")	n/a	n/a	12	04-04-08
Total Neg. Defl.	2xL/1,998 (-0.012")	n/a	n/a	9	09-00-00
Max Defl.	0.06"	n/a	n/a	9	04-04-08
Span / Depth	8.3	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Post	4" x 1-3/4"	1,641 lbs	28.9%	19.2%	Unspecified
B1 Post	4" x 1-3/4"	3,220 lbs	56.6%	37.7%	Unspecified

Notes



DWG NO. TAM 19776.17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B2(i1598)

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

March 28, 2017 09:11:10

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: FLEMING 1 EL 1 EL 2 EL 3 1ST FLR.mmdl

Description: Designs\Flush Beams\Basement\Flush Beams\B2(i1598)

Specifier:

Designer: LBV

Company:

Msc:

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

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

Calculations assume member is fully braced.

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

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

CONFORMS TO OBC 2012

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

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

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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P62/2

DWG NO. TAM 19776-17
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report



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

March 27, 2017 08:54:07

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

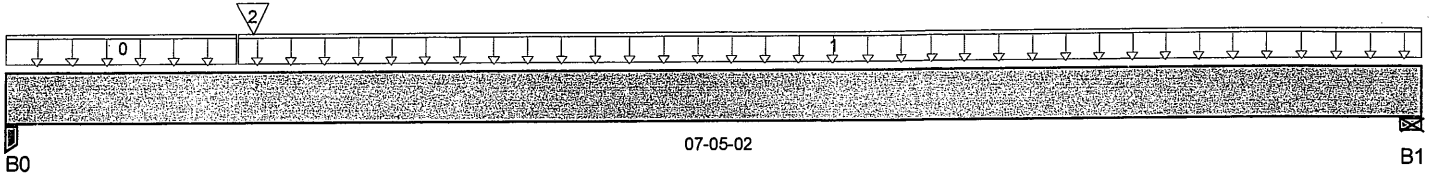
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i1616)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 07-05-02

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 2-1/4"	485 / 0	268 / 0		
B1, 4-3/8"	180 / 0	114 / 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	01-02-08	13	6			n/a
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	01-02-08	07-05-02	27	13			n/a
2	B4(i1605)	Conc. Pt. (lbs)	L	01-03-06	01-03-06	484	247			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,200 ft-lbs	19,364 ft-lbs	6.2%	1	01-03-06
End Shear	1,023 lbs	7,232 lbs	14.1%	1	01-02-02
Total Load Defl.	L/999 (0.014")	n/a	n/a	4	03-03-10
Live Load Defl.	L/999 (0.009")	n/a	n/a	5	03-03-10
Max Defl.	0.014"	n/a	n/a	4	03-03-10
Span / Depth	7.1	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	2-1/4" x 1-3/4"	1,063 lbs	33.2%	22.1%	Unspecified
B1 Wall/Plate	4-3/8" x 1-3/4"	412 lbs	10.1%	4.4%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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


Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

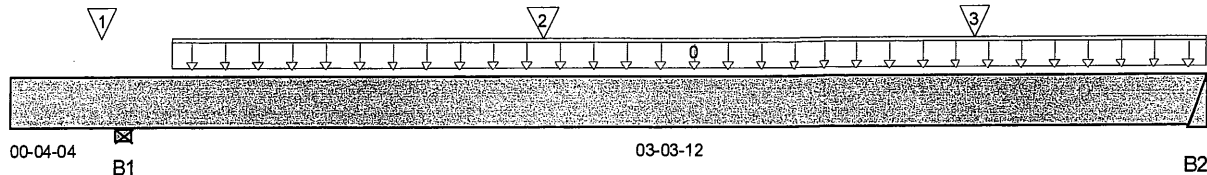
CONFORMS TO OBC 2012



DWG NO. TAM 19774-17
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report  Dry | 2 spans | Left cantilever | 0/12 slope (deg) March 27, 2017 08:54:07

Build 5033 File Name: FLEMING 1.mmd
 Job Name: Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1605)
 Address: Specifier:
 City, Province, Postal Code: WATERDOWN, Designer: LBV
 Customer: Company:
 Code reports: CCMC 12472-R Misc:



Total Horizontal Product Length = 03-08-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	1,142 / 0	631 / 0		
B2	577 / 14	291 / 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	00-06-00	03-08-00	240	120			n/a
1	-	Conc. Pt. (lbs)	L	00-03-07	00-03-07	652	373			n/a
2	J5(i1630)	Conc. Pt. (lbs)	L	01-07-08	01-07-08	160	80			n/a
3	J5(i1615)	Conc. Pt. (lbs)	L	02-11-08	02-11-08	128	64			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	953 ft-lbs	19,364 ft-lbs	4.9%	3	01-09-13
Neg. Moment	-100 ft-lbs	-19,364 ft-lbs	0.5%	1	00-04-04
End Shear	508 lbs	7,232 lbs	7%	3	02-06-02
Cont. Shear	528 lbs	7,232 lbs	7.3%	1	01-05-14
Total Load Defl.	L/999 (0.003")	n/a	n/a	10	01-11-08
Live Load Defl.	L/999 (0.002")	n/a	n/a	13	01-11-08
Total Neg. Defl.	2xL/1,998 (-0.001")	n/a	n/a	10	00-00-00
Max Defl.	0.003"	n/a	n/a	10	01-11-08
Span / Depth	3.2	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B1 Wall/Plate	3-1/2" x 1-3/4"	2,502 lbs	76.5%	33.5%	Unspecified
B2 Hanger	2" x 1-3/4"	1,229 lbs	n/a	28.8%	HUS1.81/10

Notes



DWG NO. TAM 19775-17
 STRUCTURAL
 COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i1605)

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

March 27, 2017 08:54:07

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1605)

Specifier:

Designer: LBV

Company:

Msc:

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

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

Calculations assume member is fully braced.

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

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

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 19775-17
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B5(i1810)

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

March 27, 2017 08:54:08

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

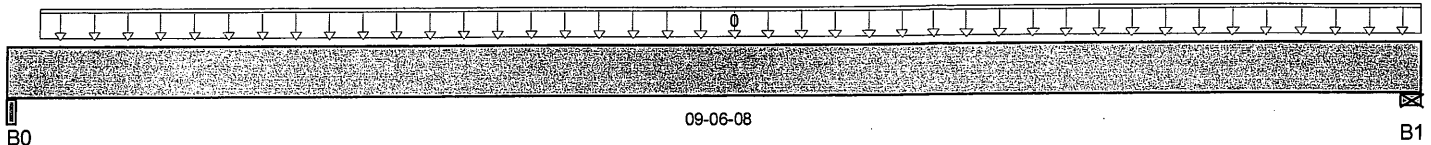
Description: Designs\Flush Beams\Basement\Flush Beams\B5(i1810)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 09-06-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/4"	49 / 0	53 / 0		
B1, 4-3/8"	50 / 0	54 / 0		

Load Summary

Tag Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0 FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-10	09-06-08	11	5	1.00	1.15	n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	296 ft-lbs	19,364 ft-lbs	1.5%	1	04-09-11
End Shear	102 lbs	7,232 lbs	1.4%	1	01-05-02
Total Load Defl.	L/999 (0.006")	n/a	n/a	4	04-09-11
Live Load Defl.	L/999 (0.003")	n/a	n/a	5	04-09-11
Max Defl.	0.006"	n/a	n/a	4	04-09-11
Span / Depth	9	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 Beam	5-1/4" x 1-3/4"	140 lbs	2.8%	1.2%	Unspecified
B1 Wall/Plate	4-3/8" x 1-3/4"	143 lbs	3.5%	1.5%	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



09-06-08, TAM 19779-17
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B6(i1608)

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

March 27, 2017 08:54:08

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

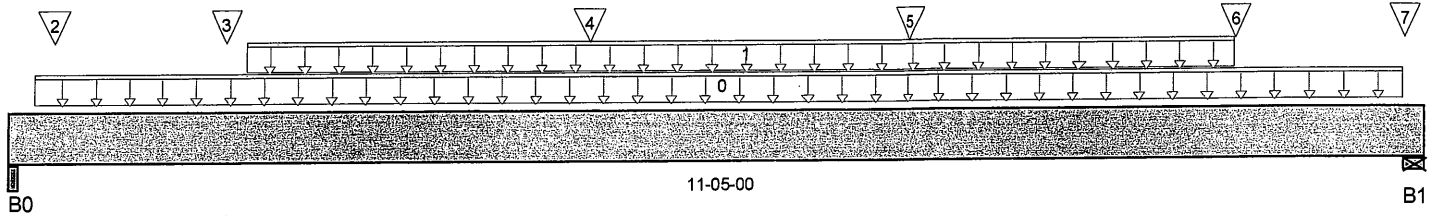
Description: Designs\Flush Beams\Basement\Flush Beams\B6(i1608)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 11-05-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/16"	1,430 / 0	765 / 0		
B1, 5-5/16"	1,729 / 0	930 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-07	11-02-15	7	4			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-10-15	09-10-15	108	54			n/a
2	-	Conc. Pt. (lbs)	L	00-04-05	00-04-05	386	210			n/a
3	J3DJ(i1640)	Conc. Pt. (lbs)	L	01-08-15	01-08-15	313	156			n/a
4	J3DJ(i1621)	Conc. Pt. (lbs)	L	04-07-15	04-07-15	314	157			n/a
5	J3(i1638)	Conc. Pt. (lbs)	L	07-02-15	07-02-15	293	146			n/a
6	J3(i1626)	Conc. Pt. (lbs)	L	09-10-15	09-10-15	293	146			n/a
7	-	Conc. Pt. (lbs)	L	11-03-00	11-03-00	586	340			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	7,017 ft-lbs	19,364 ft-lbs	36.2%	1	05-10-15
End Shear	2,376 lbs	7,232 lbs	32.9%	1	09-11-13
Total Load Defl.	L/622 (0.206")	0.534"	38.6%	4	05-09-01
Live Load Defl.	L/948 (0.135")	0.356"	38%	5	05-09-01
Max Defl.	0.206"	n/a	n/a	4	05-09-01
Span / Depth	10.8	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	5-1/16" x 1-3/4"	3,102 lbs	65.2%	28.5%	Unspecified
B1 Wall/Plate	5-5/16" x 1-3/4"	3,756 lbs	75.7%	33.1%	Unspecified

Notes



pg 1/2

DWG NO. TAM 1977B.17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B6(i1608)

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

March 27, 2017 08:54:08

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

Description: Designs\Flush Beams\Basement\Flush Beams\B6(i1608)

Specifier:

Designer: LBV

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.

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

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

CONFORMS TO OBC 2012

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

Disclosure

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

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DWG NO. TAM 1977 B.17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

**Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP****PASSED****1st Floor Flush Beams\B7(i1865)**

Dry | 1 span | No cant.

June 25, 2018 13:25:34

BC CALC® Member Report

Build 6475

Job name:

Address:

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

Customer:

Code reports: CCMC 12472-R

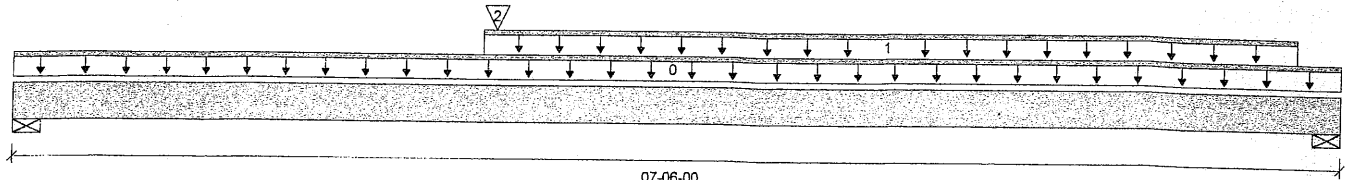
File name: FLEMING 1.mmdl

Description: 1st Floor Flush Beams\B7(i1865)

Specifier:

Designer: LBV

Company:



B1

07-06-00

Total Horizontal Product Length = 07-06-00

B2

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	788 / 0	439 / 0		
B2, 5-1/2"	509 / 0	291 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	07-06-00	Top		6			00-00-00
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	02-08-00	07-03-02	Top	24	12			n/a
2	B9(i1861)	Conc. Pt. (lbs)	L	02-08-14	02-08-14	Top	1,187	629			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	4,314 ft-lbs	17,696 ft-lbs	24.4%	1	02-08-14
End Shear	1,721 lbs	7,232 lbs	23.8%	1	01-03-06
Total Load Deflection	L/999 (0.043")	n/a	n/a	4	03-05-09
Live Load Deflection	L/999 (0.028")	n/a	n/a	5	03-05-09
Max Defl.	0.043"	n/a	n/a	4	03-05-09
Span / Depth	6.9				

Bearing Supports

	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B1	Wall/Plate 3-1/2" x 1-3/4"	1,730 lbs	52.9%	23.2%	Unspecified
B2	Wall/Plate 5-1/2" x 1-3/4"	1,127 lbs	21.9%	9.6%	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**

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

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 DWG NO. TAM 7800652
 STRUCTURAL
 COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

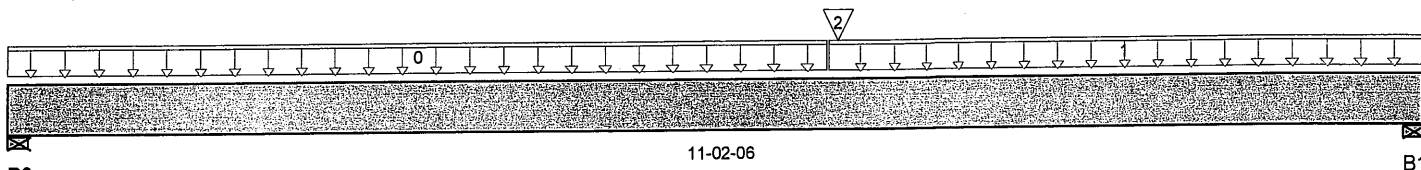
Description: Designs\Flush Beams\1st Floor\Flush Beams\B8(i1644)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 11-02-06

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	345 / 0	220 / 0		
B1, 4-3/8"	490 / 0	297 / 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	06-05-08	13	6			n/a
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	06-05-08	11-02-06	27	13			n/a
2	B9(i1646)	Conc. Pt. (lbs)	L	06-06-06	06-06-06	627	346			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,131 ft-lbs	19,364 ft-lbs	21.3%	1	06-06-06
End Shear	1,019 lbs	7,232 lbs	14.1%	1	09-10-02
Total Load Defl.	L/999 (0.098")	n/a	n/a	4	05-10-00
Live Load Defl.	L/999 (0.062")	n/a	n/a	5	05-10-00
Max Defl.	0.098"	n/a	n/a	4	05-10-00
Span / Depth	10.6	n/a	n/a		00-00-00

Bearing Supports

B0	Wall/Plate	5-1/2" x 1-3/4"	791 lbs	15.4%	6.7%	Unspecified
B1	Wall/Plate	4-3/8" x 1-3/4"	1,106 lbs	27.1%	11.8%	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.

Design based on Dry Service Condition.

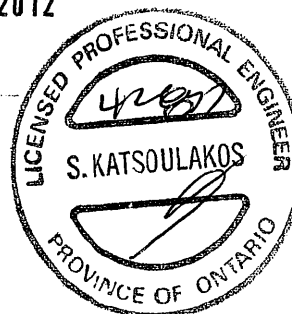
Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 2012

Disclosure

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DWG NO. TAM 19771-17
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B9(i1646)

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

March 27, 2017 08:54:07

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

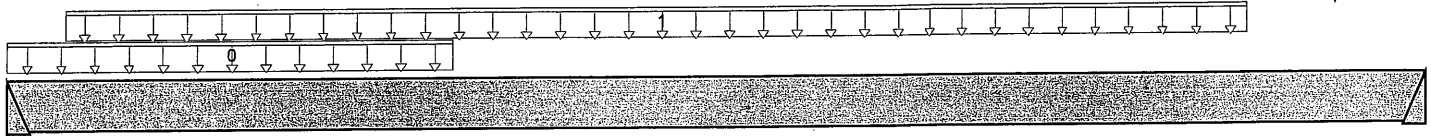
Description: Designs\Flush Beams\1st Floor\Flush Beams\B9(i1646)

Specifier:

Designer: LBV

Company:

Misc:



11-02-00

B1

Total Horizontal Product Length = 11-02-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	1,191 / 0	629 / 0		
B1	618 / 0	342 / 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	03-06-00	240	120			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	00-05-08	09-09-08	94	46			n/a
2	J6(i1654)	Conc. Pt. (lbs)	L	10-05-08	10-05-08	97	48			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,753 ft-lbs	19,364 ft-lbs	24.5%	1	03-09-08
End Shear	1,966 lbs	7,232 lbs	27.2%	1	01-01-14
Total Load Defl.	L/882 (0.149")	0.548"	27.2%	4	05-03-08
Live Load Defl.	L/999 (0.097")	n/a	n/a	5	05-03-08
Max Defl.	0.149"	n/a	n/a	4	05-03-08
Span / Depth	11.1	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"	2,572 lbs	n/a	60.2%	HUS1.81/10
B1 Hanger	2" x 1-3/4"	1,355 lbs	n/a	31.7%	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



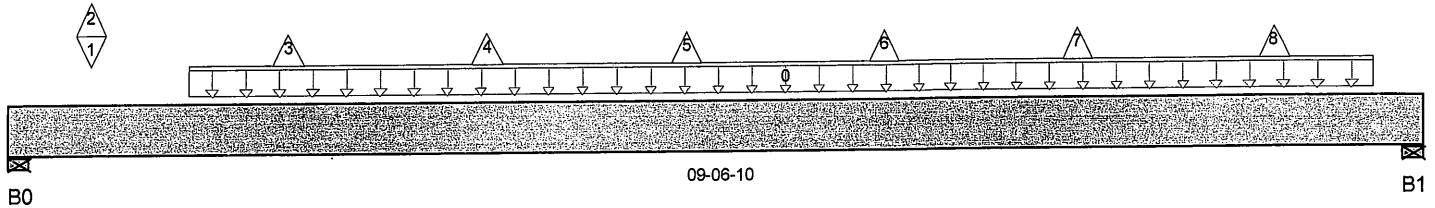
DWG NO. TAM 19769-11
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report



Build 5033
Job Name:
Address:
City, Province, Postal Code: WATERDOWN,
Customer:
Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl
Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i1724)
Specifier:
Designer: LBV
Company:
Misc:



Total Horizontal Product Length = 09-06-10

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/8"	2,363 / 83	1,194 / 0		
B1, 3-1/2"	2,238 / 90	1,128 / 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	01-02-10	09-02-10	504	240			n/a
1	-	Conc. Pt. (lbs)	L	00-06-10	00-06-10	574	281			n/a
2	-	Conc. Pt. (lbs)	L	00-06-10	00-06-10	-11				n/a
3	J2(i1684)	Conc. Pt. (lbs)	L	01-10-10	01-10-10	-27				n/a
4	J2(i1781)	Conc. Pt. (lbs)	L	03-02-10	03-02-10	-27				n/a
5	J2(i1740)	Conc. Pt. (lbs)	L	04-06-10	04-06-10	-27				n/a
6	J2(i1676)	Conc. Pt. (lbs)	L	05-10-10	05-10-10	-27				n/a
7	J2(i1822)	Conc. Pt. (lbs)	L	07-02-10	07-02-10	-27				n/a
8	J2(i1819)	Conc. Pt. (lbs)	L	08-06-10	08-06-10	-27				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	11,293 ft-lbs	38,727 ft-lbs	29.2%	1	04-06-10
End Shear	4,348 lbs	14,464 lbs	30.1%	1	08-03-04
Total Load Defl.	L/999 (0.121")	n/a	n/a	6	04-09-10
Live Load Defl.	L/999 (0.08")	n/a	n/a	8	04-09-10
Max Defl.	0.121"	n/a	n/a	6	04-09-10
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 Wall/Plate	3-1/8" x 3-1/2"	5,038 lbs	86.3%	37.8%	Unspecified
B1 Wall/Plate	3-1/2" x 3-1/2"	4,767 lbs	72.9%	31.9%	Unspecified

Notes



pg 1/2

DWG NO. TAM 19773-17
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP 1st Floor\...B10(i1724)

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

March 27, 2017 08:54:07

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B10(i1724

Specifier:

Designer: LBV

Company:

Misc:

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: 00-00-00, Bottom: 00-00-00.

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

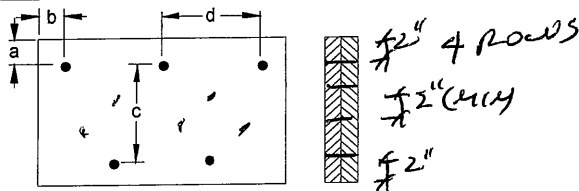
CONFORMS TO OBC 2012

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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Connection Diagram



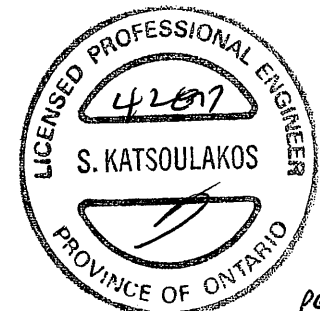
a minimum = 2" c = 7-7/8"
b minimum = 3" d = 6"

Calculated Side Load = 692.4 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 Nails

3 1/2" ARDOX SPIRAL



P622

DWG NO. TAM 19773-17
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report


Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

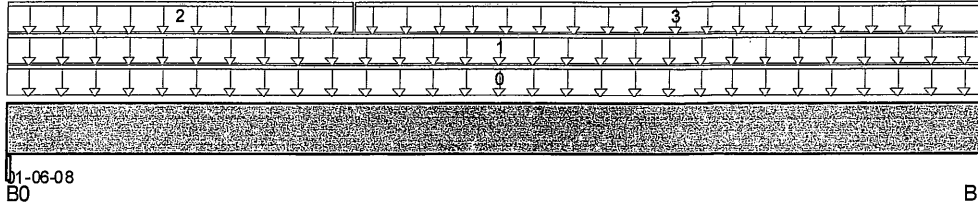
Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i1811)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 01-06-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 6-1/2"	194 / 0	231 / 0	356 / 0	
B1, 6-1/2"	194 / 0	256 / 0	356 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	ROOF	Unf. Lin. (lb/ft)	L	00-00-00	01-06-08	242	220	462		n/a
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	01-06-08	9	5			n/a
2	WALL	Unf. Lin. (lb/ft)	L	00-00-00	00-06-08		49			n/a
3	WALL	Unf. Lin. (lb/ft)	L	00-06-08	01-06-08		96			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	52 ft-lbs	38,727 ft-lbs	0.1%	13	00-09-04
End Shear	283 lbs	14,464 lbs	2%	13	00-06-08
Span / Depth	0.6	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	6-1/2" x 3-1/2"	920 lbs	7.6%	3.3%	Unspecified
B1 Beam	6-1/2" x 3-1/2"	951 lbs	7.8%	3.4%	Unspecified

Notes

Calculations assume member is fully braced.

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

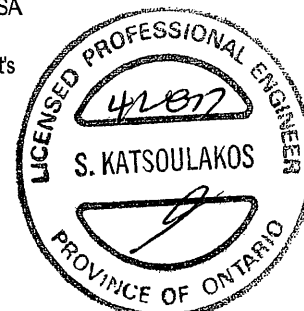
BC CALC® analysis is based on Canadian Limit States Design, as per NBCC 2010 and CSA O86.

CONFORMS TO OBC 2012

Unbalanced snow loads determined from building geometry were used in selected products verification.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



pg 1/2

DWG NO. TAM 19768.17
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: FLEMING 1.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i1811)

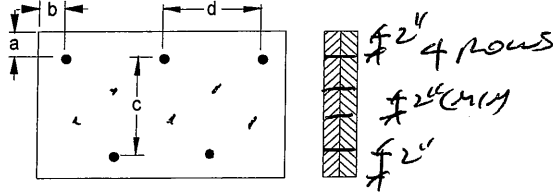
Specifier:

Designer: LBV

Company:

Msc:

Connection Diagram



a minimum = 2" c = 7-7/8"
b minimum = 3" d = 4"

Member has no side loads.

Connectors are: 16d Nails

3 1/2" ARDOX SPIRAL

Disclosure

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DWG NO. TAM 19768-17
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP 1st Floor\..B12(i1610)

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

March 27, 2017 08:54:06

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

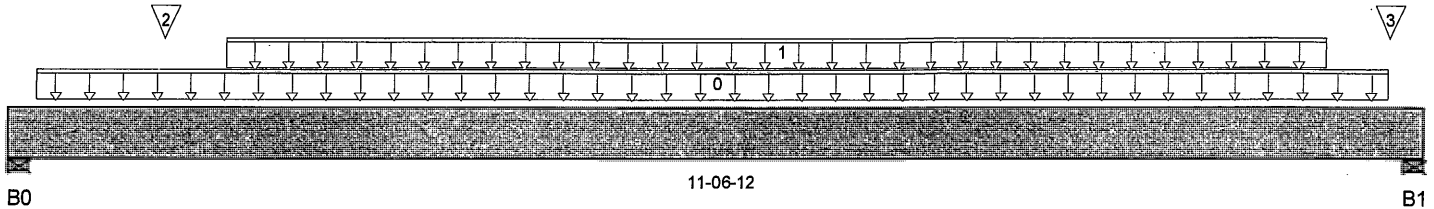
Description: Designs\Flush Beams\1st Floor\Flush Beams\B12(i1610)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 11-06-12

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	1,202 / 0	636 / 0		
B1, 6-3/4"	1,414 / 0	742 / 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	00-02-12	11-03-04	13	6			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-09-04	10-09-04	216	108			n/a
2	J3(i1709)	Conc. Pt. (lbs)	L	01-03-04	01-03-04	284	142			n/a
3	J3(i1627)	Conc. Pt. (lbs)	L	11-03-04	11-03-04	250	125			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	7,058 ft-lbs	19,364 ft-lbs	36.4%	1	05-03-04
End Shear	2,447 lbs	7,232 lbs	33.8%	1	01-05-06
Total Load Defl.	L/610 (0.21")	0.533"	39.3%	4	05-09-04
Live Load Defl.	L/931 (0.137")	0.355"	38.7%	5	05-09-04
Max Defl.	0.21"	n/a	n/a	4	05-09-04
Span / Depth	10.8	n/a	n/a		00-00-00

Disclosure

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Bearing Supports

B0	Wall/Plate	5-1/2" x 1-3/4"	2,598 lbs	50.6%	22.1%	Unspecified
B1	Wall/Plate	6-3/4" x 1-3/4"	3,048 lbs	48.2%	21.1%	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.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 201



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DWG NO. TAM 19767.17
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report



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

March 27, 2017 08:54:07

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

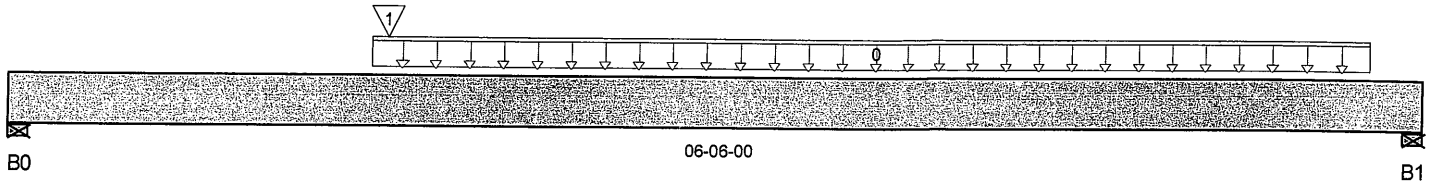
Description: Designs\Flush Beams\1st Floor\Flush Beams\B7(i1655)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 06-06-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 6"	952 / 0	522 / 0		
B1, 5-1/2"	340 / 0	197 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0	FC2 Floor Material	Unf. Lin. (lb/ft)	L	01-08-00	06-03-02	24	12			n/a
1	B9(i1646)	Conc. Pt. (lbs)	L	01-08-14	01-08-14	1,182	625			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	2,699 ft-lbs	19,364 ft-lbs	13.9%	1	01-08-14
End Shear	2,069 lbs	7,232 lbs	28.6%	1	01-05-14
Total Load Defl.	L/999 (0.018")	n/a	n/a	4	02-11-13
Live Load Defl.	L/999 (0.011")	n/a	n/a	5	02-11-13
Max Defl.	0.018"	n/a	n/a	4	02-11-13
Span / Depth	5.7	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	6" x 1-3/4"	2,080 lbs	37.1%	16.2%	Unspecified
B1	5-1/2" x 1-3/4"	757 lbs	14.7%	6.4%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012



DWG NO. TAM 19772-17
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B13(i1660)

BC CALC® Design Report



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

March 27, 2017 08:54:07

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl

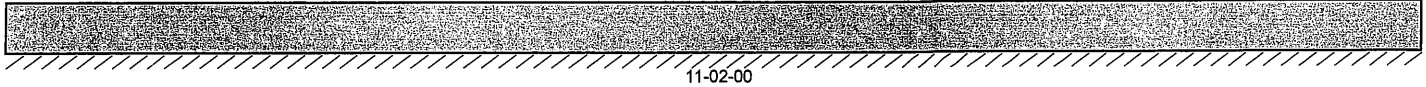
Description: Designs\Flush Beams\1st Floor\Flush Beams\B13(i1660)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 11-02-00

Reaction Summary (Down / Uplift) (lbs)

Bearing Live Dead Snow Wind

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Distributed Load(B0)	-0 lb/ft	n/a	n/a	0	n/a
Concentrated Load(B0)	-0 lbs	n/a	n/a	0	n/a

Disclosure

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BC CALC® Design Report


Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1 EL 3 2ND FLR.mmdl

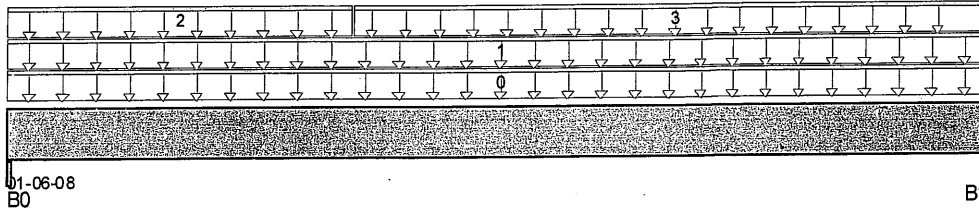
Description: Designs\Flush Beams\1st Floor\Flush Beams\B13(i1811)

Specifier:

Designer: LBV

Company:

Misc:



Total Horizontal Product Length = 01-06-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 6-1/2"	195 / 0	232 / 0	356 / 0	
B1, 6-1/2"	195 / 0	257 / 0	356 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	ROOF	Unf. Lin. (lb/ft)	L	00-00-00	01-06-08	242	220	462		n/a
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	01-06-08	11	5			n/a
2	WALL	Unf. Lin. (lb/ft)	L	00-00-00	00-06-08		49			n/a
3	WALL	Unf. Lin. (lb/ft)	L	00-06-08	01-06-08		96			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	53 ft-lbs	38,727 ft-lbs	0.1%	13	00-09-04
End Shear	283 lbs	14,464 lbs	2%	13	00-06-08
Span / Depth	0.6	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	6-1/2" x 3-1/2"	921 lbs	7.6%	3.3%	Unspecified
B1 Beam	6-1/2" x 3-1/2"	953 lbs	7.8%	3.4%	Unspecified

Notes

Calculations assume member is fully braced.

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

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



16' 1/2"

 DWG NO. TAM 1978917
 STRUCTURAL
 COMPONENT ONLY

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: FLEMING 1 EL 3 2ND FLR.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B13(i1811)

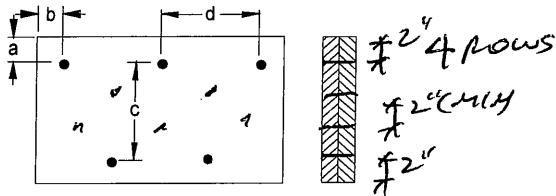
Specifier:

Designer: LBV

Company:

Misc:

Connection Diagram



a minimum = 2" c = 7-7/8"
b minimum = 3" d = 6"

Member has no side loads.

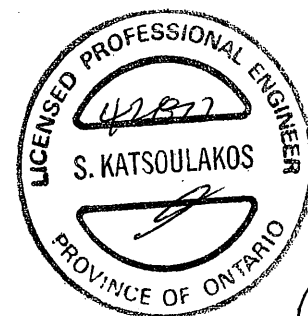
Connectors are: 16d Common Nails

3 1/2" ARDOX SPIRAL

Disclosure

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

BC CALC®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BC®, 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.



10/2/17

DWG NO. TAM 19780-17
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B15(i1860)

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

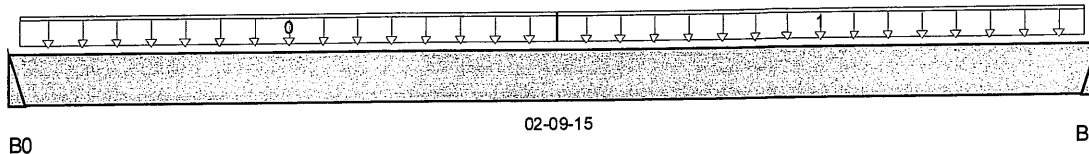
April 28, 2017 11:32:55

BC CALC® Design Report



Build 5033
Job Name:
Address:
City, Province, Postal Code: WATERDOWN,
Customer:
Code reports: CCMC 12472-R

File Name: FLEMING 1.mmdl
Description: Designs\Flush Beams\1st Floor\Flush Beams\B15(i1860)
Specifier:
Designer: LBV
Company:
Misc:



Total Horizontal Product Length = 02-09-15

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	12 / 0	15 / 0		
B1	12 / 0	15 / 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	00-00-06	01-05-00	2	1			n/a
1	FC2 Floor Material	Unf. Lin. (lb/ft)	L	01-05-00	02-09-09	16	8			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	27 ft-lbs	19,364 ft-lbs	0.1%	1	01-04-15
End Shear	28 lbs	7,232 lbs	0.4%	1	01-01-14
Total Load Defl.	L/999 (0")	n/a	n/a	4	01-05-00
Max Defl.	0"	n/a	n/a	4	01-05-00
Span / Depth	2.6	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 Hanger	2" x 1-3/4"	37 lbs	n/a	0.9%	LS90
B1 Hanger	2" x 1-3/4"	37 lbs	n/a	0.9%	LS90

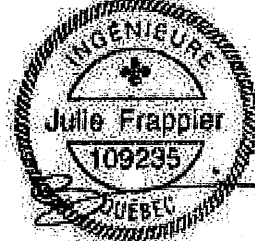
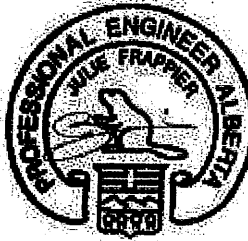
Notes

Design meets Code minimum (L/240) Total 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.
Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 2012



DWG NO. TAM 19766-17
STRUCTURAL
COMPONENT ONLY



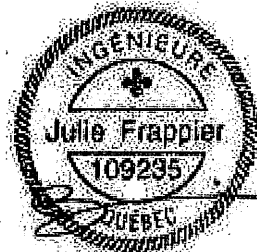
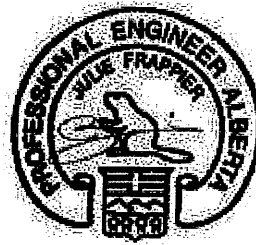
Maximum Floor Spans

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.



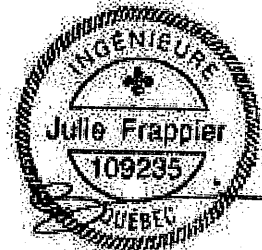
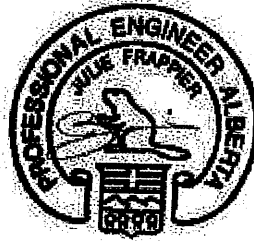
Maximum Floor Spans

Live Load = 40 psf, Dead Load = 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
	NI-90x	20'-4"	18'-9"	17'-11"	N/A	20'-10"	19'-3"	18'-5"	N/A
14"	NI-40x	20'-1"	18'-7"	17'-10"	N/A	20'-10"	19'-4"	18'-6"	N/A
	NI-60	20'-5"	18'-11"	18'-1"	N/A	21'-2"	19'-7"	18'-9"	N/A
	NI-70	21'-7"	20'-0"	19'-1"	N/A	22'-3"	20'-7"	19'-8"	N/A
	NI-80	21'-11"	20'-3"	19'-4"	N/A	22'-7"	20'-11"	20'-0"	N/A
	NI-90x	22'-7"	20'-11"	19'-11"	N/A	23'-3"	21'-6"	20'-6"	N/A
16"	NI-60	22'-3"	20'-8"	19'-9"	N/A	23'-1"	21'-5"	20'-6"	N/A
	NI-70	23'-6"	21'-9"	20'-9"	N/A	24'-3"	22'-5"	21'-5"	N/A
	NI-80	23'-11"	22'-1"	21'-1"	N/A	24'-8"	22'-10"	21'-9"	N/A
	NI-90x	24'-8"	22'-9"	21'-9"	N/A	25'-4"	23'-5"	22'-4"	N/A

Depth	Series	Mid-Span Blocking				Mid-Span Blocking and 1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	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
	NI-90x	23'-4"	21'-8"	20'-8"	N/A	23'-10"	22'-2"	21'-2"	N/A
14"	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
	NI-90x	26'-4"	24'-4"	23'-3"	N/A	26'-10"	24'-11"	23'-9"	N/A
16"	NI-60	26'-5"	24'-6"	23'-4"	N/A	27'-2"	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.



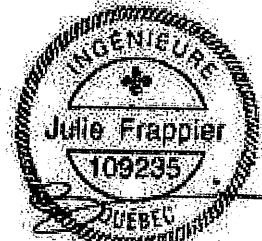
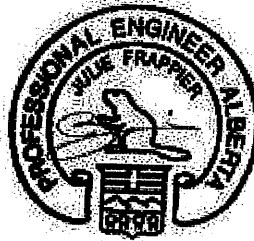
Maximum Floor Spans

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

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

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

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



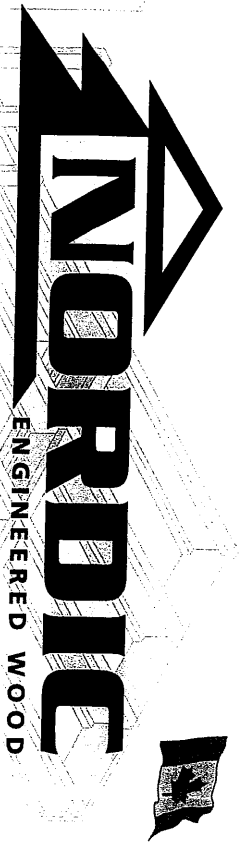
Maximum Floor Spans

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

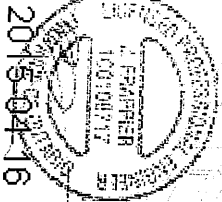
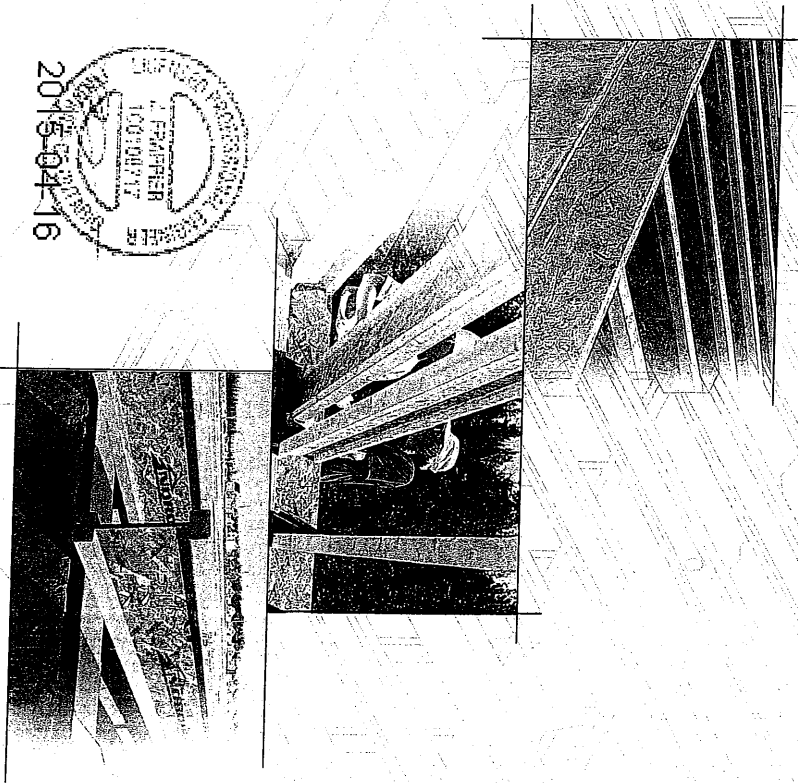
Depth	Series	Bare				1/2" Gypsum Ceiling			
		On Centre Spacing				On Centre Spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-7"	14'-2"	13'-4"	12'-4"	15'-7"	14'-2"	13'-4"	12'-4"
	NI-40x	17'-0"	16'-0"	15'-1"	13'-11"	17'-5"	16'-1"	15'-1"	13'-11"
	NI-60	17'-2"	16'-2"	15'-5"	14'-3"	17'-6"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

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

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



INSTALLATION GUIDE FOR RESIDENTIAL FLOORS



Distributed by:



N-C301 / November 2014

SAFETY AND CONSTRUCTION PRECAUTIONS

WARNING

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

Avoid Accidents by Following these Important Guidelines:

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

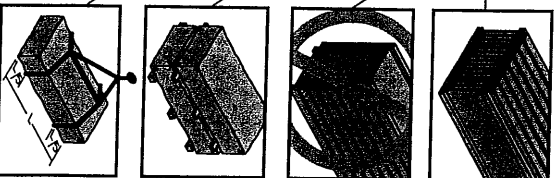


Never stack building materials over unsheathed I-joists. Once sheathed, do not over-stress I-joist with concentrated loads from building materials.

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-rolled 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 CGIBS-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
6. Tables are based on Limit States Design per CAN/CSA O86-09 Standard, and NBC 2010.
7. SI units conversion: 1 inch = 25.4 mm
1 foot = 0.305 m

WEB STIFFENERS

RECOMMENDATIONS:

- A **bearing stiffener** is required in all engineered applications with factored reactions greater than shown in the I-Ioist properties table found of the *I-Ioist Construction Guide* (C101). The gap between the stiffener and the flange is at the top.
- A **bearing stiffener** is required when the I-Ioist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.

- A **load stiffener** is required at locations where a factored concentrated load greater than 2,370 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for standard term load duration, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

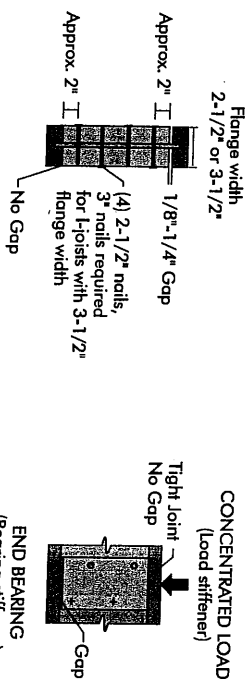
SI units conversion: 1 inch = 25.4 mm

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

Joist Depth	Joist Series	Simple spans				Multiple spans			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
12	12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	14	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	16	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	18	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
14	14	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	16	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	18	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
16	16	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	18	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
18	18	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
20	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
22	22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
24	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
26	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
28	28	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
30	30	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
32	32	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
34	34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	52	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
36	36	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	52	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	54	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
38	38	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	52	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	54	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	56	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
40	40	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	52	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	54	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	56	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	58	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
42	42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	48	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	52	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	54	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	56	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	58	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	60	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
44	44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	46								

CCMC EVALUATION REPORT 13032-R

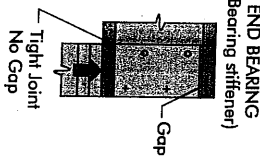
FIGURE 2
WEB STIFFENER INSTALLATION DETAILS



See table below for web stiffener size requirements

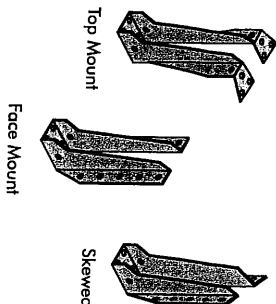
STIFFENER SIZE REQUIREMENTS

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

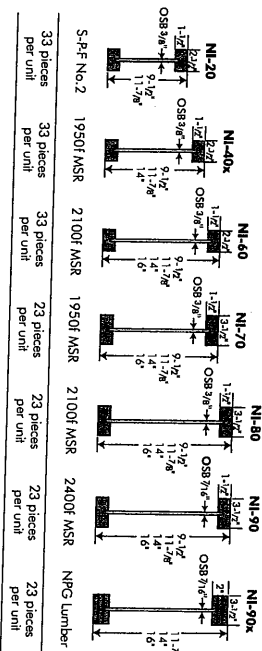


I-JOIST HANGERS

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



NORDIC I-JOIST SERIES



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

lumber in their flanges, ensuring consistent quality, superior strength, longer span carrying capacity.

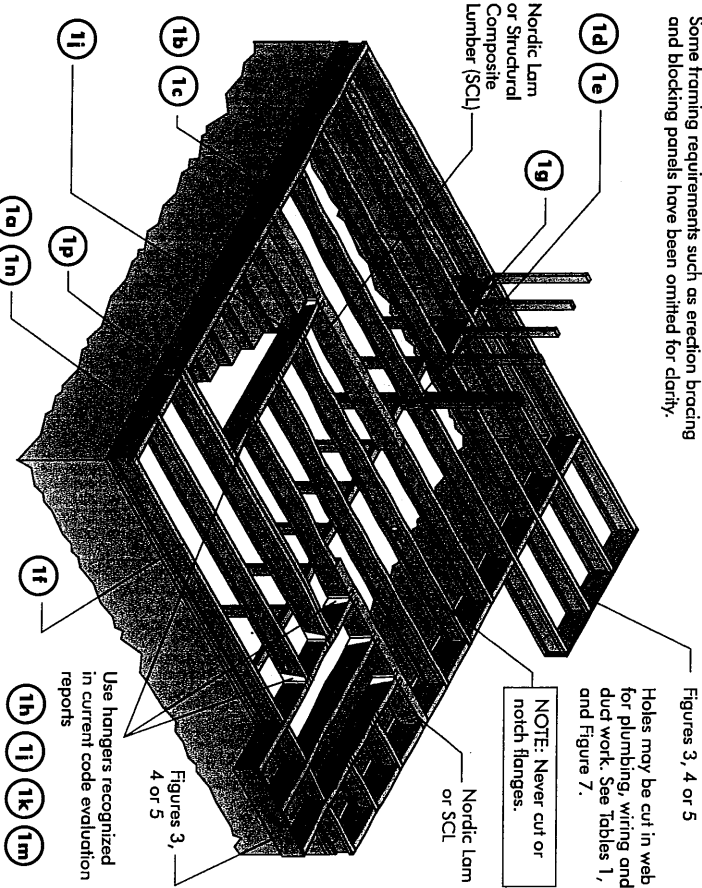
2015-04-16

INSTALLING NORDIC I-JOISTS

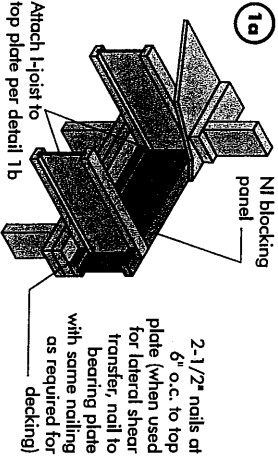
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, consult your supplier.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of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



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

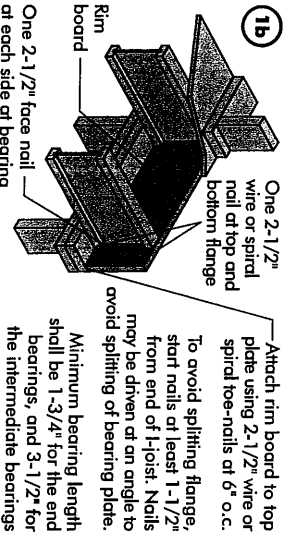


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



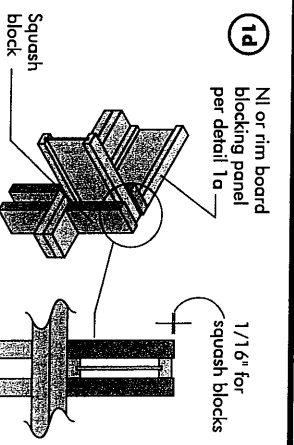
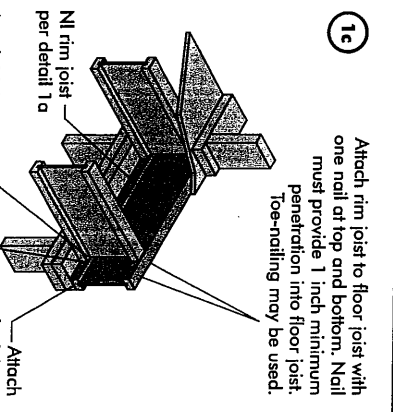
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (psf)
NI Joists	3,300

*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.



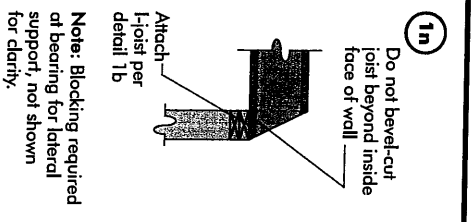
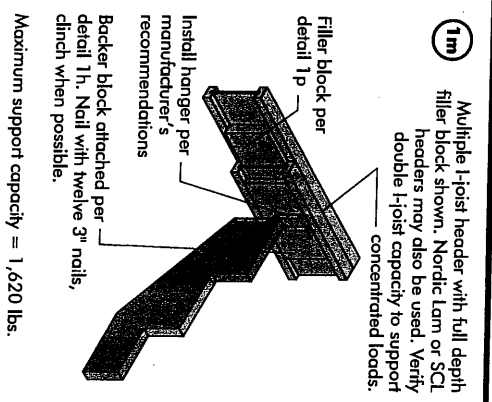
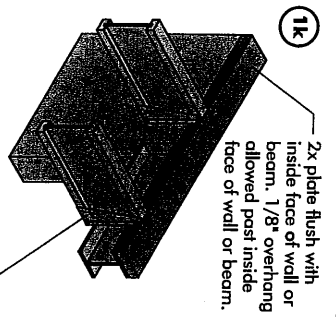
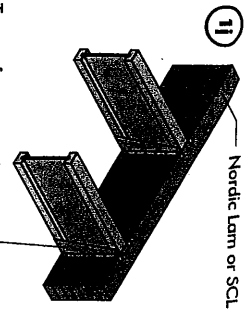
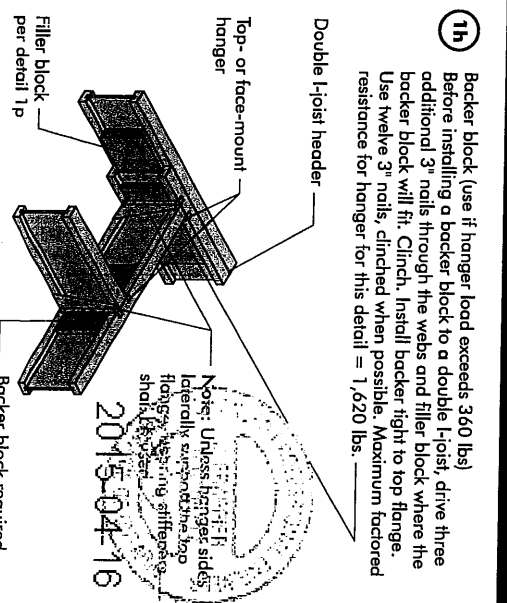
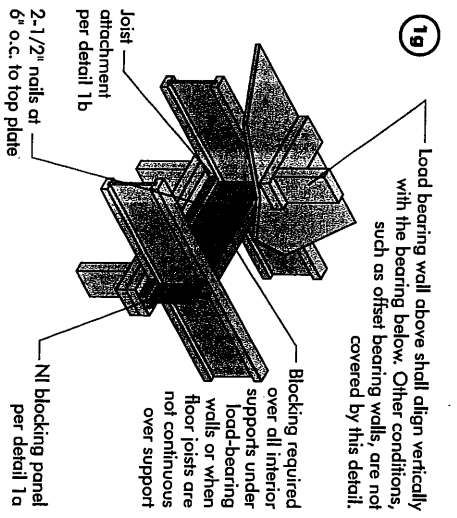
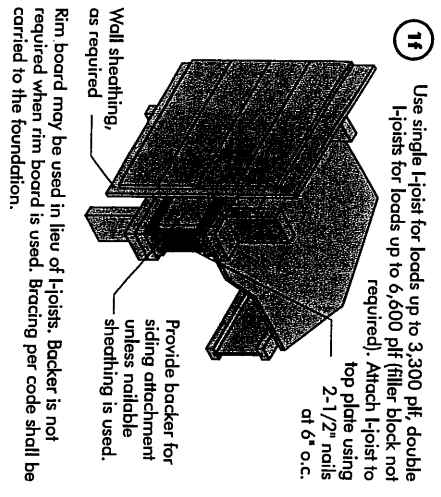
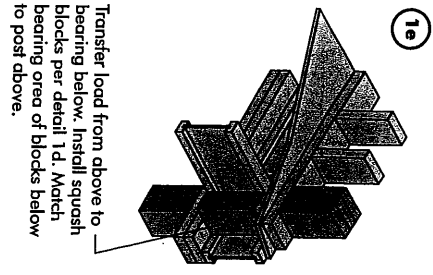
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (psf)
1-1/8" Rim Board Plus	8,090

*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
	6,600

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

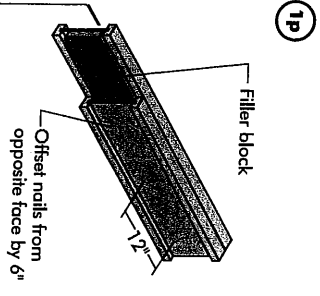


BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

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

* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-Q325 or CAN/CSA-Q437 Standard.

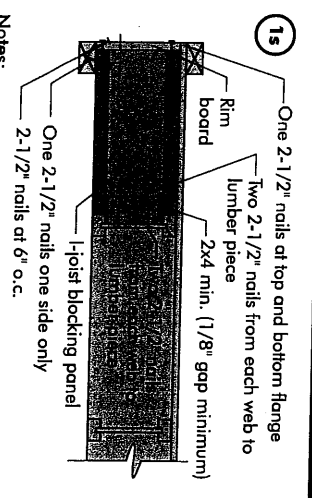
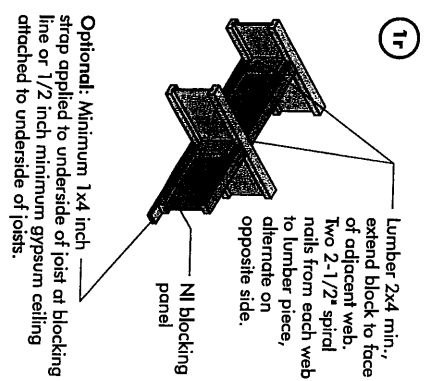
** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".



- 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 are clinched, only two nails per foot are required.
 - The maximum factored load that may be applied to one side of the double I-joist using this detail is 860 lb/ft. Verify double I-joist capacity.

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

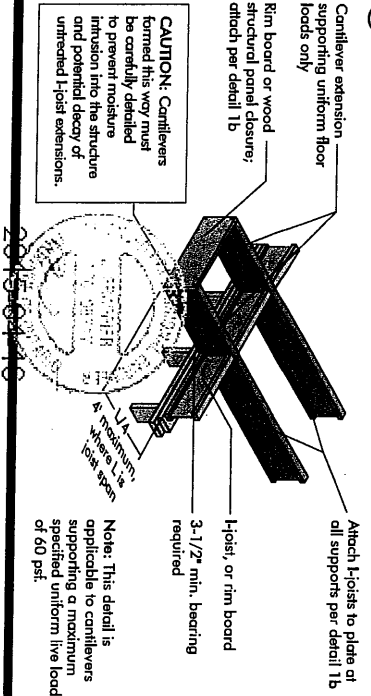
Flange Size	Joist Depth	Filler Block Size
2-1/2" x 1-1/2"	9-1/2" x 14" x 16"	2-1/8" x 6" x 8"
2-1/2" x 1-1/2"	11-7/8" x 14" x 16"	2-1/8" x 8" x 10"
3-1/2" x 1-1/2"	9-1/2" x 14" x 16"	3" x 6" x 8"
3-1/2" x 1-1/2"	11-7/8" x 14" x 16"	3" x 8" x 10"
3-1/2" x 1-1/2"	11-7/8" x 14" x 16"	3" x 12" x 12"
3-1/2"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



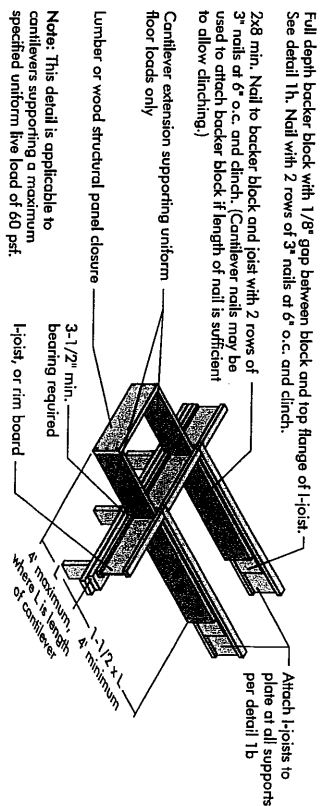
- Notes:**
- In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.
 - All nails are common spiral in this detail.

CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

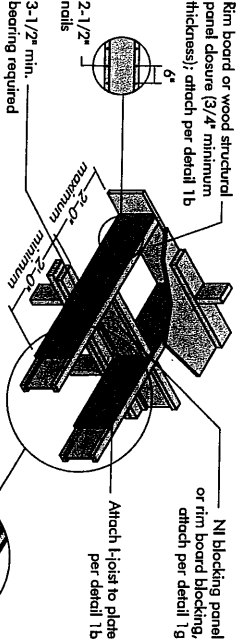


3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE



Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

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

4b Alternate Method 2 — DOUBLE I-JOIST

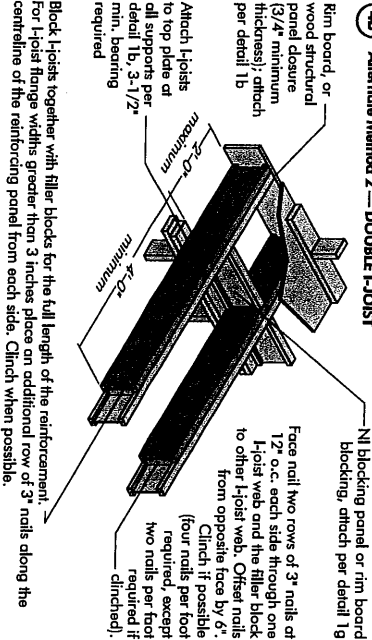
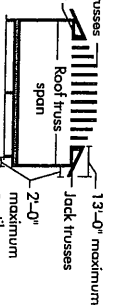
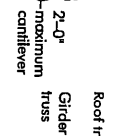
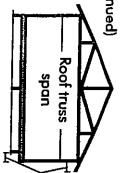


FIGURE 4 (continued)
See table below for NI reinforcement requirements of cantilever.



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

CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS		ROOF LOADING (UNFACTORED)											
	SPAN (ft)	LL = 30 psf, DL = 15 psf JOIST SPACING (in.)	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
28	28	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
32	32	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
36	36	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
40	40	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
44	44	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
48	48	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
52	52	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
56	56	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
60	60	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
64	64	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
68	68	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
72	72	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
76	76	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
80	80	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
84	84	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
88	88	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
92	92	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
96	96	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
100	100	12	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24

1. NI = No reinforcement required.
2. NI = NI reinforced with 3/4" wood structural panel on one side only.
3. NI = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist.
4. For larger openings or multiple 2'-0" wide 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 dead load, 55 psf floor joist load, and 80 psf wall load. Wall load is based on 3'-0" maximum width window or door openings.
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.
7. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
8. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

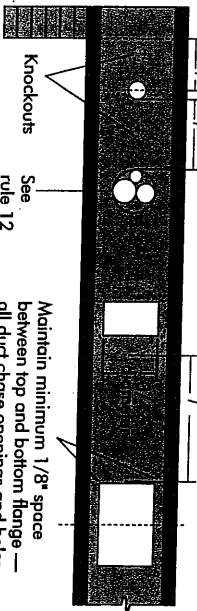
1. The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
2. I-joint top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut 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-joint web shall equal the clear distance between the flanges of the I-joint 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-joint 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 knock-out is **not** considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
10. All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

See Table 1 for minimum distance from bearing

2x diameter of larger hole

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

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



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

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



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

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

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

[illegible]

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

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, the minimum distance from the centerline of the hole to the face of any support (D) as given above may be reduced as follows:

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

Where:

$$\begin{array}{rcl} D & & \\ \text{Reduced} & = & \\ L_{\text{actual}} & = & \\ S_{AF} & = & \\ D & = & \end{array}$$

Distance from the inside face of any support to centre of hole, reduced for less-than-maximum distance shall not be less than 6 inches from the face of the support to edge of the hole.

The actual measured span distance between the inside faces of supports (ft).

Span Adjustment Factor given in this table.

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 L_{actual} .

SAE

TABLE 2
DUCT CHASE OPENING SIZES AND LOCATIONS

Minimum distance from inside face of any support to centre of opening (ft.-in.)										
Joist Depth	Joist Series	8	10	12	14	16	18	20	22	24
12	8	10	12	14	16	18	20	22	24	26
12	10	12	14	16	18	20	22	24	26	28
12	12	14	16	18	20	22	24	26	28	30
12	14	16	18	20	22	24	26	28	30	32
12	16	18	20	22	24	26	28	30	32	34
12	18	20	22	24	26	28	30	32	34	36
12	20	22	24	26	28	30	32	34	36	38
12	22	24	26	28	30	32	34	36	38	40
12	24	26	28	30	32	34	36	38	40	42
12	26	28	30	32	34	36	38	40	42	44
12	28	30	32	34	36	38	40	42	44	46
12	30	32	34	36	38	40	42	44	46	48
12	32	34	36	38	40	42	44	46	48	50
12	34	36	38	40	42	44	46	48	50	52
12	36	38	40	42	44	46	48	50	52	54
12	38	40	42	44	46	48	50	52	54	56
12	40	42	44	46	48	50	52	54	56	58
12	42	44	46	48	50	52	54	56	58	60
12	44	46	48	50	52	54	56	58	60	62
12	46	48	50	52	54	56	58	60	62	64
12	48	50	52	54	56	58	60	62	64	66
12	50	52	54	56	58	60	62	64	66	68
12	52	54	56	58	60	62	64	66	68	70
12	54	56	58	60	62	64	66	68	70	72
12	56	58	60	62	64	66	68	70	72	74
12	58	60	62	64	66	68	70	72	74	76
12	60	62	64	66	68	70	72	74	76	78
12	62	64	66	68	70	72	74	76	78	80
12	64	66	68	70	72	74	76	78	80	82
12	66	68	70	72	74	76	78	80	82	84
12	68	70	72	74	76	78	80	82	84	86
12	70	72	74	76	78	80	82	84	86	88
12	72	74	76	78	80	82	84	86	88	90
12	74	76	78	80	82	84	86	88	90	92
12	76	78	80	82	84	86	88	90	92	94
12	78	80	82	84	86	88	90	92	94	96
12	80	82	84	86	88	90	92	94	96	98
12	82	84	86	88	90	92	94	96	98	100
12	84	86	88	90	92	94	96	98	100	102
12	86	88	90	92	94	96	98	100	102	104
12	88	90	92	94	96	98	100	102	104	106
12	90	92	94	96	98	100	102	104	106	108
12	92	94	96	98	100	102	104	106	108	110
12	94	96	98	100	102	104	106	108	110	112
12	96	98	100	102	104	106	108	110	112	114
12	98	100	102	104	106	108	110	112	114	116
12	100	102	104	106	108	110	112	114	116	118
12	102	104	106	108	110	112	114	116	118	120
12	104	106	108	110	112	114	116	118	120	122
12	106	108	110	112	114	116	118	120	122	124
12	108	110	112	114	116	118	120	122	124	126
12	110	112	114	116	118	120	122	124	126	128
12	112	114	116	118	120	122	124	126	128	130
12	114	116	118	120	122	124	126	128	130	132
12	116	118	120	122	124	126	128	130	132	134
12	118	120	122	124	126	128	130	132	134	136
12	120	122	124	126	128	130	132	134	136	138
12	122	124	126	128	130	132	134	136	138	140
12	124	126	128	130	132	134	136	138	140	142
12	126	128	130	132	134	136	138	140	142	144
12	128	130	132	134	136	138	140	142	144	146
12	130	132	134	136	138	140	142	144	146	148
12	132	134	136	138	140	142	144	146	148	150
12	134	136	138	140	142	144	146	148	150	152
12	136	138	140	142	144	146	148	150	152	154
12	138	140	142	144	146	148	150	152	154	156
12	140	142	144	146	148	150	152	154	156	158
12	142	144	146	148	150	152	154	156	158	160
12	144	146	148	150	152	154	156	158	160	162
12	146	148	150	152	154	156	158	160	162	164
12	148	150	152	154	156	158	160	162	164	166
12	150	152	154	156	158	160	162	164	166	168
12	152	154	156	158	160	162	164	166	168	170
12	154	156	158	160	162	164	166	168	170	172
12	156	158	160	162	164	166	168	170	172	174
12	158	160	162	164	166	168	170	172	174	176
12	160	162	164	166	168	170	172	174	176	178
12	162	164	166	168	170	172	174	176	178	180
12	164	166	168	170	172	174	176	178	180	182
12	166	168	170	172	174	176	178	180	182	184
12	168	170	172	174	176	178	180	182	184	186
12	170	172	174	176	178	180	182	184	186	188
12	172	174	176	178	180	182	184	186	188	190
12	174	176	178	180	182	184	186	188	190	192
12	176	178	180	182	184	186	188	190	192	194
12	178	180	182	184	186	188	190	192	194	196
12	180	182	184	186	188	190	192	194	196	198
12	182	184	186	188	190	192	194	196	198	200
12	184	186	188	190	192	194	196	198	200	202
12	186	188	190	192	194	196	198	200	202	204
12	188	190	192	194	196	198	200	202	204	206
12	190	192	194	196	198	200	202	204	206	208
12	192	194	196	198	200	202	204	206	208	210
12	194	196	198	200	202	204	206	208	210	212
12	196	198	200	202	204	206	208	210	212	214
12	198	200	202	204	206	208	210	212	214	216
12	200	202	204	206	208	210	212	214	216	218
12	202	204	206	208	210	212	214	216	218	220
12	204	206	208	210	212	214	216	218	220	222
12	206	208	210	212	214	216	218	220	222	224
12	208	210	212	214	216	218	220	222	224	226
12	210	212	214	216	218	220	222	224	226	228
12	212	214	216	218	220	222	224	226	228	230
12	214	216	218	220	222	224	226	228	230	232
12	216	218	220	222	224	226	228	230	232	234
12	218	220	222	224	226	228	230	232	234	236
12	220	222	224	226	228	230	232	234	236	238
12	222	224	226	228	230	232	234	236	238	240
12	224	226	228	230	232	234	236	238	240	242
12	226	228	230	232	234	236	238	240	242	244
12	228	230	232	234	236	238	240	242	244	246
12	230	232	234	236	238	240	242	244	246	248
12	232	234	236	238	240	242	244	246	248	250
12	234	236	238	240	242	244	246	248	250	252
12	236	238	240	242	244	246	248	250	252	254
12	238	240	242	244	246	248	250	252	254	256
12	240	242	244	246	248	250	252	254	256	258
12	242	244	246	248	250	252	254	256	258	260
12	244	246	248	250	252	254	256	258	260	262
12	246	248	250	252	254	256	258	260	262	264
12	248	250	252	254	256	258	260	262	264	266
12	250	252	254	256	258	260	262	264	266	268
12	252	254	256	258	260	262	264	266	268	270
12	254	256	258	260	262	264	266	268	270	272
12	256	258	260	262	264	266	268	270	272	274
12	258	260	262	264	266	268	270	272	274	276
12	260	262	264	266	268	270	272	274	276	278
12	262	264	266	268	270	272	274	276	278	280
12	264	266	268	270	272	274	276	278	280	282
12	266	268	270	272	274	276	278	280	282	284
12	268	270	272	274	276	278	280	282	284	286
12	270	272	274	276	278	280	282	284	286	288
12	272	274	276	278	280	282	284	286	288	290
12	274	276	278	280	282	284	286	288	290	292
12	276	278	280	282	284	286	288	290	292	294
12	278	280	282	284	286	288	290	292	294	296
12	280	282	284	286	288	290	292	294	296	298
12	282	284	286	288	290	292	294	296	298	300
12	284	286	288	290	292	294	296	298	300	302
12	286	288	290	29						

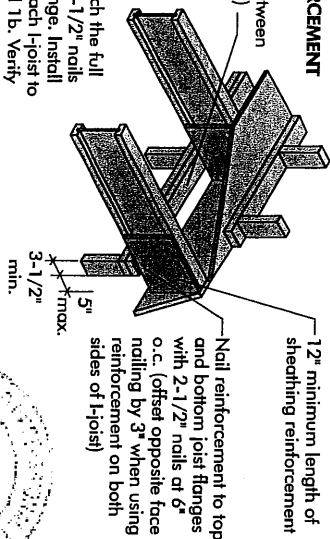
1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Duct chase opening location distance is measured from inside face of supports to centre of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. Distances 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.

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.

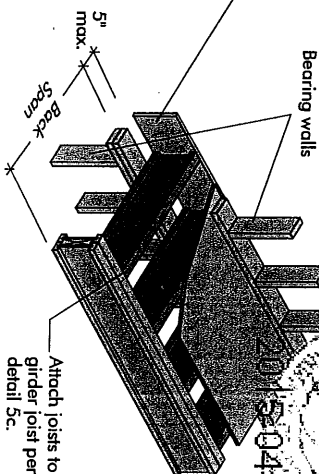


5b SET-BACK DETAIL

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

Notes:

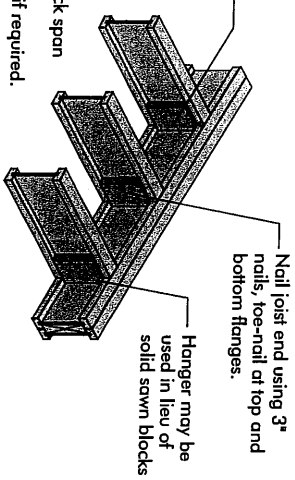
- Provide full depth blocking between joists over support (not shown for clarity)
- Attach I-joist to plate at all supports per detail 1b.
- 3-1/2" minimum I-joist bearing required.



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.

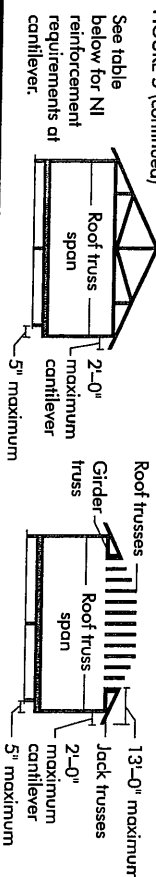
Alternate for opposite side.



Notes:

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

FIGURE 5 (continued)



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

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

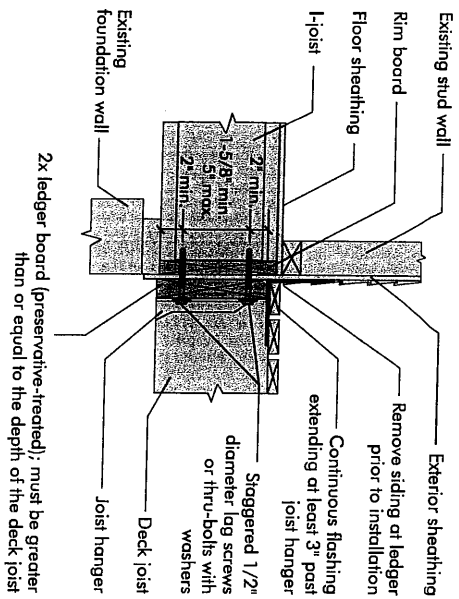
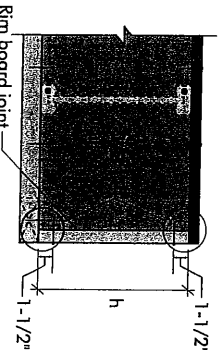
JOIST DEPTH (in.)	ROOF TRUSS		ROOF LOADING (UNFACTORED)				JOIST SPACING (in.)	
	SPAN (ft)	LL = 30 psf, DL = 15 psf	JOIST SPACING (in.)	LL = 40 psf, DL = 15 psf	JOIST SPACING (in.)	LL = 50 psf, DL = 15 psf	JOIST SPACING (in.)	
24	12	16	19.2	24	12	16	19.2	24
20	12	16	19.2	24	12	16	19.2	24
16	12	16	19.2	24	12	16	19.2	24
12	12	16	19.2	24	12	16	19.2	24
8	12	16	19.2	24	12	16	19.2	24
4	12	16	19.2	24	12	16	19.2	24
2	12	16	19.2	24	12	16	19.2	24
1	12	16	19.2	24	12	16	19.2	24
0.5	12	16	19.2	24	12	16	19.2	24

1. N = No reinforcement required.
2. N = NI reinforced with 3/4" wood structural panel on one side only.
3. N = NI reinforced with 3/4" wood structural panel on both sides, or double I-joist. 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. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

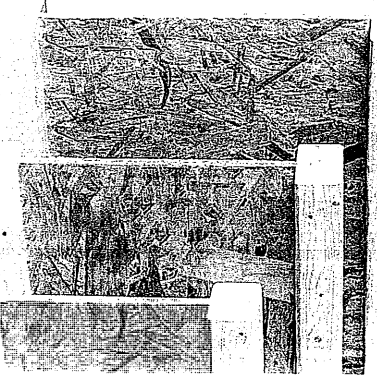
1. Wipe any mud, dirt, water, or ice from I-joist flanges before gluing.
2. Snap a chalk line across the I-joists four feet in from the wall for panel edge alignment and as a boundary for spreading glue.
3. Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
4. Lay the first panel with tongue side to the wall, and nail in place. This protects the tongue of the next panel from damage when tapped into place with a block and sledgehammer.
5. Apply a continuous line of glue (about 1/4-inch diameter) to the top flange of a single I-joist. Apply glue in a winding pattern on wide areas, such as with double I-joists.
6. Apply two lines of glue on I-joists where panel ends butt to assure proper gluing of each end.
7. After the first row of panels is in place, spread glue in the groove of one or two panels at a time before laying the next row. Glue line may be continuous or spaced, but avoid squeeze-out by applying a thinner line (1/8 inch) than used on I-joist flanges.
8. Tap the second row of panels into place, using a block to protect groove edges.
9. Stagger and 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.

Maximum Loist Spacing (in.)	Minimum Panel Thickness (in.)	Nail Size and Type			Maximum Spacing of Fasteners	
		Common Wire or Spiral Nails	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"

- 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.



Furthermore, *Chlamydomonas* variances from our products, been utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.

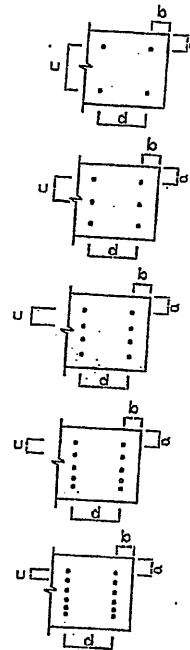


MICRO CITY ENGINEERING SERVICES INC.

TEL: (519) 287 - 2242

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

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



NOTES:

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



DWG NO TAMN1001-14

STRUCTURAL

COMPONENT ONLY

TO BE USED ONLY
WITH BEAM CALCS
BEARING THE
STAMP BELOW

PROVIDE NAILING
DETAIL # X SEE
DWG #TAMN1001-14