

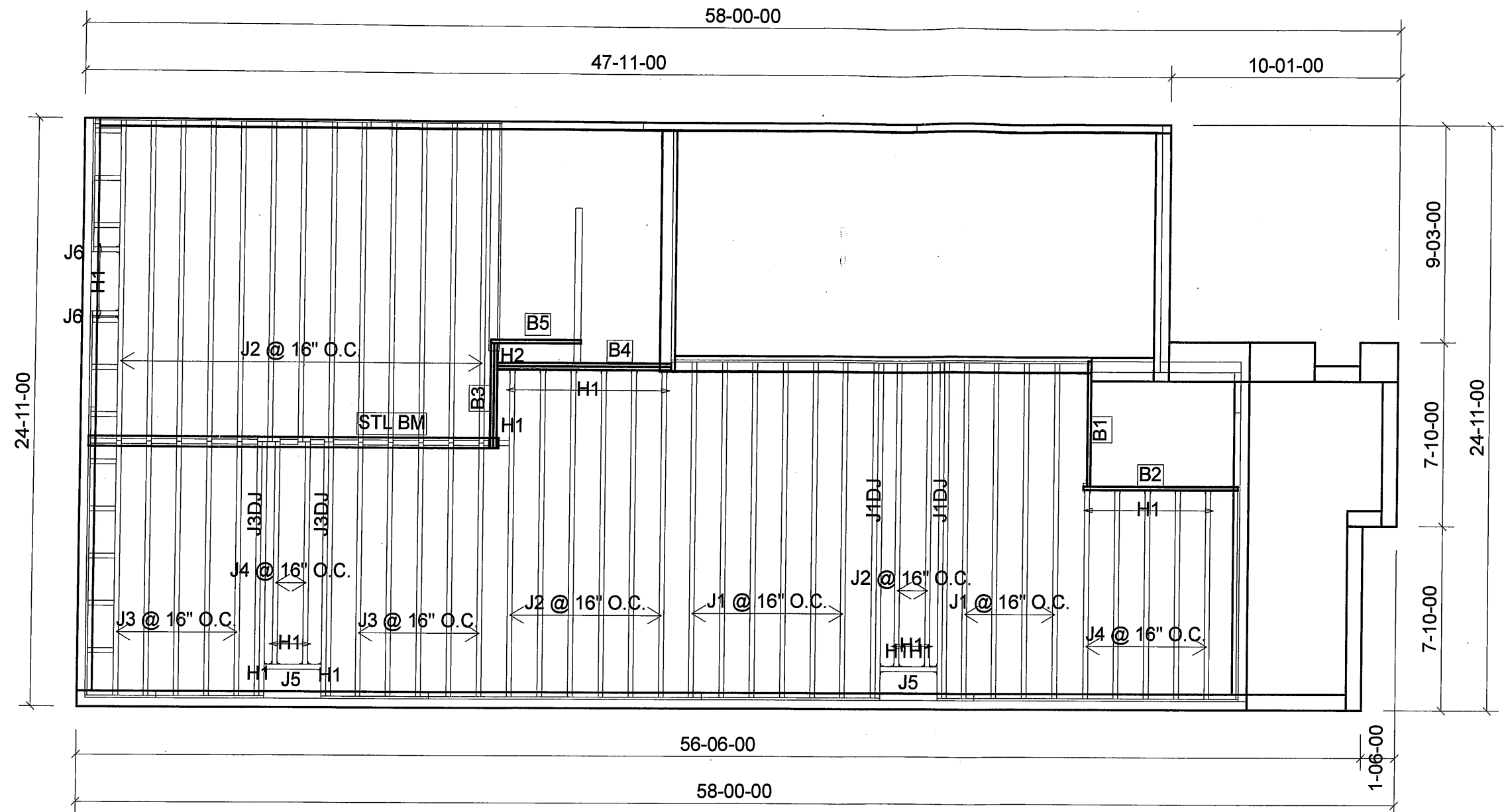
FROM PLAN DATED: APRIL 2017
BUILDER: GREENPARK HOMES
SITE: RUSSELL GARDENS
MODEL: HIGHGROVE 5E
ELEVATION: 1
LOT:
CITY: WATERDOWN
SALESMAN: M D
DESIGNER: AJ
REVISION:

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

DATE: 2/22/2018

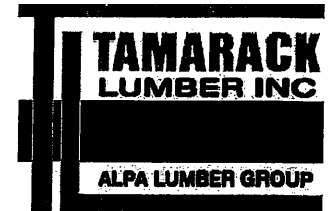
1st FLOOR

STD



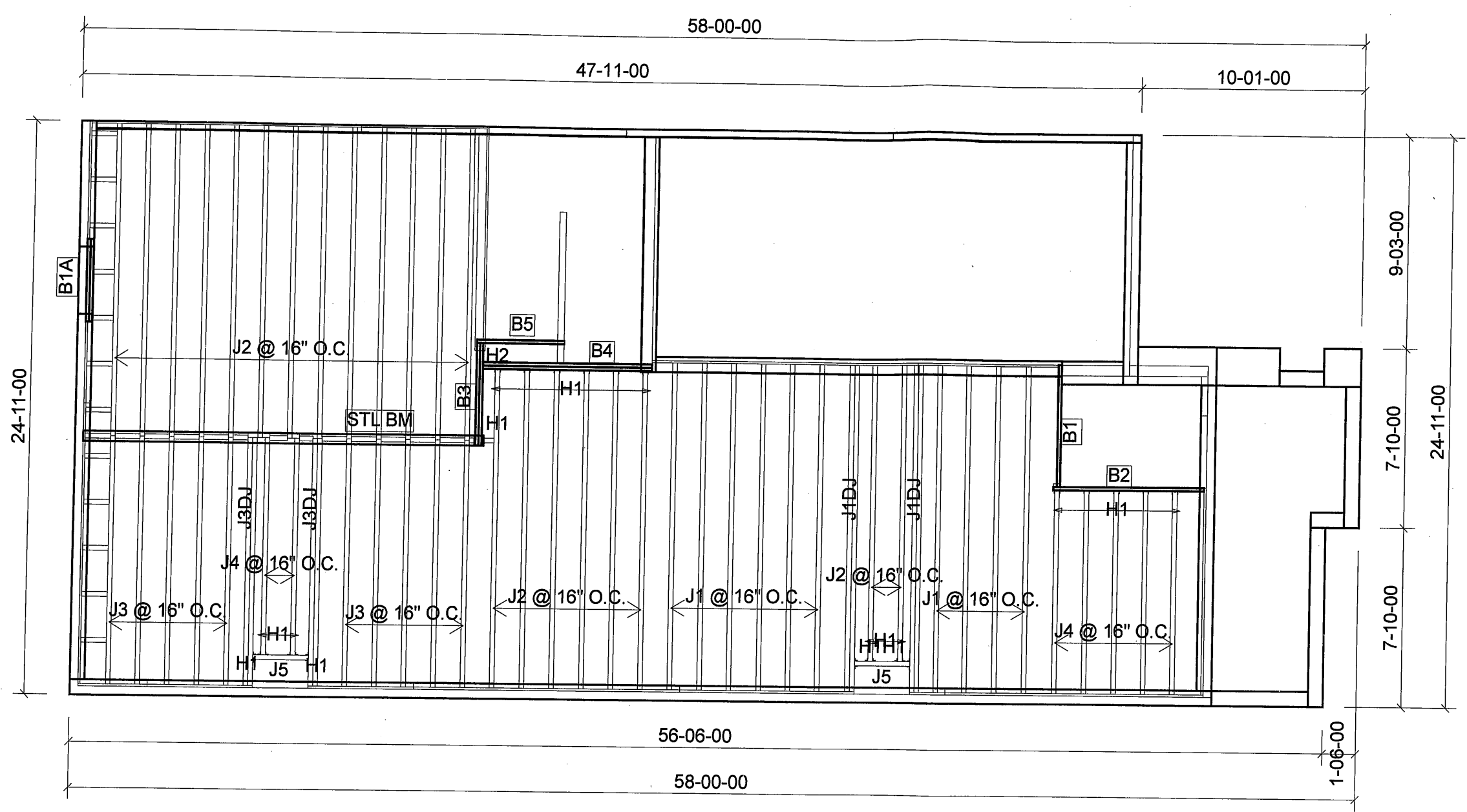
Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	10
J1DJ	16-00-00	9 1/2" NI-40x	2	4
J2	14-00-00	9 1/2" NI-40x	1	21
J3	12-00-00	9 1/2" NI-40x	1	10
J3DJ	12-00-00	9 1/2" NI-40x	2	4
J4	10-00-00	9 1/2" NI-40x	1	7
J5	4-00-00	9 1/2" NI-40x	1	2
J6	2-00-00	9 1/2" NI-40x	1	2
B2	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B4	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1

Connector Summary		
Qty	Manuf	Product
5	H1	IUS2.56/9.5
7	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
1	H2	HGUS410



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DEAD LOAD: 15.0 lb/ft
TILED AREAS: 20 lb/ft
SUBFLOOR: 3/4" GLUED AND NAILED



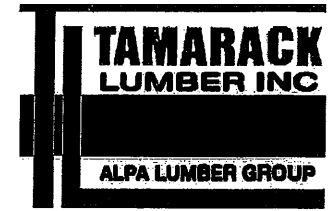
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Connector Summary		
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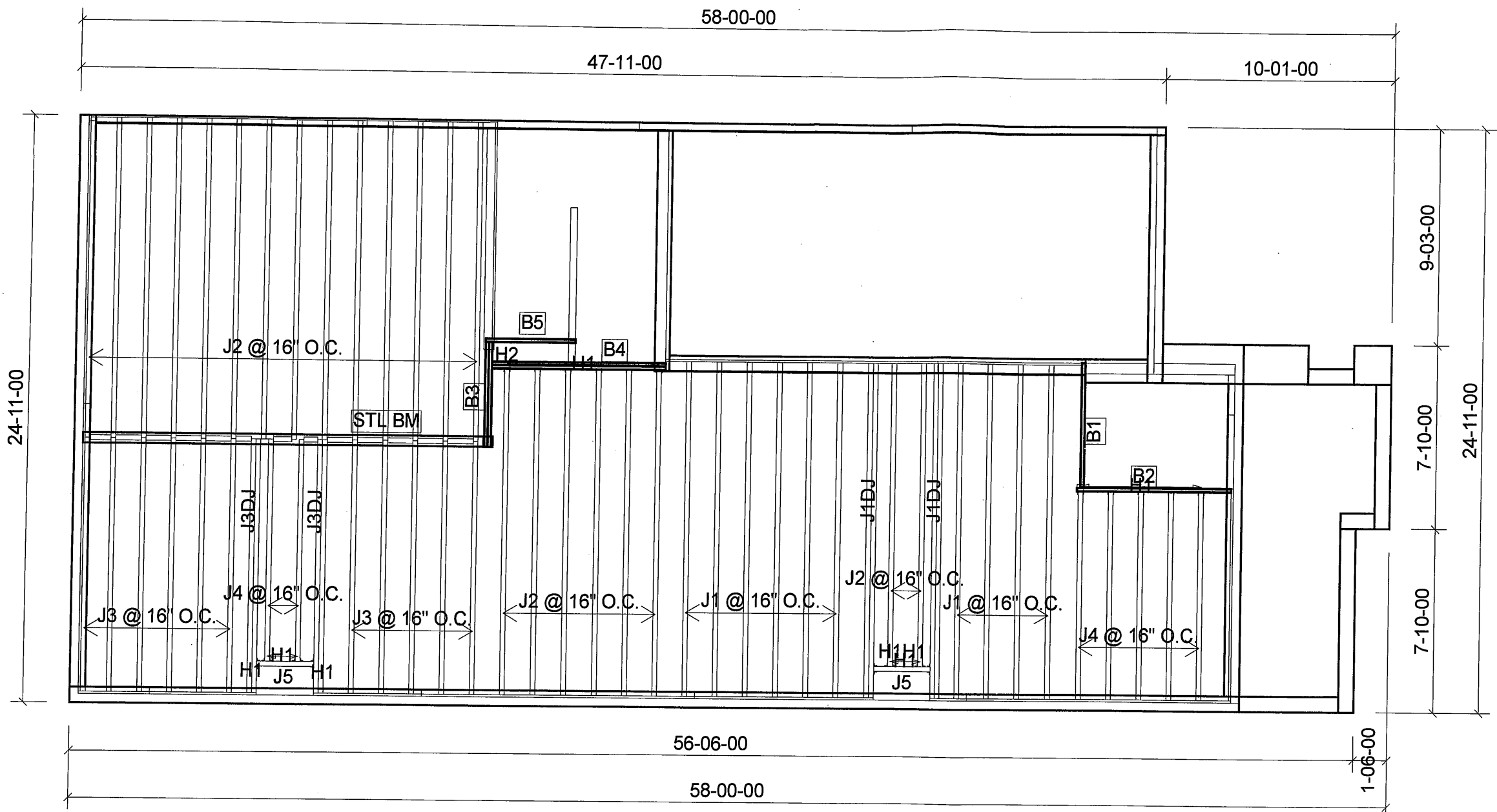
1st FLOOR

DECK



FROM PLAN DATED: APRIL 2017
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SITE: RUSSELL GARDENS
MODEL: HIGHGROVE 5E
ELEVATION: 1
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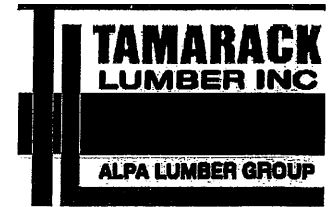
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1st FLOOR

W.O.B



FROM PLAN DATED: APRIL 2017

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SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 2

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

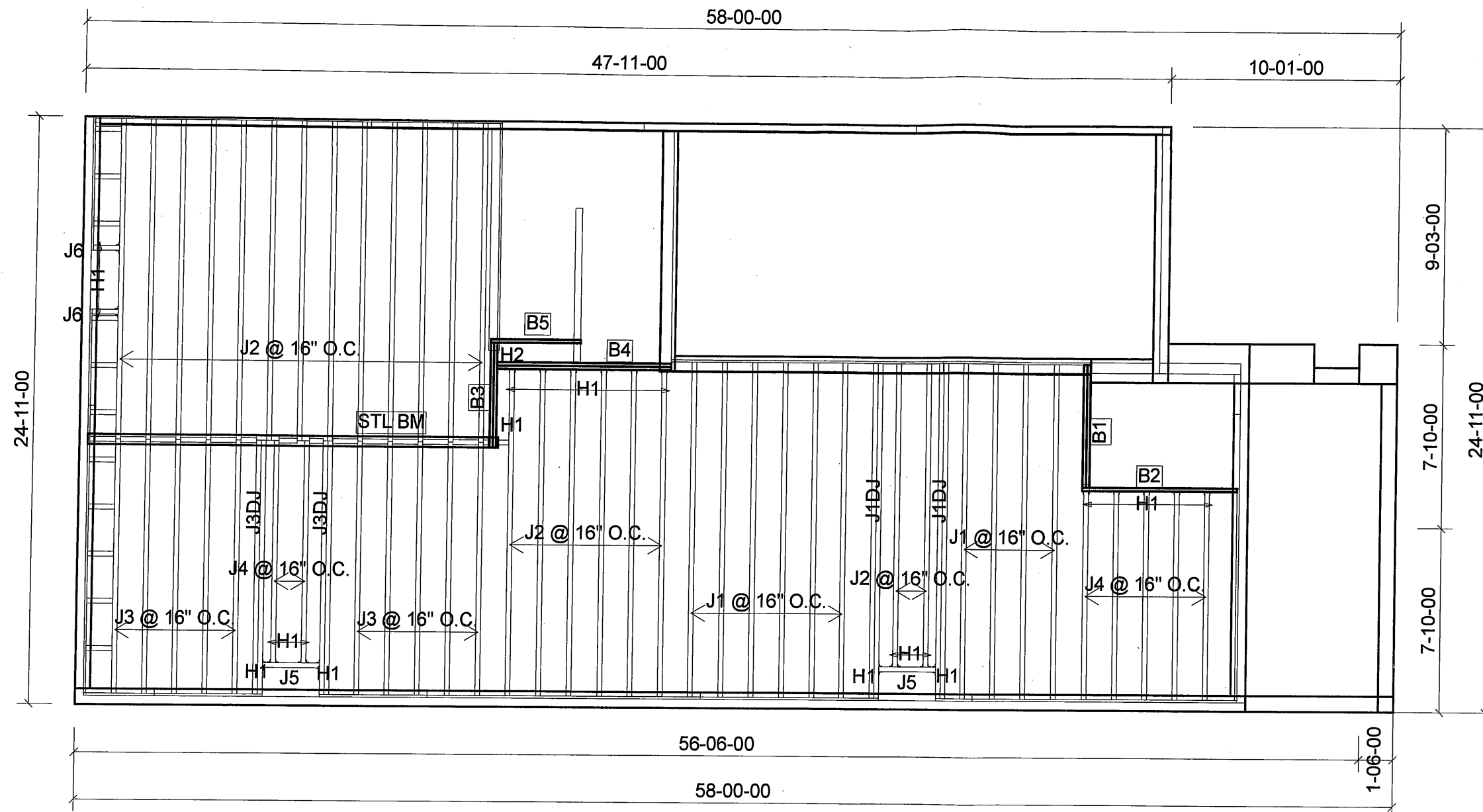
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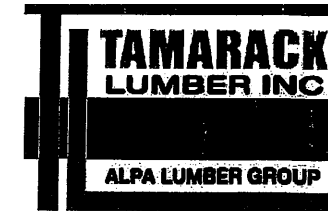
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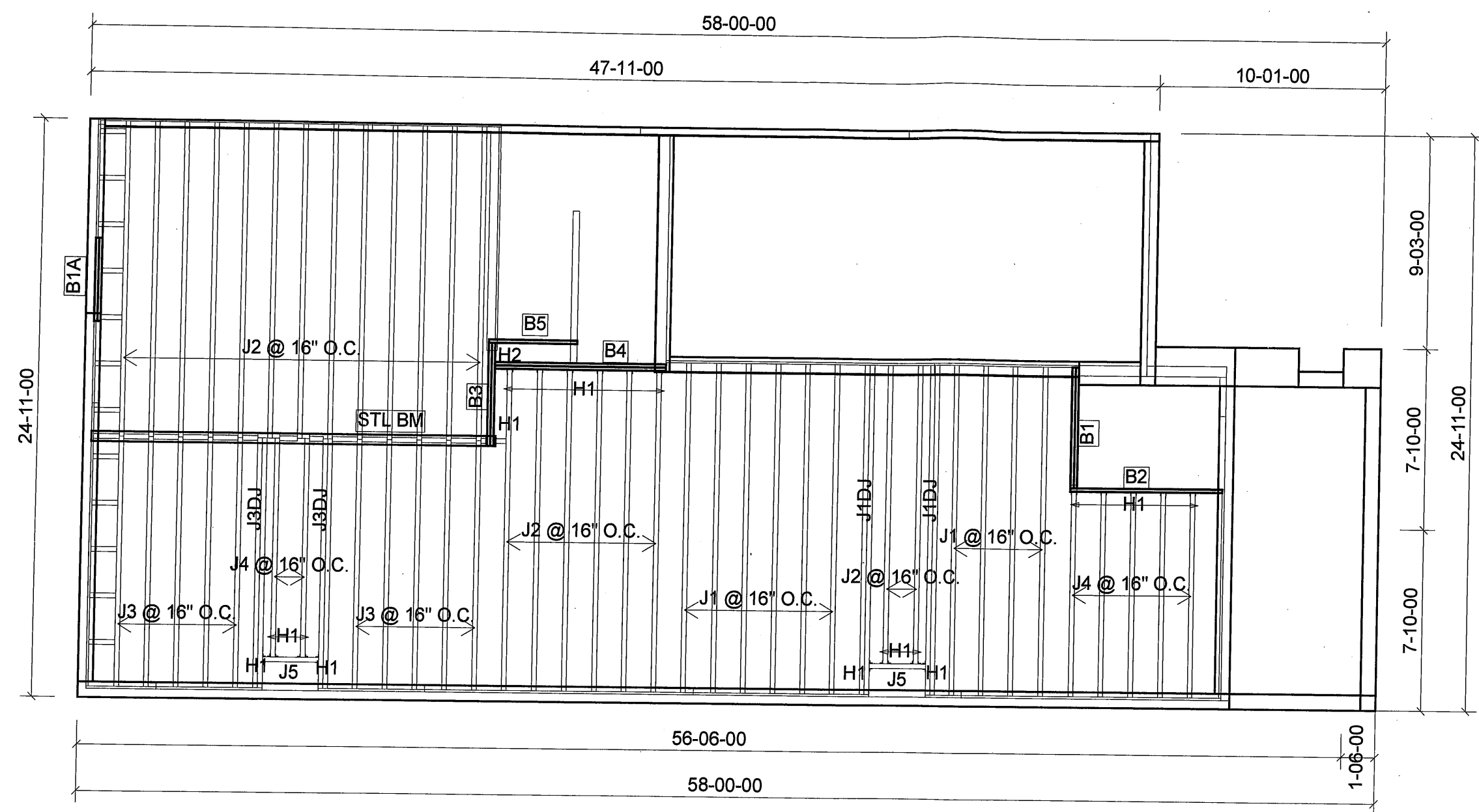
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SITE: RUSSELL GARDENS
MODEL: HIGHGROVE 5E
ELEVATION: 2
LOT:
CITY: WATERDOWN
SALESMAN: M D
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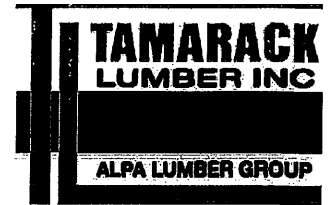
1st FLOOR

DECK



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BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 2

LOT:

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SALESMAN: M D

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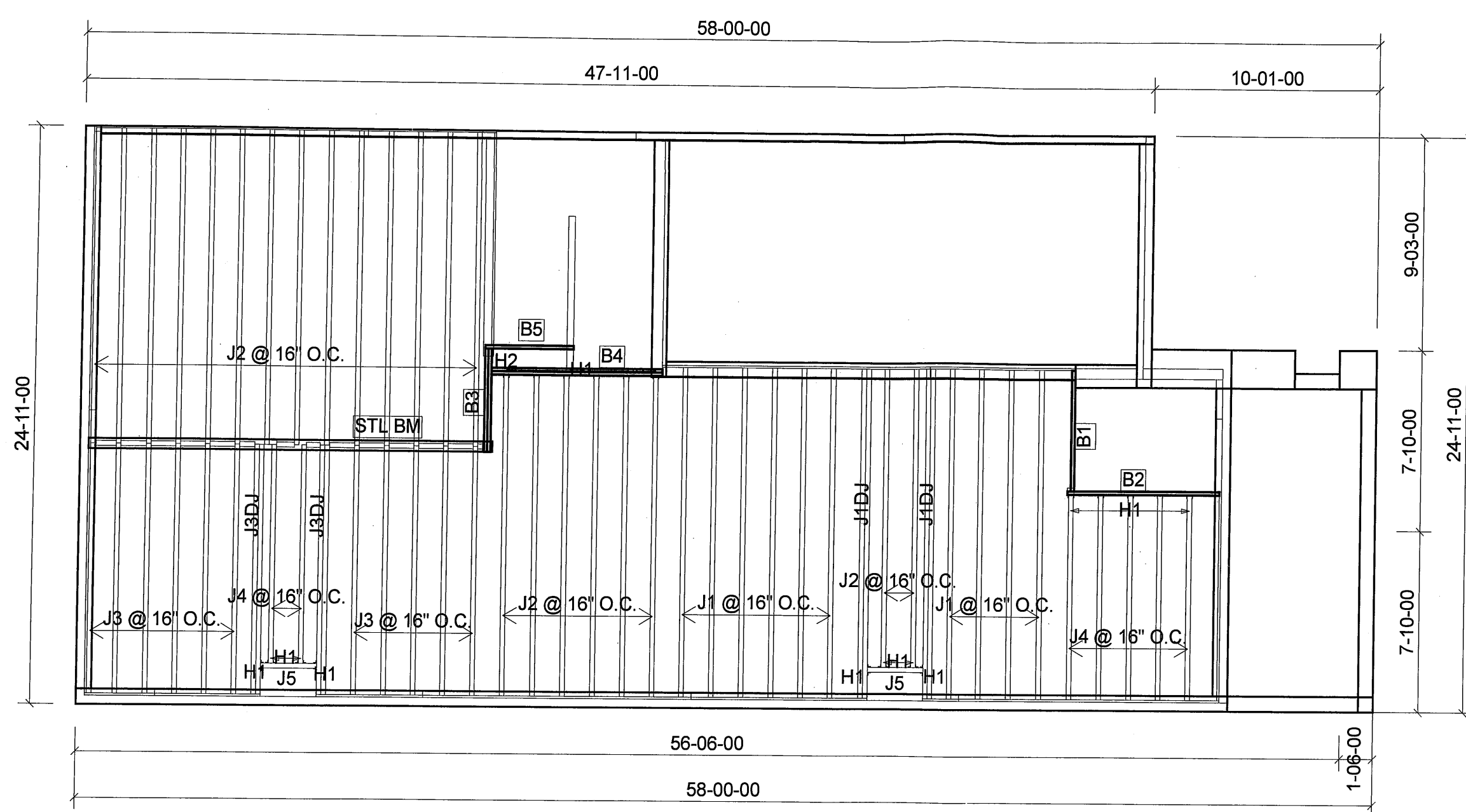
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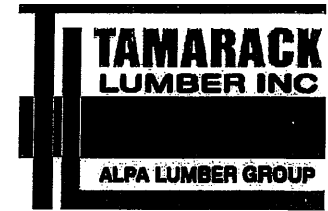
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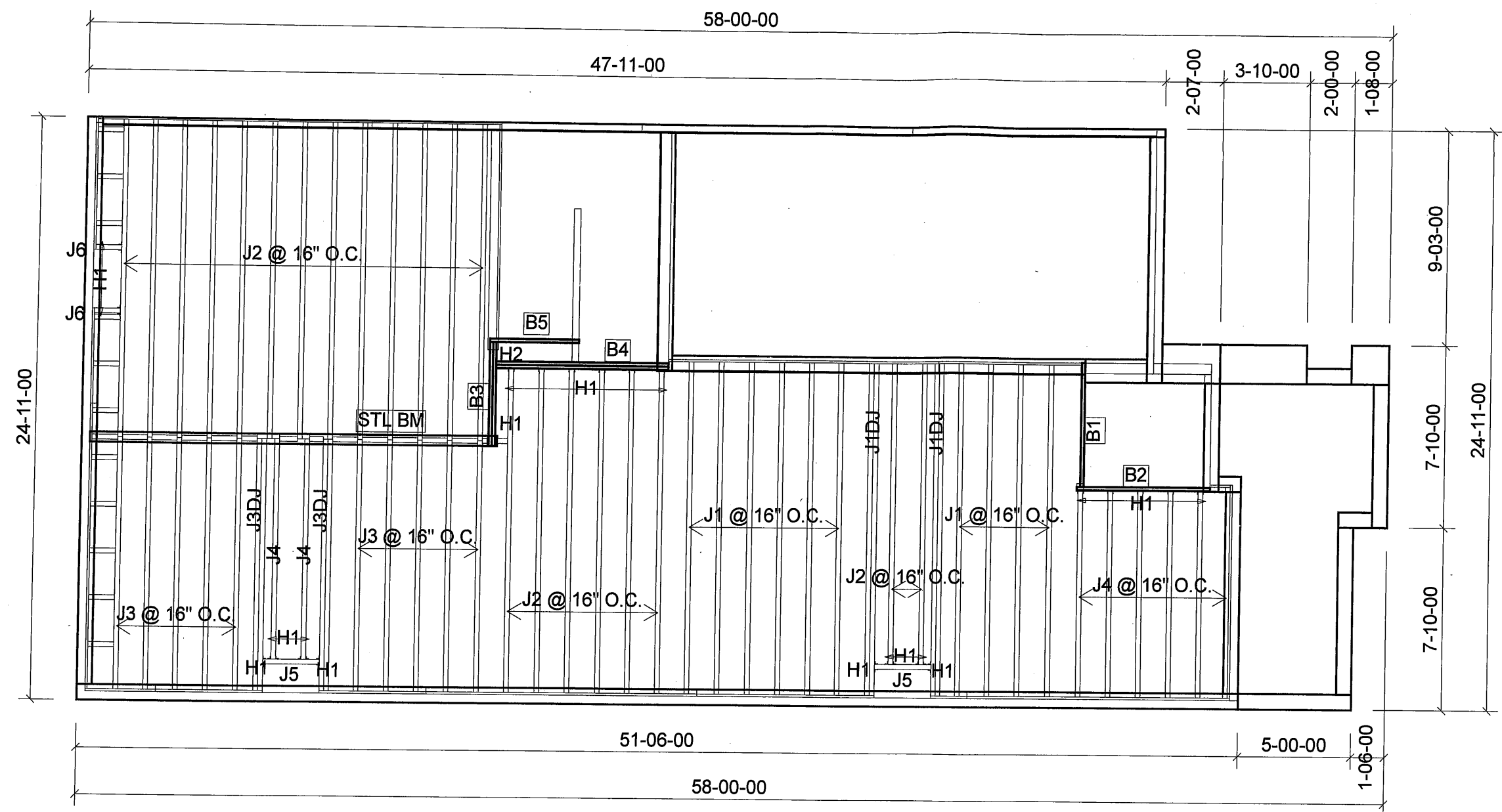
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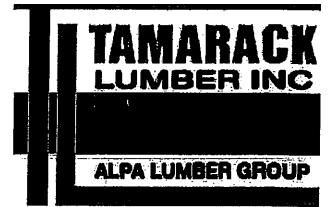
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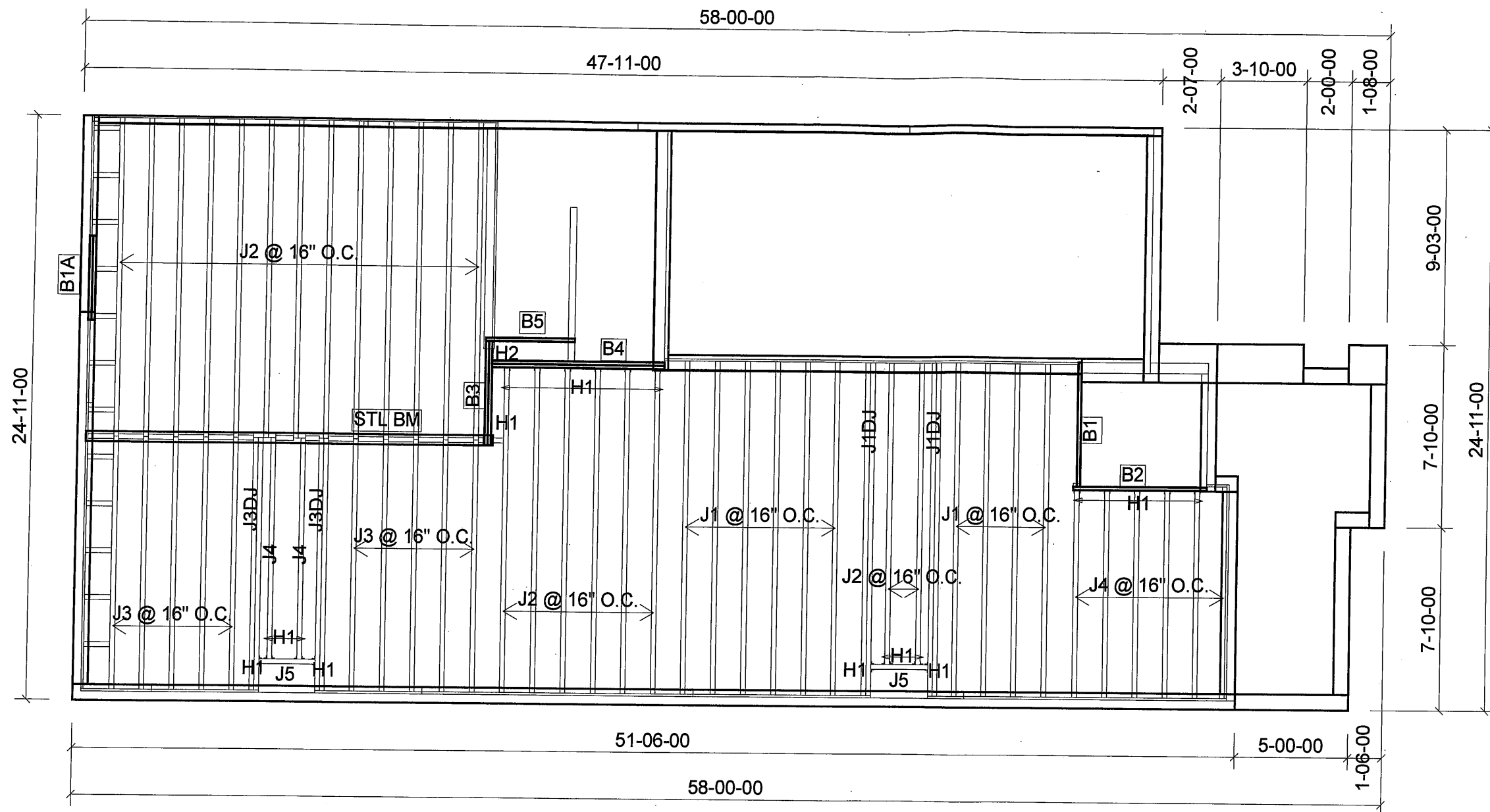
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SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 2/22/2018

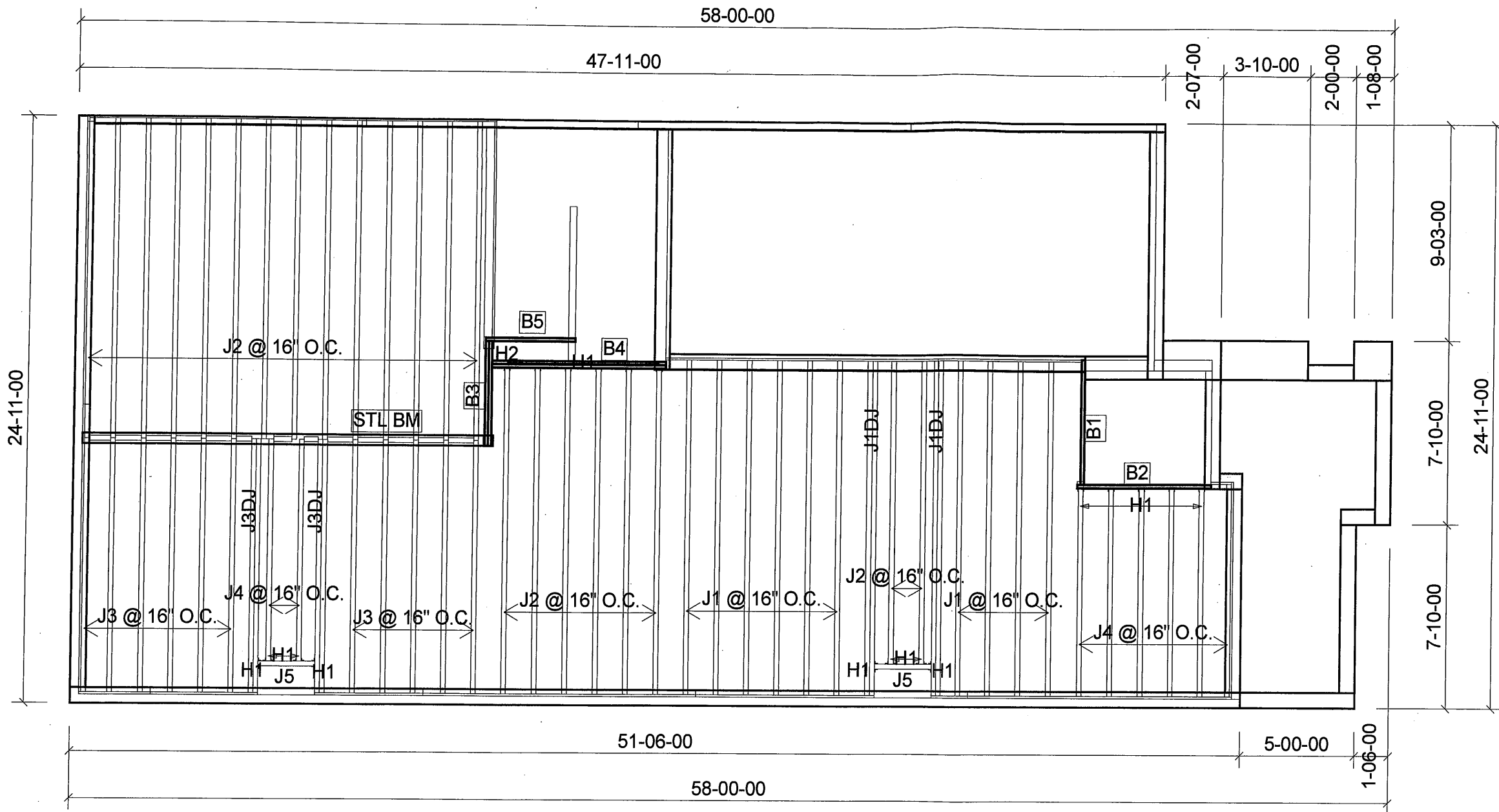
1st FLOOR

DECK



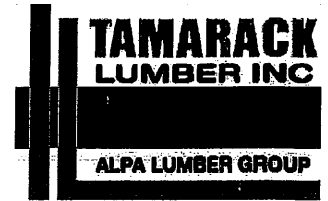
Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	10
J1DJ	16-00-00	9 1/2" NI-40x	2	4
J2	14-00-00	9 1/2" NI-40x	1	21
J3	12-00-00	9 1/2" NI-40x	1	10
J3DJ	12-00-00	9 1/2" NI-40x	2	4
J4	10-00-00	9 1/2" NI-40x	1	8
J5	4-00-00	9 1/2" NI-40x	1	2
B4	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B1A	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
5	H1	IUS2.56/9.5
7	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
1	H2	HGUS410



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	10
J1DJ	16-00-00	9 1/2" NI-40x	2	4
J2	14-00-00	9 1/2" NI-40x	1	22
J3	12-00-00	9 1/2" NI-40x	1	11
J3DJ	12-00-00	9 1/2" NI-40x	2	4
J4	10-00-00	9 1/2" NI-40x	1	8
J5	4-00-00	9 1/2" NI-40x	1	2
B4	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B1	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B2	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B3	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B5	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1

Connector Summary		
Qty	Manuf	Product
5	H1	IUS2.56/9.5
6	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
4	H1	IUS2.56/9.5
1	H2	HGUS410



FROM PLAN DATED: APRIL 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 3,3A,3B

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

NOTES:

REFER TO THE NORDIC INSTALLATION GUIDE FOR PROPER STORAGE AND INSTALLATION.

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

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

DEAD LOAD: 15.0 lb/ft

TILED AREAS: 20 lb/ft

SUBFLOOR: 3/4" GLUED AND NAILED

DATE: 2/22/2018

1st FLOOR

W.O.B

FROM PLAN DATED: APRIL 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 1

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

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

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

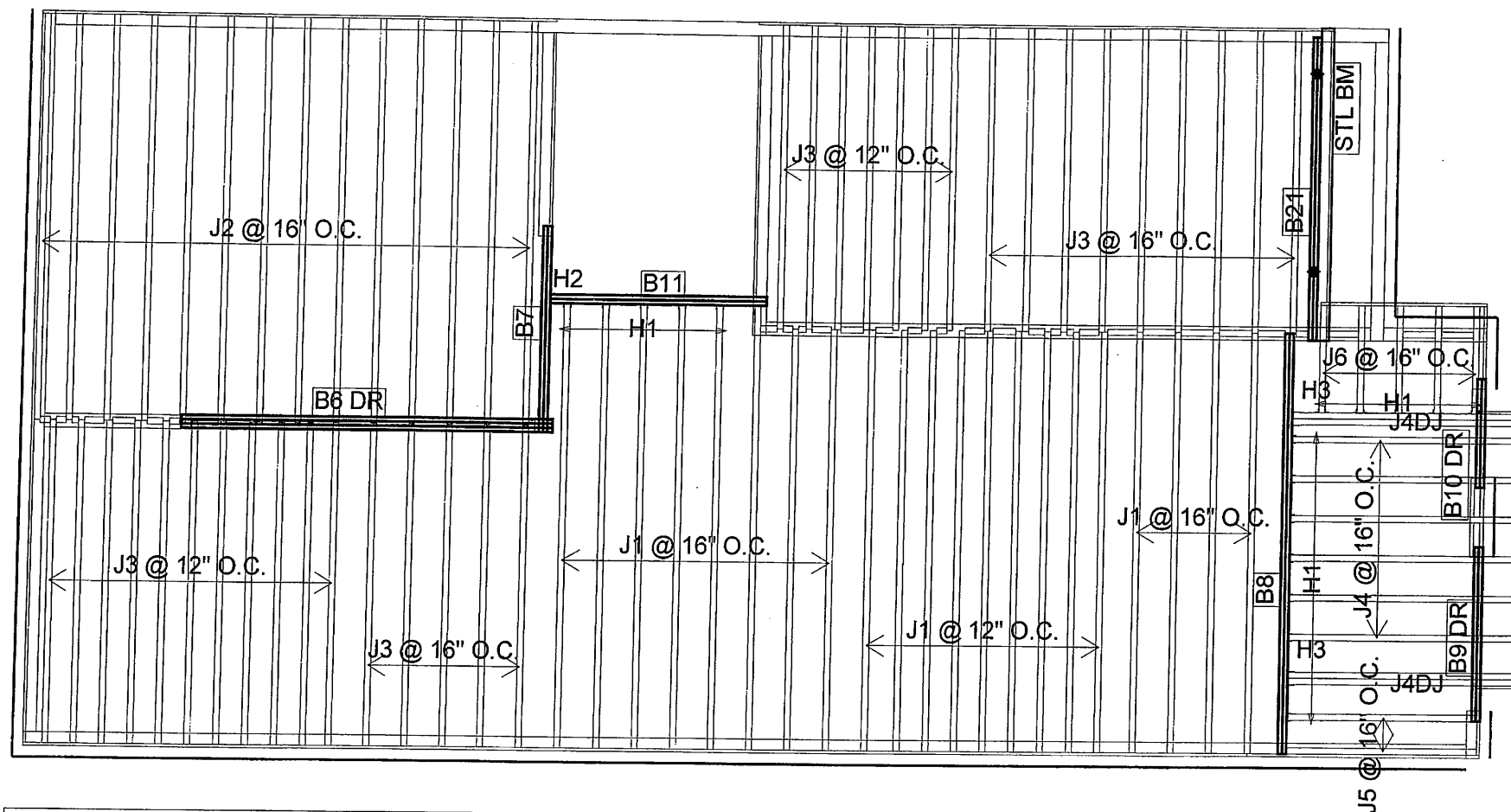
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft

SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 2018-02-07

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	21
J2	14-00-00	9 1/2" NI-40x	1	14
J3	12-00-00	9 1/2" NI-40x	1	32
J4	10-00-00	9 1/2" NI-40x	1	6
J4DJ	10-00-00	9 1/2" NI-40x	2	4
J5	8-00-00	9 1/2" NI-40x	1	2
J6	4-00-00	9 1/2" NI-40x	1	5
B8	16-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B6 DR	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B21	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B7	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B9 DR	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B10 DR	4-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
12	H1	IUS2.56/9.5
5	H1	IUS2.56/9.5
1	H2	HGUS410
2	H3	HU310-2

FROM PLAN DATED: APRIL 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 2

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

NOTES:

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

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

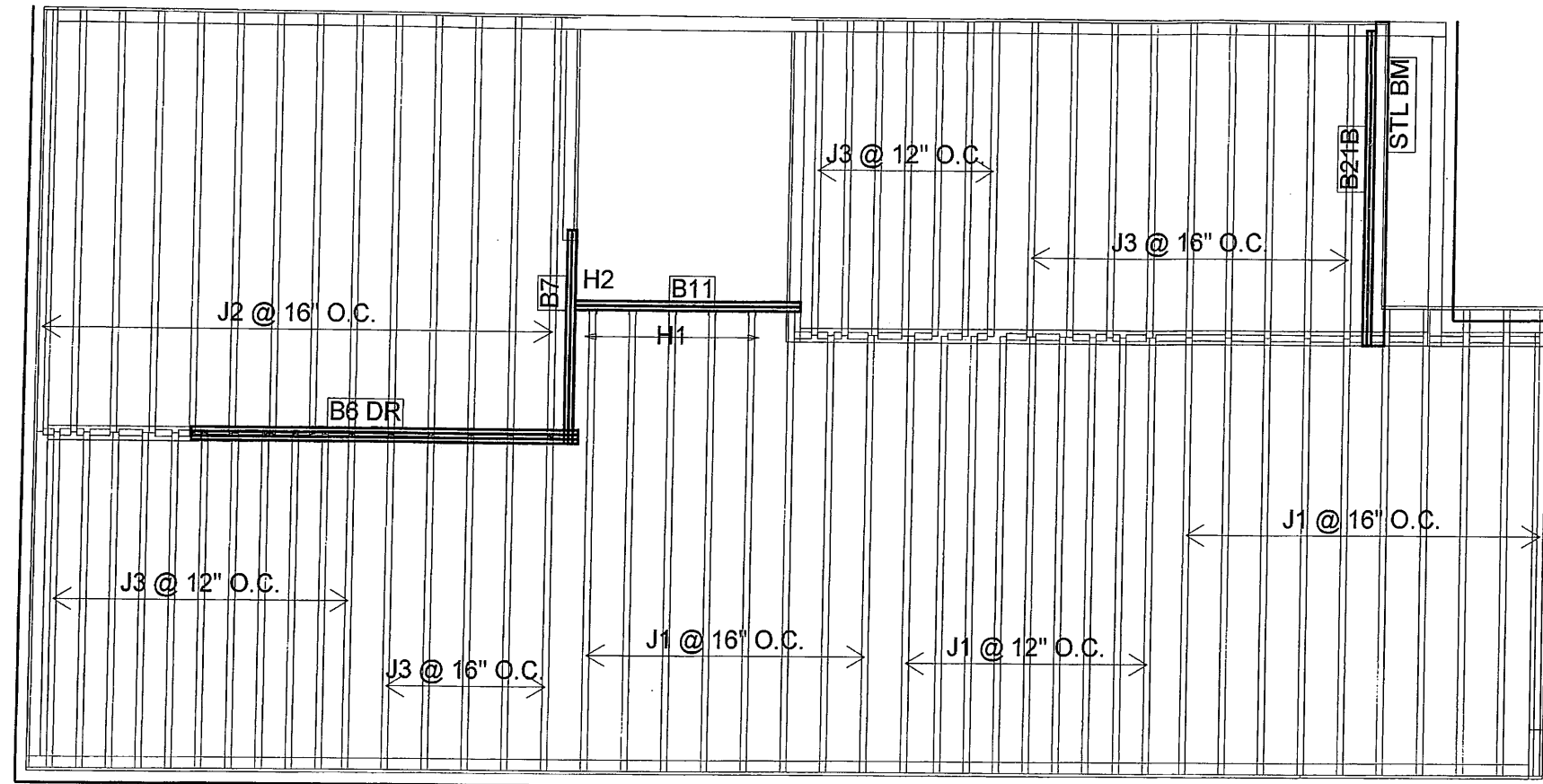
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft

SUBFLOOR: 5/8" GLUED AND NAILED

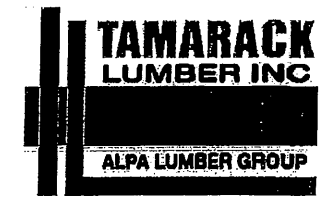
DATE: 2018-02-07

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	27
J2	14-00-00	9 1/2" NI-40x	1	14
J3	12-00-00	9 1/2" NI-40x	1	32
B6 DR	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B21B	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B7	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
5	H1	IUS2.56/9.5
1	H2	HGUS410



FROM PLAN DATED: APRIL 2017

BUILDER: GREENPARK HOMES

SITE: RUSSELL GARDENS

MODEL: HIGHGROVE 5E

ELEVATION: 3, 3A, 3B

LOT:

CITY: WATERDOWN

SALESMAN: M D

DESIGNER: AJ

REVISION:

NOTES:

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

LOADING:

DESIGN LOADS: L/480.000

LIVE LOAD: 40.0 lb/ft²

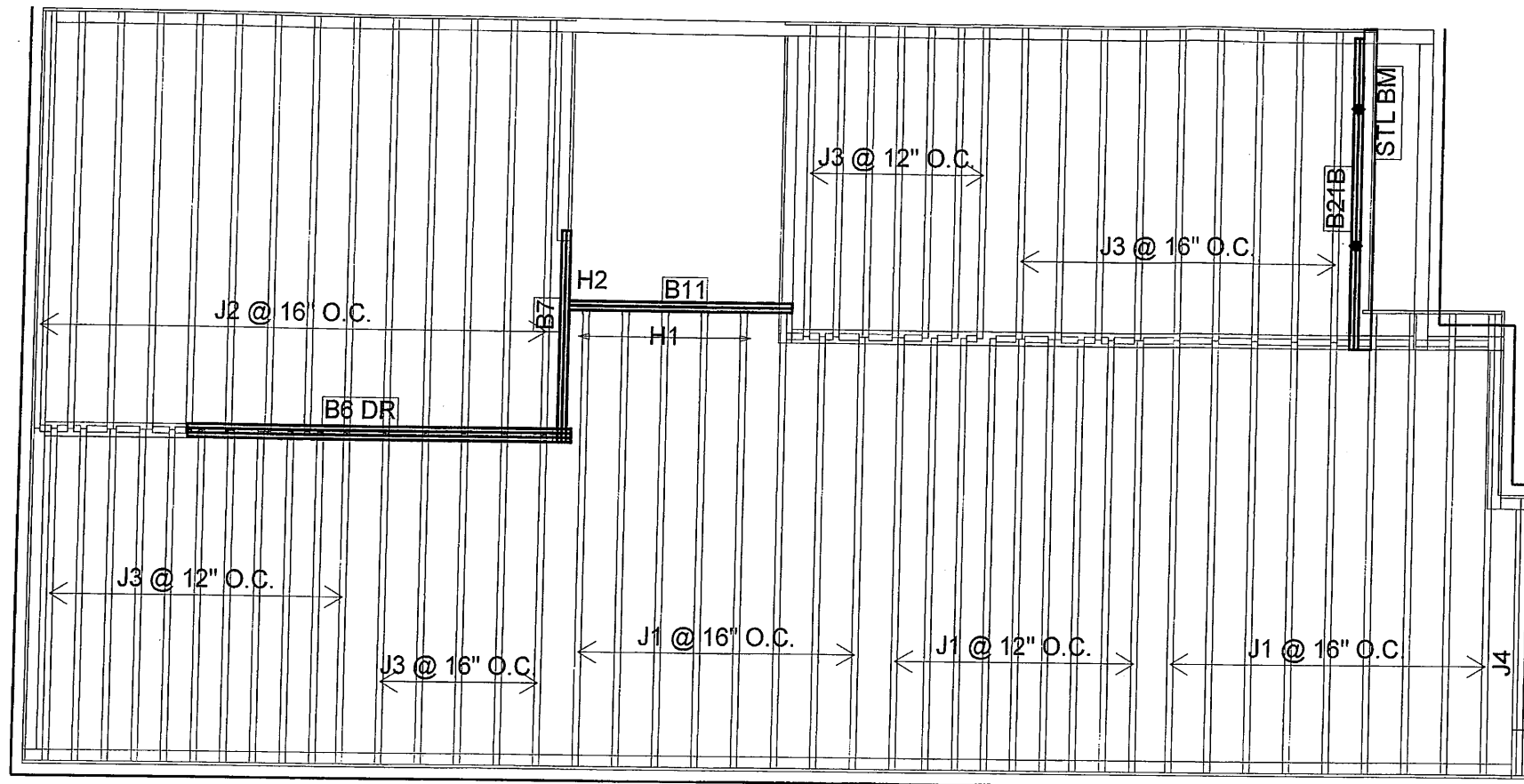
DEAD LOAD: 15.0 lb/ft²

TILED AREAS: 20 lb/ft²

SUBFLOOR: 5/8" GLUED AND NAILED

DATE: 2018-02-07

2nd FLOOR



Products				
PlotID	Length	Product	Plies	Net Qty
J1	16-00-00	9 1/2" NI-40x	1	26
J2	14-00-00	9 1/2" NI-40x	1	14
J3	12-00-00	9 1/2" NI-40x	1	32
J4	10-00-00	9 1/2" NI-40x	1	1
B6 DR	14-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	3	3
B21B	12-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B11	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B7	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2

Connector Summary		
Qty	Manuf	Product
5	H1	IUS2.56/9.5
1	H2	HGUS410

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER
BURLINGTON
Feb. 7, 2018 17:27

PROJECT
J2 GRD FLR

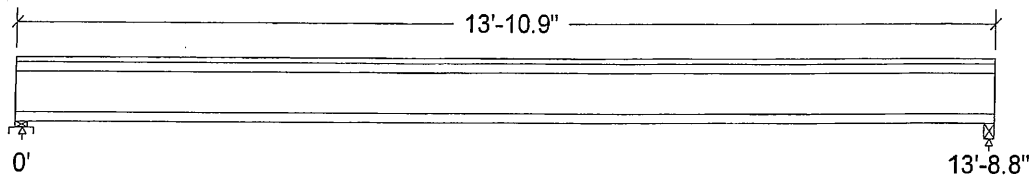
Design Check Calculation Sheet

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

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



Unfactored:			
Dead	186		185
Live	372		370
Factored:			
Total	790		786
Bearing:			
Resistance			
Joist	1861		1854
Support	3471		-
Des ratio			
Joist	0.42		0.42
Support	0.23		-
Load case	#2		#2
Length	2-1/8		1-3/4*
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	1.06		-

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

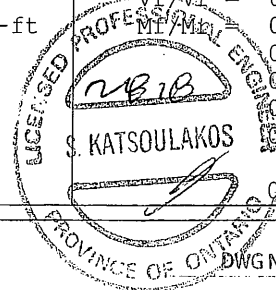
Nordic 9-1/2" NI-40x Floor joist @ 16" o.c.

Supports: 1 - Lumber Sill plate, No.1/No.2; 2 - Steel Beam, W;
Total length: 13'-10.9"; 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 = 778	Vr = 1895	lbs	Vf/Vr = 0.41
Moment(+)	Mf = 2671	Mr = 4824	lbs-ft	Mf/Mr = 0.55
Perm. Defl'n	0.09 = <L/999	0.46 = L/360	in	0.20
Live Defl'n	0.18 = L/919	0.34 = L/480	in	0.52
Total Defl'n	0.27 = L/613	0.69 = L/240	in	0.39
Bare Defl'n	0.22 = L/749	0.46 = L/360	in	0.48
Vibration	Lmax = 13'-9	Lv = 16'-2	ft	
Defl'n	= 0.029	= 0.049	in	0.59



DWG NO. TAM B201-18
STRUCTURAL
COMPONENT ONLY

Additional Data:

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

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L

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

Deflection: LC #1 = 1.0D (permanent)

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

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

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

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

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

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

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

Load Patterns: s=S/2 L=L+Ls _=no pattern load in this span

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

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

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

Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-14 Engineering Design in Wood standard (May 2014 edition).

2. Please verify that the default deflection limits are appropriate for your application.

CONFORMS TO OBC 2012

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 0281-18
STRUCTURAL
COMPONENT ONLY

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER
BURLINGTON
Feb. 7, 2018 17:26

PROJECT
J2 2ND FLR

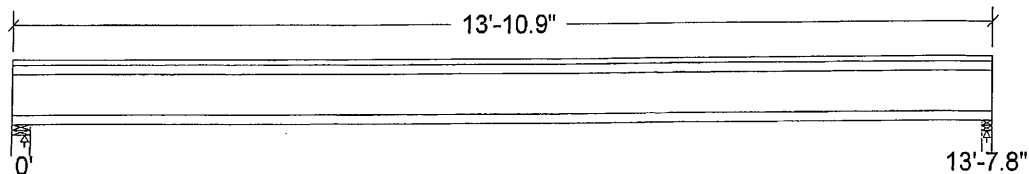
Design Check Calculation Sheet

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

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



Unfactored:			
Dead	187		184
Live	374		368
Factored:			
Total	795		782
Bearing:			
Resistance			
Joist	1878		1854
Support	5525		2758
Des ratio			
Joist	0.42		0.42
Support	0.14		0.28
Load case	#2		#2
Length	3-1/8		1-3/4*
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		1.00
fcp sup	769		769
Kzcp sup	1.15		1.02

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

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

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

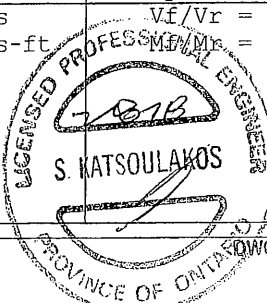
Supports: All - Lumber Wall, No. 1/No. 2

Total length: 13'-10.9"; 5/8" nailed and glued OSB sheathing

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

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 773	Vr = 1895	lbs	Vf/Vr = 0.41
Moment(+)	Mf = 2639	Mr = 4824	lbs-ft	Mf/Mr = 0.55
Perm. Defl'n	0.09 = <L/999	0.45 = L/360	in	0.20
Live Defl'n	0.18 = L/911	0.34 = L/480	in	0.53
Total Defl'n	0.27 = L/607	0.68 = L/240	in	0.39
Bare Defl'n	0.21 = L/761	0.45 = L/360	in	0.47
Vibration	Lmax = 13'-8	Lv = 15'-4	ft	
Defl'n	= 0.034	= 0.049	in	0.68



DESIGN NO. TAM 8200-18
STRUCTURAL
COMPONENT ONLY

P6 66

Additional Data:

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

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L

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

Deflection: LC #1 = 1.0D (permanent)

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

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

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

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

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

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

Load Patterns: s=S/2 L=L+Ls ___no pattern load in this span

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

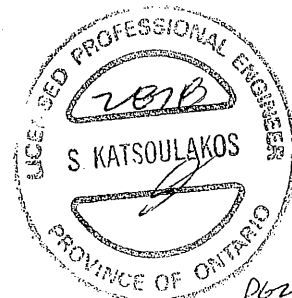
CALCULATIONS:

Deflection: E_{IEff} = 268e06 lb-in² K= 4.94e06 lbs

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

Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the CSA O86-14 Engineering Design in Wood standard (May 2014 edition).
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 8200-18
STRUCTURAL
COMPONENT ONLY

NORDIC STRUCTURES

COMPANY
TAMARACK LUMBER
BURLINGTON
Jan. 23, 2018 07:47

PROJECT
J3 2ND FLR

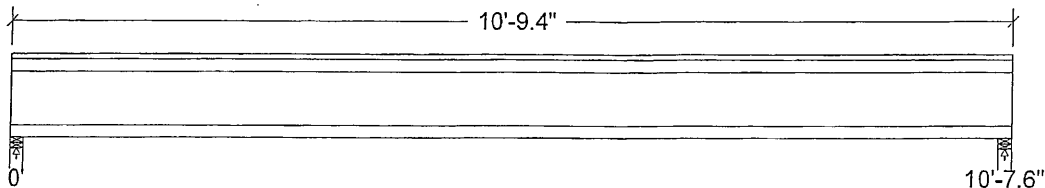
Design Check Calculation Sheet

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

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



Unfactored:			
Dead	144		144
Live	288		288
Factored:			
Total	611		611
Bearing:			
Resistance			
Joist	1854		1854
Support	2758		2758
Des ratio			
Joist	0.33		0.33
Support	0.22		0.22
Load case	#2		#2
Length	1-3/4*		1-3/4*
Min req'd	1-3/4		1-3/4
Stiffener	No		No
Kd	1.00		1.00
KB support	1.00		1.00
fcp sup	769		769
Kzcp sup	1.02		1.02

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

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

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

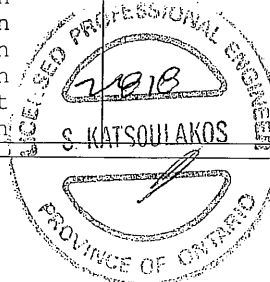
Supports: All - Lumber Wall, No.1/No.2

Total length: 10'-9.4"; 5/8" nailed and glued OSB sheathing

This section PASSES the design code check.

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

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	Vf = 603	Vr = 1895	lbs	VF/Vr = 0.32
Moment(+)	Mf = 1603	Mr = 4824	lbs-ft	ME/Mr = 0.33
Perm. Defl'n	0.04 = <L/999	0.35 = L/360	in	0.10
Live Defl'n	0.07 = <L/999	0.27 = L/480	in	0.27
Total Defl'n	0.11 = <L/999	0.53 = L/240	in	0.20
Bare Defl'n	0.09 = <L/999	0.35 = L/360	in	0.24
Vibration	Lmax = 10'-8	Lv = 15'-4	ft	
Defl'n	= 0.021	= 0.068	in	0.31



DWG NO. TAM 0202-18
STRUCTURAL
COMPONENT ONLY

Additional Data:

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

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.25D + 1.5L

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

Deflection: LC #1 = 1.0D (permanent)

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

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

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

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

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

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

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

Load Patterns: s=S/2 L=L+Ls _=no pattern load in this span

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

CALCULATIONS:Deflection: E_Ieff = 268e06 lb-in² K= 4.94e06 lbs

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

Design Notes:

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

CONFORMS TO OBC 2012


 DWG NO. TAM 0202-18
 STRUCTURAL
 COMPONENT ONLY

BC CALC® Design Report

Dry | 1 span | No cant.

February 22, 2018 12:13:51

Build 6215

Job name:

File name: HIGHGROVE 5E WOD.mmdl

Address:

Description: Basment\Flush Beams\B1A(i1713)

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

Specifier:

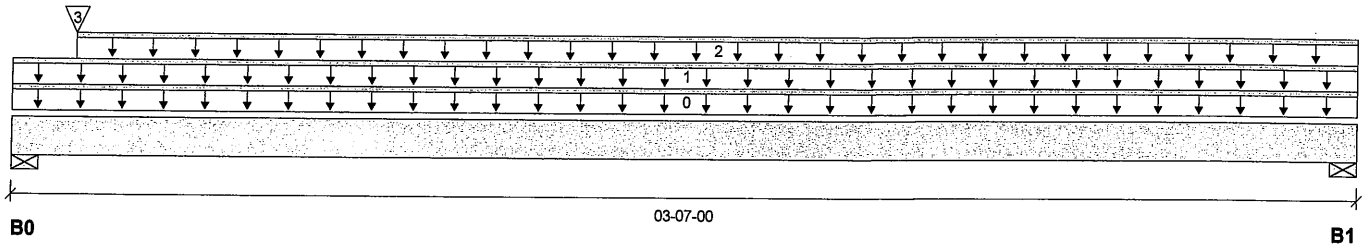
Customer:

Designer: AJ

Code reports:

CCMC 12472-R

Company:



Total Horizontal Product Length = 03-07-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4"	103 / 0	223 / 0		
B1, 4"	103 / 0	223 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	03-07-00	10	0.65	1.00	1.15	00-00-00
1	E1(i245)	Unf. Lin. (lb/ft)	L	00-00-00	03-07-00	31	101			n/a
2	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-00	03-07-00	27	13			n/a
3	Bk1(i1852)	Conc. Pt. (lbs)	L	00-02-00	00-02-00	5				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	201 ft-lbs	15,093 ft-lbs	1.3%	0	01-09-05
End Shear	116 lbs	7,521 lbs	1.5%	0	01-01-08
Total Load Deflection	L/999 (0.001")	n/a	n/a	4	01-09-05
Live Load Deflection	L/999 (0")	n/a	n/a	5	01-09-05
Max Defl.	0.001"	n/a	n/a	4	01-09-05
Span / Depth	3.8				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 4" x 3-1/2"	313 lbs	6.4%	2.8%	Unspecified
B1	Wall/Plate 4" x 3-1/2"	312 lbs	6.4%	2.8%	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.

CONFORMS TO OBC 2012

Importance Factor : Normal Part code : Part 9

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


DWG NO. TAM/0510
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report
Build 6215

Basement\Flush Beams\B1A(i1713)

Dry | 1 span | No cant.

February 22, 2018 12:13:51

Job name:

File name: HIGHGROVE 5E WOD.mmdl

Address:

Description: Basement\Flush Beams\B1A(i1713)

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

Specifier:

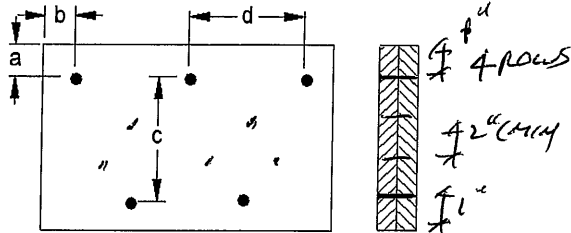
Customer:

Designer: AJ

Code reports: CCMC 12472-R

Company:

Connection Diagram



a minimum = 1"
b minimum = 3"

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

Calculated Side Load = 3.1 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 Sinkers Nails

3-1/2" ARDOX SPIRAL

Disclosure

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



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

DWG NO. TAM 10510-18
STRUCTURAL
COMPONENT ONLY



Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B1(i1244)

BC CALC® Design Report



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

September 16, 2017 09:11:19

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

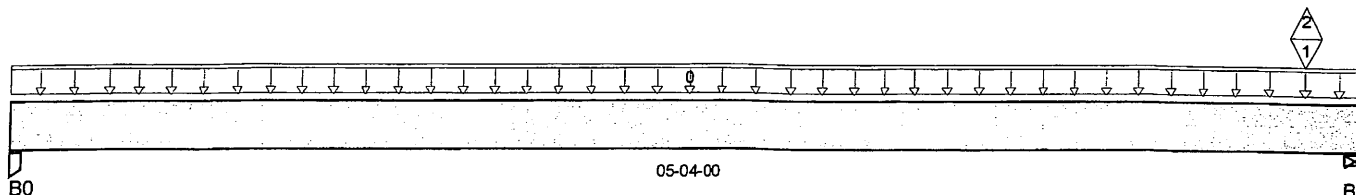
Description: Designs\Flush Beams\Basement\Flush Beams\B1(i1244)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 05-04-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 1-3/4"	76 / 0	50 / 0		
B1, 5-1/2"	826 / 29	676 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live	Dead	Snow	Wind	Trib.
0	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-00-00	05-04-00	29	15			n/a
1	4(i321)	Conc. Pt. (lbs)	L	05-01-04	05-01-04	744	621			n/a
2	4(i321)	Conc. Pt. (lbs)	L	05-01-04	05-01-04	-29				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	200 ft-lbs	12,704 ft-lbs	1.6%	1	02-06-02
End Shear	107 lbs	5,785 lbs	1.8%	1	00-11-04
Total Load Defl.	L/999 (0.002")	n/a	n/a	6	02-06-02
Live Load Defl.	L/999 (0.001")	n/a	n/a	8	02-06-02
Max Defl.	0.002"	n/a	n/a	6	02-06-02
Span / Depth	6.1	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	1-3/4" x 1-3/4"	177 lbs	7.1%	4.7%	Unspecified
B1 Wall/Plate	5-1/2" x 1-3/4"	2,084 lbs	40.6%	17.7%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO DBC 2012

DWG NO. TAM 47773-17
STRUCTURAL
COMPONENT ONLY





Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B2(i1155)

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

June 6, 2017 09:46:01

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

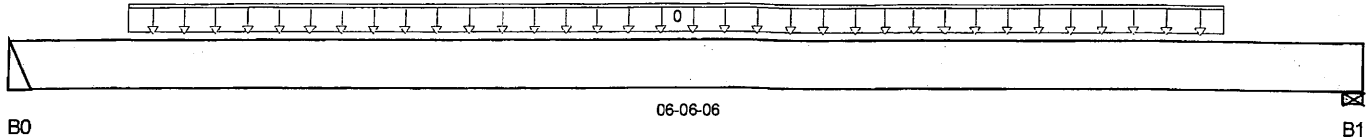
Description: Designs\Flush Beams\Basement\Flush Beams\B2(i1155)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 06-06-06

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	493 / 0	262 / 0		
B1, 2-3/8"	483 / 0	258 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	00-06-08	05-10-08	183	92			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,914 ft-lbs	12,704 ft-lbs	15.1%	1	03-10-08
End Shear	1,061 lbs	5,785 lbs	18.3%	1	00-11-08
Total Load Defl.	L/999 (0.039")	n/a	n/a	4	03-03-08
Live Load Defl.	L/999 (0.025")	n/a	n/a	5	03-03-08
Max Defl.	0.039"	n/a	n/a	4	03-03-08
Span / Depth	7.9	n/a	n/a		00-00-00

Disclosure

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

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 1-3/4"	1,067 lbs	n/a	25%	HUS1.81/10
B1 Wall/Plate	2-3/8" x 1-3/4"	1,048 lbs	59%	20.7%	Unspecified

Notes

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

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

Calculations assume 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

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.





Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B3(i1207)

BC CALC® Design Report



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

June 6, 2017 09:46:01

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

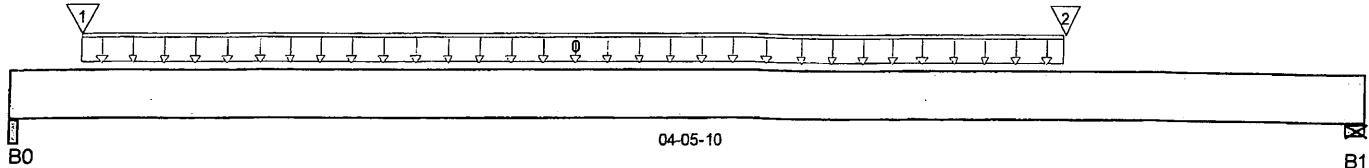
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i1207)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 04-05-10

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/4"	3,434 / 0	1,942 / 0		
B1, 4"	1,114 / 0	607 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC 1 Floor Material	Unf. Lin. (lb/ft)	L	00-02-10	03-05-14	16	8			n/a
1	-	Conc. Pt. (lbs)	L	00-02-10	00-02-10	3,138	1,765			n/a
2	B4(i1160)	Conc. Pt. (lbs)	L	03-05-14	03-05-14	1,303	687			n/a

Controls Summary	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,697 ft-lbs	25,408 ft-lbs	6.7%	1	03-05-14
End Shear	1,864 lbs	11,571 lbs	16.1%	1	03-04-02
Total Load Defl.	L/999 (0.005")	n/a	n/a	4	02-06-03
Live Load Defl.	L/999 (0.003")	n/a	n/a	5	02-06-03
Max Defl.	0.005"	n/a	n/a	4	02-06-03
Span / Depth	4.8	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	5-1/4" x 3-1/2"	7,579 lbs	96.5%	33.8%	Unspecified
B1 Wall/Plate	4" x 3-1/2"	2,429 lbs	40.6%	14.2%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

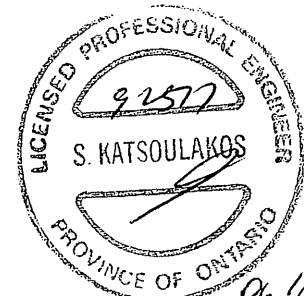
Resistance Factor phi has been applied to all presented results per CSA O86.

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO DBC 2012



DWG NO. TAM 47776-17
 STRUCTURAL
 COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B3(i1207)

BC CALC® Design Report



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

June 6, 2017 09:46:01

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

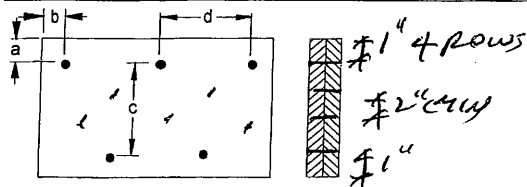
Description: Designs\Flush Beams\Basement\Flush Beams\B3(i120

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

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

Calculated Side Load = 814.8 lb/ft

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

Connectors are: 16d Nails
 3 1/2" ARDOX SPIRAL

Disclosure

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DWNO.TAM 4777617
 STRUCTURAL
 COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i1160)

BC CALC® Design Report



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

June 6, 2017 09:46:01

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mxd

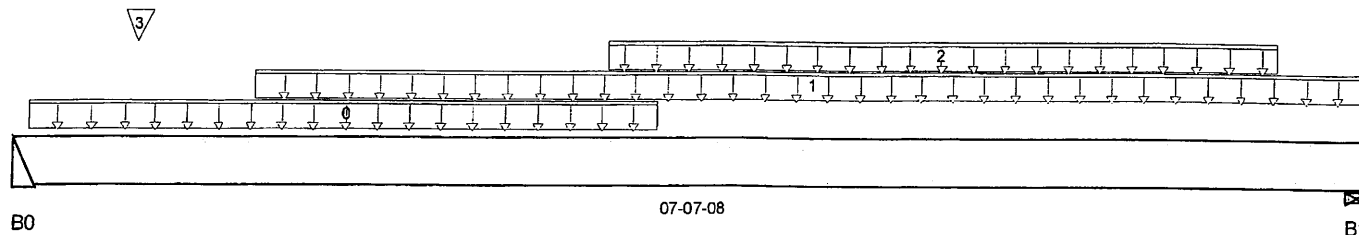
Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1160)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-07-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	1,319 / 0	696 / 0		
B1, 5-1/2"	1,917 / 0	998 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	FC 1 Floor Material	Unf. Lin. (lb/ft)	L	00-01-00	03-07-08	23	11			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-04-00	07-07-08	302	151			n/a
2	User Load	Unf. Lin. (lb/ft)	L	03-04-00	07-01-08	240	120			n/a
3	J2(i1191)	Conc. Pt. (lbs)	L	00-08-00	00-08-00	345	173			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,949 ft-lbs	25,408 ft-lbs	23.4%	1	03-11-07
End Shear	3,294 lbs	11,571 lbs	28.5%	1	06-04-08
Total Load Defl.	L/999 (0.076")	n/a	n/a	4	03-09-01
Live Load Defl.	L/999 (0.05")	n/a	n/a	5	03-09-01
Max Defl.	0.076"	n/a	n/a	4	03-09-01
Span / Depth	9	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 3-1/2"	2,848 lbs	n/a	33.4%	HGUS410
B1 Wall/Plate	5-1/2" x 3-1/2"	4,124 lbs	50.1%	17.6%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

Hanger Manufacturer: Unassigned

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

P. L.

DWG NO. TAM 4777-17
 STRUCTURAL
 COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B4(i1160)

BC CALC® Design Report



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

June 6, 2017 09:46:01

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

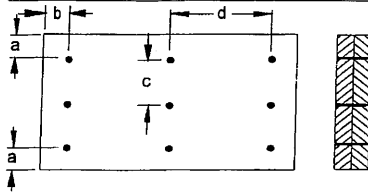
Description: Designs\Flush Beams\Basement\Flush Beams\B4(i1160)

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

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

Calculated Side Load = 624.8 lb/ft

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

Connectors are: 16d Nails
 3 1/2" ARDOX SPIRAL

Disclosure

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

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DWG NO. TAM 4777-17
 STRUCTURAL
 COMPONENT ONLY



Boise Cascade

Single 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP Basement\Flush Beams\B5(i1215)

BC CALC® Design Report



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

June 6, 2017 09:46:01

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

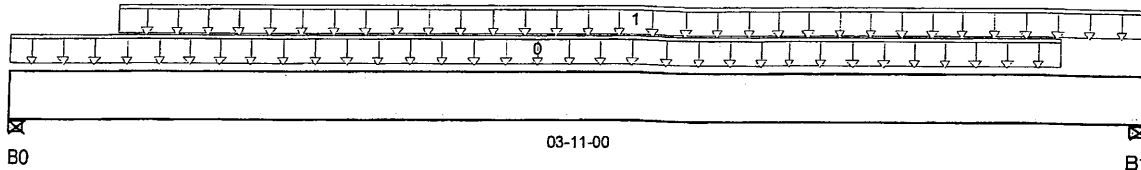
Description: Designs\Flush Beams\Basement\Flush Beams\B5(i1215)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-11-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4-1/2"	517 / 0	268 / 0		
B1, 3-1/2"	434 / 0	226 / 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	03-07-08	240	120			n/a
1	FC1 Floor Material	Unf. Lin. (lb/ft)	L	00-04-08	03-11-00	22	11			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	802 ft-lbs	12,704 ft-lbs	6.3%	1	02-00-00
End Shear	470 lbs	5,785 lbs	8.1%	1	02-10-00
Total Load Defl.	L/999 (0.005")	n/a	n/a	4	02-00-00
Live Load Defl.	L/999 (0.003")	n/a	n/a	5	02-00-00
Max Defl.	0.005"	n/a	n/a	4	02-00-00
Span / Depth	4.3	n/a	n/a		00-00-00

Disclosure

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

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	4-1/2" x 1-3/4"	1,111 lbs	33%	11.6%	Unspecified
B1 Wall/Plate	3-1/2" x 1-3/4"	933 lbs	35.6%	12.5%	Unspecified

Notes

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

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

Calculations assume member is fully braced.

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

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

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

CONFORMS TO OBC 2012

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



DWG NO. TAM 4777B-17
STRUCTURAL



Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor...B6 DR(i857)

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

June 6, 2017 09:46:02

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

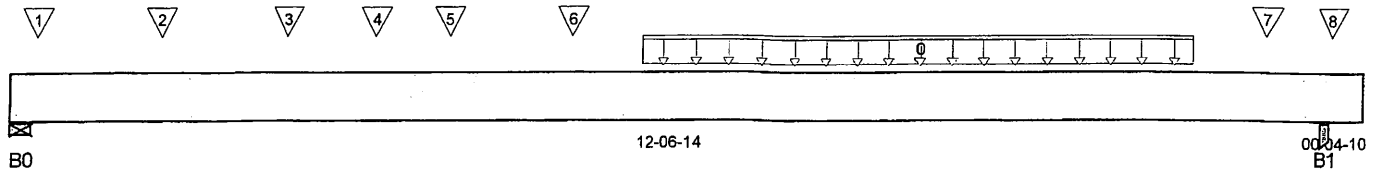
Description: Designs\Flush Beams\1st Floor\Flush Beams\B6 DR(i857

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 12-11-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-7/8"	3,155 / 0	1,671 / 0		
B1, 5-1/4"	3,418 / 0	1,849 / 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	06-00-08	11-04-08	481	241			n/a
1	-	Conc. Pt. (lbs)	L	00-02-14	00-02-14	466	233			n/a
2	-	Conc. Pt. (lbs)	L	01-04-15	01-04-15	570	285			n/a
3	-	Conc. Pt. (lbs)	L	02-07-08	02-07-08	570	285			n/a
4	J3(i935)	Conc. Pt. (lbs)	L	03-05-12	03-05-12	212	106			n/a
5	-	Conc. Pt. (lbs)	L	04-02-06	04-02-06	559	280			n/a
6	-	Conc. Pt. (lbs)	L	05-04-08	05-04-08	595	297			n/a
7	-	Conc. Pt. (lbs)	L	12-00-08	12-00-08	604	303			n/a
8	B7 DR(i1092)	Conc. Pt. (lbs)	L	12-07-12	12-07-12	433	260			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	19,797 ft-lbs	39,636 ft-lbs	49.9%	1	06-08-08
End Shear	5,899 lbs	17,356 lbs	34%	1	01-01-06
Cont. Shear	5,660 lbs	17,356 lbs	32.6%	1	11-06-12
Total Load Defl.	L/292 (0.507")	0.616"	82.3%	4	06-04-08
Live Load Defl.	L/446 (0.331")	0.41"	80.7%	5	06-04-08
Total Neg. Defl.	2xL/1,998 (-0.051")	n/a	n/a	4	12-11-08
Max Defl.	0.507"	n/a	n/a	4	06-04-08
Span / Depth	15.5	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	3-7/8" x 5-1/4"	6,822 lbs	51.2%	27.3%	Unspecified
B1 Post	5-1/4" x 5-1/4"	7,438 lbs	41.5%	22.1%	Unspecified

Notes



DWG NO. YAM 47779-17
STRUCTURAL
COMPONENT ONLY



Triple 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B6 DR(i857)

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

June 6, 2017 09:46:02

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B6 DR(i857)

Specifier:

Designer: AJ

Company:

Misc:

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

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

Calculations assume unbraced length of Top: 00-04-14, Bottom: 00-04-14.

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

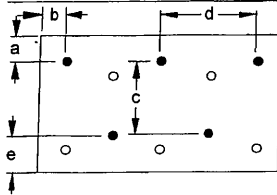
Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.

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.

BC CALO®, BC FRAMER®, AJS™, ALLJOIST®, BC RIM BOARD™, BCO®, 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.

Connection Diagram



4 rows

a minimum = 1"

c = 6 1/2"

b minimum = 3"

d = 6"

e minimum = 2"

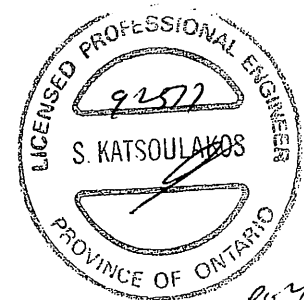
Calculated Side Load = 75.2 lb/ft

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

Nailing schedule applies to both sides of the member.

Connectors are: Nails

3 1/2" ARDOX SPIRAL



DWG NO. YAM 47779-17
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B7 (i1092)

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

June 6, 2017 09:46:02

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

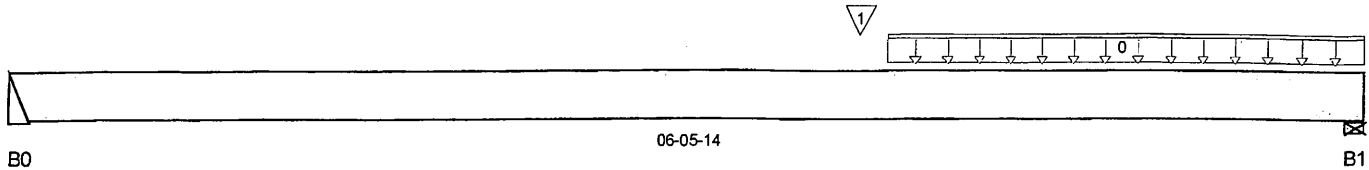
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B7 D

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 06-05-14

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0	468 / 0	279 / 0		
B1, 4"	873 / 0	498 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	R1 (i1079)	Unf. Lin. (lb/ft)	L	04-02-06	06-05-14	15	10			n/a
1	B1 1 (i856)	Conc. Pt. (lbs)	L	04-00-10	04-00-10	1,306	691			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	4,049 ft-lbs	24,081 ft-lbs	16.8%	1	04-00-10
End Shear	1,879 lbs	11,571 lbs	16.2%	1	05-04-06
Total Load Defl.	L/999 (0.03")	n/a	n/a	4	03-04-08
Live Load Defl.	L/999 (0.019")	n/a	n/a	5	03-04-08
Max Defl.	0.03"	n/a	n/a	4	03-04-08
Span / Depth	7.7	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Hanger	2" x 3-1/2"	1,051 lbs	n/a	12.3%	HGUS410
B1 Wall/Plate	4" x 3-1/2"	1,932 lbs	21.2%	11.3%	Unspecified

Notes

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

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

Calculations assume unbraced length of Top: 03-10-14, Bottom: 03-10-14.

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



P616

DWG NO. TAM4778217
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B7 (i1092)

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

June 6, 2017 09:46:02

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmd\

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

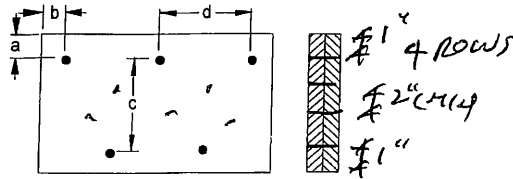
Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram



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

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

Member has no side loads.

Connectors are: 16d Nails
3 1/2" ARDOX SPIRAL

Disclosure

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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PO 2/6

DWG NO. TAM 47782-17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B8(i778)

BC CALC® Design Report



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

June 6, 2017 09:46:02

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

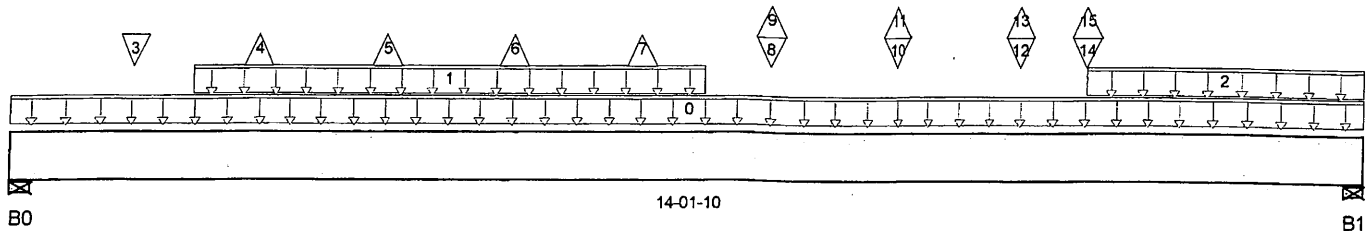
Description: Designs\Flush Beams\1st Floor\Flush Beams\B8(i778)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 14-01-10

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4-3/8"	1,057 / 84	418 / 0	0 / 157	
B1, 2-3/4"	964 / 80	376 / 0	0 / 147	

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	14-01-10	24	12			n/a
1	Smoothed Load	Unf. Lin. (lb/ft)	L	01-10-07	07-03-00	136	34			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	11-03-04	14-01-10	24	12			n/a
3	J5(i1103)	Conc. Pt. (lbs)	L	01-02-14	01-02-14	166	83			n/a
4	J4DJ(i928)	Conc. Pt. (lbs)	L	02-06-08	02-06-08	-20		-43		n/a
5	J4(i1117)	Conc. Pt. (lbs)	L	03-10-14	03-10-14	-22		-39		n/a
6	J4(i1084)	Conc. Pt. (lbs)	L	05-02-14	05-02-14	-22		-39		n/a
7	J4(i1021)	Conc. Pt. (lbs)	L	06-06-14	06-06-14	-22		-39		n/a
8	J4(i925)	Conc. Pt. (lbs)	L	07-10-14	07-10-14	181	42	-42		n/a
9	J4(i925)	Conc. Pt. (lbs)	L	07-10-14	07-10-14	-24				n/a
10	J4(i1081)	Conc. Pt. (lbs)	L	09-02-14	09-02-14	182	46	-39		n/a
11	J4(i1081)	Conc. Pt. (lbs)	L	09-02-14	09-02-14	-22				n/a
12	J4(i927)	Conc. Pt. (lbs)	L	10-06-14	10-06-14	140	35	-30		n/a
13	J4(i927)	Conc. Pt. (lbs)	L	10-06-14	10-06-14	-17				n/a
14	J4DJ(i756)	Conc. Pt. (lbs)	L	11-03-04	11-03-04	210	62	-33		n/a
15	J4DJ(i756)	Conc. Pt. (lbs)	L	11-03-04	11-03-04	-15				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	7,303 ft-lbs	25,408 ft-lbs	28.7%	21	06-08-14
End Shear	2,035 lbs	11,571 lbs	17.6%	21	01-01-14
Total Load Defl.	L/478 (0.343")	0.683"	50.2%	56	07-00-14
Live Load Defl.	L/650 (0.252")	0.456"	55.4%	83	07-00-14
Max Defl.	0.343"	n/a	n/a	56	07-00-14
Span / Depth	17.3	n/a	n/a		00-00-00

Bearing Supports

Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
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DWG NO. TAM 4778-17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B8(i778)

BC CALC® Design Report



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

June 6, 2017 09:46:02

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

Description: Designs\Flush Beams\1st Floor\Flush Beams\B8(i778)

Specifier:

Designer: AJ

Company:

Misc:

B0	Wall/Plate	4-3/8" x 3-1/2"	2,109 lbs	32.2%	11.3%	Unspecified
B1	Wall/Plate	2-3/4" x 3-1/2"	1,916 lbs	46.6%	16.3%	Unspecified

Disclosure

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

Notes

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

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

Calculations assume member is fully braced.

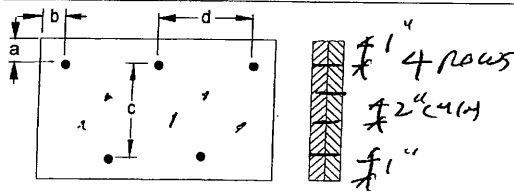
Resistance Factor phi has been applied to all presented results per CSA O86.

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 products verification.

Design based on Dry Service Condition.

Importance Factor: Normal Part code: Part 9

CONFORMS TO OBC 2012**Connection Diagram**

a minimum = 4" c = 1-1/2"
b minimum = 3" d = 12"

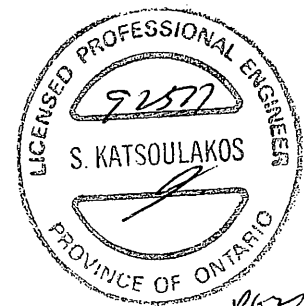
Calculated Side Load = 173.1 lb/ft

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: Nails

3 1/2" ARDOX SPIRAL

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



DWG NO. TAM 4778/1-17
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B9 DR(i1098)

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

June 6, 2017 09:46:03

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

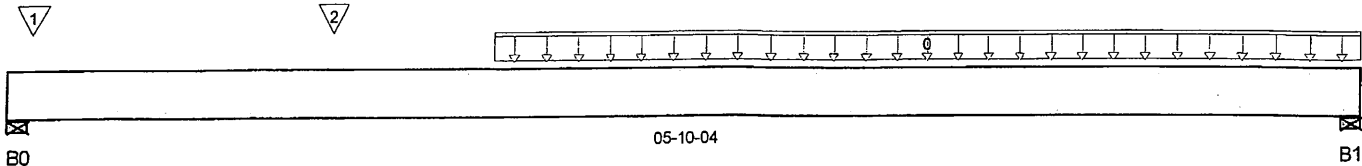
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B9 D

Specifier:

Designer: AJ

Company:

Msc:



Total Horizontal Product Length = 05-10-04

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4-1/4"	735 / 0	797 / 0	456 / 0	
B1, 4"	807 / 0	911 / 0	545 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	02-01-04	05-10-04	271	290	175		n/a
1	J5(i1103)	Conc. Pt. (lbs)	L	00-01-04	00-01-04	169	85			n/a
2	J4DJ(i928)	Conc. Pt. (lbs)	L	01-04-14	01-04-14	356	481	345		n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	3,049 ft-lbs	25,408 ft-lbs	12%	1	02-09-04
End Shear	1,954 lbs	11,571 lbs	16.9%	1	01-01-12
Total Load Defl.	L/999 (0.023")	n/a	n/a	35	02-11-04
Live Load Defl.	L/999 (0.012")	n/a	n/a	51	02-11-04
Max Defl.	0.023"	n/a	n/a	35	02-11-04
Span / Depth	6.7	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	4-1/4" x 3-1/2"	2,327 lbs	24.1%	12.8%	Unspecified
B1 Wall/Plate	4" x 3-1/2"	2,622 lbs	28.8%	15.4%	Unspecified

Notes

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

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

Calculations assume unbraced length of Top: 00-09-06, Bottom: 00-09-06.

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 product's verification.

Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9



P61E

DWG NO. TAM 4778317
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B9 DR(i1098)

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

June 6, 2017 09:46:03

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B9

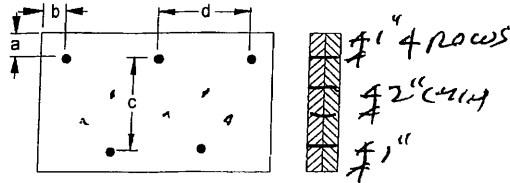
Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram



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

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

Member has no side loads.

Connectors are: 16d Nails

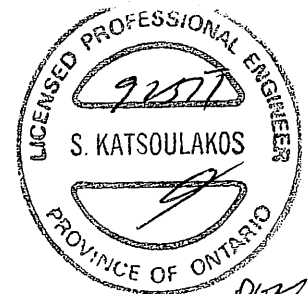
3 1/2" ARDOX SPIRAL

Disclosure

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 4778317
STRUCTURAL
COMPONENT ONLY



Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B10 DR(i777)

BC CALC® Design Report



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

June 6, 2017 09:46:03

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

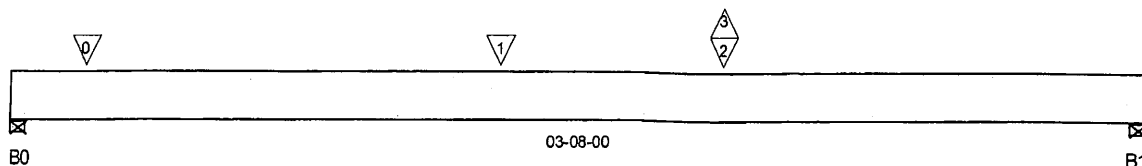
Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B10

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 03-08-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 4"	627 / 9	695 / 0	418 / 0	
B1, 4"	363 / 18	419 / 0	256 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	J4(i1081)	Conc. Pt. (lbs)	L	00-03-00	00-03-00	339	361	218		n/a
1	J4(i927)	Conc. Pt. (lbs)	L	01-07-00	01-07-00	257	274	166		n/a
2	-	Conc. Pt. (lbs)	L	02-03-07	02-03-07	394	436	290		n/a
3	-	Conc. Pt. (lbs)	L	02-03-07	02-03-07	-27				n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	1,311 ft-lbs	25,408 ft-lbs	5.2%	1	02-03-06
End Shear	1,177 lbs	11,571 lbs	10.2%	1	02-06-08
Total Load Defl.	L/999 (0.003")	n/a	n/a	58	01-10-11
Live Load Defl.	L/999 (0.002")	n/a	n/a	85	01-10-11
Max Defl.	0.003"	n/a	n/a	58	01-10-11
Span / Depth	3.9	n/a	n/a		00-00-00

Bearing Supports	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Wall/Plate	4" x 3-1/2"	2,018 lbs	22.2%	11.8%	Unspecified
B1 Wall/Plate	4" x 3-1/2"	1,196 lbs	13.2%	7%	Unspecified

Notes

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

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

Calculations assume unbraced length of Top: 00-09-03, Bottom: 00-09-03.

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





Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\...\B10 DR(i777)

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

June 6, 2017 09:46:03

BC CALC® Design Report



Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

Description: Designs\Dropped Beams\1st Floor\Dropped Beams\B1

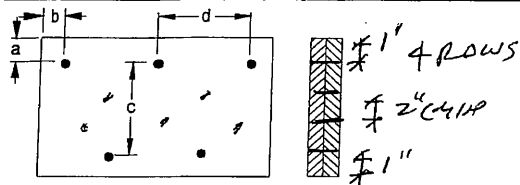
Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram



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

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

Member has no side loads.

Connectors are: 16d Nails

3 1/2" ARDOX SPIRAL

Disclosure

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P62 1/2

DWG NO. TAM 47784-17
STRUCTURAL
COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B11(i856)

BC CALC® Design Report



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

June 6, 2017 09:46:02

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports:

CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

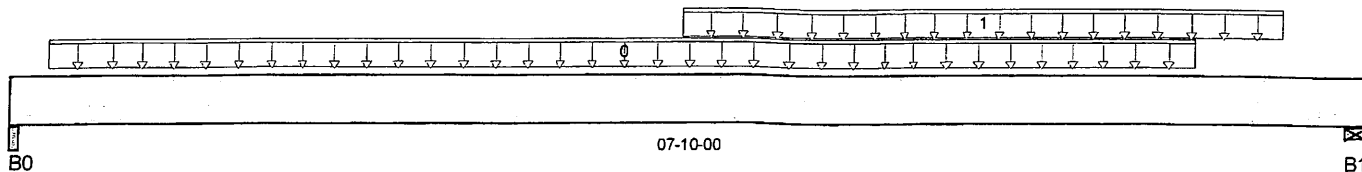
Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i856)

Specifier:

Designer: AJ

Company:

Misc:



Total Horizontal Product Length = 07-10-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 3-1/2"	1,307 / 0	692 / 0		
B1, 5-1/2"	1,564 / 0	822 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Trib.
0	Smoothed Load	Unf. Lin. (lb/ft)	L	00-02-08	06-10-08	303	152			n/a
1	User Load	Unf. Lin. (lb/ft)	L	03-10-08	07-04-08	240	120			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand / Resistance	Load Case	Location
Pos. Moment	5,929 ft-lbs	25,408 ft-lbs	23.3%	1	04-03-00
End Shear	2,940 lbs	11,571 lbs	25.4%	1	06-07-00
Total Load Defl.	L/999 (0.078")	n/a	n/a	4	03-10-08
Live Load Defl.	L/999 (0.051")	n/a	n/a	5	03-10-08
Max Defl.	0.078"	n/a	n/a	4	03-10-08
Span / Depth	9.1	n/a	n/a		00-00-00

Bearing Supports

	Dim. (L x W)	Demand	Demand / Resistance Support	Demand / Resistance Member	Material
B0 Beam	3-1/2" x 3-1/2"	2,825 lbs	26.4%	18.9%	Unspecified
B1 Wall/Plate	5-1/2" x 3-1/2"	3,373 lbs	41%	14.4%	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. TAM4770017

STRUCTURAL

COMPONENT ONLY



Boise Cascade

Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP 1st Floor\Flush Beams\B11(i856)

BC CALC® Design Report



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

June 6, 2017 09:46:02

Build 5033

Job Name:

Address:

City, Province, Postal Code: WATERDOWN,

Customer:

Code reports: CCMC 12472-R

File Name: HIGHGROVE 5E.mmdl

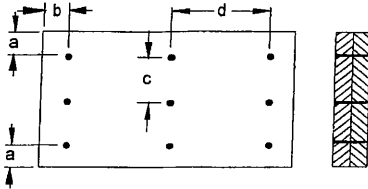
Description: Designs\Flush Beams\1st Floor\Flush Beams\B11(i856)

Specifier:

Designer: AJ

Company:

Misc:

Connection Diagram

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

Calculated Side Load = 547.6 lb/ft

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

Connectors are: 16d Nails

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

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DWG No. TAM 47700-17
 STRUCTURAL
 COMPONENT ONLY

1st Floor/Flush Beams\B21(i1400)

Dry | 1 span | No cant.

January 23, 2018 14:45:26

BC CALC® Design Report

Build 6215

Job name:

Address:

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

Customer:

Code reports: CCMC 12472-R

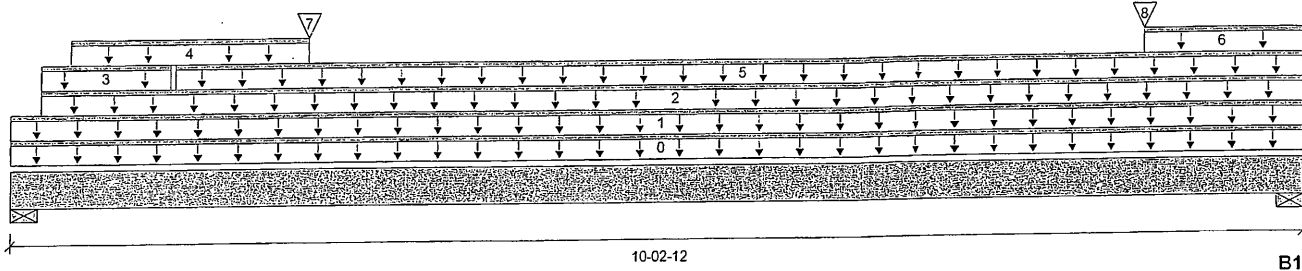
File name: HIGHGROVE 5E.mmdl

Description: 1st Floor/Flush Beams\B21(i1400)

Specifier:

Designer: AJ

Company:



Total Horizontal Product Length = 10-02-12

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	317 / 0	863 / 0	677 / 0	
B1, 1-3/4"	325 / 0	837 / 0	698 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	10-02-12		10			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	10-02-12		100			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	10-02-12	14	7			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	01-02-15	8				n/a
4	WALL	Unf. Lin. (lb/ft)	L	00-05-08	02-04-00	40	46	140		n/a
5	FC2 Floor Material	Unf. Lin. (lb/ft)	L	01-03-08	10-02-12	12	6			n/a
6	WALL	Unf. Lin. (lb/ft)	L	09-00-00	10-02-12	40	46	140		n/a
7	User Load	Conc. Pt. (lbs)	L	02-04-00	02-04-00	135	156	470		n/a
8	User Load	Conc. Pt. (lbs)	L	09-00-00	09-00-00	135	156	470		n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	3,860 ft-lbs	23,220 ft-lbs	16.6%	13	04-07-08
End Shear	1,836 lbs	11,571 lbs	15.9%	13	01-03-00
Total Load Deflection	L/999 (0.107")	n/a	n/a	45	05-01-12
Live Load Deflection	L/999 (0.046")	n/a	n/a	61	05-01-12
Max Defl.	0.107"	n/a	n/a	45	05-01-12
Span / Depth	12.3				

Bearing Supports	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B0	Wall/Plate 5-1/2" x 3-1/2"	2,252 lbs	21.9%	9.6%	Unspecified
B1	Wall/Plate 1-3/4" x 3-1/2"	2,255 lbs	69.0%	30.2%	Unspecified



DWG NO. TAM 8204-18
STRUCTURAL
COMPONENT ONLY

BC CALC® Design Report

Build 6215

Job name:

Address:

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

Customer:

Code reports: CCMC 12472-R

File name: HIGHGROVE 5E.mmdl

Description: 1st Floor Flush Beams B21(i1400)

Specifier:

Designer: AJ

Company:

Notes

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

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

Calculations assume member is fully braced.

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

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

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

CONFORMS TO OBC 2012.

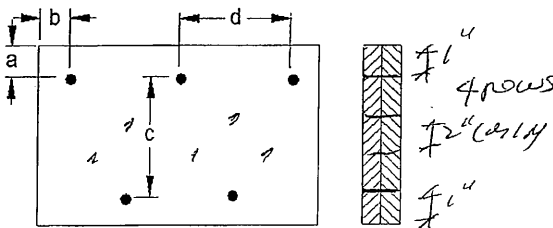
Design based on Dry Service Condition.

Importance Factor : Normal Part code : Part 9

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

Member has no side loads.

Connection Diagram



a minimum = 1"

b minimum = 3"

c = 1-1/2"

d = 6"

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

Member has no side loads.

Connectors are: 16d ^{Sinker} Nails

3-1/2" ARDOX SPIRAL

Disclosure

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DWG NO. TAM 0184-18
STRUCTURAL
COMPONENT ONLY





Boise Cascade



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

PASSED

1st Floor\Flush Beams\B21B(i1742)

Dry | 1 span | No cant.

January 23, 2018 15:56:17

BC CALC® Design Report

Build 6215

Job name:

Address:

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

Customer:

Code reports: CCMC 12472-R

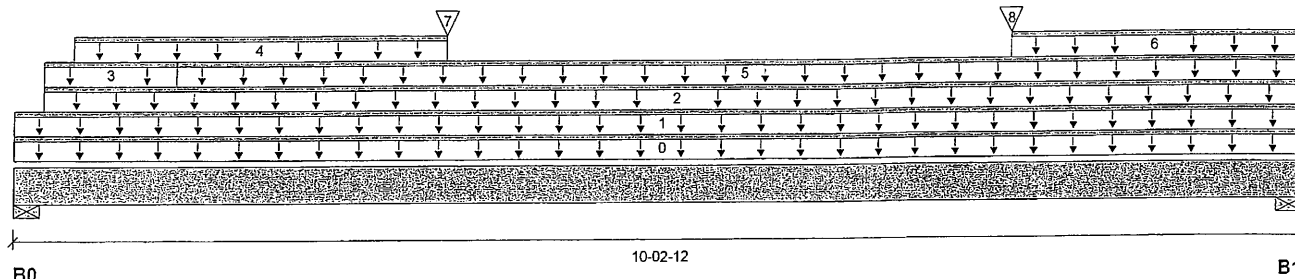
File name: HIGHGROVE 5E EL-2.mmdl

Description: 1st Floor\Flush Beams\B21B(i1742)

Specifier:

Designer: AJ

Company:



Total Horizontal Product Length = 10-02-12

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B0, 5-1/2"	323 / 0	866 / 0	680 / 0	
B1, 1-3/4"	326 / 0	837 / 0	702 / 0	

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	10-02-12		10			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-00	10-02-12		100			n/a
2	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	10-02-12	14	7			n/a
3	FC2 Floor Material	Unf. Lin. (lb/ft)	L	00-02-12	01-03-08	13				n/a
4	WALL	Unf. Lin. (lb/ft)	L	00-05-08	03-05-00	40	46	140		n/a
5	FC2 Floor Material	Unf. Lin. (lb/ft)	L	01-03-08	10-02-12	12	6			n/a
6	WALL	Unf. Lin. (lb/ft)	L	07-11-00	10-02-12	40	46	140		n/a
7	User Load	Conc. Pt. (lbs)	L	03-05-00	03-05-00	92	106	322		n/a
8	User Load	Conc. Pt. (lbs)	L	07-11-00	07-11-00	92	106	322		n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/ Resistance	Case	Location
Pos. Moment	4,756 ft-lbs	23,220 ft-lbs	20.5%	13	04-06-08
End Shear	1,837 lbs	11,571 lbs	15.9%	13	09-03-08
Total Load Deflection	L/908 (0.129")	n/a	26.4%	45	05-02-15
Live Load Deflection	L/999 (0.063")	n/a	n/a	61	05-02-15
Max Defl.	0.129"	n/a	n/a	45	05-02-15
Span / Depth	12.3				

Bearing Supports	Dim. (LxW)	Demand	Demand/ Resistance Support	Demand/ Resistance Member	Material
B0	Wall/Plate 5-1/2" x 3-1/2"	2,264 lbs	22.0%	9.6%	Unspecified
B1	Wall/Plate 1-3/4" x 3-1/2"	2,262 lbs	69.2%	30.3%	Unspecified





Boise Cascade

**Double 1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP****PASSED****1st Floor\Flush Beams\B21B(i1742)**

Dry | 1 span | No cant.

January 23, 2018 15:56:17

BC CALC® Design Report

Build 6215

Job name:

Address:

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

Customer:

Code reports: CCMC 12472-R

File name: HIGHGROVE 5E EL-2.mmdl

Description: 1st Floor\Flush Beams\B21B(i1742)

Specifier:

Designer: AJ

Company:

Notes

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

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

Calculations assume member is fully braced.

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

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

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

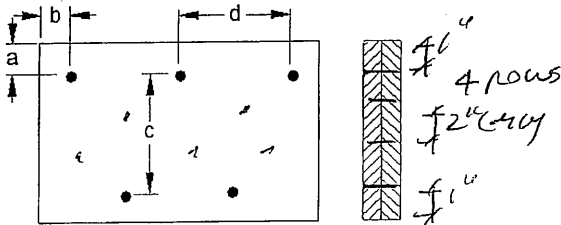
Design based on Dry Service Condition.

CONFORMS TO OBC 2012

Importance Factor : Normal Part code : Part 9

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

Member has no side loads.

Connection Diagrama minimum = 1"
b minimum = 3"c = 2-1/2"
d = 12"

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

Member has no side loads.

Connectors are: 16d Nails

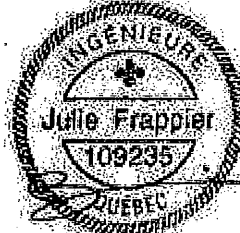
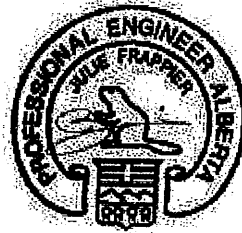
3-1/2" ARDOX SPIRAL**Disclosure**

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DWG NO. TAM 8283-8
STRUCTURAL
COMPONENT ONLY





Maximum Floor Spans

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

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

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

1. Maximum clear span applicable to simple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration, a live load deflection limit of L/480 and a total load deflection limit of L/240.

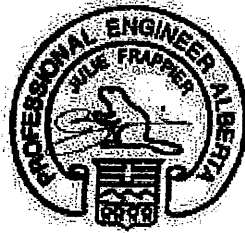
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less. The composite floor may include 1/2 inch gypsum ceiling and/or one row of blocking at mid-span with strapping. Strapping shall be minimum 1x4 inch strap applied to underside of joists at blocking line or 1/2 inch gypsum ceiling attached to joists.

3. Minimum bearing length shall be 1-3/4 inches for the end bearings.

4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.

5. This span chart is based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties. Tables are based on Limit States Design per CSA O86-09, NBC 2010, and OBC 2012.

6. Joists shall be laterally supported at supports and continuously along the compression edge. Refer to technical documentation for installation guidelines and construction details. Nordic I-joists are listed in CCMC evaluation report 13032-R and APA Product Report PR-L274C.



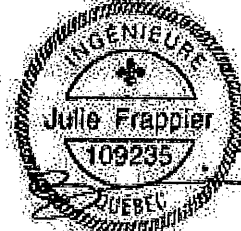
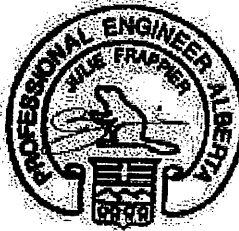
Maximum Floor Spans

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"	22'-9"	19'-5"
	NI-60	24'-10"	23'-1"	22'-0"	20'-10"	25'-6"	23'-8"	22'-4"	20'-10"
	NI-70	26'-1"	24'-3"	23'-2"	21'-10"	26'-8"	24'-11"	23'-9"	22'-4"
	NI-80	26'-6"	24'-7"	23'-5"	22'-2"	27'-1"	25'-3"	24'-1"	22'-9"
16"	NI-90x	27'-3"	25'-4"	24'-1"	22'-9"	27'-9"	25'-11"	24'-8"	23'-4"
	NI-60	27'-3"	25'-5"	24'-2"	22'-10"	28'-0"	26'-2"	24'-9"	23'-1"
	NI-70	28'-8"	26'-8"	25'-4"	23'-11"	29'-3"	27'-4"	26'-1"	24'-8"
	NI-80	29'-1"	27'-0"	25'-9"	24'-4"	29'-8"	27'-9"	26'-5"	25'-0"
	NI-90x	29'-11"	27'-10"	26'-6"	25'-0"	30'-6"	28'-5"	27'-2"	25'-8"

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



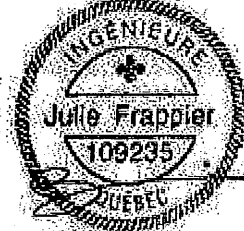
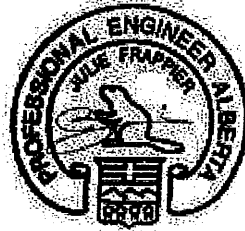
Maximum Floor Spans

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

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

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

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



Maximum Floor Spans

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

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

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

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

NORDIC

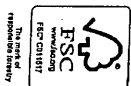
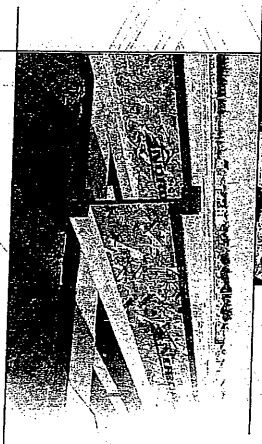
ENGINEERED WOOD

INSTALLATION GUIDE

FOR RESIDENTIAL FLOORS



Distributed by:



N-C301 / November 2014

SAFETY AND CONSTRUCTION PRECAUTIONS



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



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

WARNING

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

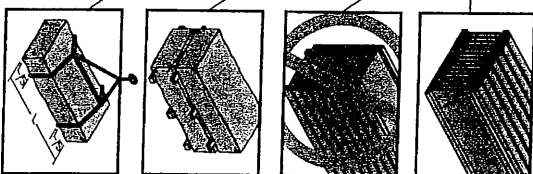
Avoid Accidents by Following these Important Guidelines:

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

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

STORAGE AND HANDLING GUIDELINES

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



MAXIMUM FLOOR SPANS

1. Maximum clear spans applicable to simple-span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
5. This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
6. Tables are based on Limit States Design per CAN/CSA C08-09 Standard, and NBC 2010.
7. SI units conversion: 1 inch = 25.4 mm
1 foot = 0.305 m

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

Joist Depth	Joist Series	Simple spans				Multiple spans					
		On centre spacing	12"	16"	19.2"	24"	On centre spacing	12"	16"	19.2"	24"
12"	12S	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12M	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12L	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12H	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12V	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12W	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12X	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Y	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Z	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12A	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12B	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12C	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12D	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12E	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12F	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12G	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12H	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12I	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12J	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12K	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12L	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12M	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12N	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12O	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12P	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Q	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12R	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12S	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12T	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12U	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12V	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12W	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12X	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Y	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Z	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12A	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12B	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12C	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12D	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12E	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12F	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12G	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12H	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12I	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12J	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12K	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12L	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12M	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12N	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12O	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12P	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Q	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12R	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12S	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12T	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12U	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12V	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12W	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12X	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Y	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Z	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12A	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12B	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12C	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12D	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12E	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12F	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12G	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12H	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12I	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12J	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12K	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12L	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12M	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12N	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12O	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12P	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Q	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12R	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12S	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12T	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12U	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12V	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12W	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12X	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Y	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Z	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12A	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12B	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12C	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12D	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12E	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12F	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12G	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12H	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12I	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12J	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12K	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12L	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12M	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12N	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12O	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12P	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Q	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12R	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12S	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12T	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12U	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12V	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12W	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12X	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Y	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
12"	12Z	11.7	11.7								

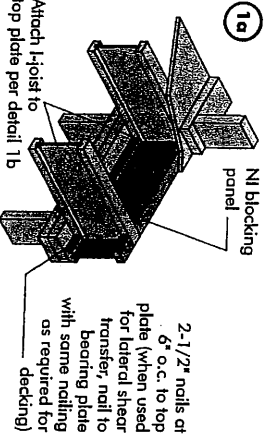
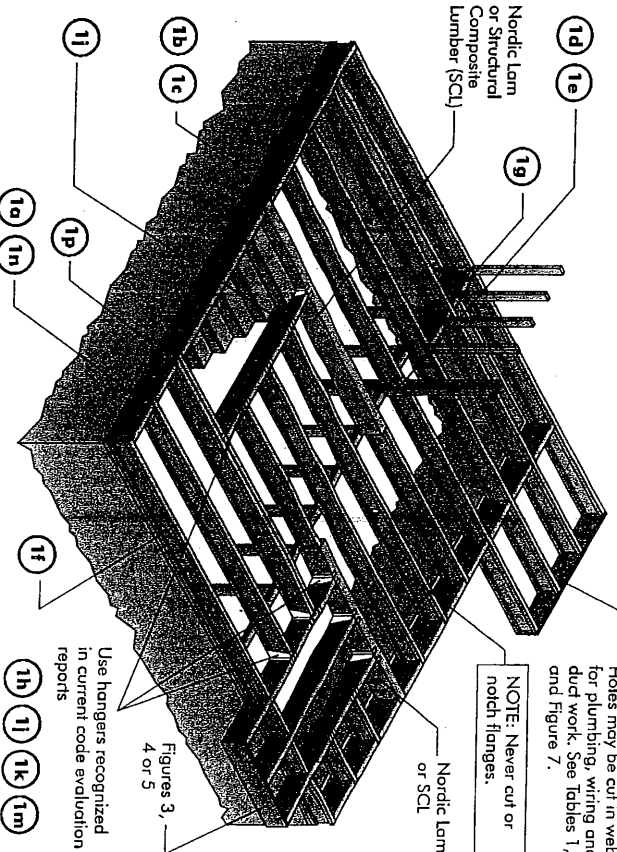
INSTALLING NORDIC I-JOISTS

1. Before laying out floor system components, verify that I-joint flange widths match hanger widths. If not, contact your supplier.
2. Except for cutting to length, I-joint 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 spans 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-joint 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-joint's bottom flange. Whenever possible, suspend all concentrated loads from the top of the I-joint. Or, attach the load to blocking that has been securely fastened to the I-joint 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-joint blocking panels.
11. For I-joists installed over and beneath bearing walls, use full depth blocking panels, rim board, or squash blocks (triple 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-joint blocking panels or other engineered wood products – such as rim board – must be cut to fit between the I-joists, and an I-joint-compatible depth selected.
13. Provide permanent lateral support of the bottom flange of all I-joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered I-joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
14. If square-edge panels are used, edges must be supported between I-joists with 2x4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
15. Nail spacing: Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.



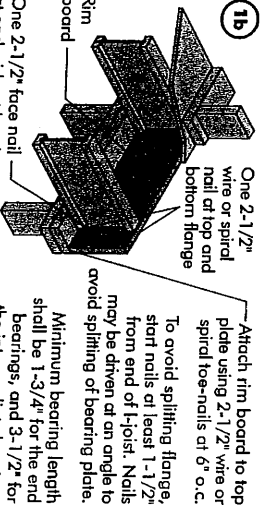
FIGURE 1
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

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



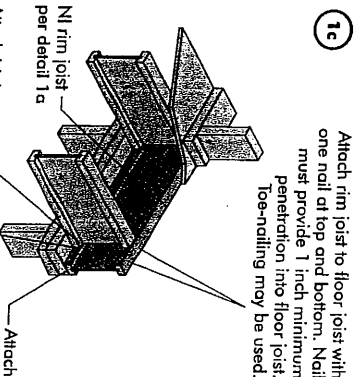
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
NI Joists	3,300

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

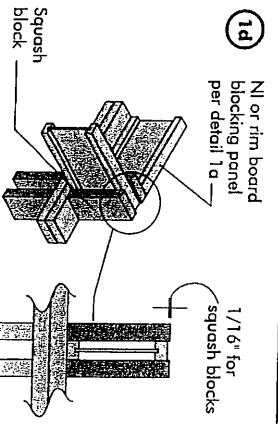


Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8\" Rim Board Plus	8,090

*The uniform vertical load is limited to a rim board depth of 1 6 inches or less and is based on standard term load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer, see detail 1d.

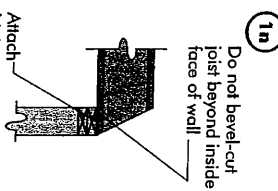
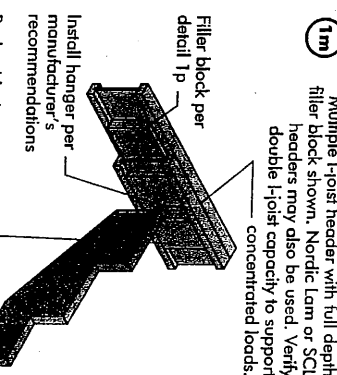
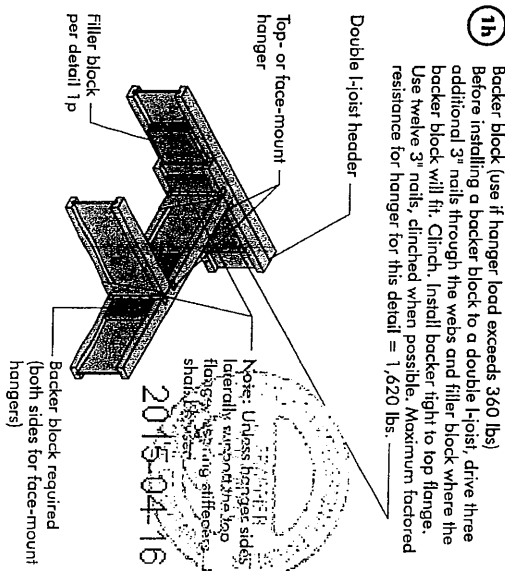
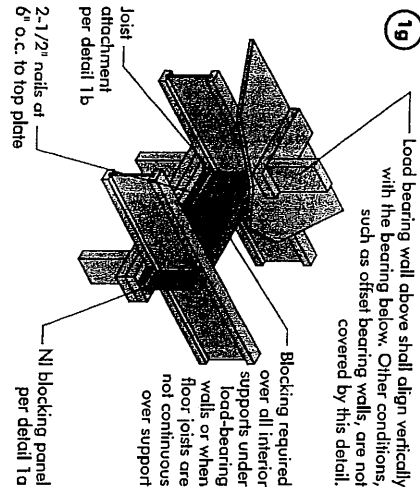
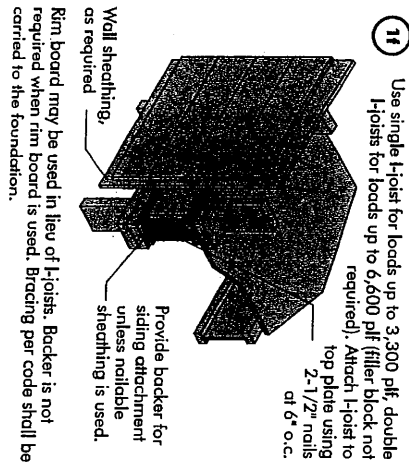
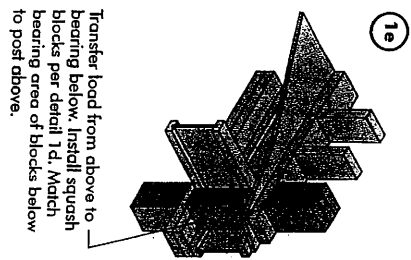


Minimum 1-3/4\"/>

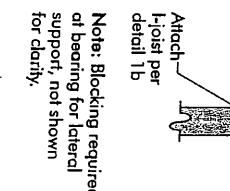
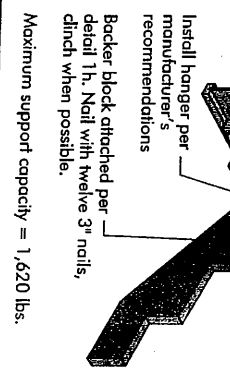
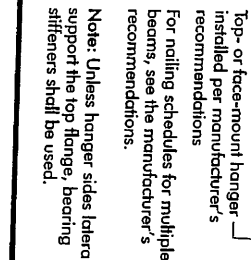


Pair of Squash Blocks	Maximum Factored Vertical per Pair of Squash Blocks (lbs)
2x Lumber	3-1/2\"/>

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



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



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

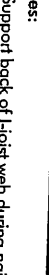
* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid sawn lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-Q437 Standard.

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

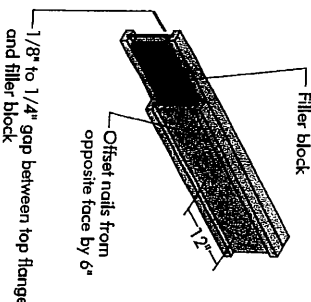
Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

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

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

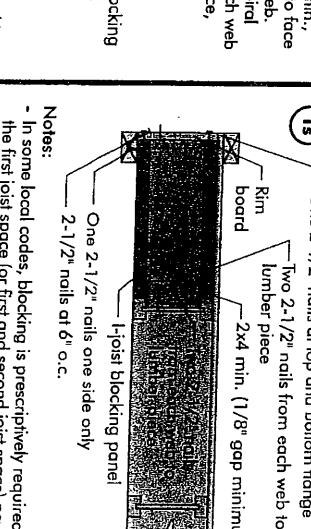
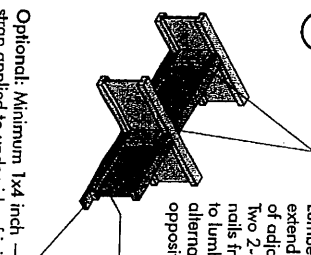


Notes:



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

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



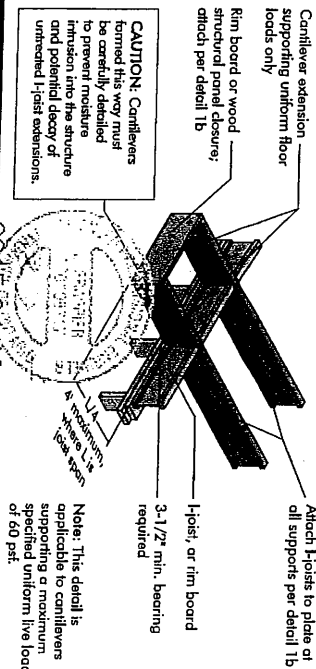
Notes:

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

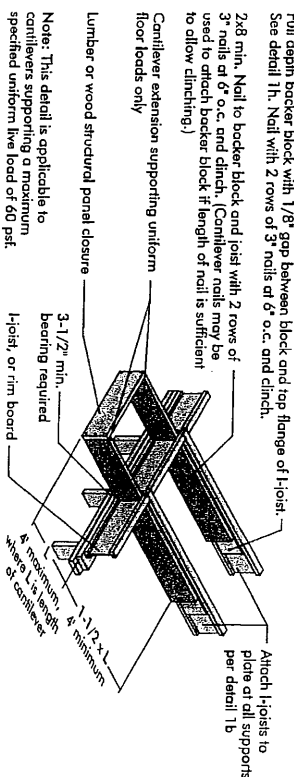
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CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

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

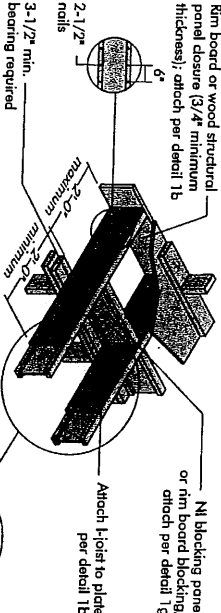


3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE

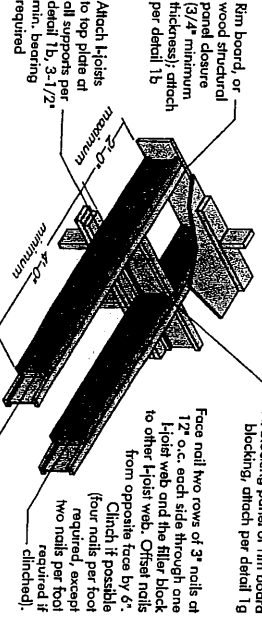


Method 2 — SHEATHING REINFORCEMENT TWO SIDES

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

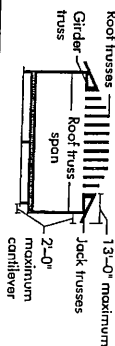
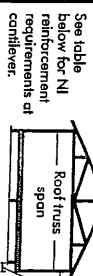
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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

4b Alternate Method 2 — DOUBLE I-JOIST



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

FIGURE 4 (continued)



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

CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft.)	JOIST SPACING (in.)	ROOF LOADING (UNFACTORED)	JOIST SPACING (in.)
12	12	16	12	16
16	16	19.2	16	19.2
24	24	24	24	24
32	32	32	32	32
40	40	40	40	40
48	48	48	48	48
56	56	56	56	56
64	64	64	64	64
72	72	72	72	72
80	80	80	80	80
88	88	88	88	88
96	96	96	96	96
104	104	104	104	104
112	112	112	112	112
120	120	120	120	120
128	128	128	128	128
136	136	136	136	136
144	144	144	144	144
152	152	152	152	152
160	160	160	160	160
168	168	168	168	168
176	176	176	176	176
184	184	184	184	184
192	192	192	192	192
200	200	200	200	200
208	208	208	208	208
216	216	216	216	216
224	224	224	224	224
232	232	232	232	232
240	240	240	240	240
248	248	248	248	248
256	256	256	256	256
264	264	264	264	264
272	272	272	272	272
280	280	280	280	280
288	288	288	288	288
296	296	296	296	296
304	304	304	304	304
312	312	312	312	312
320	320	320	320	320
328	328	328	328	328
336	336	336	336	336
344	344	344	344	344
352	352	352	352	352
360	360	360	360	360
368	368	368	368	368
376	376	376	376	376
384	384	384	384	384
392	392	392	392	392
400	400	400	400	400
408	408	408	408	408
416	416	416	416	416
424	424	424	424	424
432	432	432	432	432
440	440	440	440	440
448	448	448	448	448
456	456	456	456	456
464	464	464	464	464
472	472	472	472	472
480	480	480	480	480
488	488	488	488	488
496	496	496	496	496
504	504	504	504	504
512	512	512	512	512
520	520	520	520	520
528	528	528	528	528
536	536	536	536	536
544	544	544	544	544
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560	560	560	560	560
568	568	568	568	568
576	576	576	576	576
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592	592	592	592	592
600	600	600	600	600
608	608	608	608	608
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624	624	624	624	624
632	632	632	632	632
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648	648	648	648	648
656	656	656	656	656
664	664	664	664	664
672	672	672	672	672
680	680	680	680	680
688	688	688	688	688
696	696	696	696	696
704	704	704	704	704
712	712	712	712	712
720	720	720	720	720
728	728	728	728	728
736	736	736	736	736
744	744	744	744	744
752	752	752	752	752
760	760	760	760	760
768	768	768	768	768
776	776	776	776	776
784	784	784	784	784
792	792	792	792	792
800	800	800	800	800
808	808	808	808	808
816	816	816	816	816
824	824	824	824	824
832	832	832	832	832
840	840	840	840	840
848	848	848	848	848
856	856	856	856	856
864	864	864	864	864
872	872	872	872	872
880	880	880	880	880
888	888	888	888	888
896	896	896	896	896
904	904	904	904	904
912	912	912	912	912
920	920	920	920	920
928	928	928	928	928
936	936	936	936	936
944	944	944	944	944
952	952	952	952	952
960	960	960	960	960
968	968	968	968	968
976	976	976	976	976
984	984	984	984	984
992	992	992	992	992
1000	1000	1000	1000	1000

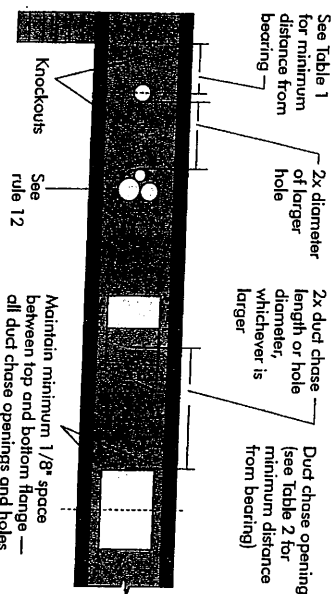
1. $U =$ the reinforcement requirement.
2. $U =$ NI reinforced with 3/4" wood structural panel on one side only.
3. $U =$ NI reinforced with 3/4" wood structural panel on both sides or double I-joist.
4. For larger openings or multiple 2'-0" wide openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
5. $U =$ For a design load or design spacing, the floor span requirements for a design dead load, 55 psf floor live load, and 80 psf wall load. Wall load is based on 3'-0" maximum width window or door openings.
6. $U =$ 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 formed 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.

WEB HOLES

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

1. The distance between the inside edge of the support and the centreline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
2. Joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut holes should be centred on the middle of the web.
4. The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
7. A knockout is **not** considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
8. Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a 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 of approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

FIGURE 7
FIELD-CUT HOLE LOCATOR



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



Knockouts are pre-cored 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 center along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

Never drill, cut or notch the flange, or over-cut the web.
Holes in webs should be cut with a sharp saw.

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

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

Joist Depth	Joist Series	2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4	Span adjustment Factor
Minimum distance from inside face of any support to centre of hole (ft-in.)																	
Round hole diameter (in.)																	
1. Above table may be used for I-joist spacing of 24 inches on centre or less.																	
2. Hole location distance is measured from inside face of supports to centre of hole.																	
3. Distances in this chart are based on uniformly loaded joists.																	

OPTIONAL:

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

$$\text{D}_{\text{reduced}} = \frac{\text{L}_{\text{actual}}}{\text{L}_{\text{max}}} \times \text{D}$$

Where:

- $\text{D}_{\text{reduced}}$ = Distance from the inside face of any support to centre of hole, reduced for less-than-maximum span applications (ft, the preferred unit)
- L_{actual} = The actual measured span distance between the inside faces of supports (ft)
- L_{max} = Span Adjustment Factor given in this table.
- D = The minimum distance from the inside face of any support to centre of hole from this table.

If L_{actual} is greater than 1, use 1 in the above calculation for L_{actual} .

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

Joist Depth	Joist Series	8	10	12	14	16	18	20	22	24	Span adjustment Factor
Minimum distance from inside face of any support to centre of opening (ft-in.)											
Duct chase length (in.)											
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.											

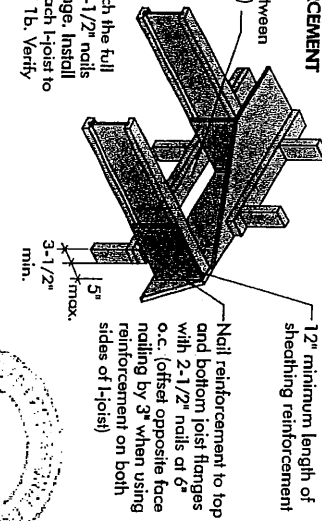
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BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

5a SHEATHING REINFORCEMENT

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

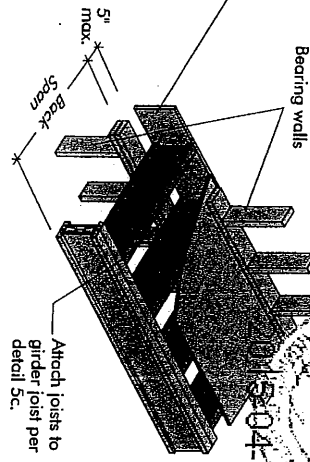
Note: Canadian softwood plywood sheathing or equivalent (minimum thickness 3/4") required on sides of joist. Depth shall match the full height of the joist. Nail with 2-1/2" nails or 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail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



5b SET-BACK DETAIL

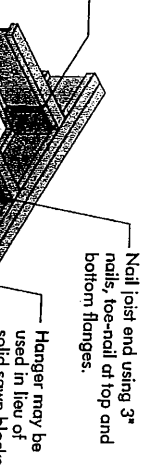
Rim board or wood structural panel closure attach per detail 1b.

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



5c SET-BACK CONNECTION

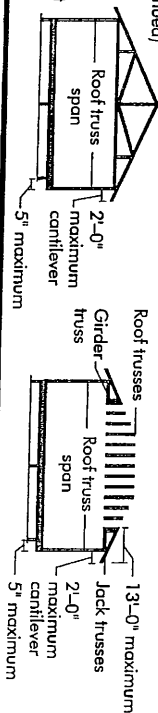
Vertical solid sawn blocks (2x6 S-P-F No. 2 or better) nailed through joist web and web of girder using 2-1/2" nails.



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

FIGURE 5 (continued)

See table below for NI reinforcement requirements at cantilever.



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

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)				ROOF LOADING (UNFACTORED)				ROOF LOADING (UNFACTORED)			
	12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
12	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
16	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
20	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
24	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
28	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
32	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
36	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
40	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
44	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
48	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
52	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
56	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
60	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
64	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
68	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
72	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
76	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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96	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
100	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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108	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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116	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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132	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
136	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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144	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
148	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
152	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
156	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
160	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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168	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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180	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
184	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
188	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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260	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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268	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
272	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
276	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
280	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
284	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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336	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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364	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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388	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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412	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
416	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
420	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
424	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
428	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
432	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
436	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
440	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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448	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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460	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
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472	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
476	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
480	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
484	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
488	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
492	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
496	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
500	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
504	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
508	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
512	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
516	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
520	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX						

BIM BOARD INSTALLATION DETAILS

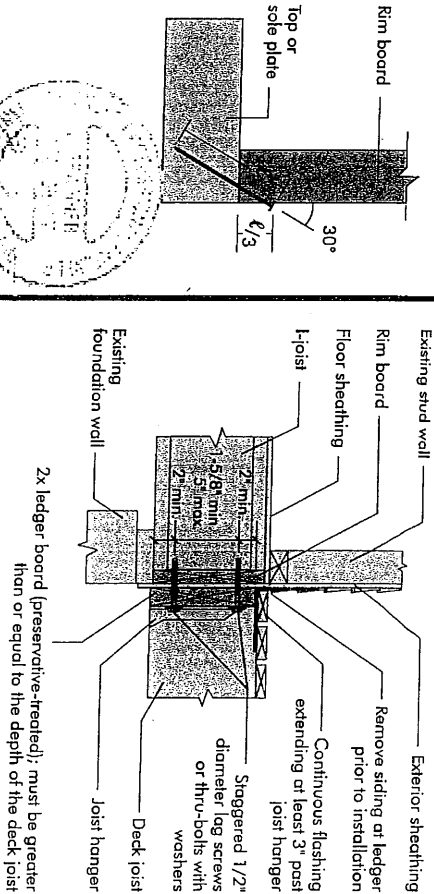
- ## FASTENERS FOR SHEATHING AND SUBFLOORING(1)

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

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.

-
- (1) 2-1/2" nail top and bottom (typical)
- 2-1/2" toe-nails at 1-1/2" o.c. (typical)
- Rim board joint
- h
- 1-1/2"
- Rim board joint

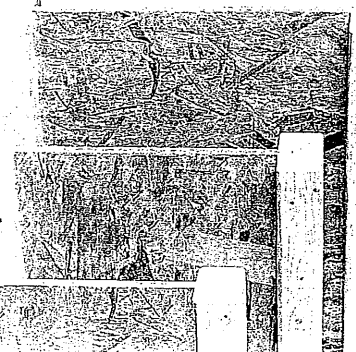
8c 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL



2015-04-16

PRODUCT WARRANTY

Customer-Oriented Perspective: *Does, in accordance with our positioning, brand, products and price, your manufacturing efforts in material and manufacturing...*

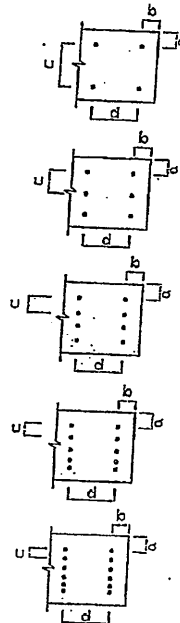


MICRO CITY ENGINEERING SERVICES INC.

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 NO X SEE

DWG #TAMN1001-14