

Products				
PlotID	Length	Product	Plies	Net Qty
B7	4-00-00	11 7/8" NI-20	1	1
B8	5-00-00	11 7/8" NI-20	1	1
B9	5-00-00	11 7/8" NI-20	1	1
B10	5-00-00	11 7/8" NI-20	1	1
B11	10-00-00	11 7/8" NI-20	1	1
B12	18-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2
B13	5-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1
B14	18-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2
B15 (-4R)	5-00-00	9 1/2" NI-20	1	1
B16 (-4R)	5-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B17 (-4R)	7-00-00	9 1/2" NI-20	1	1
B18 (-4R)	6-00-00	9 1/2" NI-20	2	2
B19 (-4R)	10-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	2	2
B20 (-4R)	8-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B21 (-4R)	17-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B22 (-4R)	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
B23 (-4R)	6-00-00	1-3/4" x 9-1/2" VERSA-LAM® 2.0 3100 SP	1	1
J1	12-00-00	9 1/2" NI-20	1	5
J2	5-00-00	9 1/2" NI-20	1	8
J3	15-00-00	11 7/8" NI-20	1	13
J4	14-00-00	11 7/8" NI-20	1	12
J5	13-00-00	11 7/8" NI-20	1	3
J6	12-00-00	11 7/8" NI-20	1	10
J7	11-00-00	11 7/8" NI-20	1	10
J8	10-00-00	11 7/8" NI-20	1	5
J9	5-00-00	11 7/8" NI-20	1	2
J10	4-00-00	11 7/8" NI-20	1	1
J11	3-00-00	11 7/8" NI-20	1	3
J12	18-00-00	11 7/8" NI-40x	1	17
J13	18-00-00	11 7/8" NI-40x	2	4
Ca1	158-00-00	1 1/8" x 11 7/8" Rim Board	1	1
Bk1	7-00-00	9 1/2" NI-20	1	1
Bk2	66-00-00	11 7/8" NI-20	1	1

Connector Summary			
PlotID	Qty	Manuf	Product
H1	1		HGUS410
H2	2		HU310-2
H3	2		HUS1.81/10
H4	28		LT251188
H5	28		LT259

SE059815 - SE059837

GROUND FLOOR FRAMING
UNIT 4006 - LOT 60 -THE LILAC
ELEVATION B

FLOOR LOADING
LIVE LOAD : 40 PSF
DEAD LOAD : 15 PSF
DEAD LOAD (TILE): 20 PSF

HATCH LEGEND	
	Ceramic Tile
	Conventional Framing

APP - AS PER PLAN
BBO - BEAM BY OTHERS
PA - POST ABOVE
O.T.B - OPEN TO BELOW
GT - GIRDER TRUSS
RT - ROOF TRUSS
RIMBOARD
1-1/8" X 11-7/8" O.S.B
SUBFLOOR: 3/4" NAILED & GLUED**

Blocking panels are required over all interior supports.

Squash blocks are required under concentrated loads.

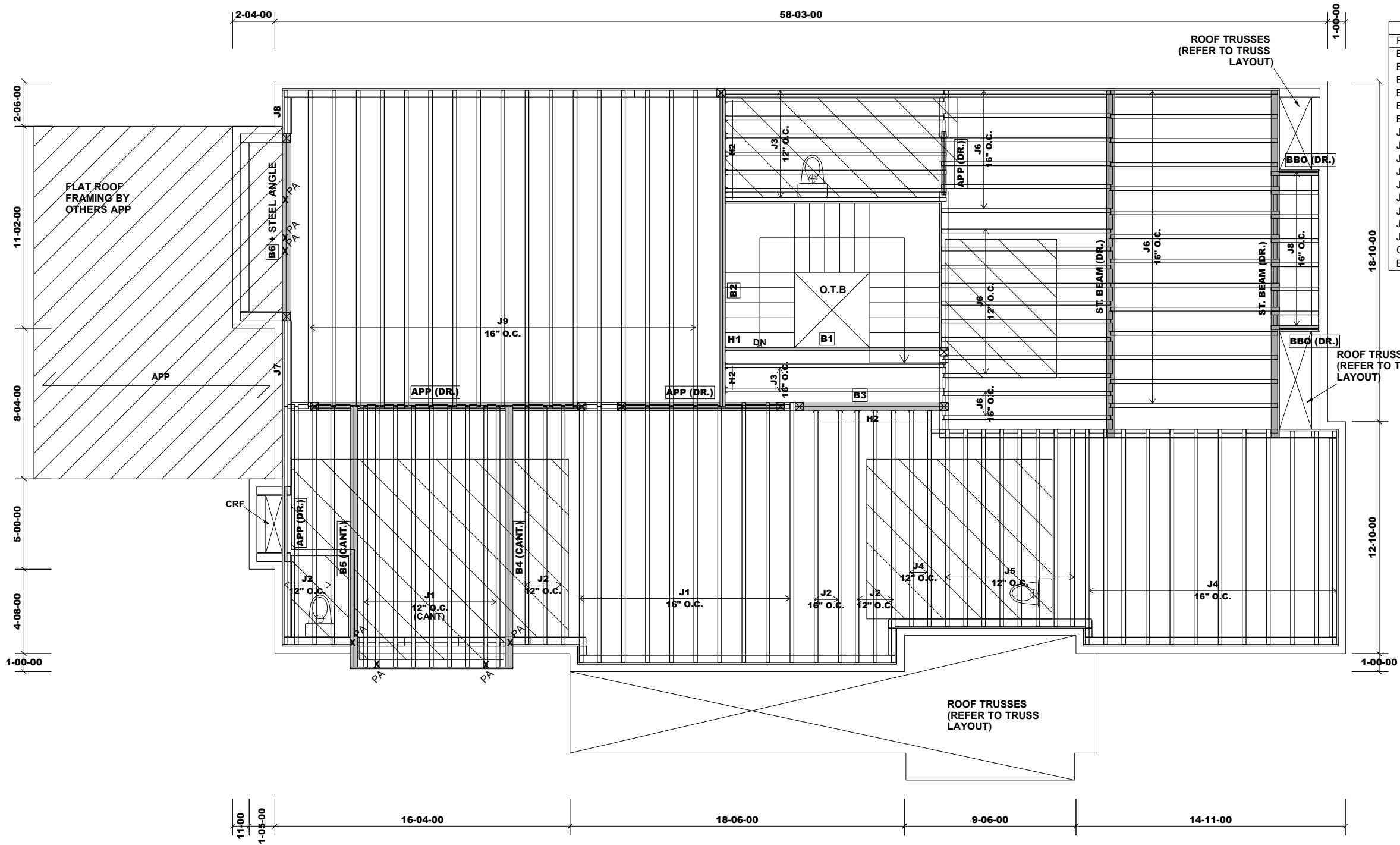
Provide I-Joist blocking between cantilevered joists (along bearing) and rimboard closure at ends.

Refer to manufacturer's specifications: (Nordic Engineering Wood Products - Construction Details Nordic Joist) NS-DC3 latest edition.

Ceramic Tile Application as per O.B.C. 9.30.6

Do not scale - refer to architectural plans for dimensions.

	Job Track: 45147	Builder: Gold Park Homes	Location: Vaughan	Sheet: 1 of 2	THESE DRAWINGS CONSTITUTE THE PROPERTY OF ALPA ROOF TRUSSES INC., SHALL NOT BE REPRODUCED, PUBLISHED, OR REDISTRIBUTED IN ANY MANNER OR UTILIZED BY ANY OTHER WITHOUT PERMISSION OF ALPA ROOF TRUSSES INC., AND WILL BE RETRACTED BY ALPA ROOF TRUSSES INC IF UTILIZED FOR ANY OTHER PURPOSE. Mitek V. 8.5.3.233
	Layout ID: 350619	Project: Pine Valley Ph2	SalesPerson: Derek F.	Date: 2022/11/18	
	Plan Log: 119480	Model: 4006 Lot 60	Yard: Home Lumber Inc.	Designer: TL	



Products				
PlotID	Length	Product	Plies	Net Qty
B1	13-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	1	1
B2	18-00-00	1-3/4" x 11-7/8" VERSA-LAM® 2.0 3100 SP	2	2
B3	9-00-00	11 7/8" NI-20	2	2
B4 (CANT.)	15-00-00	11 7/8" NI-20	2	2
B5 (CANT.)	15-00-00	11 7/8" NI-20	2	2
B6	11-00-00	11 7/8" NI-20	2	2
J1	15-00-00	11 7/8" NI-20	1	19
J2	14-00-00	11 7/8" NI-20	1	12
J3	13-00-00	11 7/8" NI-20	1	10
J4	12-00-00	11 7/8" NI-20	1	14
J5	11-00-00	11 7/8" NI-20	1	8
J6	10-00-00	11 7/8" NI-20	1	31
J7	5-00-00	11 7/8" NI-20	1	1
J8	3-00-00	11 7/8" NI-20	1	9
J9	18-00-00	11 7/8" NI-40x	1	17
Ca1	197-00-00	1 1/8" x 11 7/8" Rim Board	1	1
Bk1	66-00-00	11 7/8" NI-20	1	1

Connector Summary			
PlotID	Qty	Manuf	Product
H1	1		HUS1.81/10
H2	16		LT251188

SECOND FLOOR FRAMING
UNIT 4006 - LOT 60 -THE LILAC
ELEVATION B

FLOOR LOADING
LIVE LOAD : 40 PSF
DEAD LOAD : 15 PSF
DEAD LOAD (TILE): 20 PSF

HATCH LEGEND	
	Ceramic Tile
	Conventional Framing

APP - AS PER PLAN
BBO - BEAM BY OTHERS
PA - POST ABOVE
O.T.B - OPEN TO BELOW
GT - GIRDER TRUSS
RT - ROOF TRUSS
RIMBOARD
1-1/8" X 11-7/8" O.S.B
SUBFLOOR: 3/4" NAILED & GLUED**

Blocking panels are required over all interior supports.

Squash blocks are required under concentrated loads.

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

Refer to manufacturer's specifications: (Nordic Engineering Wood Products - Construction Details Nordic Joist) NS-DC3 latest edition.

Ceramic Tile Application as per O.B.C. 9.30.6

Do not scale - refer to architectural plans for dimensions.

Second Floor\Flush Beams\B1(i63064) (Flush Beam)

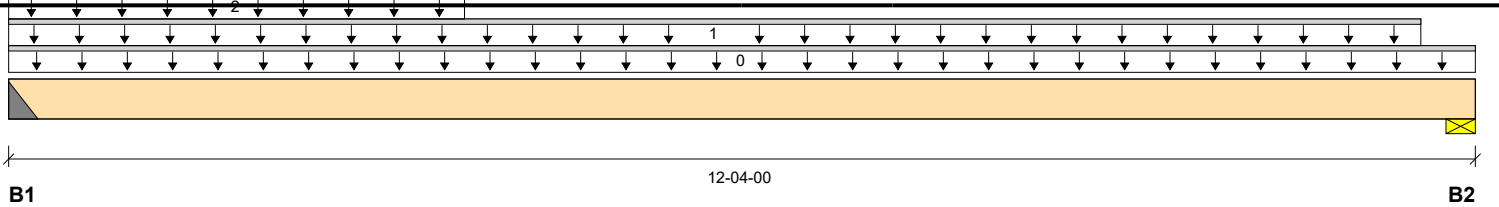
BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 11:55:41

Build 8183

 Job name: 4006 Lot 60
 Address: Pine Valley Ph2
 City, Province, Postal Code: Vaughan, ON
 Customer: Gold Park Homes
 Code reports: CCMC 12472-R

 File name: 350619.mmdl
 Description: Second Floor\Flush Beams\B1(i63064)
 Specifier:
 Designer: TL
 Company: Alpa Roof Trusses Inc.


Total Horizontal Product Length = 12-04-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2"	900 / 0	374 / 0		
B2, 5-1/2"	260 / 0	136 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	12-04-00	Top		6			00-00-00
1	FC3 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	11-10-08	Top	20	8			n/a
2	STAIR	Unf. Lin. (lb/ft)	L	00-00-00	03-10-00	Top	240	90			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2989 ft-lbs	17696 ft-lbs	16.9%	1	03-06-00
End Shear	1216 lbs	7232 lbs	16.8%	1	01-01-14
Total Load Deflection	L/999 (0.097")	n/a	n/a	4	05-05-13
Live Load Deflection	L/999 (0.067")	n/a	n/a	5	05-05-13
Max Defl.	0.097"	n/a	n/a	4	05-05-13
Span / Depth	12.0				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 2" x 1-3/4"	1816 lbs	n/a	42.5%	HUS1.81/10
B2	Wall/Plate 5-1/2" x 1-3/4"	560 lbs	9.5%	4.8%	Spruce-Pine-Fir

Cautions

Hanger model HUS1.81/10 and seat length were input by the user.

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL beam.

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 11-10-08.

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®,

SE059815

Second Floor\Flush Beams\B2(i62716) (Flush Beam)

BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 11:56:02

Build 8183

Job name: 4006 Lot 60

File name: 350619.mmdl

Address: Pine Valley Ph2

Description: Second Floor\Flush Beams\B2(i62716)

City, Province, Postal Code: Vaughan, ON

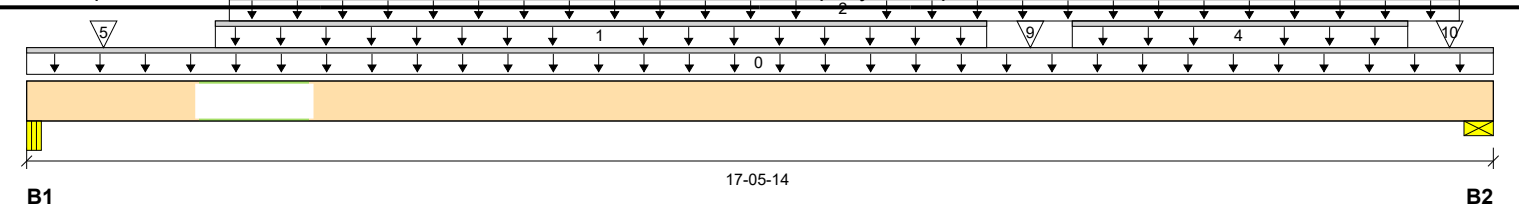
Specifier:

Customer: Gold Park Homes

Designer: TL

Code reports: CCMC 12472-R

Company: Alpa Roof Trusses Inc.



Total Horizontal Product Length = 17-05-14

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2-5/8"	1582 / 0	1261 / 0		
B2, 4-3/8"	1590 / 0	1575 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-05-14	Top		12			00-00-00
1	FC3 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	02-03-00	11-05-06	Top	6				n/a
2	WALL	Unf. Lin. (lb/ft)	L	02-05-00	17-01-00	Top		60			n/a
3	FC3 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	11-03-00	17-05-14	Top	30	11			n/a
4	Smoothed Load	Unf. Lin. (lb/ft)	L	12-05-10	16-05-10	Front	247	123			n/a
5	J3(i62868)	Conc. Pt. (lbs)	L	00-11-00	00-11-00	Front	278	104			n/a
6	J3(i62869)	Conc. Pt. (lbs)	L	02-03-00	02-03-00	Front	282	106			n/a
7	B1(i63064)	Conc. Pt. (lbs)	L	03-02-02	03-02-02	Front	892	370			n/a
8	-	Conc. Pt. (lbs)	L	11-04-08	11-04-08	Front	87	402			n/a
9	J3(i63083)	Conc. Pt. (lbs)	L	11-11-10	11-11-10	Front	189	93			n/a
10	J3(i62937)	Conc. Pt. (lbs)	L	16-11-10	16-11-10	Front	174	83			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	13943 ft-lbs	35392 ft-lbs	39.4%	1	11-03-00
End Shear	3946 lbs	14464 lbs	27.3%	1	16-01-10
Total Load Deflection	L/361 (0.567")	n/a	66.5%	4	08-09-00
Live Load Deflection	L/784 (0.261")	n/a	45.9%	5	08-09-00
Max Defl.	0.567"	n/a	n/a	4	08-09-00
Span / Depth	17.2				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 2-5/8" x 3-1/2"	3949 lbs	35.2%	35.2%	VL 2.0 3100 SP
B2	Wall/Plate 4-3/8" x 3-1/2"	4353 lbs	46.2%	23.3%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 08-00-00.

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

SE059816



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Second Floor**
Label: **B3 - i62562**
Type: **Beam**

2 Ply Member
11 7/8" NI-20

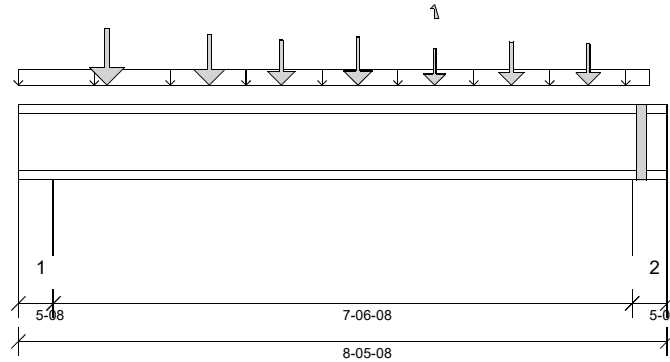
Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:56



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 1 1/2"

Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 4 1/2"
- 615 psi Wall @ 8'- 1"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	4'- 5 1/8"	1.25D + 1.5L	1.00	4264 lb ft	11160 lb ft	Passed - 38%
Factored Shear:	0'- 5 9/16"	1.25D + 1.5L	1.00	2168 lb	4480 lb	Passed - 48%
Live Load (LL) Pos. Defl.:	4'- 2 3/8"	L		0.060"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	4'- 2 7/16"	D + L		0.086"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5L	1.00	2188 lb		4480 lb	16918 lb	Passed - 49%
2	5-08	1.25D + 1.5L	1.00	2051 lb		4480 lb	16918 lb	Passed - 46%

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	8'- 5 1/2"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	8'- 2 3/4"	FC3 Floor Decking (Plan View Fill)	Top	7 lb/ft	18 lb/ft	-	-
Point	1'- 1 7/8"	1'- 1 7/8"	J2(i62894)	Front	141 lb	375 lb	-	-
Point	2'- 5 7/8"	2'- 5 7/8"	J2(i62895)	Front	120 lb	320 lb	-	-
Point	3'- 5 1/8"	3'- 5 1/8"	J2(i62831)	Front	105 lb	273 lb	-	-
Point	4'- 5 1/8"	4'- 5 1/8"	J2(i62832)	Front	124 lb	281 lb	-	-
Point	5'- 5 1/8"	5'- 5 1/8"	J2(i63088)	Front	84 lb	193/0 lb	-	-
Point	6'- 5 1/8"	6'- 5 1/8"	J4(i62896)	Front	108 lb	241 lb	-	-
Point	7'- 5 1/8"	7'- 5 1/8"	J4(i62897)	Front	101 lb	226 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	10(i59369)	450 lb	1084 lb	-	-
2	8'	8'- 5 1/2"	4(i59352)	445 lb	996 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

SE059817



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Second Floor**
Label: **B4 (CANT.) - i63150**
Type: **Beam**

2 Ply Member
11 7/8" NI-20

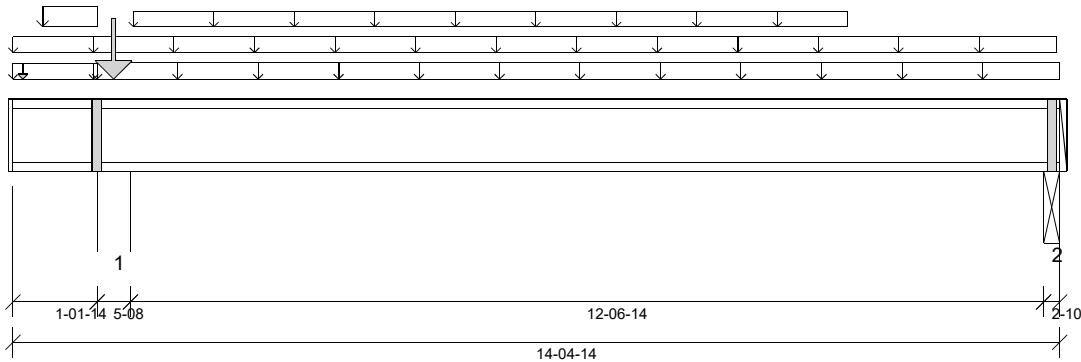
Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:58



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 12'- 6 7/8"

Factored Resistance of Support Material:

- 615 psi Wall @ 1'- 4 5/8"
- 1220 psi Beam @ 14'- 3 1/4"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	7'- 11 13/16"	1.25D + 1.5L	0.68	1459 lb ft	7638 lb ft	Passed - 19%
Factored Neg. Moment:	1'- 4 5/8"	1.25D + 1.5L	0.65	206 lb ft	7254 lb ft	Passed - 3%
Factored Shear:	1'- 7 7/16"	1.25D + 1.5L	0.68	476 lb	3066 lb	Passed - 16%
Live Load (LL) Pos. Defl.:	7'- 9 15/16"	L		0.044"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	7'- 10 11/16"	D + L		0.068"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5S + L	1.00	5380 lb		10140 lb	16918 lb	Passed - 53%
2	2-10	1.25D + 1.5L	0.68	466 lb		2840 lb	10958 lb	Passed - 16%

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	14'- 4 7/8"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	14'- 4 5/16"	FC3 Floor Decking (Plan View Fill)	Top	5 lb/ft	12 lb/ft	-	-
Uniform	0'	1'- 1 7/8"	FC3 Floor Decking (Plan View Fill)	Top	-	8 lb/ft	-	-
Uniform	0'- 4 7/8"	1'- 1 7/8"	E37(i59321)	Top	101 lb/ft	-	-	-
Uniform	1'- 1 7/8"	14'- 4 7/8"	FC3 Floor Decking (Plan View Fill)	Top	7 lb/ft	20 lb/ft	-	-
Uniform	1'- 7 7/8"	11'- 5 7/8"	FC3 Floor Decking (Plan View Fill)	Top	4 lb/ft	-	-	-
Point	0'- 1 5/8"	0'- 1 5/8"	E38(i59314)	Top	62 lb	-	-	-
Point	1'- 4 5/8"	1'- 4 5/8"	E36(i59310)	Top	1348 lb	-	2038 lb	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	1'- 1 7/8"	1'- 7 3/8"	E20(i59306)	1654 lb	237 lb	2048 lb	-
2	14'- 2 1/4"	14'- 4 7/8"	APP (DR.)(i63234)	122 lb	211/-2 lb	-1 lb	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- The deflection at the cantilever for either live and/or total loads is less than 3/8" and therefore has been excluded from the deflection ratio considerations.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

SE059818



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Second Floor**
Label: **B5 (CANT.) - i63196**
Type: **Beam**

2 Ply Member
11 7/8" NI-20

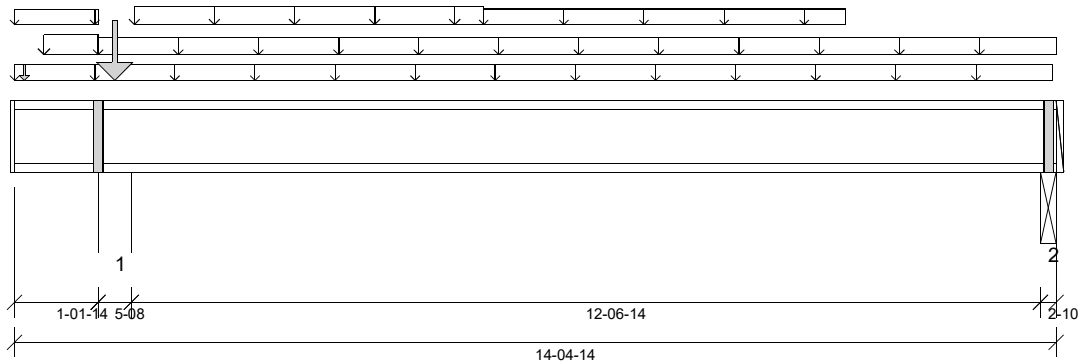
Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:58



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD
Service Condition: Dry
LL Deflection Limit: L/360,
TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:
Top: 0' Bottom: 12'- 6 7/8"

Factored Resistance of Support Material:

- 615 psi Wall @ 1'- 4 5/8"
- 1220 psi Beam @ 14'- 3 1/4"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	7'- 1 1/2"	1.25D + 1.5L	0.65	2138 lb ft	7292 lb ft	Passed - 29%
Factored Neg. Moment:	1'- 4 5/8"	1.25D + 1.5L	0.65	237 lb ft	7254 lb ft	Passed - 3%
Factored Shear:	1'- 7 7/16"	1.25D + 1.5L	0.65	818 lb	2927 lb	Passed - 28%
Live Load (LL) Pos. Defl.:	7'- 9 15/16"	L		0.051"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	7'- 8 3/8"	D + L		0.104"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5-08	1.25D + 1.5S + L	1.00	6595 lb		10140 lb	16918 lb	Passed - 65%
2	2-10	1.25D + 1.5L	0.65	598 lb		2711 lb	10461 lb	Passed - 22%

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	14'- 4 7/8"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	14'- 4 5/16"	FC3 Floor Decking (Plan View Fill)	Top	5 lb/ft	13 lb/ft	-	-
Uniform	0'	1'- 1 7/8"	FC3 Floor Decking (Plan View Fill)	Top	-	8 lb/ft	-	-
Uniform	0'- 4 7/8"	1'- 1 7/8"	E39(i59326)	Top	101 lb/ft	-	-	-
Uniform	1'- 1 7/8"	14'- 4 7/8"	FC3 Floor Decking (Plan View Fill)	Top	9 lb/ft	24 lb/ft	-	-
Uniform	1'- 7 7/8"	6'- 5 7/8"	User Load	Top	60 lb/ft	-	-	-
Uniform	6'- 5 7/8"	11'- 5 7/8"	FC3 Floor Decking (Plan View Fill)	Top	5 lb/ft	-	-	-
Point	0'- 1 5/8"	0'- 1 5/8"	E38(i59314)	Top	81 lb	-	34 lb	-
Point	1'- 4 5/8"	1'- 4 5/8"	E40(i59308)	Top	1582 lb	-	2388 lb	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	1'- 1 7/8"	1'- 7 3/8"	E20(i59306)	2151 lb	270 lb	2426 lb	-
2	14'- 2 1/4"	14'- 4 7/8"	APP (DR.)(i63234)	189 lb	239/-2 lb	-4 lb	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- The deflection at the cantilever for either live and/or total loads is less than 3/8" and therefore has been excluded from the deflection ratio considerations.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

SE059819



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Second Floor**
Label: **B6 - i63596**
Type: **Beam**

2 Ply Member
11 7/8" NI-20

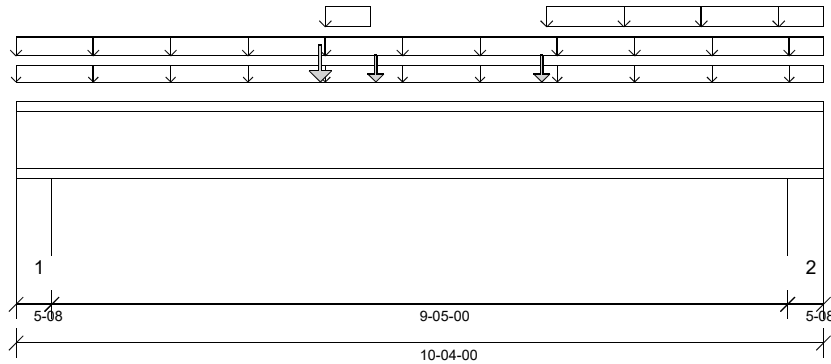
Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:59



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 9'- 5"

Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 4 1/2"
- 615 psi Wall @ 9'- 11 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	4'- 7 1/4"	1.25D + 1.5S + L	0.84	4064 lb ft	9380 lb ft	Passed - 43%
Factored Shear:	9'- 10 7/16"	1.25D + 1.5S + L	0.84	1667 lb	3766 lb	Passed - 44%
Live Load (LL) Pos. Defl.:	5'- 2 3/16"	S + 0.5L		0.041"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	5'- 2 1/8"	D + S + 0.5L		0.119"	L/240	Passed - L/949

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5'-08	1.25D + 1.5L	0.65	1202 lb		2912 lb	10997 lb	Passed - 41%
2	5'-08	1.25D + 1.5S + L	0.84	1829 lb		3766 lb	14220 lb	Passed - 49%

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	10'- 4"	Self Weight	Top	6 lb/ft	-	-	-
Uniform	0'	10'- 4"	E21(i59318)	Top	101 lb/ft	-	-	-
Uniform	0'	10'- 4"	FC3 Floor Decking (Plan View Fill)	Top	11 lb/ft	31 lb/ft	-	-
Uniform	3'- 11 1/2"	4'- 6 1/2"	E21(i59318)	Top	47 lb/ft	-	74 lb/ft	-
Uniform	6'- 9 1/2"	10'- 4"	E21(i59318)	Top	47 lb/ft	-	74 lb/ft	-
Point	3'- 10 3/4"	3'- 10 3/4"	E21(i59318)	Top	108 lb	-	157 lb	-
Point	4'- 7 1/4"	4'- 7 1/4"	E21(i59318)	Top	57 lb	-	83 lb	-
Point	6'- 8 3/4"	6'- 8 3/4"	E21(i59318)	Top	57 lb	-	83 lb	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	E6(i59305)	770 lb	158 lb	236 lb	-
2	9'- 10 1/2"	10'- 4"	E8(i59300)	869 lb	158 lb	392 lb	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

SE059820



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B7 - i63057**
Type: **Beam**

1 Ply Member
11 7/8" NI-20

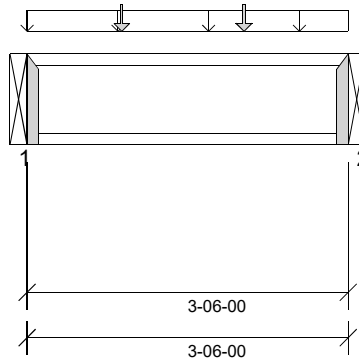
Status:
**Design
Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:59



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018,
ABC 2019, OBC 2012 (2019
Amendment)

Design Methodology: LSD
Service Condition: Dry
LL Deflection Limit: L/360,
TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports
must be laterally restrained. Top and bottom edges
of the member must be fully restrained or have the
following maximum unbraced length:

Top: 0' Bottom: 1'- 1 1/2"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 769 psi Beam @ 3'- 6"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	1'- 9 11/16"	1.25D + 1.5L	1.00	303 lb ft	5580 lb ft	Passed - 5%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	316 lb	2240 lb	Passed - 14%

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-12	1.25D + 1.5L	1.00	317 lb		1970 lb	-	Passed - 16%
2	1-12	1.25D + 1.5L	1.00	311 lb		1970 lb	-	Passed - 16%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	LT251188		-	-	-	Connector manually specified by the user.
2	LT251188		-	-	-	Connector manually specified by the user.

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	3'- 6"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	0'	3'- 6"	User Load	Top	19 lb/ft	50 lb/ft	-	-
Point	1'- 3/8"	1'- 3/8"	J11(i62541)	Front	25 lb	67 lb	-	-
Point	2'- 4 3/8"	2'- 4 3/8"	J11(i62694)	Front	26 lb	70 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B11(i62806)	64 lb	157 lb	-	-
2	3'- 6"	3'- 6"	B8(i62458)	63 lb	155 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059821



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B8 - i62458**
Type: **Beam**

1 Ply Member
11 7/8" NI-20

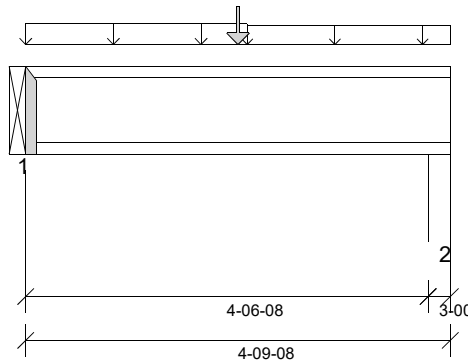
Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26

11/18/2022 11:59



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 2'- 3 1/2"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 615 psi Wall @ 4'- 7 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 4 3/4"	1.25D + 1.5L	1.00	595 lb ft	5580 lb ft	Passed - 11%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	378 lb	2240 lb	Passed - 17%
Total Load (TL) Pos. Defl.:	2'- 3 11/16"	D + L		0.012"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-12	1.25D + 1.5L	1.00	394 lb		1970 lb	-	Passed - 20%
2	3-00	1.25D + 1.5L	1.00	363 lb		2120 lb	4614 lb	Passed - 17%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	LT251188		-	-	-	Connector manually specified by the user.
* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.						

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 9 1/2"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	0'	2'- 6"	FC2 Floor Decking (Plan View Fill)	Top	20 lb/ft	53 lb/ft	-	-
Uniform	2'- 6"	4'- 9 1/2"	FC2 Floor Decking (Plan View Fill)	Top	11 lb/ft	31 lb/ft	-	-
Point	2'- 4 3/4"	2'- 4 3/4"	B7(i63057)	Back	63 lb	155 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B12(i63798)	81 lb	191 lb	-	-
2	4'- 6 1/2"	4'- 9 1/2"	6(i59359)	78 lb	182 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059822



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B9 - i63077**
Type: **Beam**

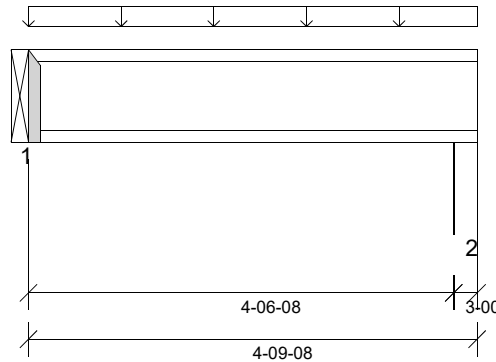
1 Ply Member
11 7/8" NI-20

Status:
**Design
Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:00



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018,
ABC 2019, OBC 2012 (2019
Amendment)

Design Methodology: LSD
Service Condition: Dry
LL Deflection Limit: L/360,
TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports
must be laterally restrained. Top and bottom edges
of the member must be fully restrained or have the
following maximum unbraced length:

Top: 0' Bottom: 4'- 6 1/2"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 615 psi Wall @ 4'- 7 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 3 5/8"	1.25D + 1.5L	1.00	180 lb ft	5580 lb ft	Passed - 3%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	156 lb	2240 lb	Passed - 7%

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-12	1.25D + 1.5L	1.00	156 lb		1970 lb	-	Passed - 8%
2	3-00	1.25D + 1.5L	1.00	183 lb		2120 lb	4614 lb	Passed - 9%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	LT251188	-	-	-	-	Connector manually specified by the user.

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 9 1/2"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	-0'	4'- 9 1/2"	FC2 Floor Decking (Plan View Fill)	Top	12 lb/ft	33 lb/ft	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B12(i63798)	35 lb	76 lb	-	-
2	4'- 6 1/2"	4'- 9 1/2"	7(i59362)	40 lb	88 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059823



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B10 - i62456**
Type: **Beam**

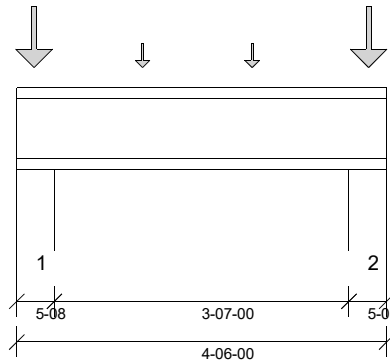
1 Ply Member
11 7/8" NI-20

Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:00



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 1'- 3 7/8"

Factored Resistance of Support Material:

- 615 psi Wall @ 0'- 4 1/2"
- 615 psi Wall @ 4'- 1 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 10 3/8"	1.25D + 1.5L	1.00	133 lb ft	5580 lb ft	Passed - 2%
Factored Neg. Moment:	0'- 4 1/2"	1.25D + 1.5L	1.00	248 lb ft	5580 lb ft	Passed - 4%
Factored Shear:	0'- 5 9/16"	1.25D + 1.5L	1.00	313 lb	2240 lb	Passed - 14%

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	5'-08	1.25D + 1.5L	1.00	1826 lb		2240 lb	8459 lb	Passed - 82%
2	5'-08	1.25D + 1.5L	1.00	1809 lb		2240 lb	8459 lb	Passed - 81%

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 6"	Self Weight	Top	3 lb/ft	-	-	-
Point	1'- 6 3/8"	1'- 6 3/8"	J9(i63058)	Front	55 lb	148 lb	-	-
Point	2'- 10 3/8"	2'- 10 3/8"	J9(i62495)	Front	58 lb	155 lb	-	-
Point	0'- 2 9/16"	0'- 2 9/16"	User Load	Top	288 lb	768 lb	-	-
Point	4'- 3 3/8"	4'- 3 3/8"	User Load	Top	288 lb	768 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 5 1/2"	6(i59359)	381 lb	999 lb	-	-
2	4'- 1/2"	4'- 6"	7(i59362)	321 lb	840 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059824



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B11 - i62806**
Type: **Beam**

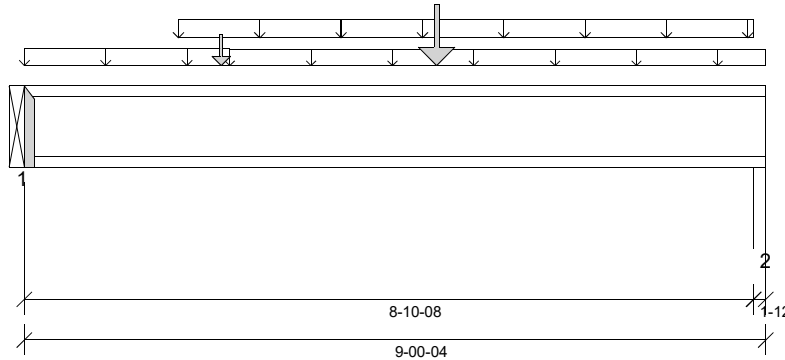
1 Ply Member
11 7/8" NI-20

Status:
Design Passed

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version 8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:00



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018, ABC 2019, OBC 2012 (2019 Amendment)

Design Methodology: LSD
Service Condition: Dry
LL Deflection Limit: L/360,
TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 6'- 6 1/4"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 615 psi Wall @ 8'- 11 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	5'- 3/16"	1.25D + 1.5L	1.00	3362 lb ft	5580 lb ft	Passed - 60%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	1054 lb	2240 lb	Passed - 47%
Live Load (LL) Pos. Defl.:	4'- 6 1/16"	L		0.088"	L/360	Passed - L/999
Live Load (LL) Neg. Defl.:	8'- 10 1/2"	L		0.021"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	4'- 6 3/16"	D + L		0.163"	L/240	Passed - L/653
Total Load (TL) Neg. Defl.:	8'- 10 1/2"	D + L		0.038"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-12	1.25D + 1.5L	1.00	1063 lb		1970 lb	-	Passed - 54%
2	1-12	1.25D + 1.5L	1.00	1054 lb		1970 lb	2691 lb	Passed - 54%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	LT251188	-	-	-	-	Connector manually specified by the user.

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	9'- 1/4"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	0'	2'- 6"	FC2 Floor Decking (Plan View Fill)	Top	12 lb/ft	33 lb/ft	-	-
Uniform	1'- 10 1/2"	8'- 10 1/2"	User Load	Top	60 lb/ft	-	-	-
Uniform	2'- 6"	9'- 1/4"	FC2 Floor Decking (Plan View Fill)	Top	5 lb/ft	12 lb/ft	-	-
Point	2'- 4 3/4"	2'- 4 3/4"	B7(i63057)	Front	64 lb	157 lb	-	-
Point	5'- 3/16"	5'- 3/16"	User Load	Top	174 lb	464 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B12(i63798)	341 lb	419 lb	-	-
2	8'- 10 1/2"	9'- 1/4"	8(i59364)	408 lb	369 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059825

Ground Floor\Flush Beams\B12(i63798) (Flush Beam)

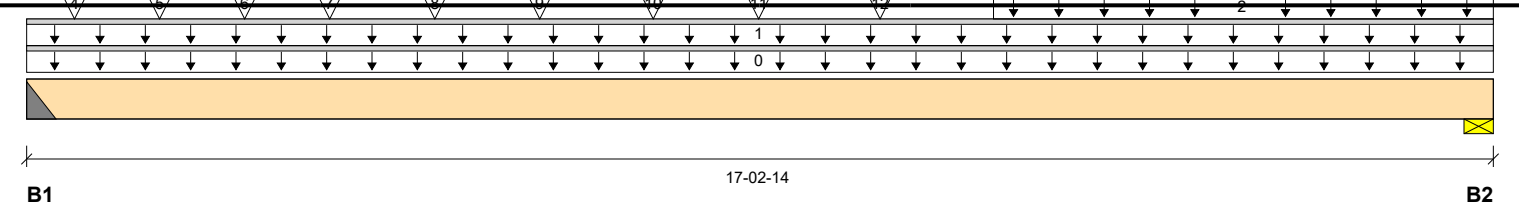
BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 12:01:55

Build 8183

 Job name: 4006 Lot 60
 Address: Pine Valley Ph2
 City, Province, Postal Code: Vaughan, ON
 Customer: Gold Park Homes
 Code reports: CCMC 12472-R

 File name: 350619.mmdl
 Description: Ground Floor\Flush Beams\B12(i63798)
 Specifier:
 Designer: TL
 Company: Alpa Roof Trusses Inc.


Total Horizontal Product Length = 17-02-14

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2"	1605 / 0	890 / 0		
B2, 2-3/8"	1607 / 0	775 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-02-14	Top		12			00-00-00
1	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	17-02-14	Top	19	7			n/a
2	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	11-04-06	17-02-14	Top	6				n/a
3	STAIR	Unf. Lin. (lb/ft)	L	13-00-00	16-10-00	Top	240	90			n/a
4	J8(i62774)	Conc. Pt. (lbs)	L	00-06-12	00-06-12	Back	159	70			n/a
5	J8(i62771)	Conc. Pt. (lbs)	L	01-06-12	01-06-12	Back	186	82			n/a
6	J8(i62771)	Conc. Pt. (lbs)	L	02-06-12	02-06-12	Back	186	82			n/a
7	J8(i62558)	Conc. Pt. (lbs)	L	03-06-12	03-06-12	Back	171	75			n/a
8	-	Conc. Pt. (lbs)	L	04-09-09	04-09-09	Back	548	397			n/a
9	J11(i62541)	Conc. Pt. (lbs)	L	06-00-06	06-00-06	Back	64	24			n/a
10	J11(i62694)	Conc. Pt. (lbs)	L	07-04-06	07-04-06	Back	66	25			n/a
11	B8(i62458)	Conc. Pt. (lbs)	L	08-07-04	08-07-04	Back	191	81			n/a
12	J9(i63058)	Conc. Pt. (lbs)	L	10-00-06	10-00-06	Back	141	53			n/a
13	J9(i62495)	Conc. Pt. (lbs)	L	11-04-06	11-04-06	Back	146	55			n/a
14	B9(i63077)	Conc. Pt. (lbs)	L	12-10-12	12-10-12	Back	76	35			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	13104 ft-lbs	35392 ft-lbs	37.0%	1	08-07-04
End Shear	3304 lbs	14464 lbs	22.8%	1	16-00-10
Total Load Deflection	L/401 (0.509")	n/a	59.8%	4	08-07-04
Live Load Deflection	L/618 (0.33")	n/a	58.2%	5	08-07-04
Max Defl.	0.509"	n/a	n/a	4	08-07-04
Span / Depth	17.2				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 2" x 3-1/2"	3519 lbs	n/a	41.2%	HGUS410
B2	Wall/Plate 2-3/8" x 3-1/2"	3379 lbs	66.1%	33.3%	Spruce-Pine-Fir

Cautions

Hanger model HGUS410 and seat length were input by the user.

Header for the hanger HGUS410 is a Double 1-3/4" x 11-7/8" LVL beam.

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

SE059826

Ground Floor\Flush Beams\B13(i62574) (Flush Beam)

BC Design Engine Member Report

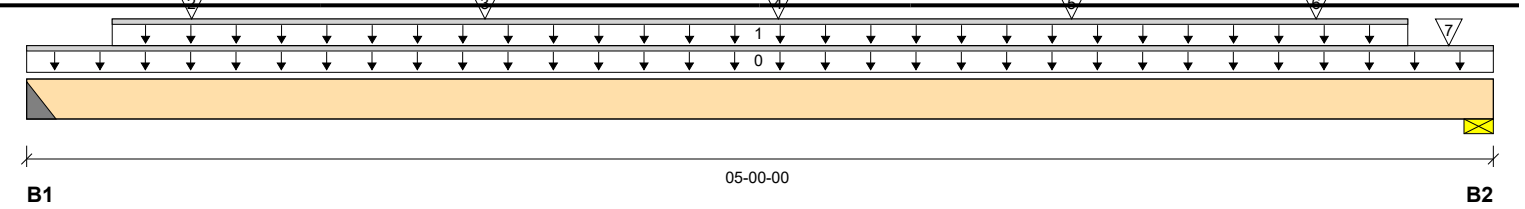
Dry | 1 span | No cant.

November 18, 2022 12:02:12

Build 8183

Job name: 4006 Lot 60
Address: Pine Valley Ph2
City, Province, Postal Code: Vaughan, ON
Customer: Gold Park Homes
Code reports: CCMC 12472-R

File name: 350619.mmdl
Description: Ground Floor\Flush Beams\B13(i62574)
Specifier:
Designer: TL
Company: Alpa Roof Trusses Inc.



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2"	414 / 0	344 / 0		
B2, 3-1/2"	566 / 0	409 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	05-00-00	Top		6			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-03-08	04-08-08	Top		60			n/a
2	J8(i62774)	Conc. Pt. (lbs)	L	00-06-12	00-06-12	Front	159	77			n/a
3	J8(i62771)	Conc. Pt. (lbs)	L	01-06-12	01-06-12	Front	186	90			n/a
4	J8(i62602)	Conc. Pt. (lbs)	L	02-06-12	02-06-12	Front	186	90			n/a
5	J8(i62558)	Conc. Pt. (lbs)	L	03-06-12	03-06-12	Front	171	83			n/a
6	J8(i62678)	Conc. Pt. (lbs)	L	04-04-12	04-04-12	Front	133	63			n/a
7	LANDING	Conc. Pt. (lbs)	L	04-10-03	04-10-03	Top	145	55			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1306 ft-lbs	17696 ft-lbs	7.4%	1	02-06-12
End Shear	842 lbs	7232 lbs	11.6%	1	01-01-14
Total Load Deflection	L/999 (0.007")	n/a	n/a	4	02-05-04
Live Load Deflection	L/999 (0.004")	n/a	n/a	5	02-05-04
Max Defl.	0.007"	n/a	n/a	4	02-05-04
Span / Depth	4.7				



Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 2" x 1-3/4"	1052 lbs	n/a	24.6%	HUS1.81/10
B2	Wall/Plate 3-1/2" x 1-3/4"	1360 lbs	36.1%	18.2%	Spruce-Pine-Fir

Cautions

Hanger model HUS1.81/10 and seat length were input by the user.

Header for the hanger HUS1.81/10 is a Double 1-3/4" x 11-7/8" LVL beam.

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
Design meets Code minimum (L/360) Live load deflection criteria.
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 2015 and CSA O86.
Design based on Dry Service Condition.
Importance Factor : Normal Part code : Part 9
Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-08.

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®,

SE059827

Ground Floor\Flush Beams\B14(i63809) (Flush Beam)

BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 12:02:30

Build 8183

Job name: 4006 Lot 60

File name: 350619.mmdl

Address: Pine Valley Ph2

Description: Ground Floor\Flush Beams\B14(i63809)

City, Province, Postal Code: Vaughan, ON

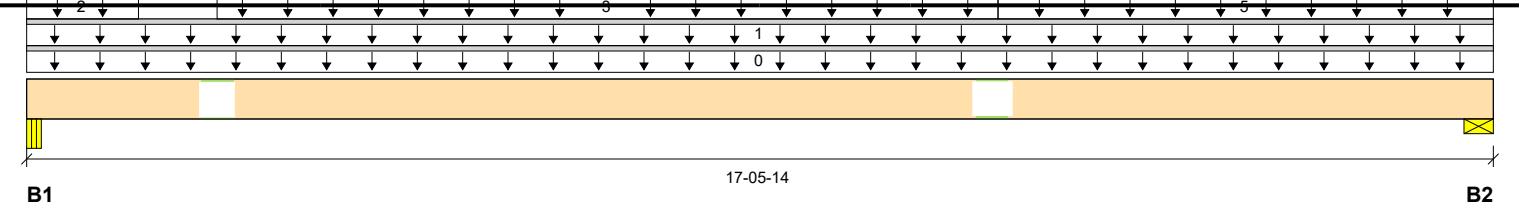
Specifier:

Customer: Gold Park Homes

Designer: TL

Code reports: CCMC 12472-R

Company: Alpa Roof Trusses Inc.


Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2-3/4"	2146 / 0	1527 / 0		
B2, 2-3/8"	709 / 0	1009 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	17-05-14	Top		12			00-00-00
1	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	17-05-14	Top	16	6			n/a
2	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	01-04-00	Top	27				n/a
3	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	02-03-04	11-07-00	Top	14	5			n/a
4	WALL	Unf. Lin. (lb/ft)	L	04-04-00	17-02-00	Top		60			n/a
5	FC2 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	11-07-00	17-05-14	Top	6				n/a
6	J12(i63747)	Conc. Pt. (lbs)	L	01-04-00	01-04-00	Front	378	142			n/a
7	B12(i63798)	Conc. Pt. (lbs)	L	02-03-04	02-03-04	Front	1591	883			n/a
8	B13(i62574)	Conc. Pt. (lbs)	L	11-06-02	11-06-02	Front	407	336			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	12236 ft-lbs	35392 ft-lbs	34.6%	1	08-01-15
End Shear	5007 lbs	14464 lbs	34.6%	1	01-02-10
Total Load Deflection	L/401 (0.514")	n/a	59.8%	4	08-06-14
Live Load Deflection	L/847 (0.243")	n/a	42.5%	5	08-04-07
Max Defl.	0.514"	n/a	n/a	4	08-06-14
Span / Depth	17.4				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Beam 2-3/4" x 3-1/2"	5128 lbs	86.6%	43.7%	Unspecified
B2	Wall/Plate 2-3/8" x 3-1/2"	2325 lbs	45.5%	22.9%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 09-00-04.

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





Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B15 (-4R) - i62265**
Type: **Beam**

1 Ply Member

9 1/2" NI-20

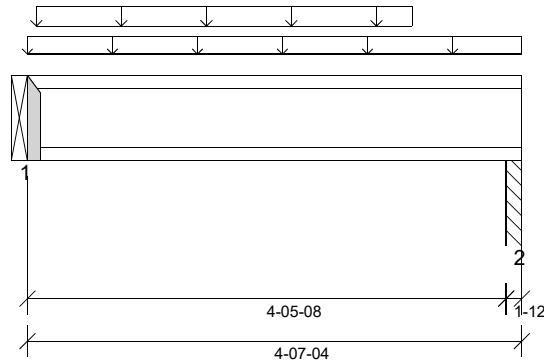
Status:

**Design
Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:02



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018,
ABC 2019, OBC 2012 (2019
Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports
must be laterally restrained. Top and bottom edges
of the member must be fully restrained or have the
following maximum unbraced length:

Top: 0' Bottom: 4'- 7 1/4"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 1334 psi Column @ 4'- 6 1/2"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 2 7/16"	1.25D + 1.5L	1.00	345 lb ft	4310 lb ft	Passed - 8%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	305 lb	1770 lb	Passed - 17%
Total Load (TL) Pos. Defl.:	2'- 3"	D + L		0.011"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1-12	1.25D + 1.5L	1.00	314 lb		1630 lb	-	Passed - 19%
2	1-12	1.25D + 1.5L	1.00	248 lb		1630 lb	5838 lb	Passed - 15%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	LT259		-	-	-	Connector manually specified by the user.
* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.						

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	4'- 7 1/4"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	0'	4'- 7 1/4"	FC1 Floor Decking (Plan View Fill)	Top	8 lb/ft	21 lb/ft	-	-
Uniform	0'- 1"	3'- 7"	User Load	Top	19 lb/ft	50 lb/ft	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B17 (-4R)(i62249)	65 lb	156 lb	-	-
2	4'- 5 1/2"	4'- 7 1/4"	Pt1(i62260)	52 lb	121 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059829

Build 8183

Job name: 4006 Lot 60

File name: 350619.mmdl

Address: Pine Valley Ph2

Description: Ground Floor\Flush Beams\B16 (-4R)(i62257)

City, Province, Postal Code: Vaughan, ON

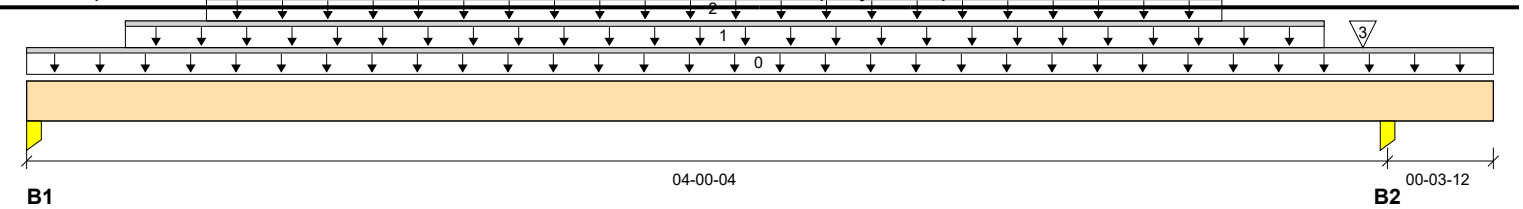
Specifier:

Customer: Gold Park Homes

Designer: TL

Code reports: CCMC 12472-R

Company: Alpa Roof Trusses Inc.



Total Horizontal Product Length = 04-04-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	278 / 0	114 / 0		
B2, 3-1/2"	775 / 0	528 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	04-04-00	Top	1.00	0.65	1.00	1.15	00-00-00
1	STAIR	Unf. Lin. (lb/ft)	L	00-03-08	03-10-00	Top	67	25			n/a
2	Smoothed Load	Unf. Lin. (lb/ft)	L	00-06-06	03-06-06	Back	98	37			n/a
3	B20 (-4R)(i62262)	Conc. Pt. (lbs)	L	03-11-06	03-11-06	Front	517	421			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	600 ft-lbs	11610 ft-lbs	5.2%	2	02-00-06
End Shear	435 lbs	5785 lbs	7.5%	1	01-01-00
Cont. Shear	504 lbs	5785 lbs	8.7%	1	03-01-00
Total Load Deflection	L/999 (0.004")	n/a	n/a	9	02-01-02
Live Load Deflection	L/999 (0.003")	n/a	n/a	12	02-01-02
Total Neg. Defl.	2xL/1998 (-0.001")	n/a	n/a	9	04-04-00
Max Defl.	0.004"	n/a	n/a	9	02-01-02
Span / Depth	4.8				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 3-1/2" x 1-3/4"	559 lbs	5.3%	7.5%	Spruce-Pine-Fir
B2	Column 3-1/2" x 1-3/4"	1822 lbs	17.2%	24.4%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 3
 Cantilevers require sheathed bottom flanges, blocking at cantilever support and closure at ends.
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-08.

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®,

SE059830



Customer: **Gold Park Homes**
Job Address: **Pine Valley Ph2**
City: **Vaughan**
Job Track: **45147**

Job Name: **350619**
Level: **Ground Floor**
Label: **B17 (-4R) - i62249**
Type: **Beam**

1 Ply Member

9 1/2" NI-20

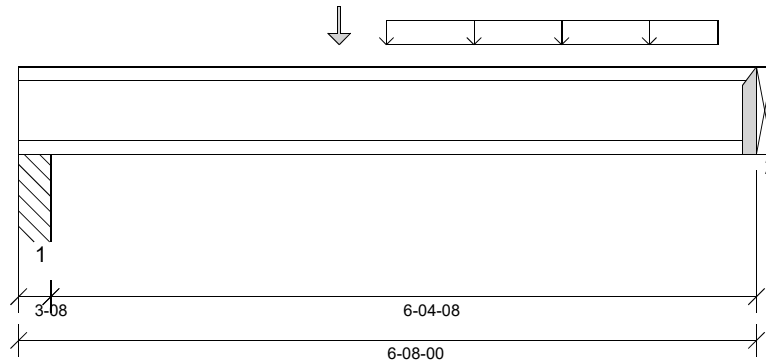
Status:

**Design
Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:03



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018,
ABC 2019, OBC 2012 (2019
Amendment)

Design Methodology: LSD
Service Condition: Dry
LL Deflection Limit: L/360,
TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports
must be laterally restrained. Top and bottom edges
of the member must be fully restrained or have the
following maximum unbraced length:

Top: 2'- 9 1/2" Bottom: 2'- 9 1/2"

Factored Resistance of Support Material:

- 1334 psi Column @ 0'- 2 1/2"
- 769 psi Beam @ 6'- 8"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	3'- 9 7/8"	1.25D + 1.5L	1.00	1005 lb ft	4310 lb ft	Passed - 23%
Factored Shear:	6'- 7 15/16"	1.25D + 1.5L	1.00	565 lb	1770 lb	Passed - 32%
Live Load (LL) Pos. Defl.:	3'- 6 3/16"	L		0.034"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	3'- 6 1/8"	D + L		0.048"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	3-08	1.25D + 1.5L	1.00	365 lb		1739 lb	11676 lb	Passed - 21%
2	1-12	1.25D + 1.5L	1.00	565 lb		1630 lb	-	Passed - 35%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
2	LT259	-	-	-	-	Connector manually specified by the user.

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	6'- 8"	Self Weight	Top	3 lb/ft	-	-	-
Uniform	3'- 3 7/8"	6'- 3 7/8"	Smoothed Load	Front	38 lb/ft	101 lb/ft	-	-
Point	2'- 10 3/4"	2'- 10 3/4"	B15 (-4R)(i62265)	Front	65 lb	156 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'- 3 1/2"	Pt1(i62253)	79 lb	178 lb	-	-
2	6'- 8"	6'- 8"	B19 (-4R)(i62250)	116 lb	280 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

SE059831



Customer: **Gold Park Homes**
 Job Address: **Pine Valley Ph2**
 City: **Vaughan**
 Job Track: **45147**

Job Name: **350619**
 Level: **Ground Floor**
 Label: **B18 (-4R) - i62247**
 Type: **Beam**

2 Ply Member

9 1/2" NI-20

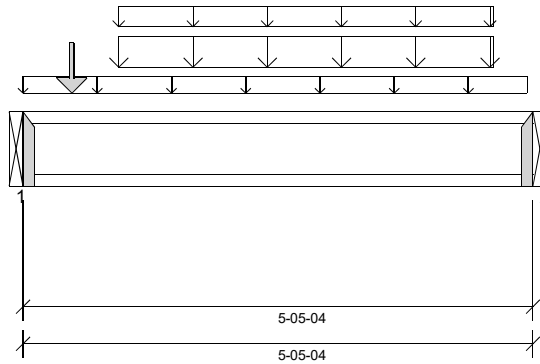
Status:

**Design
Passed**

Illustration Not to Scale. Pitch: 0/12

Designed by Single Member Design Engine in MiTek® Structure Version
8.5.3.233.Update5.15

Report Version: 2021.03.26 11/18/2022 12:03



DESIGN INFORMATION

Building Code: NBCC 2015, Part9, BCBC 2018,
ABC 2019, OBC 2012 (2019
Amendment)

Design Methodology: LSD

Service Condition: Dry

LL Deflection Limit: L/360,

TL Deflection Limit: L/240,

Lateral Restraint Requirements:

Both ends of the member and the outer supports must be laterally restrained. Top and bottom edges of the member must be fully restrained or have the following maximum unbraced length:

Top: 0' Bottom: 0'- 9 3/4"

Factored Resistance of Support Material:

- 769 psi Beam @ 0'
- 769 psi Beam @ 5'- 5 1/4"



ANALYSIS RESULTS

Design Criteria	Location	Load Combination	LDF	Design	Limit	Result
Factored Pos. Moment:	2'- 6 1/4"	1.25D + 1.5L	1.00	2979 lb ft	8620 lb ft	Passed - 35%
Factored Shear:	0'- 1/16"	1.25D + 1.5L	1.00	2068 lb	3540 lb	Passed - 58%
Live Load (LL) Pos. Defl.:	2'- 8 9/16"	L		0.035"	L/360	Passed - L/999
Total Load (TL) Pos. Defl.:	2'- 8 9/16"	D + L		0.059"	L/240	Passed - L/999

SUPPORT AND REACTION INFORMATION

ID	Input Bearing Length	Controlling Load Combination	LDF	Factored Downward Reaction	Factored Uplift Reaction	Factored Resistance of Member	Factored Resistance of Support	Result
1	1'-12	1.25D + 1.5L	1.00	2073 lb		3260 lb	-	Passed - 64%
2	1'-12	1.25D + 1.5L	1.00	1884 lb		3260 lb	-	Passed - 58%

CONNECTOR INFORMATION

ID	Part No.	Manufacturer	Nailing Requirements			Other Information or Requirement for Reinforcement Accessories
			Top	Face	Member	
1	HU310-2		-	-	-	Connector manually specified by the user.
2	HU310-2		-	-	-	Connector manually specified by the user.

* Connectors: Refer to manufacturer's specifications, fasteners requirements and installation instruction. Where header fasteners are longer than the width of the supporting member, install backer block or clinch header nails.

SPECIFIED LOADS

Type	Start Loc	End Loc	Source	Face	Dead (D)	Live (L)	Snow (S)	Wind (W)
Self Weight	0'	5'- 5 1/4"	Self Weight	Top	5 lb/ft	-	-	-
Uniform	-0'	5'- 4 1/2"	User Load	Top	60 lb/ft	-	-	-
Uniform	1'- 1/4"	5'- 1/4"	Smoothed Load	Front	124 lb/ft	249 lb/ft	-	-
Uniform	1'- 1/4"	5'- 1/4"	Smoothed Load	Back	46 lb/ft	91 lb/ft	-	-
Point	0'- 6 1/4"	0'- 6 1/4"	-	Front	144 lb	292 lb	-	-

UNFACTORED REACTIONS

ID	Start Loc	End Loc	Source	Dead (D)	Live (L)	Snow (S)	Wind (W)
1	0'	0'	B19 (-4R)(i62250)	610 lb	874 lb	-	-
2	5'- 5 1/4"	5'- 5 1/4"	B21 (-4R)(i62252)	564 lb	786 lb	-	-

DESIGN NOTES

- The dead loads used in the design of this member were applied to the structure as projected dead loads.
- Analysis and Design has been performed using precision loading from actual modeled conditions. Some loads may have been modified to simplify reporting.
- Tributary Loads have been generated based on actual spacing between members in the model which may differ from the default system spacing. The actual loads applied to the member are shown in the Specified Loads table.
- Transfer reactions may differ from design results as allowed per building codes and standard load distribution practices.
- This report is based on modeled conditions input by the user. Source information for the loads and supports are provided for reference only. Verify that all loads and support conditions are correct.
- Review all loads and reactions to ensure that the member/bearing/connector/structure can resist adequately. Unless already specified on this report, anchorage for uplift reactions to be specified by others. Installation of member and accessories (if required) as per manufacturer's instruction.
- When the applied loads are coming from a member/post/wall above that does not sit directly on this beam, adequate load transfer elements, such as squash blocks, wall studs, or beveled plates are required to transfer the loads to this beam.

PLY TO PLY CONNECTION

- Member design assumed proper ply to ply connection by others. Verify connection between plies according to code specification and follow the manufacturer's installation instruction. Loads assumed to be distributed equally to each ply.

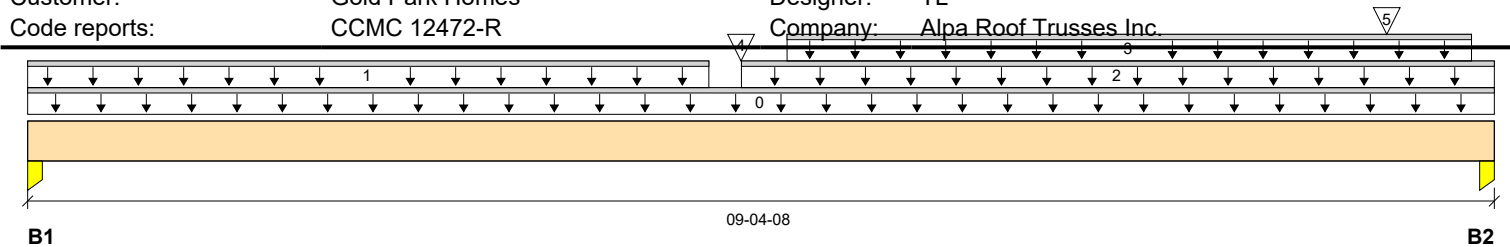
SE059832

BC Design Engine Member Report

Dry | 1 span | No cant.

April 21, 2023 10:43:19

 Job name: 4006 Lot 60
 Address: Pine Valley Ph2
 City, Province, Postal Code: Vaughan, ON
 Customer: Gold Park Homes
 Code reports: CCMC 12472-R

 File name: 350619.mmdl
 Description: Ground Floor\Flush Beams\B19 (-4R)(i64364)
 Specifier:
 Designer: TL
 Company: Alpa Roof Trusses Inc.


Total Horizontal Product Length = 09-04-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 1-3/4"	1193 / 0	955 / 0		
B2, 1-3/4"	1437 / 0	1163 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	09-04-08	Top		10			00-00-00
1	FC1 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	04-04-04	Top	16	6			n/a
2	FC1 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	04-06-12	09-04-08	Top	33	12			n/a
3	WALL	Unf. Lin. (lb/ft)	L	04-10-04	09-02-12	Top		60			n/a
4	-	Conc. Pt. (lbs)	L	04-06-11	04-06-11	Top	2096	1556			n/a
5	LANDING	Conc. Pt. (lbs)	L	08-08-04	08-08-04	Top	304	114			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	12539 ft-lbs	23219 ft-lbs	54.0%	1	04-08-08
End Shear	3288 lbs	11571 lbs	28.4%	1	08-05-04
Total Load Deflection	L/475 (0.233")	n/a	50.5%	4	04-08-00
Live Load Deflection	L/859 (0.129")	n/a	41.9%	5	04-08-00
Max Defl.	0.233"	n/a	n/a	4	04-08-00
Span / Depth	11.6				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 1-3/4" x 3-1/2"	2982 lbs	28.1%	39.9%	Spruce-Pine-Fir
B2	Column 1-3/4" x 3-1/2"	3610 lbs	34.0%	48.3%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 04-07-04.

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

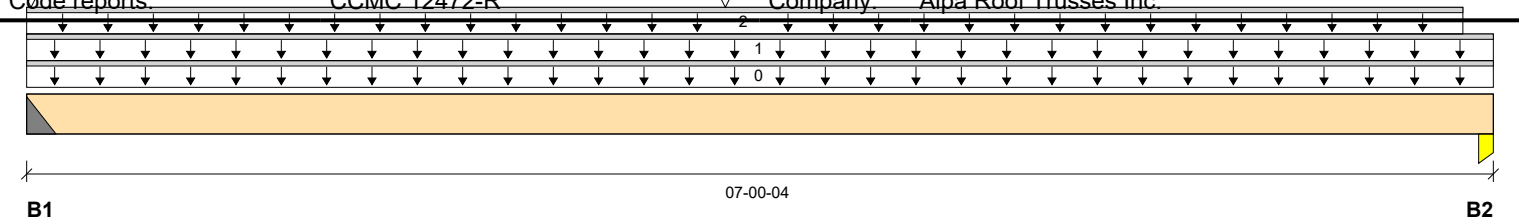
BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 12:04:15

Build 8183

 Job name: 4006 Lot 60
 Address: Pine Valley Ph2
 City, Province, Postal Code: Vaughan, ON
 Customer: Gold Park Homes
 Code reports: CCMC 12472-R

 File name: 350619.mmdl
 Description: Ground Floor\Flush Beams\B20 (-4R)(i62262)
 Specifier:
 Designer: TL
 Company: Alpa Roof Trusses Inc.

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 2"	521 / 0	427 / 0		
B2, 1-3/4"	201 / 0	296 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	07-00-04	Top		5			00-00-00
1	FC1 Floor Decking (Plan View Fill)	Unf. Lin. (lb/ft)	L	00-00-00	07-00-04	Top	16	6			n/a
2	WALL	Unf. Lin. (lb/ft)	L	00-00-00	06-10-08	Top		60			n/a
3	LANDING	Conc. Pt. (lbs)	L	00-00-04	00-00-04	Top	304	114			n/a
4	LANDING	Conc. Pt. (lbs)	L	03-04-02	03-04-02	Top	304	114			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	1683 ft-lbs	11610 ft-lbs	14.5%	1	03-04-02
End Shear	607 lbs	5785 lbs	10.5%	1	00-11-08
Total Load Deflection	L/999 (0.036")	n/a	n/a	4	03-06-03
Live Load Deflection	L/999 (0.017")	n/a	n/a	5	03-05-03
Max Defl.	0.036"	n/a	n/a	4	03-06-03
Span / Depth	8.6				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Hanger 2" x 1-3/4"	1315 lbs	n/a	30.8%	HUS1.81/10
B2	Column 1-3/4" x 1-3/4"	672 lbs	12.7%	18.0%	Spruce-Pine-Fir

Cautions

Hanger model HUS1.81/10 and seat length were input by the user.

Header for the hanger HUS1.81/10 is a Single 1-3/4" x 9-1/2" LVL beam.

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 07-00-04.


Disclosure

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SE059834

BC Design Engine Member Report

Dry | 2 spans | No cant.

November 18, 2022 12:05:12

Build 8183

Job name: 4006 Lot 60

File name: 350619.mmdl

Address: Pine Valley Ph2

Description: Ground Floor\Flush Beams\B21 (-4R)(i62252)

City, Province, Postal Code: Vaughan, ON

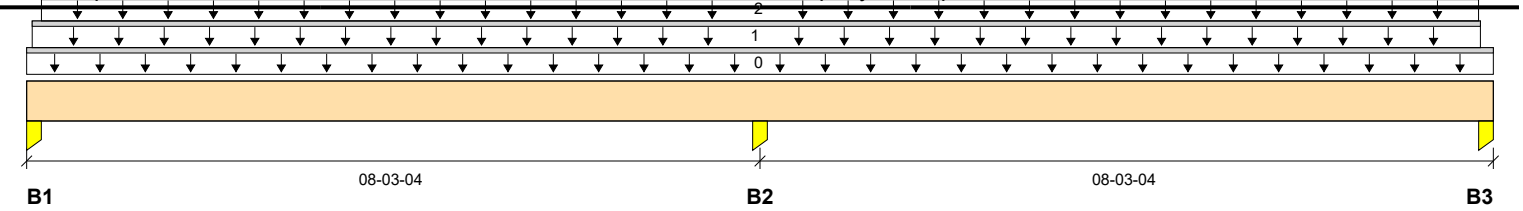
Specifier:

Customer: Gold Park Homes

Designer: TL

Code reports: CCMC 12472-R

Company: Alpha Roof Trusses Inc.



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 1-3/4"	376 / 11	447 / 0		
B2, 3-1/2"	777 / 0	1169 / 0		
B3, 1-3/4"	74 / 85	173 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	16-06-08	Top		5			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-00-12	16-04-12	Top		60			n/a
2	-	Unf. Lin. (lb/ft)	L	00-02-00	16-04-08	Top	21	8			n/a
3	TILE	Unf. Lin. (lb/ft)	L	04-10-04	16-04-08	Top		2			n/a
4	B18 (-4R)(i62247)	Conc. Pt. (lbs)	L	04-04-04	04-04-04	Front	786	564			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	3655 ft-lbs	11610 ft-lbs	31.5%	2	04-04-04
Neg. Moment	-2517 ft-lbs	-11047 ft-lbs	22.8%	1	08-03-04
End Shear	1051 lbs	5785 lbs	18.2%	2	00-11-04
Cont. Shear	1686 lbs	5785 lbs	29.1%	1	07-04-00
Total Load Deflection	L/999 (0.094")	n/a	n/a	9	03-11-05
Live Load Deflection	L/999 (0.05")	n/a	n/a	12	04-00-15
Total Neg. Defl.	L/999 (-0.024")	n/a	n/a	9	10-11-00
Max Defl.	0.094"	n/a	n/a	9	03-11-05
Span / Depth	10.3				



Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 1-3/4" x 1-3/4"	1122 lbs	21.1%	30.0%	Spruce-Pine-Fir
B2	Column 3-1/2" x 1-3/4"	2626 lbs	24.7%	35.1%	Spruce-Pine-Fir
B3	Column 1-3/4" x 1-3/4"	242 lbs	7.0%	10.0%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 02-00-00.

Disclosure

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

SE059835

BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 12:05:31

Build 8183

Job name: 4006 Lot 60

File name: 350619.mmdl

Address: Pine Valley Ph2

Description: Ground Floor\Flush Beams\B22 (-4R)(i62261)

City, Province, Postal Code: Vaughan, ON

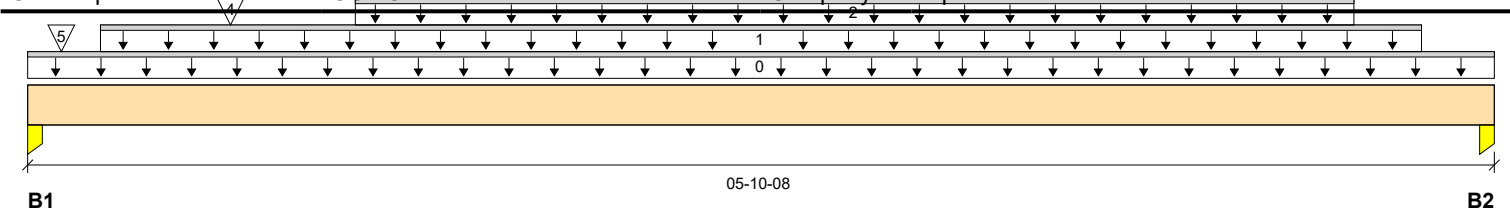
Specifier:

Customer: Gold Park Homes

Designer: TL

Code reports: CCMC 12472-R

Company: Alpa Roof Trusses Inc.



Total Horizontal Product Length = 05-10-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	764 / 0	535 / 0		
B2, 3-1/2"	593 / 0	468 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	05-10-08	Top		5			00-00-00
1	WALL	Unf. Lin. (lb/ft)	L	00-03-08	05-07-00	Top		60			n/a
2	Smoothed Load	Unf. Lin. (lb/ft)	L	01-03-12	05-03-12	Back	244	121			n/a
3	FC1 Floor Decking (Plan View Fill)	Trapezoidal (lb/ft)	L	03-09-12	05-10-08	Top	11				n/a
4	J1(i62248)	Conc. Pt. (lbs)	L	00-09-12	00-09-12	Back	219	108			n/a
5	LANDING	Conc. Pt. (lbs)	L	00-01-10	00-01-10	Top	145	55			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	2241 ft-lbs	11610 ft-lbs	19.3%	1	02-09-12
End Shear	1389 lbs	5785 lbs	24.0%	1	04-09-08
Total Load Deflection	L/999 (0.033")	n/a	n/a	4	02-11-04
Live Load Deflection	L/999 (0.019")	n/a	n/a	5	02-11-04
Max Defl.	0.033"	n/a	n/a	4	02-11-04
Span / Depth	6.8				


Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 3-1/2" x 1-3/4"	1815 lbs	17.1%	24.3%	Spruce-Pine-Fir
B2	Column 3-1/2" x 1-3/4"	1474 lbs	13.9%	19.7%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-12.

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®,

SE059836

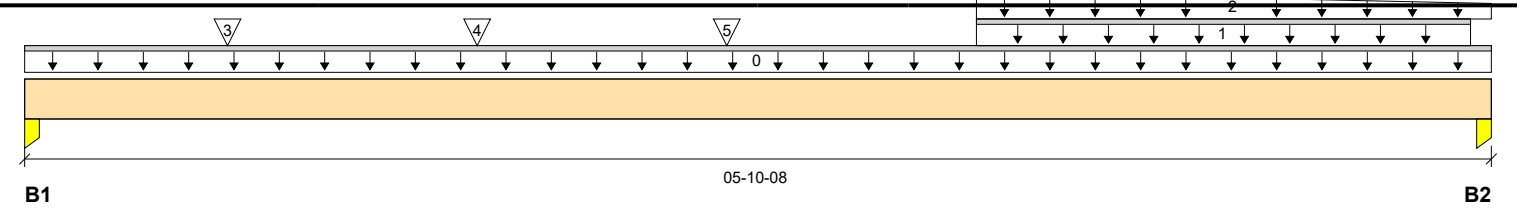
BC Design Engine Member Report

Dry | 1 span | No cant.

November 18, 2022 12:05:44

Build 8183

 Job name: 4006 Lot 60
 Address: Pine Valley Ph2
 City, Province, Postal Code: Vaughan, ON
 Customer: Gold Park Homes
 Code reports: CCMC 12472-R

 File name: 350619.mmdl
 Description: Ground Floor\Flush Beams\B23 (-4R)(i62259)
 Specifier:
 Designer: TL
 Company: Alpha Roof Trusses Inc.


Total Horizontal Product Length = 05-10-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind
B1, 3-1/2"	225 / 0	126 / 0		
B2, 3-1/2"	218 / 0	123 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 1.00	Dead 0.65	Snow 1.00	Wind 1.15	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	05-10-08	Top		5			00-00-00
1	TILE	Unf. Lin. (lb/ft)	L	03-09-12	05-09-08	Top		2			n/a
2	FC1 Floor Decking (Plan View Fill)	Trapezoidal (lb/ft)	L	03-09-12	05-10-08	Top	11	4			n/a
3	J2(i62660)	Conc. Pt. (lbs)	L	00-09-12	00-09-12	Front	80	40			n/a
4	J2(i62661)	Conc. Pt. (lbs)	L	01-09-12	01-09-12	Front	89	44			n/a
5	J2(i62663)	Conc. Pt. (lbs)	L	02-09-12	02-09-12	Front	89	44			n/a
6	J2(i62664)	Conc. Pt. (lbs)	L	03-09-12	03-09-12	Front	84	42			n/a
7	J2(i62668)	Conc. Pt. (lbs)	L	04-09-12	04-09-12	Front	83	41			n/a

Controls Summary

	Factored Demand	Factored Resistance	Demand/Resistance	Case	Location
Pos. Moment	727 ft-lbs	11610 ft-lbs	6.3%	1	02-09-12
End Shear	463 lbs	5785 lbs	8.0%	1	04-09-08
Total Load Deflection	L/999 (0.011")	n/a	n/a	4	02-11-04
Live Load Deflection	L/999 (0.007")	n/a	n/a	5	02-11-04
Max Defl.	0.011"	n/a	n/a	4	02-11-04
Span / Depth	6.8				

Bearing Supports

	Dim. (LxW)	Demand	Demand/Resistance Support	Demand/Resistance Member	Material
B1	Column 3-1/2" x 1-3/4"	495 lbs	4.7%	6.6%	Spruce-Pine-Fir
B2	Column 3-1/2" x 1-3/4"	480 lbs	4.5%	6.4%	Spruce-Pine-Fir

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 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 2015 and CSA O86.
 Design based on Dry Service Condition.
 Importance Factor : Normal Part code : Part 9
 Calculations assume unbraced length of Top: 00-00-00, Bottom: 00-09-12.


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SE059837

Maximum Floor Spans – M3.1, L/360

Design Criteria

Spans:	Simple span
Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limits:	L/360 under live load and L/240 under total load
Sheathing:	23/32 in. nailed-glued oriented strand board (OSB) sheathing



Maximum Floor Spans

Joist depth	Joist series	Bare On centre spacing				1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	15'-9"	14'-10"	14'-4"	13'-5"	16'-2"	15'-4"	14'-6"	13'-5"
	NI-40x	16'-10"	15'-10"	15'-3"	14'-8"	17'-2"	16'-3"	15'-8"	14'-11"
	NI-60	16'-11"	16'-0"	15'-5"	14'-9"	17'-4"	16'-4"	15'-9"	15'-2"
	NI-80	18'-0"	16'-11"	16'-3"	15'-7"	18'-5"	17'-3"	16'-7"	15'-11"
11-7/8"	NI-20	17'-8"	16'-8"	16'-1"	15'-6"	18'-3"	17'-3"	16'-7"	16'-0"
	NI-40x	19'-1"	17'-9"	17'-1"	16'-5"	19'-8"	18'-3"	17'-6"	16'-10"
	NI-60	19'-4"	17'-11"	17'-3"	16'-7"	19'-11"	18'-6"	17'-8"	17'-0"
	NI-80	20'-9"	19'-2"	18'-3"	17'-5"	21'-3"	19'-8"	18'-9"	17'-10"
	NI-90	21'-2"	19'-7"	18'-8"	17'-9"	21'-8"	20'-1"	19'-1"	18'-1"
14"	NI-40x	21'-2"	19'-7"	18'-8"	17'-9"	21'-10"	20'-3"	19'-4"	18'-4"
	NI-60	21'-6"	19'-11"	19'-0"	18'-0"	22'-2"	20'-7"	19'-8"	18'-8"
	NI-80	23'-1"	21'-4"	20'-3"	19'-3"	23'-8"	21'-11"	20'-10"	19'-9"
	NI-90	23'-6"	21'-9"	20'-8"	19'-7"	24'-1"	22'-4"	21'-3"	20'-1"
16"	NI-60	23'-5"	21'-8"	20'-8"	19'-7"	24'-2"	22'-5"	21'-5"	20'-4"
	NI-80	25'-1"	23'-2"	22'-1"	20'-11"	25'-9"	23'-10"	22'-9"	21'-6"
	NI-90	25'-7"	23'-7"	22'-6"	21'-3"	26'-3"	24'-3"	23'-1"	21'-11"

Joist depth	Joist series	Mid-span blocking with 1x4 inch strap On centre spacing				Mid-span blocking and 1/2 in. gypsum ceiling On centre spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	17'-1"	15'-5"	14'-6"	13'-5"	17'-1"	15'-5"	14'-6"	13'-5"
	NI-40x	18'-6"	17'-5"	16'-7"	14'-11"	19'-0"	17'-8"	16'-7"	14'-11"
	NI-60	18'-9"	17'-7"	16'-10"	15'-7"	19'-2"	17'-11"	16'-10"	15'-7"
	NI-80	20'-0"	18'-7"	17'-10"	17'-1"	20'-6"	19'-1"	18'-2"	17'-5"
11-7/8"	NI-20	20'-1"	18'-8"	17'-6"	16'-1"	20'-7"	18'-8"	17'-6"	16'-1"
	NI-40x	21'-8"	20'-2"	19'-0"	17'-0"	22'-3"	20'-9"	19'-0"	17'-0"
	NI-60	21'-11"	20'-5"	19'-6"	18'-6"	22'-6"	21'-0"	20'-1"	18'-8"
	NI-80	23'-5"	21'-9"	20'-9"	19'-8"	23'-11"	22'-3"	21'-3"	20'-2"
	NI-90	23'-11"	22'-2"	21'-1"	20'-0"	24'-4"	22'-8"	21'-8"	20'-6"
14"	NI-40x	24'-3"	22'-7"	20'-11"	18'-8"	24'-11"	22'-11"	20'-11"	18'-8"
	NI-60	24'-8"	22'-11"	21'-10"	20'-8"	25'-3"	23'-7"	22'-7"	21'-4"
	NI-80	26'-3"	24'-5"	23'-3"	22'-0"	26'-10"	25'-0"	23'-10"	22'-7"
	NI-90	26'-9"	24'-10"	23'-8"	22'-5"	27'-4"	25'-5"	24'-3"	22'-11"
16"	NI-60	27'-1"	25'-2"	24'-0"	22'-9"	27'-9"	26'-0"	24'-10"	23'-1"
	NI-80	28'-10"	26'-10"	25'-6"	24'-2"	29'-6"	27'-6"	26'-3"	24'-10"
	NI-90	29'-5"	27'-3"	26'-0"	24'-6"	30'-0"	27'-11"	26'-8"	25'-2"

Notes:

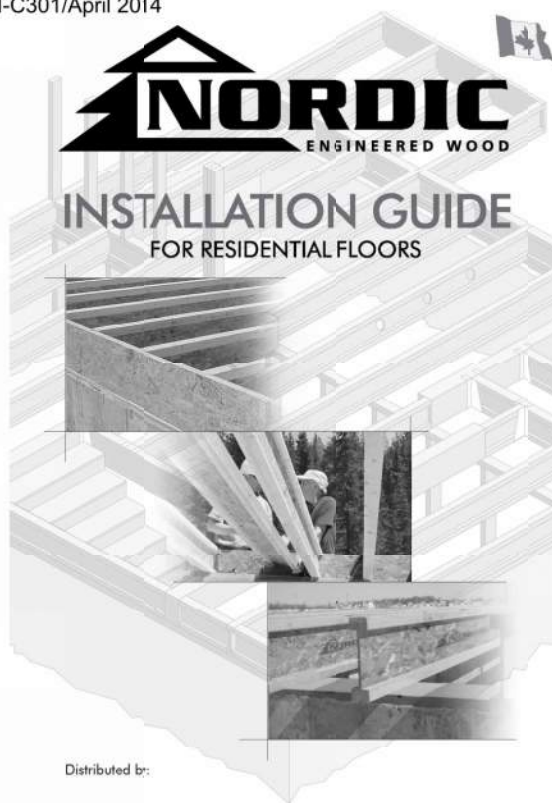
- The tabulated clear spans are based on CSA O86-14 and NBC 2015, and are applicable to residential floor construction meeting the above design criteria.
- For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Minimum bearing length shall be 1-3/4 inch for end bearings, and 3-1/2 inches for intermediate bearings.
- Bearing stiffeners are not required when I-joists are used in accordance with this table, except as required for hangers.
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.

The construction details for residential designs are prone to changes.

Details released after April 2014 supersedes N-C301

Installation must comply with latest documentation on I-Joist and other Nordic products from the <http://nordic.ca/>

This document 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 its component based on the design criteria and loadings shown on the calculation sheets.



Distributed by:

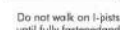


SAFETY AND CONSTRUCTION PRECAUTIONS

WARNING

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

Avoid Accidents by Following these Important Guidelines:



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



Never stack building materials over unbraced I-joists. Once sheathed, do not move across I-joists with concentrated loads from building materials.

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-briding 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 flange 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 1 foot 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 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-briding.
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 on the shipping end. Avoid cutting unbraced bundles.
2. Store, stack, and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or flatwise.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. When handling I-joists with a crane on the job site, take a few simple precautions to prevent damage to the I-joists and injury to your work crew.
 - Pick I-joists in bundles as shipped by the supplier.
 - Orient the bundles so that the webs of the I-joists are vertical.
 - Pick the bundles at the 5th points, using a spreader bar if necessary.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE CRUTY TO REPAIR A DAMAGED I-JOIST.

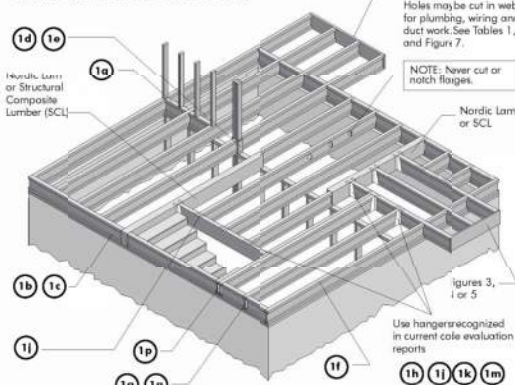


INSTALLING NORDIC I-JOISTS

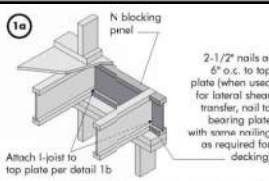
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not contact your supplier.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true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

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

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

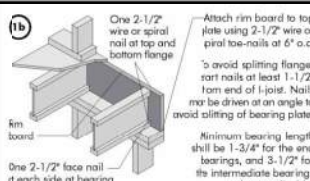


All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.122" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for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



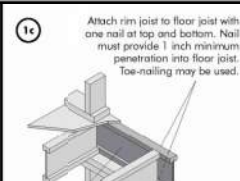
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
Ni Joists	3,300

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



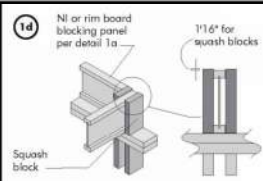
Blocking Panel or Rim Joist	Maximum Factored Uniform Vertical Load* (plf)
1-1/8" Rim Board Plus	8,090

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



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

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



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

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

The construction details for residential designs are prone to changes.

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MAXIMUM FLOOR SPANS

- Maximum **clear** spans applicable to simple span or multiple-span residential floor construction with a design live load of 40 psf and dead load of 15 psf. The ultimate limit states are based on the factored loads of 1.50L + 1.25D. The serviceability limit states include the consideration for floor vibration and a live load deflection limit of L/480. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Spans are based on a composite floor with glued-nailed oriented strand board (OSB) sheathing with a minimum thickness of 5/8 inch for a joist spacing of 19.2 inches or less, or 3/4 inch for joist spacing of 24 inches. Adhesive shall meet the requirements given in CGS-71.26 Standard. No concrete topping or bridging element was assumed. Increased spans may be achieved with the use of gypsum and/or a row of blocking at mid-span.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
- Bearing stiffeners are not required when I-joists are used with the spans and spacings given in this table, except as required for hangers.
- This span chart is based on uniform loads. For applications with other than uniform loads, an engineering analysis may be required based on the use of the design properties.
- Tables are based on Limit States Design per CAN/CSA C86-09 Standard, and NBC 2010.
- SI units conversion: 1 inch = 25.4 mm
1 foot = 0.305 m

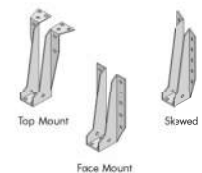
MAXIMUM FLOOR SPANS FOR NORDIC I-JOISTS SIMPLE AND MULTIPLE SPANS

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

CCAC EVALUATION REPORT 13032-R

I-JOIST HANGERS

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



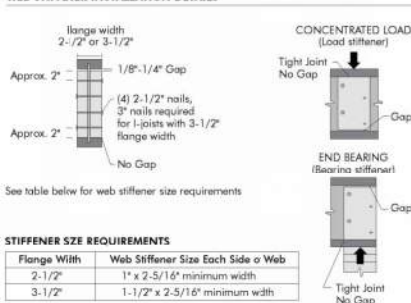
WEB STIFFENER

RECOMMENDATIONS:

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

SI units conversion: 1 inch = 25.4 mm

FIGURE 4 WEB STIFFENER INSTALLATION DETAILS



See table below for web stiffener size requirements

NORDIC I-JOIST SERIES

Ni-20	Ni-40x	Ni-60	Ni-70	Ni-80	Ni-90	Ni-90x
33 pieces per unit	33 pieces per unit	33 pieces per unit	33 pieces per unit	23 pieces per unit	23 pieces per unit	2 pieces per unit

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

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

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

11 Use single I-joist for load up to 3,300 plf, double I-joists for loads up to 1,600 plf (filler block not required). Attach I-joist to top plate using 2-1/2" nails at 6" o.c.

Provide backer for siding attachment unless nailable sheathing is used.

Wall sheathing, as required.

Rim board may be used in lieu of I-joists. Backer is not required when rim board is used. Tracing per code shall be carried to the foundation.

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

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

Joist attachment per detail 1b

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

NI blocking panel per detail 1a

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

Double I-joist header

Top- or face-mount hanger

Filler block per detail 1p

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

Backer block required (both sides for face-mount hangers)

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

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

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

* Minimum grade for backer block material shall be S-PF No. 2 or better for solid saw lumber and wood structural panels conforming to CAN/CSA-O337 or CAN/CSA-O437 Standard.

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

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

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

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

Top-mount hanger installed per manufacturer's recommendations.

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

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

Filler block per detail 1p

Install hanger per manufacturer's recommendations.

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

Maximum support capacity = 1,620 lbs.

17 Do not level-cut joist beyond inside face of wall.

Attach I-joist per detail 1b

Note: Blocking required at bearing for lateral resistance to roof trusses for clarity.

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

NI blocking panel

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

19 One 2-1/2" nails at top and bottom flange. Two 2-1/2" nails from each web to lumber piece. 2x4 min. (1/8" gap minimum).

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

I-joist blocking panel

One 2-1/2" nails one side only

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

Note: In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the stark joist. Where required, see local code requirements for spacing of the blocking.

All nails are common spiral in this detail.

Notes:

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

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Flange Size	Joist Depth	Filler Block Size
2-1/2" x 1-1/2"	9-1/2"	21/8" x 6"
	11-7/8"	21/8" x 8"
	14"	21/8" x 10"
	16"	21/8" x 12"
2-1/2" x 1-1/2"	9-1/2"	3" x 6"
	11-7/8"	3" x 8"
	14"	3" x 10"
	16"	3" x 12"
3-1/2" x 2"	11-7/8"	3" x 7"
	14"	3" x 9"
	16"	3" x 11"

The construction details for residential designs are prone to changes.

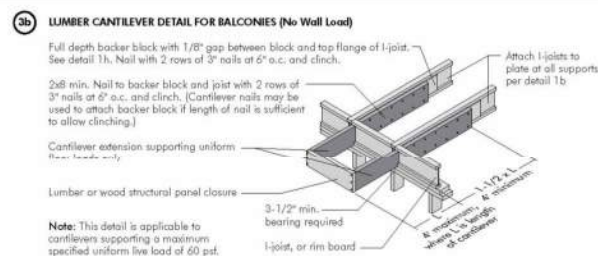
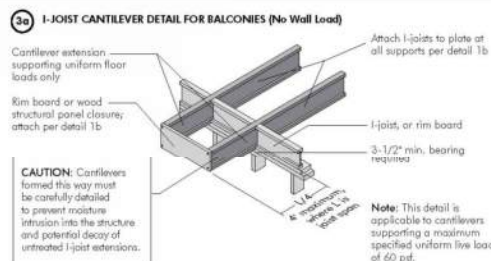
Details released after April 2014 supersedes N-C301

Installation must comply with latest documentation on I-Joist and other Nordic products from the <http://nordic.ca/>

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CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)



CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

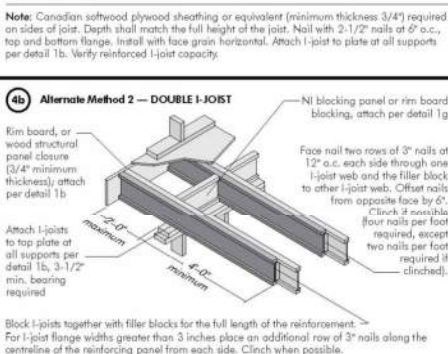
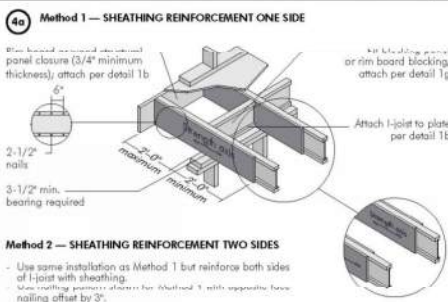
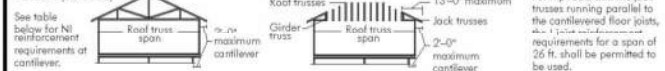


FIGURE 4 (continued)



CANTILEVER REINFORCEMENT METHODS ALLOWED

Joist Depth (in.)	Roof Truss Span (ft)	ROOF LOADING (UNFACTORED)							
		LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf			
		Joist Spacing (in.)				Joist Spacing (in.)			
		12	16	19.2	24	12	16	19.2	24
9-1/2	26	N	N	1	2	N	1	2	X
	28	N	N	1	X	N	1	2	X
	30	N	1	1	X	N	1	2	X
	32	N	1	2	X	N	2	X	X
	34	N	1	2	X	N	2	X	X
11-7/8	26	N	1	2	X	N	1	2	X
	28	N	1	2	X	N	1	2	X
	30	N	1	2	X	N	1	2	X
	32	N	1	2	X	N	1	2	X
	34	N	1	2	X	N	1	2	X
14	26	N	N	N	N	N	N	N	1
	28	N	N	N	N	N	N	N	1
	30	N	N	N	N	N	N	N	1
	32	N	N	N	1	N	N	N	1
	34	N	N	N	1	N	N	N	1
16	26	N	N	N	1	N	N	N	1
	28	N	N	N	1	N	N	N	1
	30	N	N	N	1	N	N	N	1
	32	N	N	N	N	N	N	N	1
	34	N	N	N	N	N	N	N	1

- N = No reinforcement required.
- Ni reinforced with 3/4" wood structural panel on one side only.
- Ni reinforced with 3/4" wood structural panel on both sides, or double I-joist.
- X = Try a deeper joist or closer spacing.
- Maximum design load shall be: 15 psf roof dead load, 65 psf floor total load, and 80 psf wall load. Wall load is based on 9'-0" maximum width window or door openings.
- For larger openings, or multiple 9'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
- Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
- For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge beam, the Roof Truss Span is equivalent to the distance between the supporting walls or if a truss is used.
- Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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

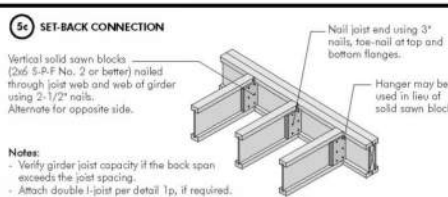
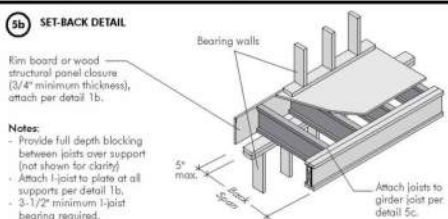
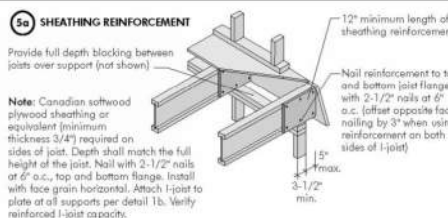
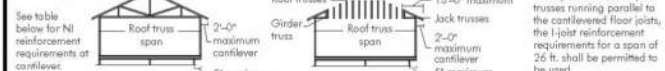


FIGURE 5 (continued)



BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

Joist Depth (in.)	Roof Truss Span (ft)	ROOF LOADING (UNFACTORED)							
		LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf			
		Joist Spacing (in.)				Joist Spacing (in.)			
		12	16	19.2	24	12	16	19.2	24
9-1/2	26	1	X	X	X	2	X	X	X
	28	1	X	X	X	2	X	X	X
	30	1	X	X	X	2	X	X	X
	32	2	X	X	X	2	X	X	X
	34	2	X	X	X	2	X	X	X
11-7/8	26	X	2	X	X	X	X	X	X
	28	X	2	X	X	X	X	X	X
	30	X	2	X	X	X	X	X	X
	32	X	2	X	X	X	X	X	X
	34	X	2	X	X	X	X	X	X
14	26	N	2	X	X	1	X	X	X
	28	N	2	X	X	1	X	X	X
	30	N	2	X	X	1	X	X	X
	32	1	X	X	X	2	X	X	X
	34	1	X	X	X	2	X	X	X
16	26	1	X	X	X	2	X	X	X
	28	1	X	X	X	2	X	X	X
	30	1	X	X	X	2	X	X	X
	32	1	X	X	X	2	X	X	X
	34	1	X	X	X	2	X	X	X

- N = No reinforcement required.
- Ni reinforced with 3/4" wood structural panel on one side only.
- Ni reinforced with 3/4" wood structural panel on both sides, or double I-joist.
- X = Try a deeper joist or closer spacing.
- Maximum design load shall be: 15 psf roof dead load, 65 psf floor total load, and 80 psf wall load. Wall load is based on 9'-0" maximum width window or door openings.
- For larger openings, or multiple 9'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
- Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 15 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
- For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge beam, the Roof Truss Span is equivalent to the distance between the supporting walls or if a truss is used.
- Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

The construction details for residential designs are prone to changes.

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Installation must comply with latest documentation on I-Joist and other Nordic products from the <http://nordic.ca/>

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WEB HOLES

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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

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

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of hole (ft.-in.)													Span adjustment Factor
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	
9-1/2"	N120	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N140	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N160	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N180	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
11-7/8"	N120	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N140	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N160	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N180	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
14"	N120	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N140	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N160	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N180	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
16"	N120	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N140	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N160	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"
	N180	0-7"	1-0"	1-10"	1-4"	1-6"	1-7"	1-8"	1-9"	1-10"	1-11"	1-12"	1-13"	1-14"	1-15"

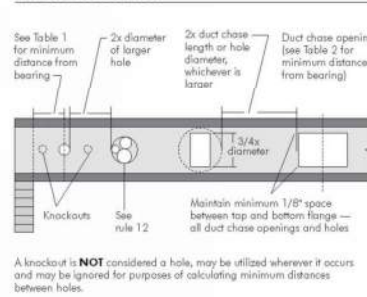
- Above table may be used for I-joist spacing of 24 inches on centre or less.
- Hole location distance is measured from inside face of supports to centre of hole.
- Distances in this chart are based on uniformly loaded joists.

OPTIONAL:

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

- Where:
- $D_{reduced} = D \times \frac{S_{actual}}{S_{max}}$ = Distance from the inside face of any support to centre of hole, reduced for less than maximum span applications [9]. The reduced distance shall not be less than 6 inches from the face of the support to edge of the hole.
 - S_{actual} = The actual measured span distance between the inside faces of supports [9].
 - S_{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 $\frac{S_{actual}}{S_{max}}$ is greater than 1, use 1 in the above calculation for $\frac{S_{actual}}{S_{max}}$.

FIGURE 7
FIELD-CUT HOLE LOCATOR



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 centre along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.

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

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

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

Joist Depth	Joist Series	Minimum distance from inside face of any support to centre of opening (ft.-in.)												
		8	10	12	14	16	18	20	22	24	26	28	30	32
9-1/2"	N120	4-1"	4-5"	4-10"	4-5"	5-0"	5-1"	5-6"	5-1"	5-6"	5-1"	5-6"	5-1"	5-6"
	N140	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N160	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N180	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
11-7/8"	N120	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N140	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N160	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N180	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
14"	N120	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N140	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N160	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N180	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
16"	N120	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N140	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N160	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"
	N180	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"	5-0"

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

INSTALLING THE GLUED FLOOR SYSTEM

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

FASTENERS FOR SHEATHING AND SUBFLOORING(1)

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

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

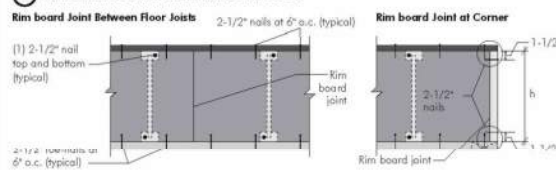
Ref.: NRC-CNRC, National Building Code of Canada 2010, Table 9.23.3.5.

IMPORTANT NOTE:

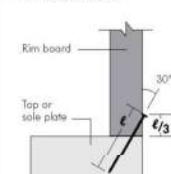
Floor sheathing must be field glued to the I-joist flanges in order to achieve the maximum spans shown in this document. If sheathing is nailed only, I-joist spans must be verified with your local distributor.

RIM BOARD INSTALLATION DETAILS

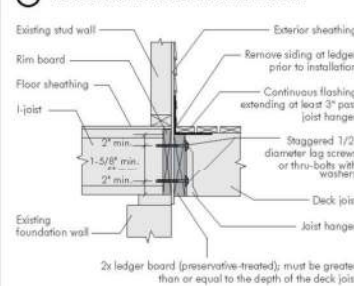
80 ATTACHMENT DETAILS WHERE RIM BOARDS ABUT



86 TOE-NAIL CONNECTION AT RIM BOARD



86 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL



PRODUCT WARRANTY

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

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



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

WEB HOLE SPECIFICATIONS

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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

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

TABLE 1

LOCATION OF CIRCULAR HOLES IN JOIST WEBS

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

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

1. Above table may be used for I-joist spacing of 24 inches on centre or less.
2. Hole location distance is measured from inside face of supports to centre of hole.
3. Distances in this chart are based on uniformly loaded joists.
4. The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

TABLE 2

DUCT CHASE OPENING SIZES AND LOCATIONS

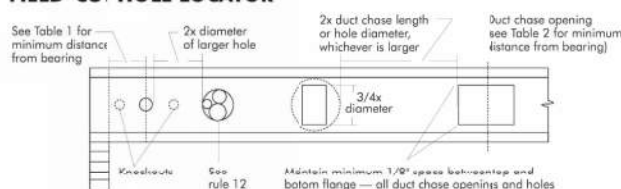
Simple Span Only

Joist Depth	Joist Series	Minimum Distance from Inside Face of Supports to Centre of Opening (ft - in.)												
		Duct Chase Length (in.)												
		8	10	12	14	16	18	20	22	24	26	28	30	32
9-1/2"	NI-20	4-1"	4-5"	4-10"	5-4"	5-8"	6-1"	6-6"	7-1"	7-5"	---	---	---	---
	NI-40x	5-3"	5-8"	6-0"	6-5"	6-10"	7-3"	7-8"	8-2"	8-6"	---	---	---	---
	NI-60	5-4"	5-9"	6-2"	6-7"	7-1"	7-5"	8-0"	8-3"	8-9"	---	---	---	---
	NI-80	6-1"	6-6"	6-10"	6-5"	6-10"	7-3"	7-8"	8-2"	8-6"	---	---	---	---
11-7/8"	NI-20	5-9"	6-2"	6-6"	7-1"	7-5"	7-9"	8-3"	8-9"	9-4"	---	---	---	---
	NI-40x	6-8"	7-2"	7-6"	8-1"	8-6"	9-1"	9-6"	10-1"	10-9"	---	---	---	---
	NI-60	7-3"	7-8"	8-0"	8-6"	9-0"	9-3"	9-9"	10-3"	11-0"	---	---	---	---
	NI-70	7-1"	7-4"	7-9"	8-3"	8-7"	9-1"	9-6"	10-1"	10-4"	---	---	---	---
14"	NI-80	7-2"	7-7"	8-0"	8-5"	8-10"	9-4"	9-8"	10-2"	10-8"	---	---	---	---
	NI-90	7-7"	8-1"	8-5"	8-10"	9-4"	9-8"	10-2"	10-8"	11-2"	---	---	---	---
	NI-40x	8-1"	8-7"	9-0"	9-6"	10-1"	10-7"	11-2"	12-0"	12-8"	---	---	---	---
	NI-60	8-9"	9-3"	9-8"	10-1"	10-6"	11-1"	11-6"	12-3"	13-0"	---	---	---	---
16"	NI-70	8-7"	9-1"	9-5"	9-10"	10-4"	10-8"	11-2"	11-7"	12-3"	---	---	---	---
	NI-80	9-0"	9-3"	9-9"	10-1"	10-7"	11-1"	11-6"	12-1"	12-6"	---	---	---	---
	NI-90	9-4"	9-9"	10-3"	10-7"	11-1"	11-7"	12-1"	12-7"	13-2"	---	---	---	---
	NI-60	10-3"	10-8"	11-2"	11-6"	12-1"	12-6"	13-2"	14-1"	14-10"	---	---	---	---
16"	NI-70	10-1"	10-5"	11-0"	11-4"	11-10"	12-3"	12-8"	13-2"	14-0"	---	---	---	---
	NI-80	10-4"	10-9"	11-3"	11-9"	12-1"	12-7"	13-1"	13-6"	14-4"	---	---	---	---
	NI-90	11-1"	11-5"	11-10"	12-4"	12-10"	13-2"	13-9"	14-4"	15-2"	---	---	---	---
	NI-60	11-1"	11-5"	11-10"	12-4"	12-10"	13-2"	13-9"	14-4"	15-2"	---	---	---	---

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.
5. The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

FIGURE 7

FIELD-CUT HOLE LOCATOR



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

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

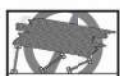
Holes in webs should be cut with a sharp saw.

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

SAFETY AND CONSTRUCTION PRECAUTIONS



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



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

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

AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-briding at joist ends. When I-joists are installed 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, when called for, 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-briding.
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.

The construction details for residential designs are prone to changes.

Details released after September 2013 supersedes N-303

Installation must comply with latest documentation on I-Joist and other Nordic products from the <http://nordic.ca/>

This document 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 its component based on the design criteria and loadings shown on the calculation sheets.



1a NI blocking panel

Attach I-joist to top plate per detail 1b

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

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

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

1b Rim board

One 2-1/2" face nail at each side at bearing

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

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

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

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

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

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

1d NI or rim board blocking panel per detail 1a

Squash block

+ 1/16" for squash blocks

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

Provide lateral bracing per detail 1a or 1b

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

1g Joist attachment per detail 1b

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

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

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

NI blocking panel per detail 1a

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

Backer block required (both sides for face-mount hangers)

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

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

* Minimum grade for backer block material shall be S-P-F No. 2 or better for solid wood lumber and wood structural panels conforming to CAN/CSA-O325 or CAN/CSA-O437 Standard.

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

1i Nordic Lam or Structural Composite Lumber (SCL)

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

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

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

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

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

Top-mount hanger installed per manufacturer's recommendations

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

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

Install hanger per manufacturer's recommendations

Maximum support capacity = 1,620 lbs.

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

Attach I-joist per detail 1b

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

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

NI blocking panel

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

1p FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Offset nails from opposite face by 6"

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

NOTES:

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

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

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

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

I-joist blocking panel

One 2-1/2" nail one side only

NOTES:

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

All nails shown in the above details are assumed to be common wire nails unless otherwise noted. 3" (0.125" dia.) common spiral nails may be substituted for 2-1/2" (0.128" dia.) common wire nails. Framing lumber assumed to be Spruce-Pine-Fir No. 2 or better. Individual components not shown to scale for clarity.

WEB STIFFENERS

RECOMMENDATIONS:

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

FIGURE 2

WEB STIFFENER INSTALLATION DETAILS

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

Approx. 2"

1/8" - 1/4" Gap

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

No Gap

CONCENTRATED LOAD (Load stiffener)

Tight Joint No Gap

Gap

END BEARING (Bearing stiffener)

Gap

Tight Joint No Gap

Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/8" 6" minimum width
3-1/2"	1-1/2" x 2-1/8" 6" minimum width

See the adjacent table for web stiffener size requirements

CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

Method 1 — SHEATHING REINFORCEMENT ONE SIDE

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

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

Attach I-joist to plate per detail 1b

2-1/2" nails

3-1/2" min. bearing required

Method 2 — SHEATHING REINFORCEMENT TWO SIDES

Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.

Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

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

RIM BOARD INSTALLATION DETAILS

8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

Rim Board Joint Between Floor Joists

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

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

Rim board joint

Rim Board Joint at Corner

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

1-1/2"

2-1/2" nails

h

1-1/2"

8b TOE-NAIL CONNECTION AT RIMBOARD

Rim board

Top or sole plate

30°

1/3

The construction details for residential designs are prone to changes.

Details released after September 2013 supersedes N-303

Installation must comply with latest documentation on I-Joist and other Nordic products from the <http://nordic.ca/>

This document 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 its component based on the design criteria and loadings shown on the calculation sheets.

