



Residential Structures P.C.
3410 N. Davidson St.
Charlotte, N.C. 28205
Phone 704-332-5469
www.residentialstructurespc.com

March 21, 2022

Del Oldland
Components Territory Manager
Raleigh/Durham/Fayetteville
84 Lumber
443-221-1853
del.oldland@84lumber.com

Re: Lot 7 Prince Place, Fuquay Varina NC

Dear Mr. Oldland:

Per your request, I have completed a limited structural review of the roof truss and floor truss (second floor framing) layouts for the above referenced single family residence. More specifically, you have requested that I review the LVL beam calculation/ design sheets for the LVL beams located in the second-floor system for compliance with 2018 North Carolina Residential Code. Please see comments below.

Based on information you have provided; I understand that the roof system (trusses) and second floor system will be framed in accordance with the roof and floor truss layouts you have provided (See Detail 1 and Detail 2 attached). Provided the framing follows the layouts, the LVL structural beams shown on the floor truss layout (Detail 2) and associated calculations (see LVL beam calcs, 10 pages total) will meet or exceed the structural requirements of the 2018 NCRC.

This report does not constitute an overall review or observation of all aspects of this property. It only represents a report of the items specifically covered by this report. Nothing is implied or can be assumed on any items not mentioned in this report. This review was limited to the items mentioned above. All other aspects of construction should be completed in accordance with code requirements.

Should you have any questions, please feel free to contact me.

Sincerely,

Kevin P. Munson
Residential Structures P.C.

(Attachments 12 pages total)

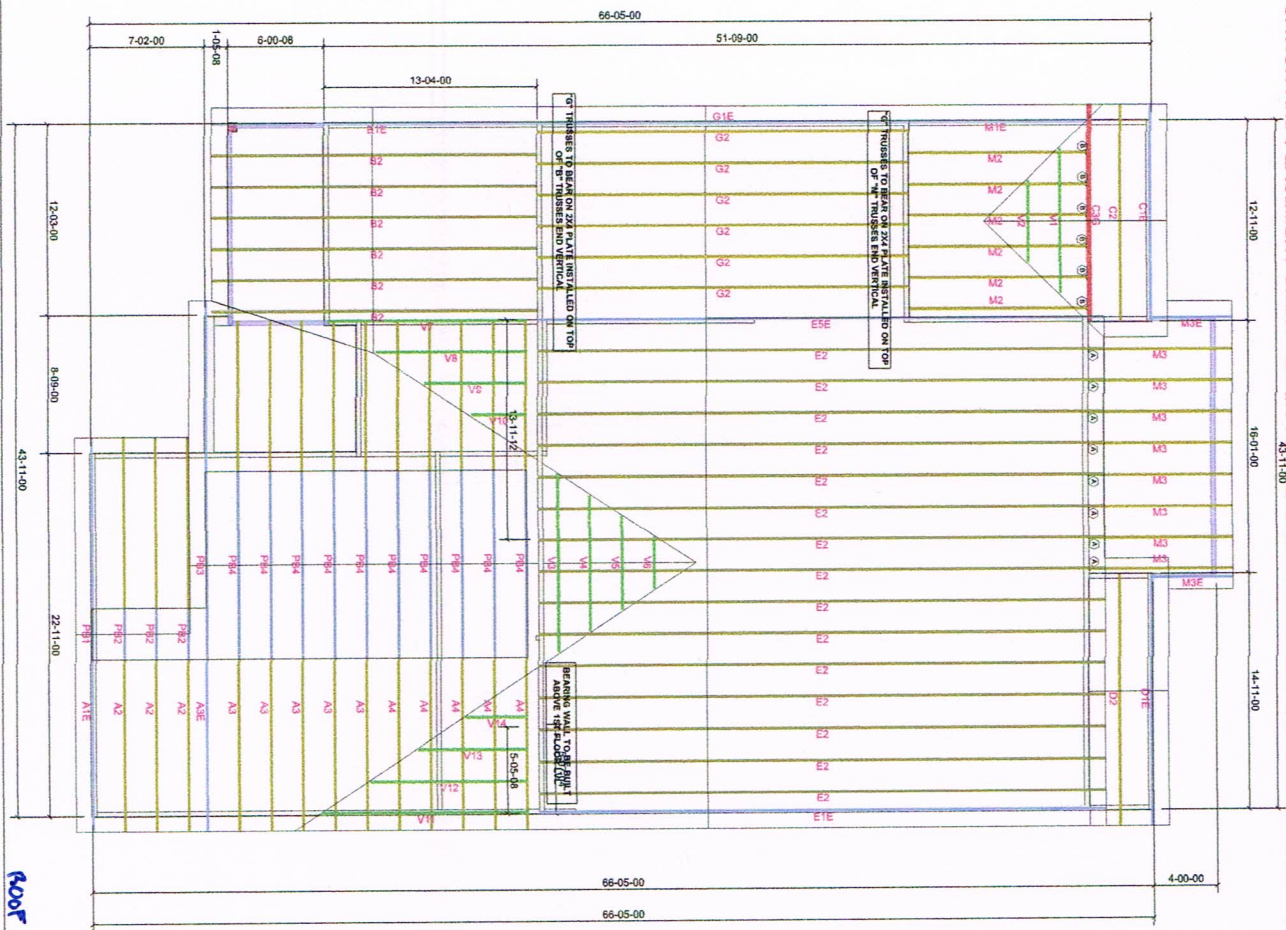


DETAIL 1

THIS LAYOUT IS INTENDED FOR THE PURPOSE OF TRUSS LOCATION AND PLACEMENT ONLY. REFER TO THE BUILDING PLANS FOR ACTUAL BUILDING CONSTRUCTION.

1st Level Roof Area 2877.49
2nd Level Roof Area 240.13

HANGER LIST		
A	LUS24	8
B	HLS26	6
C	-	-



GENERAL NOTES:

- DO NOT CUT OR MODIFY TRUSSES
- TRUSSES ARE SPACED 24" ON CENTER UNLESS OTHERWISE NOTED
- REFER TO THE INDIVIDUAL TRUSS DESIGN DRAWINGS FOR THE LOCATION OF LATERAL BRACING AND MULTI-PLY CONNECTION REQUIREMENTS.
- PER ANSI TP1 1-2002 THE TRUSS ENGINEER IS RESPONSIBLE FOR TRUSS TO TRUSS CONNECTIONS AND TRUSS PLY TO PLY CONNECTIONS. THIS TRUSS PLACEMENT PLAN RECOMMENDS TRUSS TO BEARING CONNECTIONS AND TRUSS TO BEAM CONNECTIONS WHICH SHALL BE REVIEWED BY THE BUILDING DESIGNER. IT IS THE RESPONSIBILITY OF THE BUILDING DESIGNER TO RESOLVE ALL ROOF FORCES ADEQUATELY TO THE FOUNDATION.

WIND SPEED: 115 mph
TOP DEAD LOAD: 10.0 lb/ft²
BOTTOM DEAD LOAD: 10.0 lb/ft²

PROJECT: Lot 7 @ PRINCE PLACE
CUSTOMER: DAVIDSON HOMES
MODEL: Cypress D w/Cov Prch & 4 Bdrm
ORDER #: 28200A
PRINT DATE: 12/8/2021
DRAWN BY: BES
SCALE: N.T.S.

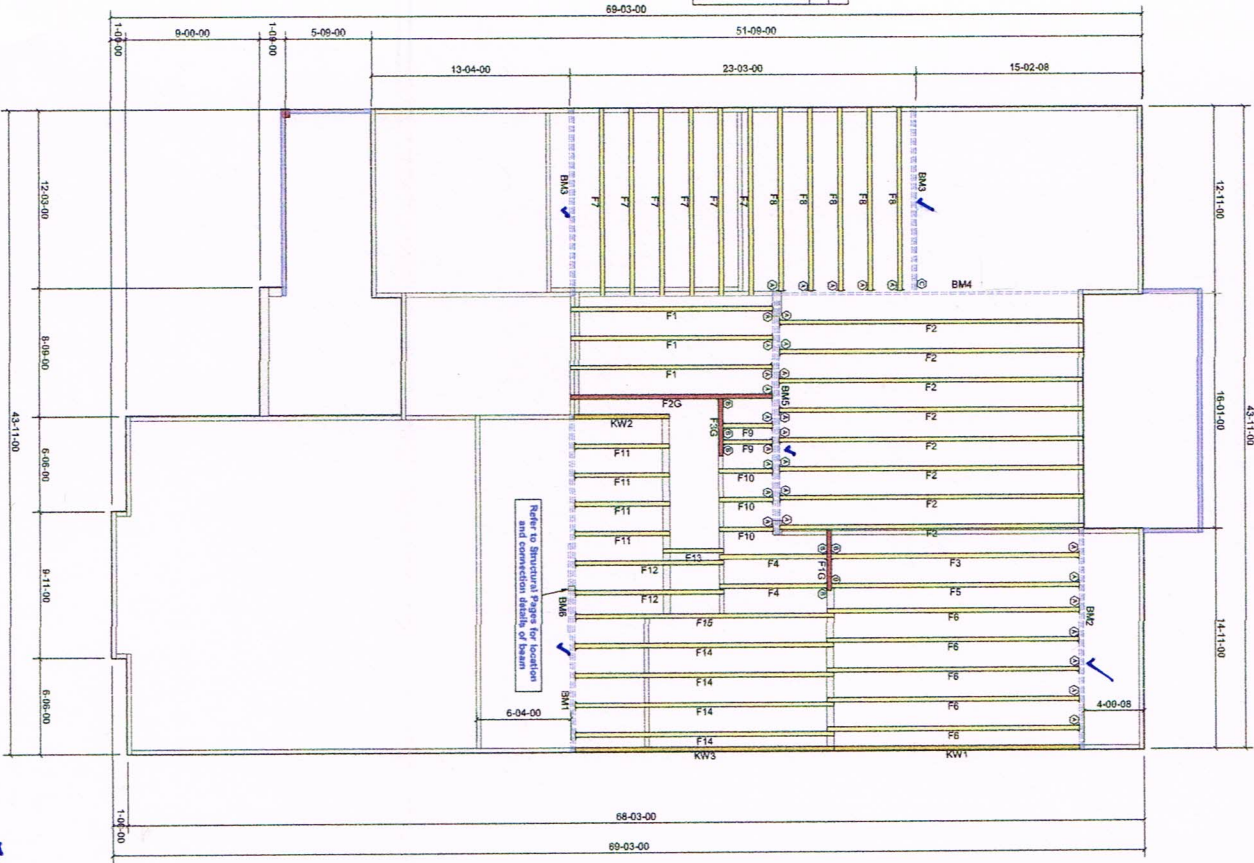


DEDICATED TO QUALITY AND EXCELLENCE
200 ELMETT ROAD
DUNN, NORTH CAROLINA 28534
PHONE: 919-892-2400

THIS LAYOUT IS INTENDED FOR THE PURPOSE OF TRUSS LOCATION AND PLACEMENT ONLY. REFER TO THE BUILDING PLANS FOR ACTUAL BUILDING CONSTRUCTION.

ProdID	Length	Product	Pieces	Net Qty
BM1	24-00-00	1-3/4" x 14" LVL BY OTHERS	2	2
BM4	22-00-00	1-3/4" x 14" LVL BY OTHERS	3	3
BM2	16-00-00	1-3/4" x 14" LVL BY OTHERS	2	2
BM5	16-00-00	1-3/4" x 14" LVL BY OTHERS	3	3
BM3	14-00-00	1-3/4" x 14" LVL BY OTHERS	2	4
BM6	6-00-00	1-3/4" x 14" LVL BY OTHERS	1	1

HANGER LIST			
A	LUS410	20	
B	THM22	7	
C	HUS410	1	



0
1st Level Floor Area 1370.49
0
2nd Level Floor Area

FLUOR TRUSS

GENERAL NOTES:

- DO NOT CUT OR MODIFY TRUSSES
- TRUSSES ARE SPACED 24" ON CENTER UNLESS OTHERWISE NOTED
- REFER TO THE INDIVIDUAL TRUSS DESIGN DRAWINGS FOR THE LOCATION OF LATERAL BRACING AND MULTI-PLY CONNECTION REQUIREMENTS.
- PER ANSI TPI 1-2002 THE TRUSS ENGINEER IS RESPONSIBLE FOR TRUSS TO TRUSS CONNECTIONS AND TRUSS PLY TO PLY CONNECTIONS. THIS TRUSS PLACEMENT PLAN RECOMMENDS TRUSS TO BEARING CONNECTIONS AND TRUSS TO BEAM CONNECTIONS WHICH SHALL BE REVIEWED BY THE BUILDING DESIGNER. IT IS THE RESPONSIBILITY OF THE BUILDING DESIGNER TO RESOLVE ALL ROOF FORCES ADEQUATELY TO THE FOUNDATION.

BOTTOM DEAD LOAD: 5.0 lb/ft²

BOTTOM LIVE LOAD:

TOP DEAD LOAD: 10.0 lb/ft²

TOP LIVE LOAD: 40.0 lb/ft²

PROJECT:

Lot 7 @ PRINCE PLACE

CUSTOMER:

Davidson Homes

MODEL:

Cypress D w/Owner Ext.

ORDER #:

28201A

PRINT DATE:

9/29/2021

DRAWN BY:

BES

SCALE:

N.T.S

DEDICATED TO QUALITY AND EXCELLENCE
 200 EMMETT ROAD
 DUNWOODY, GA 30338
 PHONE: 978-922-2400



COMMENTS



BM1 (Floor Beam)

Dry | 2 spans | No cant.

February 21, 2022 14:23:29

BC CALC® Member Report

Build 8104

Job name:

File name:

Address:

Description:

City, State, Zip:

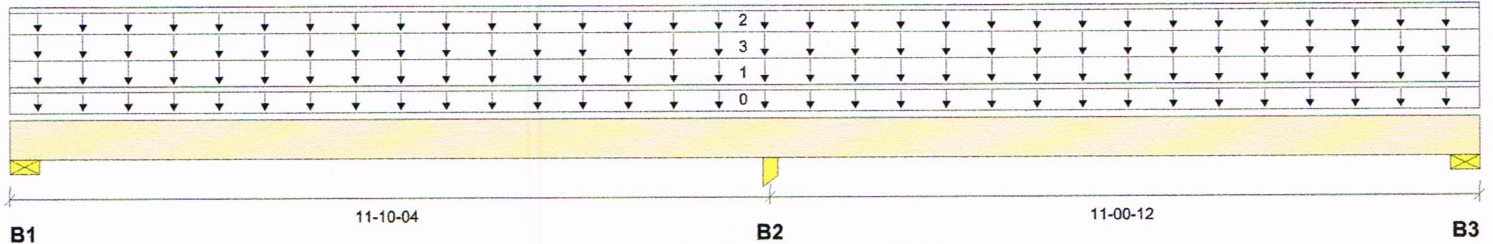
Specifier:

Customer:

Designer:

Code reports: ESR-1040

Company:



Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B1, 3-1/2"	675 / 73	2351 / 0	1738 / 0		
B2, 5-1/2"	1762 / 0	6887 / 0	4799 / 0		
B3, 3-1/2"	636 / 97	2108 / 0	1601 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	22-11-00	Top		13				00-00-00
1		Unf. Area (lb/ft²)	L	00-00-00	22-11-00	Top	40	15				03-02-00
2		Unf. Lin. (lb/ft)	L	00-00-00	22-11-00	Top		90				n/a
3		Unf. Area (lb/ft²)	L	00-00-00	22-11-00	Top		20	20			17-03-00

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	9261 ft-lbs	30.7%	115%	8	04-10-00
Neg. Moment	-12767 ft-lbs	42.3%	115%	13	11-10-04
End Shear	2922 lbs	27.3%	115%	8	01-05-08
Cont. Shear	4847 lbs	45.3%	115%	13	10-05-08
Total Load Deflection	L/973 (0.143")	24.7%	n/a	8	05-06-07
Live Load Deflection	L/999 (0.067")	n/a	n/a	23	05-08-02
Max Defl.	0.143"	14.3%	n/a	8	05-06-07
Span / Depth	10.0				



Bearing Supports

	Dim. (LxW)	Value	% Allow Support	% Allow Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	4160 lbs	n/a	45.3%	Unspecified
B2	Column 5-1/2" x 3-1/2"	11808 lbs	n/a	81.8%	Unspecified
B3	Wall/Plate 3-1/2" x 3-1/2"	3786 lbs	n/a	41.2%	Unspecified

Notes

Design meets Code minimum (L/240) Total load deflection criteria.
 Design meets Code minimum (L/360) Live load deflection criteria.
 Design meets arbitrary (1") Maximum Total load deflection criteria.
 BC CALC® analysis is based on IBC 2009.
 Design based on Dry Service Condition.
 Calculations assume member is fully braced.



BM1 (Floor Beam)

Dry | 2 spans | No cant.

February 21, 2022 14:23:29

BC CALC® Member Report

Build 8104

Job name:

Address:

City, State, Zip:

Customer:

Code reports: ESR-1040

File name:

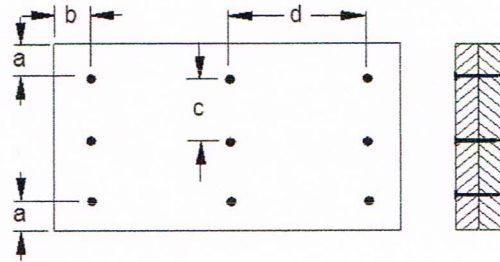
Description:

Specifier:

Designer:

Company:

Connection Diagram: Full Length of Member



a minimum = 2" c = 5"
b minimum = 3" d = 12"

Calculated Side Load = 0.0 lb/ft
Connectors are: 3-1/4 in. Pneumatic Gun Nails



Disclosure

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

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BM2 (Floor Beam)

Dry | 1 span | No cant.

February 21, 2022 12:25:02

BC CALC® Member Report

Build 8104

Job name:

File name:

Address:

Description:

City, State, Zip:

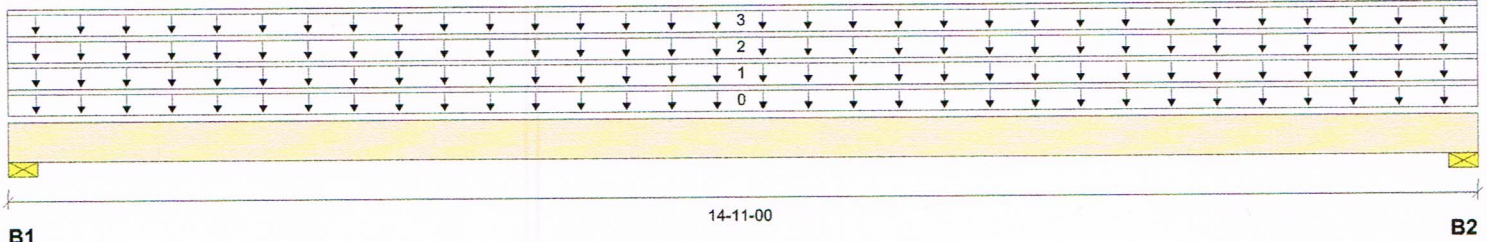
Specifier:

Customer:

Designer:

Code reports: ESR-1040

Company:



Total Horizontal Product Length = 14-11-00

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B1, 3-1/2"	2506 / 0	4420 / 0	2715 / 0		
B2, 3-1/2"	2506 / 0	4420 / 0	2715 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	100%	90%	115%	160%	Roof Live 125%	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	14-11-00	Top		13				00-00-00
1		Unf. Lin. (lb/ft)	L	00-00-00	14-11-00	Top	336	126				n/a
2		Unf. Lin. (lb/ft)	L	00-00-00	14-11-00	Top		90				n/a
3		Unf. Lin. (lb/ft)	L	00-00-00	14-11-00	Top		364	364			n/a

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	29203 ft-lbs	96.8%	115%	3	07-05-08
End Shear	6706 lbs	62.6%	115%	3	01-05-08
Total Load Deflection	L/241 (0.719")	99.5%	n/a	3	07-05-08
Live Load Deflection	L/514 (0.338")	70.1%	n/a	6	07-05-08
Max Defl.	0.719"	71.9%	n/a	3	07-05-08
Span / Depth	12.4				



Bearing Supports

	Dim. (LxW)	Value	% Allow Support	% Allow Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	8335 lbs	n/a	90.7%	Unspecified
B2	Wall/Plate 3-1/2" x 3-1/2"	8335 lbs	n/a	90.7%	Unspecified

Notes

- Design meets Code minimum (L/240) Total load deflection criteria.
- Design meets Code minimum (L/360) Live load deflection criteria.
- Design meets arbitrary (1") Maximum Total load deflection criteria.
- BC CALC® analysis is based on IBC 2009.
- Design based on Dry Service Condition.
- Calculations assume member is fully braced.



BM2 (Floor Beam)

Dry | 1 span | No cant.

February 21, 2022 12:25:02

BC CALC® Member Report

Build 8104

Job name:

Address:

City, State, Zip:

Customer:

Code reports: ESR-1040

File name:

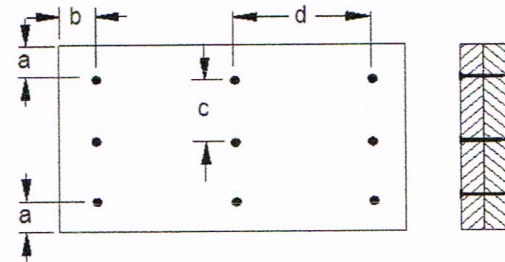
Description:

Specifier:

Designer:

Company:

Connection Diagram: Full Length of Member



a minimum = 2" c = 5"
b minimum = 3" d = 12"



Calculated Side Load = 0.0 lb/ft
Connectors are: 3-1/4 in. Pneumatic Gun Nails

Disclosure

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BM3 (Floor Beam)

Dry | 1 span | No cant.

February 21, 2022 13:22:38

BC CALC® Member Report

Build 8104

Job name:

Address:

City, State, Zip:

Customer:

Code reports: ESR-1040

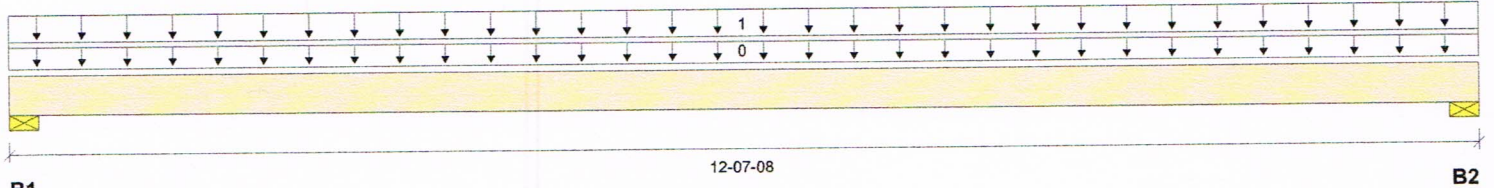
File name:

Description:

Specifier:

Designer:

Company:



Total Horizontal Product Length = 12-07-08

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B1, 3-1/2"		2226 / 0	2146 / 0		
B2, 3-1/2"		2226 / 0	2146 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	12-07-08	Top		13				00-00-00
1		Unf. Area (lb/ft²)	L	00-00-00	12-07-08	Top		20	20			17-00-00

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	12815 ft-lbs	42.5%	115%	1	06-03-12
End Shear	3362 lbs	31.4%	115%	1	01-05-08
Total Load Deflection	L/630 (0.232")	38.1%	n/a	1	06-03-12
Live Load Deflection	L/999 (0.114")	n/a	n/a	2	06-03-12
Max Defl.	0.232"	23.2%	n/a	1	06-03-12
Span / Depth	10.4				



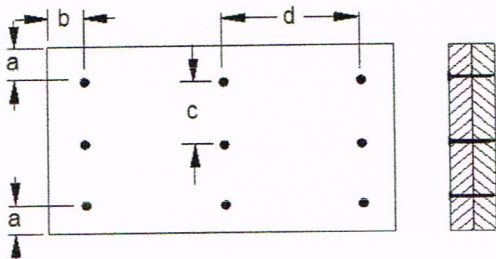
Bearing Supports

	Dim. (LxW)	Value	% Allow Support	% Allow Member	Material
B1	Wall/Plate 3-1/2" x 3-1/2"	4372 lbs	n/a	47.6%	Unspecified
B2	Wall/Plate 3-1/2" x 3-1/2"	4372 lbs	n/a	47.6%	Unspecified

Notes

- Design meets Code minimum (L/240) Total load deflection criteria.
- Design meets Code minimum (L/360) Live load deflection criteria.
- Design meets arbitrary (1") Maximum Total load deflection criteria.
- BC CALC® analysis is based on IBC 2009.
- Design based on Dry Service Condition.
- Calculations assume member is fully braced.

Connection Diagram: Full Length of Member





BC CALC® Member Report
Build 8104
Job name:
Address:
City, State, Zip:
Customer:
Code reports: ESR-1040

BM3 (Floor Beam)
Dry | 1 span | No cant.

February 21, 2022 13:22:38

File name:
Description:
Specifier:
Designer:
Company:

Connection Diagram: Full Length of Member

a minimum = 2" c = 5"
b minimum = 3" d = 12"

Calculated Side Load = 0.0 lb/ft
Connectors are: 3-1/4 in. Pneumatic Gun Nails



Disclosure

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BM4 (Floor Beam)

Dry | 1 span | No cant.

February 21, 2022 10:29:15

BC CALC® Member Report

Build 8104

Job name:

File name:

Address:

Description:

City, State, Zip:

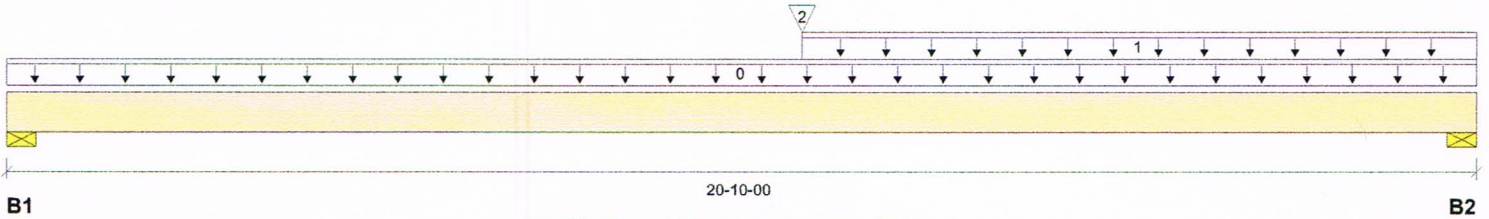
Specifier:

Customer:

Designer:

Code reports: ESR-1040

Company:



Total Horizontal Product Length = 20'-10"

Reaction Summary (Down / Uplift) (lbs)

Bearing	Live	Dead	Snow	Wind	Roof Live
B1, 3-1/2"	203 / 0	1712 / 0	976 / 0		
B2, 3-1/2"	705 / 0	3223 / 0	1156 / 0		

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live	Dead	Snow	Wind	Roof Live	Tributary
							100%	90%	115%	160%	125%	
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	20-10-00	Top		19				00-00-00
1		Unf. Lin. (lb/ft)	L	11-03-04	20-10-00	Top	95	252				n/a
2		Conc. Pt. (lbs)	L	11-03-04	11-03-04	Top		2132	2132			n/a

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	28488 ft-lbs	63.0%	115%	2	11-03-04
End Shear	4120 lbs	25.7%	115%	3	19-04-08
Total Load Deflection	L/326 (0.749")	73.6%	n/a	2	10-11-09
Live Load Deflection	L/904 (0.27")	39.8%	n/a	5	10-11-09
Max Defl.	0.749"	74.9%	n/a	2	10-11-09
Span / Depth	17.5				



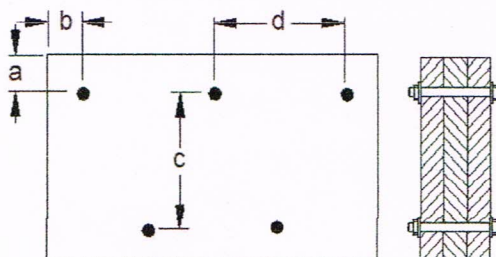
Bearing Supports

	Dim. (LxW)	Value	% Allow Support	% Allow Member	Material
B1	Wall/Plate 3-1/2" x 5-1/4"	2688 lbs	n/a	19.5%	Unspecified
B2	Wall/Plate 3-1/2" x 5-1/4"	4619 lbs	n/a	33.5%	Unspecified

Notes

- Design meets Code minimum (L/240) Total load deflection criteria.
- Design meets Code minimum (L/360) Live load deflection criteria.
- Design meets arbitrary (1") Maximum Total load deflection criteria.
- BC CALC® analysis is based on IBC 2009.
- Design based on Dry Service Condition.
- Calculations assume member is fully braced.

Connection Diagram: Full Length of Member





BC CALC® Member Report
Build 8104
Job name:
Address:
City, State, Zip:
Customer:
Code reports: ESR-1040

BM4 (Floor Beam)
Dry | 1 span | No cant.

February 21, 2022 10:29:15

File name:
Description:
Specifier:
Designer:
Company:

Connection Diagram: Full Length of Member

a minimum = 2" c = 10"
b minimum = 2-1/2" d = 24"

Calculated Side Load = 0.0 lb/ft
Bolts are assumed to be Grade A307 or Grade 2 or higher.
Connectors are: 1/2 in. Staggered Through Bolt



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BM5 (Floor Beam)

Dry | 1 span | No cant.

February 21, 2022 14:22:43

BC CALC® Member Report

Build 8104

Job name:

File name:

Address:

Description:

City, State, Zip:

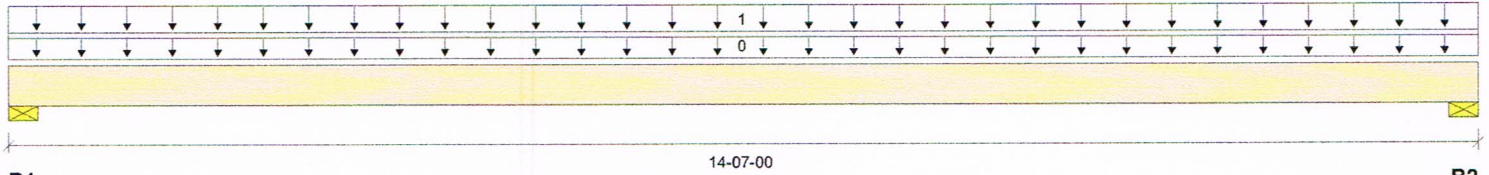
Specifier:

Customer:

Designer:

Code reports: ESR-1040

Company:



Total Horizontal Product Length = 14-07-00

Reaction Summary (Down / Uplift) (lbs)

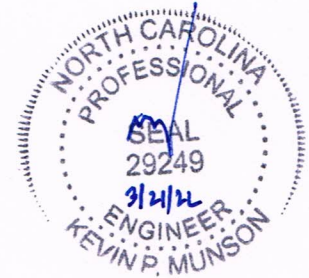
Bearing	Live	Dead	Snow	Wind	Roof Live
B1, 3-1/2"	5007 / 0	2015 / 0			
B2, 3-1/2"	5007 / 0	2015 / 0			

Load Summary

Tag	Description	Load Type	Ref.	Start	End	Loc.	Live 100%	Dead 90%	Snow 115%	Wind 160%	Roof Live 125%	Tributary
0	Self-Weight	Unf. Lin. (lb/ft)	L	00-00-00	14-07-00	Top		19				00-00-00
1		Unf. Area (lb/ft²)	L	00-00-00	14-07-00	Top	40	15				17-02-00

Controls Summary

	Value	% Allowable	Duration	Case	Location
Pos. Moment	24018 ft-lbs	61.1%	100%	1	07-03-08
End Shear	5618 lbs	40.2%	100%	1	01-05-08
Total Load Deflection	L/448 (0.378")	53.5%	n/a	1	07-03-08
Live Load Deflection	L/629 (0.27")	57.2%	n/a	2	07-03-08
Max Defl.	0.378"	37.8%	n/a	1	07-03-08
Span / Depth	12.1				



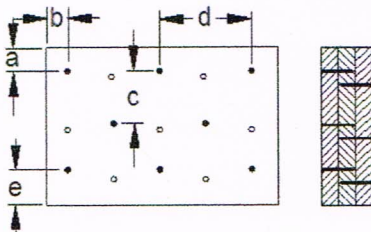
Bearing Supports

	Dim. (LxW)	Value	% Allow Support	% Allow Member	Material
B1	Wall/Plate 3-1/2" x 5-1/4"	7022 lbs	n/a	51.0%	Unspecified
B2	Wall/Plate 3-1/2" x 5-1/4"	7022 lbs	n/a	51.0%	Unspecified

Notes

- Design meets Code minimum (L/240) Total load deflection criteria.
- Design meets Code minimum (L/360) Live load deflection criteria.
- Design meets arbitrary (1") Maximum Total load deflection criteria.
- BC CALC® analysis is based on IBC 2009.
- Design based on Dry Service Condition.
- Calculations assume member is fully braced.

Connection Diagram: Full Length of Member





BC CALC® Member Report
Build 8104
Job name:
Address:
City, State, Zip:
Customer:
Code reports: ESR-1040

BM5 (Floor Beam)
Dry | 1 span | No cant.

February 21, 2022 14:22:43

File name:
Description:
Specifier:
Designer:
Company:

Connection Diagram: Full Length of Member

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

Calculated Side Load = 0.0 lb/ft
Nailing applies to both sides of the member
Connectors are: 3-1/4 in. Pneumatic Gun Nails



Disclosure

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

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