Structural Calculations for

Banbury - Single Family Residence Addition

8275 SE 61st Street Mercer Island, WA

Prepared by:
Johnson Structural Engineering, Inc.

Larry P. Johnson, PE

152 West Short Street Bozeman, MT 59715 Ph 406-585-2939



DESIGN DATA INFORMATION SHEET

Banbury - Single Family Residence Addition

8275 SE 61st Street Mercer Island, WA JN DATE Sheet 2 of 29 19-446

2/6/2019

PREPARED BY

Larry P. Johnson, PE

Grade 40, 40 ksi, #3 bar Grade 60, 60 ksi, all others

REFERENCES

IBC/IRC

2015

ASCE 7

2010

to support foundation.

Allowable Stress Design - Basic Load Combinations Used:

For Soil For Cor	Allowable Design Strength Design, Factored Loads						
DEAD LOADS	Roof 15 Floor 12 Int. Walls 10 Ext. Walls 12	psf psf psf psf	LIVE LOADS	Roof Floor Deck	40	psf psf psf	
SNOW:	Pg Ce Ct I Pf min = 20 I pf = 0.7 Pg Ce Ct I		25 Psf 1.0 1.0 1.0 20 Psf 25.0 Psf				
WIND	Basic Wind Speed Exposure Category Enclosed Structure Structure Category Importance Factor Internal Pressure Co	eff.	110 MPH B II 1.00 N/A				
SEISMIC	Structure Category Importance Factor Seismic Use Group Site Soil Profile Seismic Design Cate Basic Seismic Syster Analysis Procedure		D Wood Framed S	unknown Shear Wall al Force Procedure	e, ASCE 7, C	Chap 9.5.5	
SOILS	Soils Bearing Capaci	ty, per Tabl	e 1806.2	1,500 Responsibil	psf ity of Contra	ctor and/or	
CONCRETE	Fc = 2500 psi			Owner to ve	erify soil cond	dition suitable	

REBAR

DESIGN DATA	1		Banbu
INFORMATION SHEET			8275 S

Banbury - Single Family Residence Addition 8275 SE 61st Street

Sheet 3 of 29 JN 19-446 DATE 2/6/2019

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Bozeman, MT 59715 (406) 585-2939 phone Date	ect: <u>Banburg</u> - SFR Addolon No.: <u>19-446</u> e: <u>2-5-19</u> et No.: 4
Ar Vertical Analysis Proj. Lo.	sation: 8275 St Glst Street Mercer Island, WA Snow + 25 PSF
1 Kitchen Bay Window - H1 Root Span = 6,5' next trib, = 3 = 15.5'	- Snow = 25 ps
Use(2) 734 1/x 7/4 " LVL <	
Z. South Window header - HZ span = 6.5'	
100 f tn'b, = 4 wall ht = 5' Use 1x8DF#2	
3. Dining West door header - H3	
span = 12,5' roof trib-=15,5' Usc 5/2x/2 24F-V14	**************************************
4 Main level floor joist-FJ1	
5pan - 8-3" USC 2x8DF#2@16	
5 Main level floor beam at South Add FBI Span = 12/ floor trib, = 2-2/40 = 4/2 = 4/2/40	
Wall height = 8 to 11	ó18 = 41
1) SE S/2 XIO/2 Elulam FB (a span = 7.5 t 7.75	FB1Rti=3112 #
floor trib. = 4' wall bt = 12'	FBla Rtu=16274 4739 4
1 roof trub = 41 Use 5/2 × 10/2 G	we 2'x 2'x 8" ftg

FBI = mid span = 5003 # use 2/2/x 8 ftg

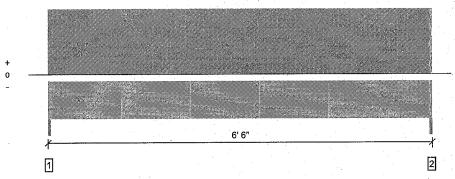


MEMBER REPORT

Level, Wall: Header - H1

2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL

Overall Length: 6' 6"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2190 @ 0	3806 (1.50")	Passed (58%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1699 @ 8 3/4"	5544	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3559 @ 3' 3"	8182	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.079 @ 3' 3"	0.217	Passed (L/984)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.138 @ 3' 3"	0.313	Passed (L/566)		1.0 D + 1.0 S (All Spans)

• Deflection criteria: LL (L/360) and TL (5/16").

- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 6" o/c unless detailed otherwise.
- · Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 6" o/c unless detailed otherwise.

		Bearing Len	igth	Load	s to Suppor	ts (lbs)	
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - SPF	1.50"	1.50"	1.50"	931	1259	2190	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	931	1259	2190	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 6"	N/A	7.4		
1 - Uniform (PSF)	0 to 6' 6"	15' 6"	18.0	25.0	Roof snow load

Weyerhaeuser Notes

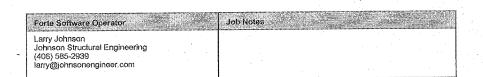
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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

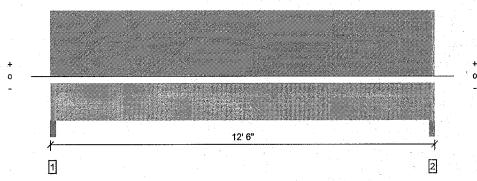
System: Wall
Member Type: Header
Building Use: Residential
Building Code: IBC 2015
Design Methodology: ASD

PASSED



1 piece(s) 5 1/2" x 12" 24F-V4 DF Glulam

Overall Length: 12' 6"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4266 @ 1 1/2"	10725 (3.00")	Passed (40%)	:	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3413 @ 1' 3"	13409	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	12803 @ 6' 3"	30360	Passed (42%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.138 @ 6' 3"	0.408	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.243 @ 6' 3"	0.613	Passed (L/606)		1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' 6" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' 6" o/c unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 12'3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- · Applicable calculations are based on NDS.

2015 mark 2015 mark 2016 m		Bearing Len	igth	Load	s to Suppor	ts (lbs)	120,000
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - SPF	3.00"	3.00"	1.50"	1844	2422	4266	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	1844	2422	4266	None

	110	Tributary	Dead	Snow	
Loads	Location (Side)	Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 6"	N/A	16.0		
1 - Uniform (PSF)	0 to 12' 6"	15' 6"	18.0	25.0	Roof snow load

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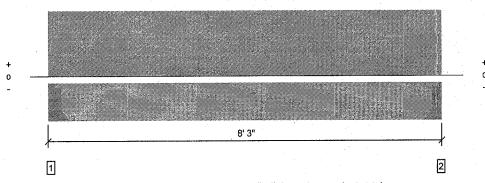
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(F)	

System: Wall
Member Type: Header
Building Use: Residential
Building Code: IBC 2015
Design Methodology: ASD

Forte Software Operator	Job Notes			
Larry Johnson Johnson Structural Engineering (406) 585-2939				
larry@johnsonengineer.com		٠.		

Overall Length: 8' 3"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	272 @ 3 1/2"	1406 (1.50")	Passed (19%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	230 @ 10 3/4"	1305	Passed (18%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	532 @ 4' 2 1/2"	1360	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.059 @ 4' 2 1/2"	0.261	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.077 @ 4' 2 1/2"	0.392	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A			HM-

System: Floor Member Type: Joist Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 7' 10" o/c unless detailed otherwise.
- \bullet Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 7' 10" o/c unless detailed otherwise.
- · A 15% increase in the moment capacity has been added to account for repetitive member usage.
- · Applicable calculations are based on NDS.
- · No composite action between deck and joist was considered in analysis.

		Bearing Ler	igth	Load	s to Suppor	ts (ibs)	
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Hanger on 7 1/4" SPF beam	3.50"	Hanger ¹	1.50"	67	224	291	See note ¹
2 - Hanger on 7 1/4" SPF beam	1.50"	Hanger ¹	1.50"	65	216	281	See note 1

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- 1 See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong	g-Tie Connectors		a safeki		180	Haller of Aller
Support Company of the Company of th	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Face Mount Hanger	LU26	1.50"	N/A	6-10d	4-10dx1.5	None
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10d	4-10dx1.5	None

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1,00)	Comments
1 - Uniform (PSF)	0 to 8' 3"	16"	12.0	40.0	Residential - Living Areas

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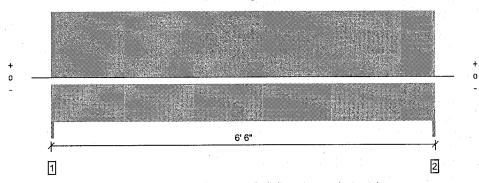
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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

Forte Software Operator	Job Notes
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1 piece(s) 4 x 8 Douglas Fir-Larch No. 2

Overall Length: 6' 6"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	775 @ 0	3281 (1.50")	Passed (24%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	601 @ 8 3/4"	3502	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1259 @ 3' 3"	3438	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.023 @ 3' 3"	0.217	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.054 @ 3' 3"	0.313	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

• Deflection criteria: LL (L/360) and TL (5/16").

- \cdot Top Edge Bracing (Lu): Top compression edge must be braced at 6' 6" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 6" o/c unless detailed otherwise.
- · Applicable calculations are based on NDS.

and the state of t		Bearing Ler	igth	Load	s to Suppoi	ts (lbs)	
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - SPF	1.50"	1.50"	1.50"	450	325	775	None
2 - Trimmer - SPF	1.50"	1.50"	1.50"	450	325	775	None

Loads	Location (Side)	Tributary Width	Dead (0,90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 6"	N/A	6.4		
1 - Uniform (PSF)	0 to 6' 6"	4'	18.0	25.0	Roof snow load
2 - Uniform (PSF)	0 to 6' 6"	5'	12.0	-	Wall load

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SUSTAINABLE FORESTRY INITIATIVE

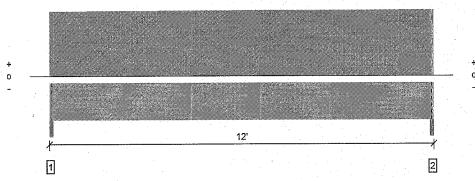
System.: Wall Member Type: Header Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

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Forte Software Operator	Job Notes	
Larry Johnson Johnson Structural Engineering (406) 585-2939 larry@johnsonengineer.com		***************************************
Tally (a) Control of the Control		

1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam

Overall Length: 12'

Level, Floor: Flush Beam - FB1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2747 @ 11' 11 1/2"	7150 (2.00")	Passed (38%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2267 @ 10' 11 1/2"	11733	Passed (19%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	8097 @ 6' 1/8"	23244	Passed (35%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.092 @ 6'	0.397	Passed (L/999+)		1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.217 @ 6'	0.596	Passed (L/660)		1.0 D + 0.75 L + 0.75 S (All Spans)

System: Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' o/c unless detailed otherwise.
- · Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' o/c unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length $L=11'\ 11''$.
- · The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- · Applicable calculations are based on NDS.

		Bearing Len	igth		Loads to S	upports (lb	s)	305 ⁻⁷⁷⁰
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Column - SPF	2.00"	2.00"	1.50"	1572	639	901	3112	Blocking
2 - Column - SPF	2.00"	2.00"	1.50"	1584	801	749	3134	Blocking

Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12'	N/A	14.0			
1 - Tapered (PSF)	0 to 12' (Front)	2' to 4'	12.0	40.0	-	Residential - Living Areas
2 - Tapered (PSF)	0 to 12' (Top)	8' to 11'	12.0	-	-	Wall load
3 - Tapered (PSF)	0 to 12' (Top)	7' to 4'	18.0	-	25.0	Roof snow load

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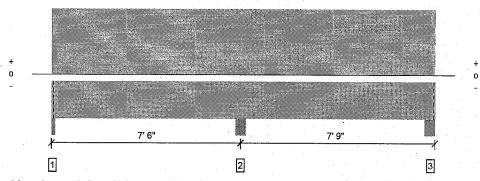
The product application, Input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

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Forte Software Operator	Job Notes	
Larry Johnson		
Johnson Structural Engineering		
(406) 585-2939		
larry@johnsonengineer.com	*	

1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam

Overall Length: 15' 3"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4398 @ 7' 6"	19663 (5.50")	Passed (22%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1556 @ 6' 4 3/4"	10203	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Pos Moment (Ft-lbs)	1932 @ 3' 1/8"	20213	Passed (10%)	1.00	1.0 D + 1.0 L (Alt Spans)
Neg Moment (Ft-lbs)	-3029 @ 7' 6"	15580	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.009 @ 3' 6 7/16"	0.249	Passed (L/999+)		1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.018 @ 3' 4 1/2"	0.373	Passed (L/999+)		1.0 D + 0.75 L + 0.75 S (Alt Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 15' 3" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 3" o/c unless detailed otherwise.
- \bullet Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 5' 11 1/4".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length $L=3^{\circ}$ 8 5/8".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- · Applicable calculations are based on NDS.

ender E		Bearing Length			Loads to St			
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Column - SPF	2.00"	2.00"	1.50"	791	529/-74	307	1627/-74	Blocking
2 - Column - SPF	5.50"	5.50"	1.50"	2585	1488	930	5003	None
3 - Column - SPF	5.50"	5.50"	1.50"	865	573/-75	334	1772/-75	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 3"	N/A	14.0			
1 - Uniform (PSF)	0 to 15' 3" (Front)	4'	12.0	40.0	· · · · · ·	Residential - Living Areas
2 - Uniform (PSF)	0 to 15' 3" (Top)	12'	12.0	-		Wall load
3 - Uniform (PSF)	0 to 15' 3" (Top)	4'	18.0	-	25.0	Roof snow load

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

System: Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

Forte Software Operator	Job Notes		1
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Johnson Structural Engineering, Inc. 440 North Grand Ave. Bozeman, MT 59715

SHEET

PROJECT:

Banbury - SFR Addition Mercer Island, WA

JN 19-446

FOOTING DESIGN F2.0			
ITEM VALUE	NOTES	FB1a Column	
Soils Bearing Capacity	1500 psf	Post Area Req'd, Full @ .73*	
Uplift, U =	0 lbs	DF2 Beam 7.58 10.39 in^2	
Footing Load P =	4739 lbs	HF2 Beam 11.70 16.03 in^2	
Footing Depth D =	8 in	Post = 6 X 6	
Post Dimensions b=	5.50 in	Area Provided = 30.25 in^2	
w=	5.50 in	Contact Pressure 157 psi	
Approximate Bearing B =	1480 psf	(Footing wt removed)	
Estimated Area A =	3.20 sf	(P / B)	
Estimated base Be =	1.79 Ft	(Sq. Root of A)	
Trial Footing Base b =	2.00 Ft		
Footing Weight =	387 lbs	UPLIFT OKAY	
Total Load Pt =	5.14 Kips	(P + Conc. Wt.)	
Allowable Bearing =	1.50 ksf		
Actual bearing q =	1.28 ksf	OKAY (Pt / b^2)	
Bending Moment M =	0.36 K-ft	(q *(b- 0.5)^2 /8)	
Embedment Depth d =	5 in	(D - 3")	
Min Stl Area Amin =	0.05 in^2/ft	(M*12/(Fb*0.875*d))	
Reinforcing Bar Size (#) = USE 2'-0" x 2'-0" x 8" w /	4 2 - #4's	E.W.	

SHEET

PROJECT:

Banbury - SFR Addition Mercer Island, WA

JN 19-446

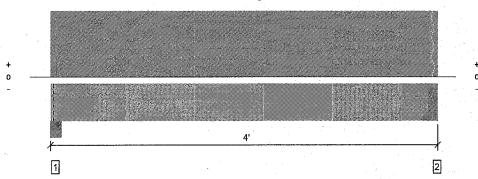
FOOTING DESIGN F2.0		
ITEM VALUE	NOTES	FB1a Column
Soils Bearing Capacity	1500 psf	Post Area Reg'd, Full @ .73*
Uplift, U =	0 lbs	DF2 Beam 8.00 10.97 in^2
Footing Load P =	5003 lbs	HF2 Beam 12.35 16.92 in^2
Footing Depth D =	8 in	Post = 6 X 6
Post Dimensions b=	5.50 in	Area Provided = 30.25 in^2
w=	5.50 in	Contact Pressure 165 psi
Approximate Bearing B =	1480 psf	(Footing wt removed)
Estimated Area A =	3.38 sf	(P / B)
Estimated base Be =	1.84 Ft	(Sq. Root of A)
Trial Footing Base b =	2.00 Ft	
Footing Weight =	387 lbs	UPLIFT OKAY
Total Load Pt =	5.40 Kips	(P + Conc. Wt.)
Allowable Bearing =	1.50 ksf	
Actual bearing q =	1.35 ksf	OKAY (Pt / b^2)
Bending Moment M =	0.38 K-ft	(q *(b- 0.5)^2 /8)
Embedment Depth d =	5 in	(D - 3")
Min Stl Area Amin =	0.05 in^2/ft	(M*12/(Fb*0.875*d))
Reinforcing Bar Size (#) =	4	<u></u>
USE 2'-0" x 2'-0" x 8" w /	2 - #4's	E.VV.

Johnson Structural Engineering, Inc. 152 W. Short St.	Project: Banbury - SFR Add Hear
Bozeman, MT 59715	Job No.: 19-946
(406) 585-2939 phone	Date: 2-5-/9
larry@johnsonengineering.com	Sheet No.: 13
6 East Floor beam-FBZ	
5pan = 4	FBI Rpc = 3/34*
floor brub =1	FBZR+ - 1748#
wall height = 8	4882 + G1g
100 f fnib =15,5'	USE 21x2x84 Ft g
Use 4×10 PoTo	A CALLER OF THE STATE OF THE ST
	The state of the s
F. West Floor beam-FB3	
span = 8	FB3 R-L= 5727
floor tock = 1	FB1a (2+1 = 1772
ded trub = 1 = 8	7497#
wall ht = 8'	USL 2'-6'x2-6'x8" ff49
roof trib = 15.5, , , ,	Principal Community Commun
Use 5/2x 10/2 24F	-146LB <
3. Rech Hoor joist-FJZ	
5pan -4579	
UZ ZXIDHF#1 P.T @	2/6 o.c. + + + + +
7. Dech floor beam West-FB4	FB4a
Span : 8.5 Uled = .08(13x14-15	50/2 Span=13-6"
span : 8.5 Lled = .08(13x14-15)	Foli Span=13-6" Floor this=3=4"
Use 6x 10 PTF HI	=#2 USE 6×10 P.T. HF #2
0. Spiral stairmay 77(452)x15 x (40+20) = 1990# = 3000	2pgn=15' FB46
	Ploor trib. = 4 +6 2' 02x
7 (= 1x LS x (40+20) - 1990 + 3000	5TU Hoor tonlo -21 6'1111
	FL Floor Endlo -2' 6' CXCI.
	The same of the sa

j.

1 piece(s) 4 x 10 Hem-Fir No. 2

Overall Length: 4'



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1370 @ 3' 10 1/2"	2126 (1.50")	Passed (64%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	766 @ 3' 1 1/4"	3723	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1199 @ 2' 1 1/2"	4879	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.004 @ 2' 1 1/2"	0.117	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.009 @ 2' 1 1/2"	0.175	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System : Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 3' 11" o/c unless detailed otherwise.
- · Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 3' 11" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

1.50 September 1990		Bearing Ler	igth		Loads to S	upports (lb) Series (Series Series	
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Column - SPF	6.00"	6.00"	1.50"	840	85	823	1748	Blocking
2 - Hanger on 9 1/4" SPF beam	1.50"	Hanger ¹	1.50"	740	75	727	1542	See note 1

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

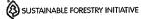
Connector: Simpson Strong	g-Tie Connectors	11.				200
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
2 - Face Mount Hanger	LUS410	2.00"	N/A	8-16d	6-16d	None

Loads	Location (Side)	Tributary Width	Dead (0,90)	Floor Live (1,00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 10 1/2"	N/A	8.2			
1 - Uniform (PSF)	0 to 4' (Front)	1'	12.0	40.0	<u> </u>	Residential - Living Areas
2 - Uniform (PSF)	0 to 4' (Top)	8'	12.0	-	-	Wall load
3 - Uniform (PSF)	0 to 4' (Top)	15' 6"	18.0	-	25.0	Roof snow load

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator



Forte Software Operator	Job Notes			
Larry Johnson Johnson Structural Engineering (406) 585-2939				
larry@johnsonengineer.com	•		** .	

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FOOTING DESIGN F2.0

Johnson Structural Engineering, Inc. 440 North Grand Ave. Bozeman, MT 59715

SHEET

JN 19-446

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PROJECT: Banbury - SFR Addition

Mercer Island, WA

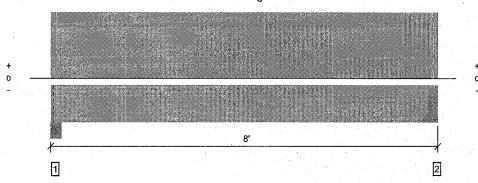
ITEM VALUE	NOTES	FB2 Column	
Soils Bearing Capacity	1500 psf	Post Area Req'd, Full @ .73*	
Uplift, U =	0 lbs	DF2 Beam 7.81 10.70 in^2	
Footing Load P =	4882 lbs	HF2 Beam 12.05 16.51 in^2	,
Footing Depth D =	8 in	Post = 6 X	6
Post Dimensions b=	5.50 in	Area Provided = 30.25 in^2	
W=	5.50 in	Contact Pressure 161 psi	
Approximate Bearing B =	1480 psf	(Footing wt removed)	
Estimated Area A =	3.30 sf	(P / B)	
Estimated base Be =	1.82 Ft	(Sq. Root of A)	
Trial Footing Base b =	2.00 Ft		
Footing Weight =	387 lbs	UPLIFT OKAY	
Total Load Pt =	5.28 Kips	(P + Conc. Wt.)	
Allowable Bearing =	1.50 ksf		
Actual bearing q =	1.32 ksf	OKAY (Pt / b^2)	
Bending Moment M =	0.37 K-ft	(q *(b- 0.5)^2 /8)	
Embedment Depth d =	5 in	(D - 3")	
Min Stl Area Amin =	0.05 in^2/ft	(M*12/(Fb*0.875*d))	
Reinforcing Bar Size (#) =	4		41.1
USE 2'-0" x 2'-0" x 8" w /	2 - #4's	E.W.	

System: Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

1 piece(s) 5 1/2" x 10 1/2" 24F-V4 DF Glulam

Overall Length: 8'



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4356 @ 7' 10 1/2"	5363 (1.50")	Passed (81%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	3340 @ 7'	11733	Passed (28%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Pos Moment (Ft-lbs)	8168 @ 4' 1 1/2"	23244	Passed (35%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.051 @ 4' 1 1/2"	0.250	Passed (L/999+)	-	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.087 @ 4' 1 1/2"	0.375	Passed (L/999+)	ł	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 7' 11" o/c unless detailed otherwise.
- · Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 7' 11" o/c unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 7' 6".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- · Applicable calculations are based on NDS.

Supports	Total	Bearing Len	gth Required	Dead	Loads to S Floor Live	upports (lb Snow	s) Total	Accessories
1 - Column - SPF	6.00"	6.00"	1.50"	1984	2145	1598	5727	Blocking
2 - Hanger on 10 1/2" SPF beam	1.50"	Hanger ¹	1.50"	1862	2015	1502	5379	See note 1

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- 1 See Connector grid below for additional information and/or requirements.

Connector: Simpson Stron Support	g-Tie Connectors Model	Seat Length	Top Nails	Face Nails	Member Nails Accessorie	a 5
2 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

Loads	Location (Side)	Tributary Width	Dead (0.90)	Figor Live (1,00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 10 1/2"	N/A	14.0			
1 - Uniform (PSF)	0 to 8' (Front)	1'	12.0	40.0		Residential - Living Areas
2 - Uniform (PSF)	0 to 8' (Top)	8'	12.0	-	-	Wall load
3 - Uniform (PSF)	0 to 8' (Top)	15' 6"	18.0	- ' '	25.0	Roof snow load
4 - Uniform (PSF)	0 to 8' (Back)	8'	10.0	60.0	-	Deck floor load

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job	Notes				
Larry Johnson Johnson Structural Engineering						
(406) 585-2939 larry@johnsonengineer.com						

PROJECT:

Johnson Structural Engineering, Inc. 440 North Grand Ave. Bozeman, MT 59715

SHEET

Banbury - SFR Addition

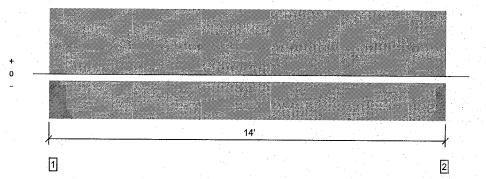
Mercer Island, WA

JN 19-446

	Wichool Iolai	101 V V V
FOOTING DESIGN F2.5 ITEM VALUE	NOTES	FB1a end + FB3 Column
Soils Bearing Capacity	1500 psf	Post Area Req'd, Full @ .73*
Uplift, U ≐	0 lbs	DF2 Beam 12.00 16.44 in^2
Footing Load P =	7499 lbs	HF2 Beam 18.52 25.36 in^2
Footing Depth D =	8 in	Post = 6 X 6
Post Dimensions b=	5.50 in	Area Provided = 30.25 in^2
w=	5.50 in	Contact Pressure 248 psi
Approximate Bearing B =	1480 psf	(Footing wt removed)
Estimated Area A =	5.07 sf	
Estimated base Be =	2.25 Ft	
Trial Footing base =	2.50 Ft	
Footing Weight =	604 lbs	UPLIFT OKAY
Total Load Pt =	8.12 Kips	
Allowable Bearing =	1.50 ksf	
Actual bearing q =	1.30 ksf	OKAY
Bending Moment M =	0.65 K-ft	
Embedment Depth d =	5 in	
Min Stl Area Amin =	0.09 in^2/ft	
Reinforcing Bar Size (#) =	4	
USE 2'-6" x 2'-6" x 8" w /	3 - #4's	E.W.

1 piece(s) 2 x 10 Hem-Fir No. 1 @ 16" OC

Overall Length: 14'



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	626 @ 5 1/2"	911 (1.50")	Passed (69%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	554 @ 1' 2 3/4"	1388	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-Ibs)	2100 @ 7' 2"	2199	Passed (96%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.393 @ 7' 2"	0.447	Passed (L/410)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.459 @ 7' 2"	0.671	Passed (L/351)		1.0 D + 1.0 L (Ali Spans)
TJ-Pro™ Rating	N/A	N/A			

Member Type: Joist Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

System: Floor

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 11" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 5" o/c unless detailed otherwise.
- $\boldsymbol{\cdot}$ A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- · No composite action between deck and joist was considered in analysis.

ich Germann ge		Bearing Ler	igth	Load	s to Supper	ts (lbs)	Zuren Staat
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Hanger on 9 1/4" SPF beam	5.50"	Hanger ¹	1.50"	96	573	669	See note 1
2 - Hanger on 9 1/4" SPF beam	1.50"	Hanger ¹	1.50"	91	547	638	See note 1

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- 1 See Connector grid below for additional information and/or requirements.

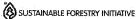
Connector: Simpson Stron	g-Tie Connectors					100 pt
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Face Mount Hanger	LU28	1.50"	N/A	8-10d	6-10dx1.5	None
2 - Face Mount Hanger	LU28	1.50"	N/A	8-10d	6-10dx1.5	None

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 14'	16"	10.0	60.0	Deck floor load

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

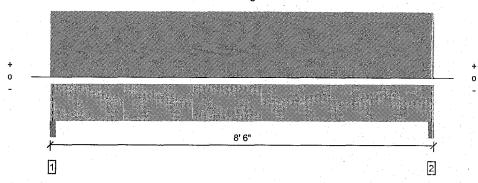


Forte Software Operator	J	lob Notes				
Larry Johnson Johnson Structural Engineering						
(406) 585-2939 larry@johnsonengineer.com						

Level, Floor: Flush Beam - FB4

1 piece(s) 6 x 10 Hem-Fir No. 2

Overall Length: 8' 6"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2139 @ 1 1/2"	6683 (3.00")	Passed (32%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1615 @ 1' 1/2"	4877	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4281 @ 4' 3"	4654	Passed (92%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.101 @ 4' 3"	0.275	Passed (L/978)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.121 @ 4' 3"	0.412	Passed (L/816)		1.0 D + 1.0 L (All Spans)

System : Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 6" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 8' 6" o/c unless detailed otherwise.
- · Applicable calculations are based on NDS.

		Bearing Ler	igth	Load	s to Suppor	ts (lbs)	
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - SPF	3.00"	3.00"	1.50"	354	1785	2139	Blocking
2 - Beam - SPF	3.00"	3.00"	1.50"	354	1785	2139	Blocking

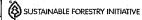
· Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

1 - Uniform (PSF)	0 to 8' 6" (Back)	7'	10.0	60.0	Deck floor load
0 - Self Weight (PLF)	0 to 8' 6"	N/A	13.2		
Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1,00)	Comments

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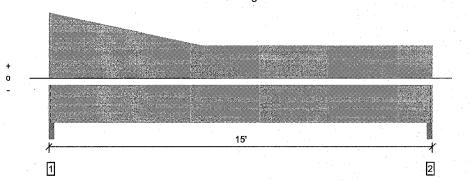
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator



Forte Softwere Operator	Job N	lotes				
Larry Johnson Johnson Structural Engineering (406) 585-2939 larry@johnsonengineer.com						
					- 1	

1 piece(s) 6 x 10 Hem-Fir No. 2

Overall Length: 15'



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1516 @ 1 1/2"	6683 (3.00")	Passed (23%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1223 @ 1' 1/2"	4877	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4571 @ 7' 1 13/16"	4654	Passed (98%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.330 @ 7' 4 7/8"	0.492	Passed (L/536)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.418 @ 7' 4 15/16"	0.738	Passed (L/424)		1.0 D + 1.0 L (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 15' o/c unless detailed otherwise.
- · Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

		Bearing Ler	igth	Load	s to Suppor	ts (lbs)		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessorie	26
1 - Column - SPF	3.00"	3.00"	1,50"	302	1214	1516	Blocking	
2 - Beam - SPF	3.00"	3.00"	1.50"	257	946	1203	Blocking	

Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0:90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 15'	N/A	13.2	1.0	
1 - Tapered (PSF)	0 to 6' (Back)	4' to 2'	10.0	60.0	Deck floor load
2 - Tapered (PSF)	6' to 15' (Back)	2'	10.0	60.0	Deck floor load

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC ES under technical reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

System: Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

Forte Software Operator	Job Notes
Larry Johnson Johnson Structural Engineering (406) 585-2939 larry@johnsonengineer.com	

PASSED

			engana pal
		properties (12 pt)	
27 June 20 June 1990	13' 6"	A THE STATE OF THE	
1			[2]

All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1949 @ 13' 4 1/2"	3898 (1.75")	Passed (50%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1674 @ 1' 1/2"	4877	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6435 @ 6' 9"	7239	Passed (89%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.362 @ 6' 9"	0.442	Passed (L/439)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.442 @ 6' 9"	0.663	Passed (L/359)		1.0 D + 1.0 L (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 5" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 5" o/c unless detailed otherwise.
- · Applicable calculations are based on NDS.

C-12 (2-3) P. (4-3)		Bearing Ler	igth	Load	s to Suppoi	ts (lbs)	and the second
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - SPF	3.00"	3.00"	1.50"	359	1620	1979	Blocking
2 - Beam - SPF	3.00"	1.75"	1.50"	358	1620	1978	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

	115000	Tributary	Dead	Floor Live	
Loads	Location (Side)	Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 13' 4 3/4"	N/A	13.2		
1 - Uniform (PSF)	0 to 13' 6" (Top)	41	10.0	60.0	Deck floor load

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC ES under technical reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

System: Floor

Member Type: Flush Beam Building Use: Residential Building Code: IBC 2015 Design Methodology: ASD

Forte Software Operator	Job Notes		
Larry Johnson Johnson Structural Engineering (406) 585-2939 larry@johnsonengineer.com			

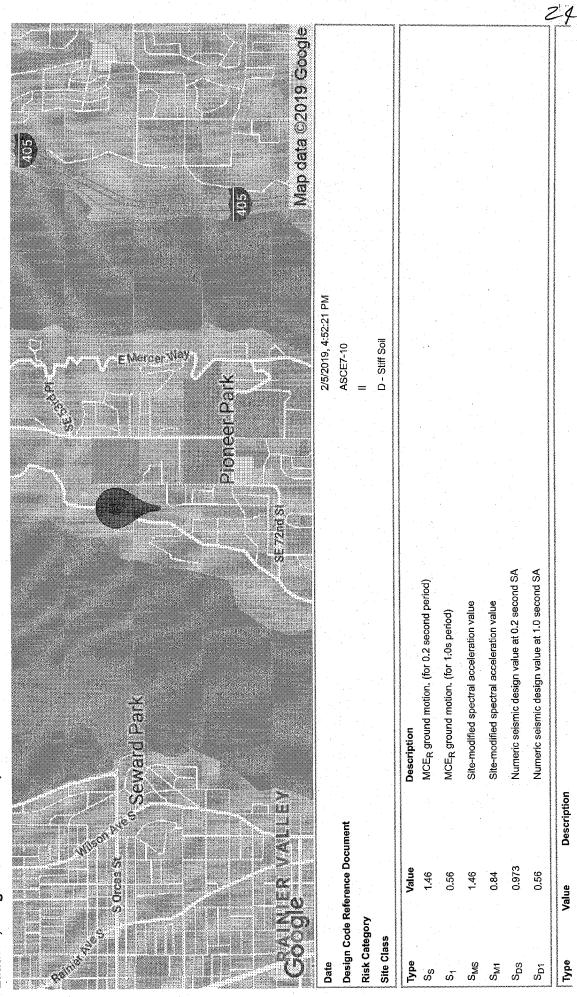
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Banbury - SFR Addition

8275 SE 61st St, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5476169, -122.2296883999999



SHEET

PROJECT LOCATION:

Banbury - SFR Addition

JN 19-446

Bozeman, MT

SEISMIC LOADING CALCULATIONS PER ASCE 7-10

STRUC CATEGORY =

TABLE 1.5-1

IMPORTANCE, I =

1.00

TABLE 1.5-2

DETERMINE FREQUENCY OF STRUCTURE

SOIL PROFILE

D

'D' IF UNKNOWN

Ss S1 1.460 0.560 Fa Fv 1.000 1.500

FROM USGS HAZARDS, ZIPCODE DIRECTORY

Sms = Fa*Ss =

1.460

0.560

Sm1 = Fv*S1 =

0.840

Sds = 2/3 Sms =

0.973 g

Sd1 = 2/3 Sm1 =

g

SEISMIC DESIGN CATEGORY

PER SHORT PERIOD RESPONSE

PER 1-SEC PERIOD RESPONSE

D TABLE 9.4.2.1a

D

USE MAXIMUM SEISMIC DESIGN CATEGORY

D

RESPONSE SPECTRUM

To = .2Sd1 / Sds =

0.115

Ts = Sd1 / Sds =

0.575

EQN 9.5.5.3.2

APPROXIMATE PERIOD

Cu = 1.40

PEROXIMATE PERIOD

0.020

 $Ta = Ct*hn^x$

0.210 SEC

x = hn = hridge =

Ct =

0.75 23.0

FT

T' I STHE UPPER LIMIT FOR THE STRUCTURE'S PERIOD

FUNDAMENTAL PERIOD

T = Cu * Ta

0.294 SEC

STRUCTURE FREQUENCY (f) IS THE INVERSE OF 'Ta'

f =

4.76

Hz

RIGID

STRUCTURE

COMMENTARY TO SECTION 6 OFFERS AN ALTERNATIVE METHOD FOR ESTIMATING IF THE STRUCTURE IS RIGID -

IF h / LEAST WIDTH, B OR L, IS < 4.0, STRUCTURE IS DEEMED RIGID

C6.2

h = 23.0 FT heave = 16.0 FT hmn = 19.5 FT

19.5 FT 66.0 FT 27.0 FT EAVE MEAN

RIDGE

WIDTH OF STRUCTURE DEPTH OF STRUCTURE

B =

L=

SHEET

PROJECT LOCATION:

Banbury - SFR Addition Bozeman, MT

JN 19-446

Dozeman, w

SEISMIC LOADING CALCULATIONS PER ASCE 7-10

h / LEAST WIDTH =

0.85

RIGID

EQUIVALENT LATERAL FORCE PROCEDURE

V = Cs * W

Sds = 0.973 Sd1 = 0.560 I = 1.000 Sd1 = 0.210

R = **6.5** Wood Framed Shear Wall

Cs = Sds / (R/I) 0.150
Cs <= Sd1 / T (R/I) 0.410
USE MIN 0.150
Cs > 0.044 Sds I 0.043 — USE MAX
Cs > 0.5 S1 / (R/I) 0.043

Cs =

DETERMINE WEIGHT OF STRUCTURE

	PSF	HEIGHT	LENGTH	AREA	WEIGHT	
Upper Roofing @	15			343	5145	5145
2nd Level Ext Walls @	12	8	45	360	4320	2160
2nd Level Int Walls @	10	0	0	0	0	0
Lower Roofing @	15				0	. 0
2nd Level Floor @	12			190	2280	2280
			TOTAL WEIGI	HT	11745 LBS	

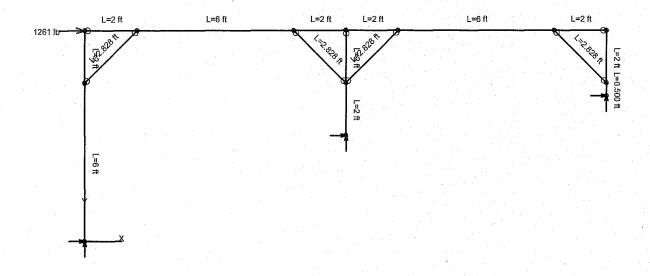
0.150

RECALL, V = Cs * W

Base shear, V =

1759 Lbs

152 W. Short St. Bozeman, MT 59715 (406) 585-2939 phone larry @johnsonengineering.com Pavel Design						ruc	:tu	ral	E I	ngi	ine	eri	ng	, Ir	ıc.]	Proj	ect:	$\underline{\mathcal{B}}$	ian	ber	<u>'S</u>	5	,F/c	2 _	A	ddo	4%	26
Date: 2-5-77 Sheet No.: 27							15										Job :	No.	• _	19	-4	46	2	-18 . ·				1,442	
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Axial Force, Fx

All Members: Max = 853 lb (M11) Min = -1731 lb (M16)

