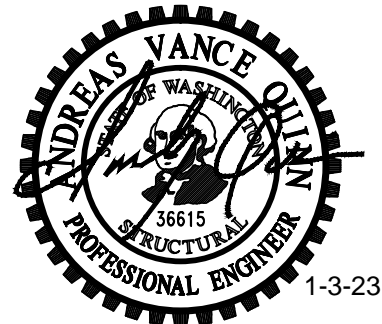


STRUCTURAL CALCULATIONS

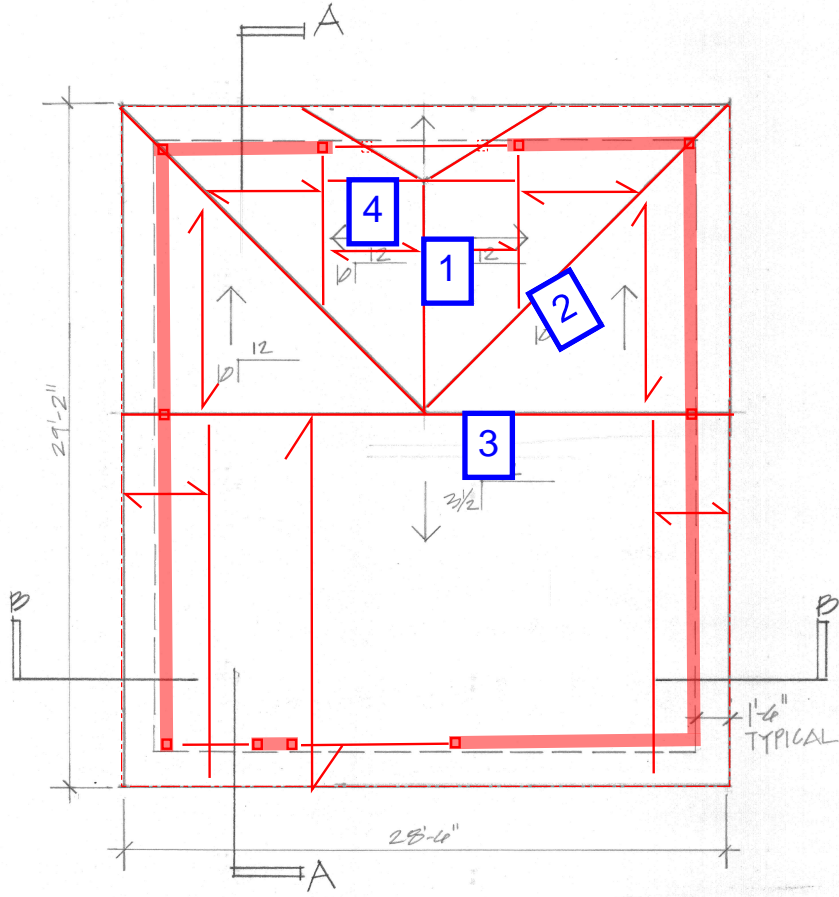
Baby Buddha Studio

Berryman Residence
5222 W. Mercer Way
Mercer Island, WA
98040

1/3/2023

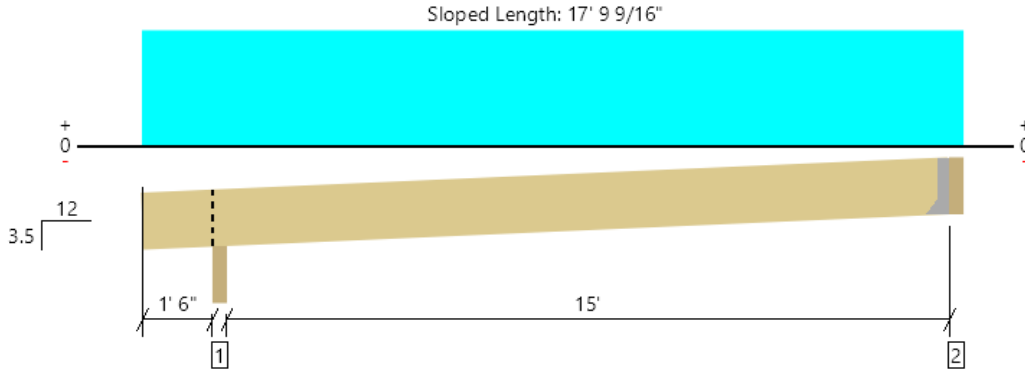


ROOF
FRAMING
KEY



ROOF PLAN
1/4" = 1'-0"

Roof, Rafter, typ
1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Member Length : 17' 9 3/16"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	610 @ 16' 9 1/2"	911 (1.50")	Passed (67%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	538 @ 2' 8 5/16"	1941	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2292 @ 9' 3 3/8"	2964	Passed (77%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.274 @ 9' 2 13/16"	0.789	Passed (L/692)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.442 @ 9' 2 7/8"	1.052	Passed (L/428)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 3.5/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Birdsmouth cut has not been analyzed.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Birdsmouth - SPF	3.50"	3.50"	1.50"	291	465	756	Blocking
2 - Hanger on 11 1/4" SPF beam	3.50"	Hanger ¹	1.50"	243	391	634	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.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 6" o/c	
Bottom Edge (Lu)	17' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
2 - Face Mount Hanger	LRU28Z	1.94"	N/A	6-10dx1.5	5-10d		

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 17' 1"	24"	15.0	25.0	Default Load

Weyerhaeuser Notes

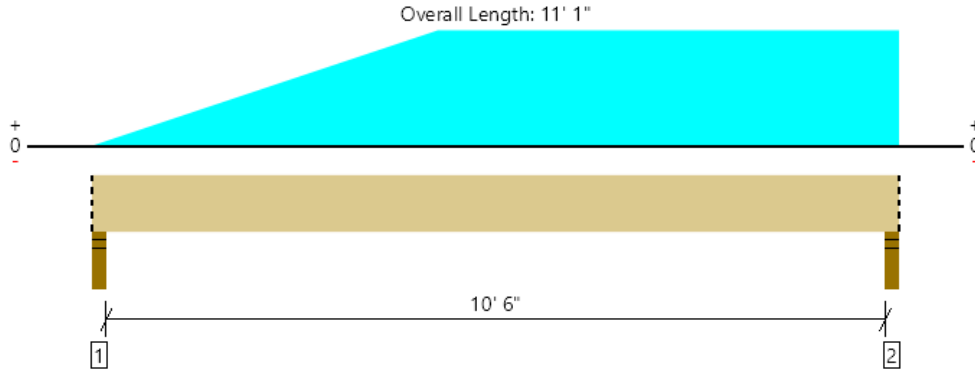
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Roof, 1/ Dormer ridge
2 piece(s) 2 x 12 HF No.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)	988 @ 10' 11"	4253 (3.50")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	757 @ 9' 10 1/4"	3881	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2428 @ 5' 10 1/8"	5155	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.064 @ 5' 7 1/2"	0.538	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.107 @ 5' 7 1/2"	0.717	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.50"	3.50"	1.50"	282	392	674	Blocking
2 - Stud wall - DF	3.50"	3.50"	1.50"	400	588	988	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 1" o/c	
Bottom Edge (Lu)	11' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 1"	N/A	8.6	--	
1 - Tapered (PSF)	0 to 4' 9" (Front)	0 to 4' 6"	15.0	25.0	Roof
2 - Uniform (PSF)	4' 9" to 11' 1" (Front)	4' 6"	15.0	25.0	Roof

Weyerhaeuser Notes

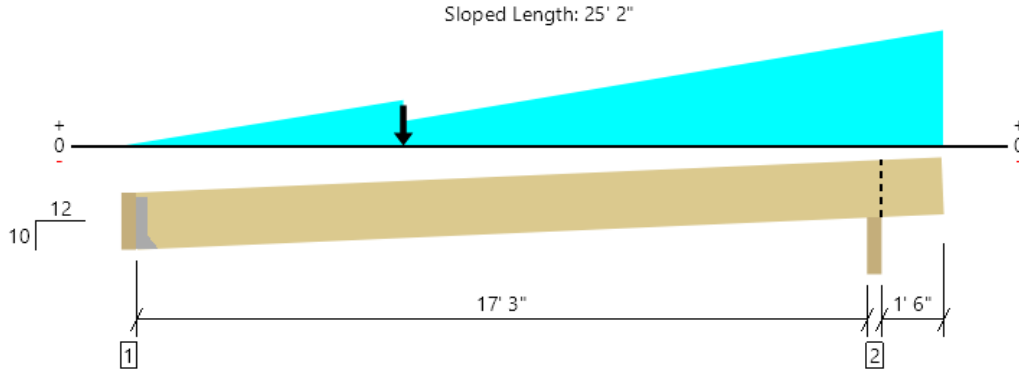
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jjaj@bcq-se.com	



Roof, 2/ Hip
1 piece(s) 6 x 12 DF No.1



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

Member Length : 25' 7"

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1775 @ 3 1/2"	5156 (1.50")	Passed (34%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	2441 @ 16' 9 11/16"	8244	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9940 @ 9' 2 7/8"	15684	Passed (63%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.440 @ 9' 7/8"	1.132	Passed (L/617)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.825 @ 9' 7/8"	1.510	Passed (L/330)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 10/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Hanger on 11 1/2" DF beam	3.50"	Hanger ¹	1.50"	852	922	1774	See note ¹
2 - Beveled Plate - DF	3.50"	3.50"	1.50"	1704	1932	3636	Blocking

- 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.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	24' 9" o/c	
Bottom Edge (Lu)	24' 9" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	U610X SLU39	2.00"	N/A	14-10d	6-10d		

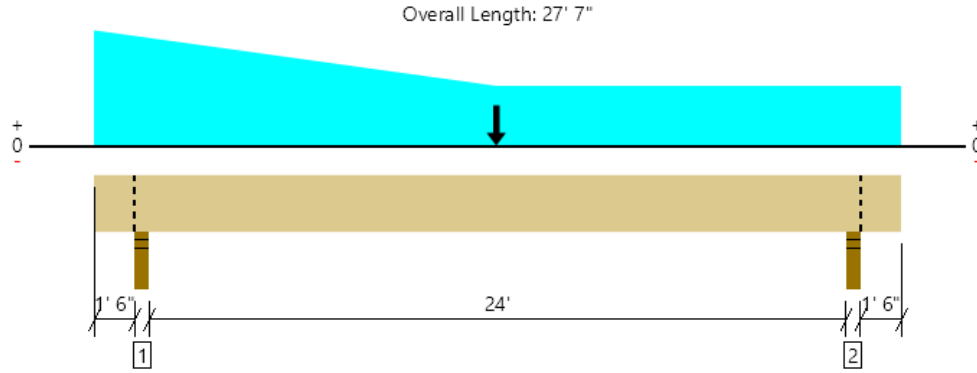
- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 19' 4"	N/A	16.0	--	
1 - Tapered (PSF)	0 to 6' 6"	0 to 2'	15.0	25.0	Roof
2 - Tapered (PSF)	6' 6" to 19' 4"	0 to 4'	15.0	25.0	Roof
3 - Tapered (PSF)	0 to 19' 4"	0 to 7'	15.0	25.0	Roof
4 - Point (lb)	6' 6"	N/A	210	350	Roof beam

FortewEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Roof, 3/ Ridge
 1 piece(s) 5 1/8" x 15" 24F-V4 DF Glulam



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)	7321 @ 1' 7 3/4"	11211 (3.50")	Passed (65%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	5594 @ 3' 1/2"	15618	Passed (36%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	40962 @ 13' 9"	42628	Passed (96%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-796 @ 1' 7 3/4"	34073	Passed (2%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.902 @ 13' 8 1/8"	1.215	Passed (L/323)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	1.561 @ 13' 8 1/4"	1.619	Passed (L/187)	--	1.0 D + 1.0 S (Alt Spans)

System : Roof
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Upward deflection on left and right cantilevers exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume factor of 0.96 that was calculated using length L = 24' 1 3/4".
- Critical negative moment adjusted by a volume factor of 1.00 that was calculated using length L = 1' 9 1/4".
- 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	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - DF	3.50"	3.50"	2.29"	3013	4308	7321	Blocking
2 - Stud wall - DF	3.50"	3.50"	1.83"	2462	3396	5858	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	15' o/c	
Bottom Edge (Lu)	27' 7" o/c	

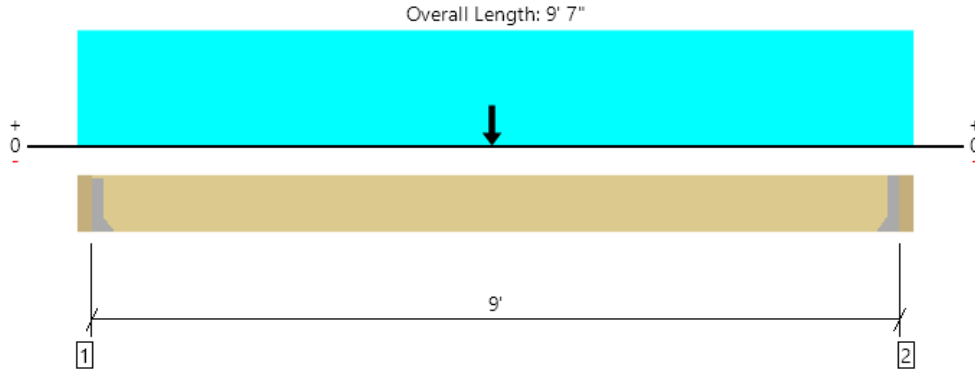
•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 27' 7"	N/A	18.7	--	
1 - Uniform (PSF)	0 to 27' 7" (Front)	7' 6"	15.0	25.0	Roof
2 - Tapered (PSF)	0 to 13' 9" (Front)	7' to 0	15.0	25.0	Roof
3 - Tapered (PSF)	13' 9" to 27' 7" (Front)	0 to 7'	-	-	Roof
4 - Point (lb)	13' 9" (Front)	N/A	282	392	Linked from: 1/ Dormer ridge, Support 1
5 - Point (lb)	13' 9" (Front)	N/A	852	922	Linked from: 2/ Hip, Support 1

Forteweb Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Roof, 4/ Drop Beam
2 piece(s) 2 x 12 HF No.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)	1064 @ 3 1/2"	1823 (1.50")	Passed (58%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	981 @ 1' 2 3/4"	3881	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3862 @ 4' 9"	5155	Passed (75%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.061 @ 4' 9 7/16"	0.450	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.103 @ 4' 9 7/16"	0.600	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Hanger on 11 1/4" HF beam	3.50"	Hanger ¹	1.50"	447	640	1087	See note ¹
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger ¹	1.50"	442	633	1075	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.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' o/c	
Bottom Edge (Lu)	9' o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	LUS28-2	2.00"	N/A	6-10d	4-10d		
2 - Face Mount Hanger	LUS28-2	2.00"	N/A	6-10d	4-10d		

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

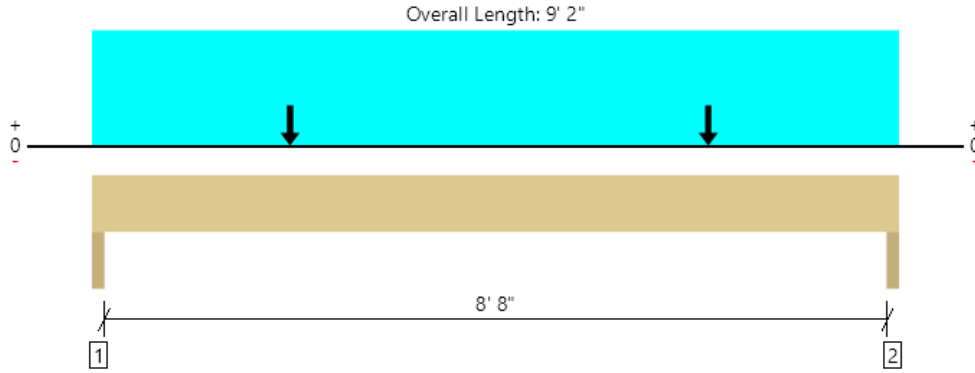
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3 1/2" to 9' 3 1/2"	N/A	8.6	--	
1 - Uniform (PSF)	0 to 9' 7" (Front)	2'	15.0	25.0	Default Load
2 - Point (lb)	4' 9" (Front)	N/A	124	206	
3 - Point (lb)	4' 9" (Top)	N/A	400	588	Linked from: 1/ Dormer ridge, Support 2

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

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Roof, Header @ dormer
3 piece(s) 2 x 8 HF No.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)	1495 @ 9' 1/2"	5468 (3.00")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1419 @ 8' 3 3/4"	3752	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3128 @ 4' 5 5/8"	3853	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.159 @ 4' 7"	0.297	Passed (L/674)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.260 @ 4' 7"	0.313	Passed (L/411)	--	1.0 D + 1.0 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.50"	577	898	1474	None
2 - Trimmer - DF	3.00"	3.00"	1.50"	584	910	1495	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 2" o/c	
Bottom Edge (Lu)	9' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 2"	N/A	8.3	--	
1 - Uniform (PSF)	0 to 9' 2"	2'	15.0	25.0	Snow
2 - Point (lb)	2' 3"	N/A	405	675	
3 - Point (lb)	7'	N/A	405	675	

Weyerhaeuser Notes

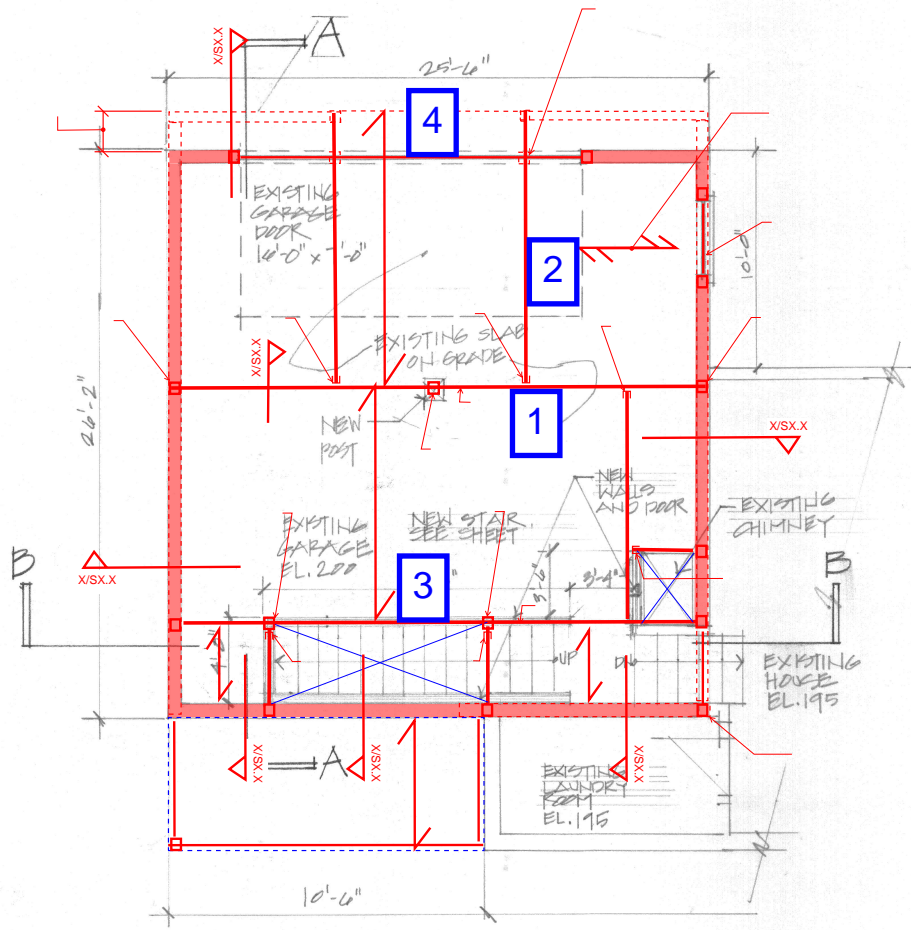
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ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	

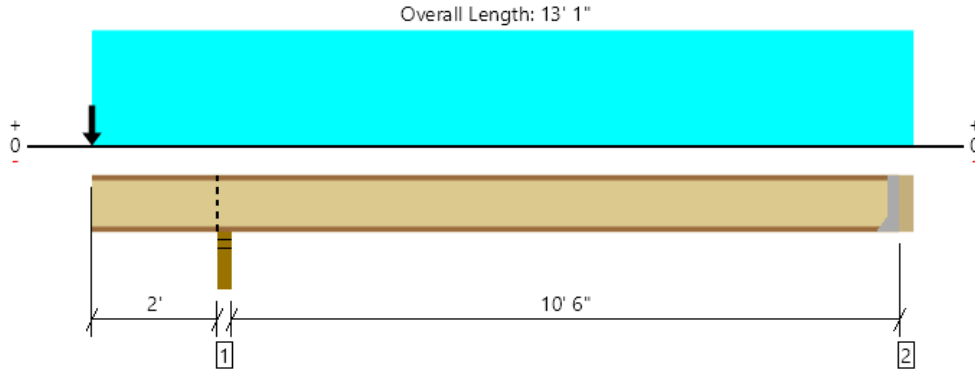


**FLOOR
FRAMING
KEY**



GARAGE PLAN
1/4" = 1'-0"

Floor, Floor: Joist
 1 piece(s) 11 7/8" TJI @ 110 @ 16" OC



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)	852 @ 2' 1 3/4"	1935 (3.50")	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	387 @ 2'	1560	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	777 @ 8' 2 1/4"	3160	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.059 @ 7' 5 5/8"	0.266	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.038 @ 0	0.215	Passed (2L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	58	40	Passed	--	--

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.50"	442	410	80	852	Blocking
2 - Hanger on 11 7/8" HF beam	3.50"	Hanger ¹	1.75" / - ²	60	299	-13	359	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.
- ² Required Bearing Length / Required Bearing Length with Web Stiffeners

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 6" o/c	
Bottom Edge (Lu)	7' o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	IUS1.81/11.88	2.00"	N/A	10-10dx1.5	2-Strong-Grip	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

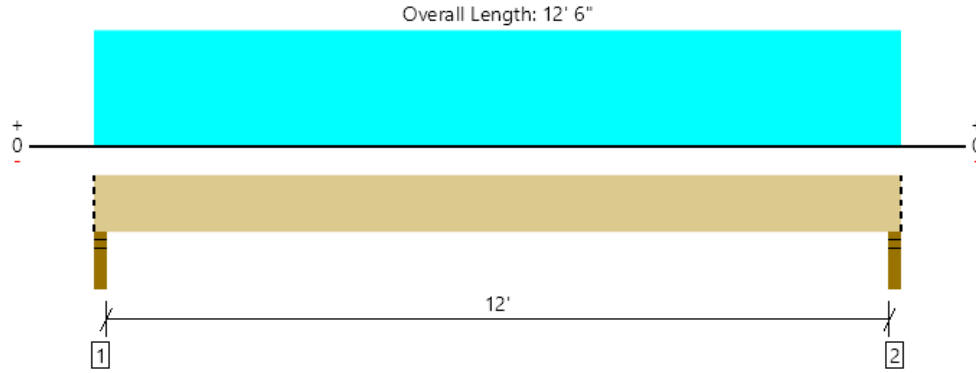
Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 13' 1"	16"	15.0	40.0	-	Default Load
2 - Point (PLF)	0	16"	30.0	-	50.0	Roof above
3 - Point (PLF)	0	16"	150.0	-	-	Wall wt above

Forteweb Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Floor, 1/ Flush Beam

1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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)	3776 @ 1 1/2"	4253 (3.00")	Passed (89%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3027 @ 1' 2 7/8"	8035	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	11334 @ 6' 3"	19902	Passed (57%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.245 @ 6' 3"	0.306	Passed (L/599)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.345 @ 6' 3"	0.613	Passed (L/426)	--	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/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.00"	3.00"	2.66"	1089	2688	3776	Blocking
2 - Stud wall - HF	3.00"	3.00"	2.66"	1089	2688	3776	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 6" o/c	
Bottom Edge (Lu)	12' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 6"	N/A	13.0	--	
1 - Uniform (PSF)	0 to 12' 6" (Front)	10' 9"	15.0	40.0	Default Load

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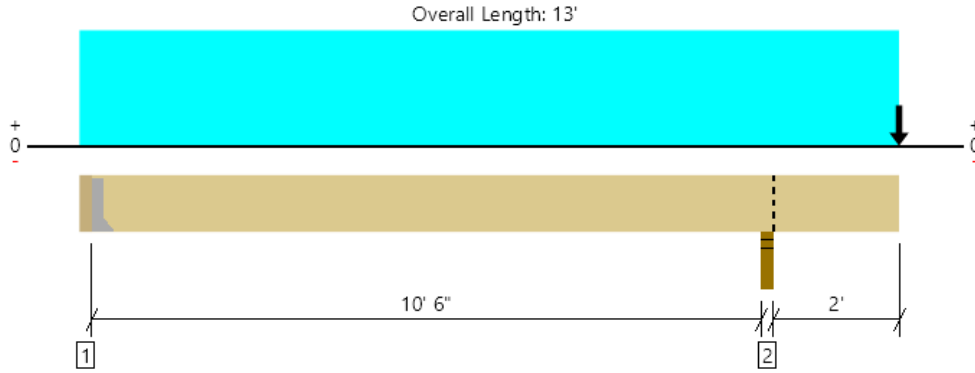
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Floor, 2/ Cantilever Beam
 1 piece(s) 3 1/2" x 11 7/8" 1.5E TimberStrand® LSL



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)	2059 @ 10' 10 1/2"	4253 (3.00")	Passed (48%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1508 @ 11' 11 7/8"	9878	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-3209 @ 10' 10 1/2"	18346	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.046 @ 13'	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.070 @ 13'	0.213	Passed (2L/734)	--	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/480) and TL (L/240).
- Overhang deflection criteria: LL (0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Hanger on 11 7/8" HF beam	3.00"	Hanger ¹	1.50"	58	297	-180	355/-122	See note ¹
2 - Stud wall - HF	3.00"	3.00"	1.50"	945	408	1078	2059	Blocking

- 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.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 9" o/c	
Bottom Edge (Lu)	12' 9" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	LUS410	2.00"	N/A	8-10dx1.5	6-10d		

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	3" to 13'	N/A	13.0	--	--	
1 - Uniform (PSF)	0 to 13' (Front)	1' 4"	15.0	40.0	-	Default Load
2 - Point (lb)	13' (Top)	N/A	577	-	898	Linked from: Header @ dormer, Support 1

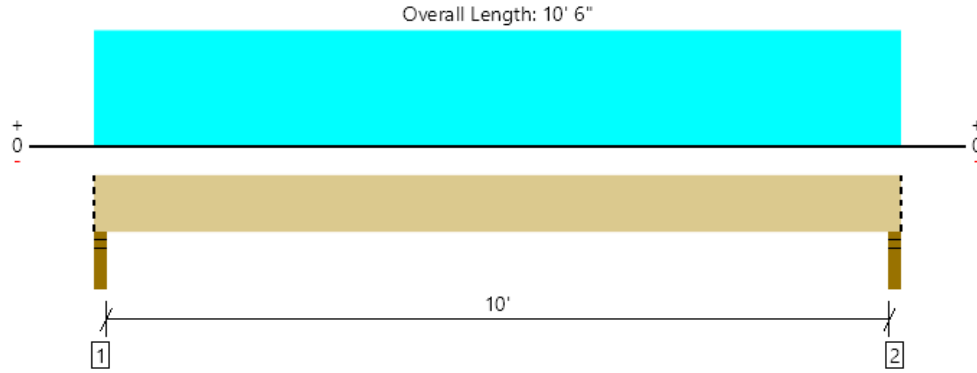
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 The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Floor, 3/ Flush Beam

1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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)	2089 @ 1 1/2"	4253 (3.00")	Passed (49%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1596 @ 1' 2 7/8"	8035	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5226 @ 5' 3"	19902	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.081 @ 5' 3"	0.256	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.116 @ 5' 3"	0.512	Passed (L/999+)	--	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/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.00"	3.00"	1.50"	619	1470	2089	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	619	1470	2089	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	13.0	--	
1 - Uniform (PSF)	0 to 10' 6" (Front)	7'	15.0	40.0	Default Load

Weyerhaeuser Notes

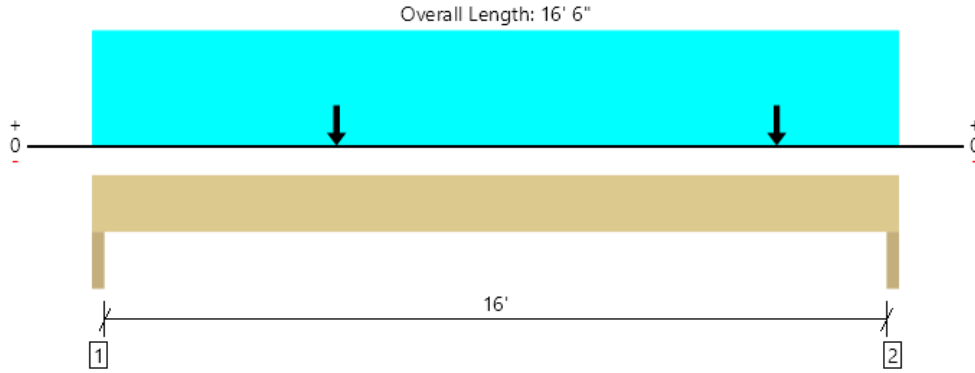
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Floor, 4/ Garage Header
 1 piece(s) 5 1/4" x 11 1/4" 2.OE Parallam® PSL



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)	5406 @ 16' 4 1/2"	9844 (3.00")	Passed (55%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4331 @ 15' 3 3/4"	11419	Passed (38%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	17906 @ 7' 8 5/8"	26955	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.474 @ 8' 2 5/16"	0.542	Passed (L/411)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.812 @ 8' 2 1/4"	0.813	Passed (L/240)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Trimmer - DF	3.00"	3.00"	1.50"	1973	2408	1325	4772	None
2 - Trimmer - DF	3.00"	3.00"	1.65"	2264	2533	1656	5406	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 6" o/c	
Bottom Edge (Lu)	16' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 6"	N/A	18.5	--	--	
1 - Uniform (PSF)	0 to 16' 6"	6' 3"	15.0	40.0	-	Floor
2 - Uniform (PSF)	0 to 16' 6"	2'	15.0	-	25.0	Snow
3 - Point (lb)	5'	N/A	945	408	1078	Linked from: 2/ Cantilever Beam, Support 2
4 - Point (lb)	14'	N/A	945	408	1078	Linked from: 2/ Cantilever Beam, Support 2

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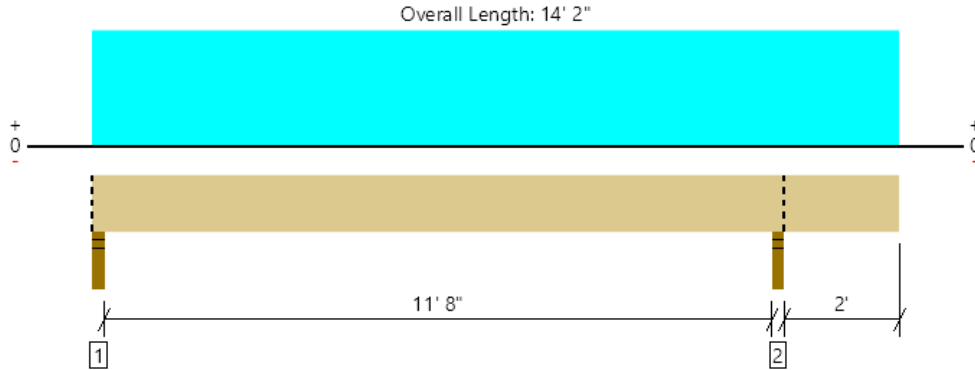
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jaj@bcq-se.com	



Floor, Deck beam
1 piece(s) 6 x 8 DF No.1



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)	2196 @ 12' 1/2"	6683 (3.00")	Passed (33%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1433 @ 11' 3 1/2"	4675	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4616 @ 6' 1/4"	5156	Passed (90%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.264 @ 6' 1"	0.298	Passed (L/542)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.380 @ 6' 3/4"	0.596	Passed (L/377)	--	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/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/480) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.00"	3.00"	1.50"	504	1095/-34	1599	Blocking
2 - Stud wall - HF	3.00"	3.00"	1.50"	707	1489	2196	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 2" o/c	
Bottom Edge (Lu)	14' 2" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 14' 2"	N/A	10.4	--	
1 - Uniform (PSF)	0 to 14' 2" (Front)	3'	25.0	60.0	Default Load

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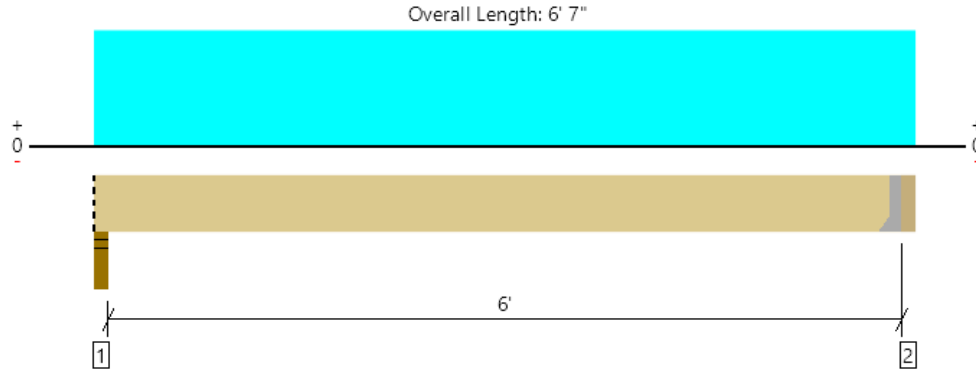
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jane Johnson Bykonen Carter Quinn (206) 264-7784 jjaj@bccq-se.com	



Floor, Deck joist
1 piece(s) 2 x 8 HF No.2 @ 16" OC



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)	345 @ 6' 3 1/2"	911 (1.50")	Passed (38%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	276 @ 5' 8 1/4"	1088	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	524 @ 3' 3"	1284	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.040 @ 3' 3"	0.152	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.056 @ 3' 3"	0.304	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- 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.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	108	260	368	Blocking
2 - Hanger on 7 1/4" HF beam	3.50"	Hanger ¹	1.50"	111	267	378	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.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 4" o/c	
Bottom Edge (Lu)	6' 4" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5		

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 6' 7"	16"	25.0	60.0	Default Load

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⚠ This is a beta release of the new ATC Hazards by Location website. Please [contact us](#) with feedback.

ℹ The ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

ATC Hazards by Location

Search Information

Address: 5222 W Mercer Way, Mercer Island, WA 98040, USA
Coordinates: 47.5561045, -122.2248269
Elevation: 199 ft
Timestamp: 2022-10-03T22:36:37.337Z
Hazard Type: Wind



ASCE 7-16

MRI 10-Year 67 mph
MRI 25-Year 73 mph
MRI 50-Year 78 mph
MRI 100-Year 83 mph
Risk Category I 92 mph
Risk Category II 97 mph
Risk Category III 104 mph
Risk Category IV 108 mph

ASCE 7-10

MRI 10-Year 72 mph
MRI 25-Year 79 mph
MRI 50-Year 85 mph
MRI 100-Year 91 mph
Risk Category I 100 mph
Risk Category II 110 mph
Risk Category III-IV 115 mph

ASCE 7-05

ASCE 7-05 Wind Speed 85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher.

NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

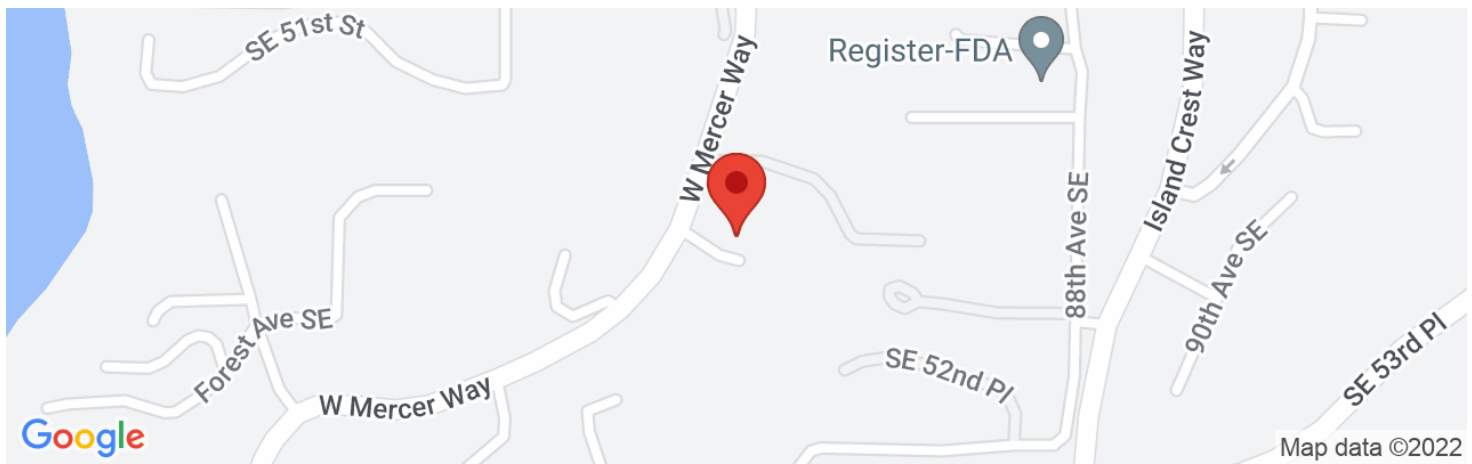
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Berryman Residence

5222 W Mercer Way, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5561045, -122.2248269



Date	10/3/2022, 3:35:26 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

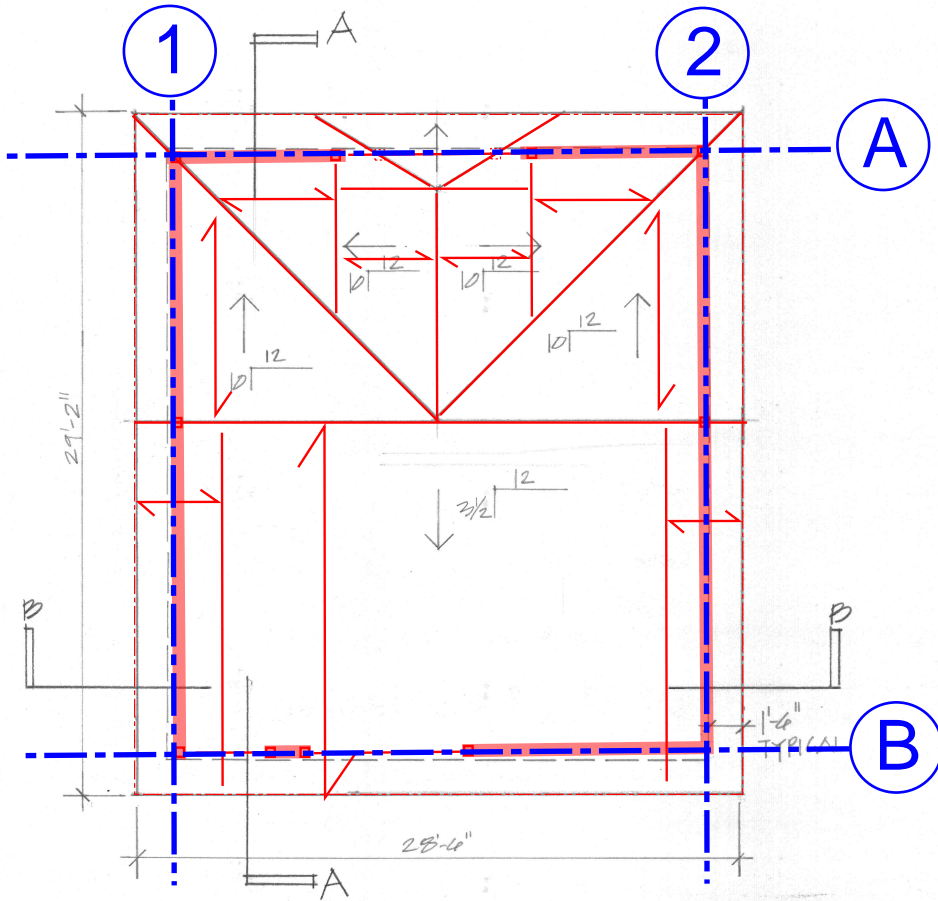
Type	Value	Description
S_S	1.448	MCE_R ground motion. (for 0.2 second period)
S_1	0.503	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.738	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.158	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.62	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.744	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
S_{sRT}	1.448	Probabilistic risk-targeted ground motion. (0.2 second)
S_{sUH}	1.605	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S_{sD}	4.087	Factored deterministic acceleration value. (0.2 second)
S_{1RT}	0.503	Probabilistic risk-targeted ground motion. (1.0 second)
S_{1UH}	0.56	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S_{1D}	1.592	Factored deterministic acceleration value. (1.0 second)
PGA_d	1.372	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.62	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.902	Mapped value of the risk coefficient at short periods
C_{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s
C_v	1.39	Vertical coefficient

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LATERAL KEY



ROOF PLAN
1/4" = 1'-0"

MASSING	Uniform Loads (PSF)		Area (SF)	Σw (k)
	ROOF	Misc 15	Partitions 6.5	834

FLOORS	Uniform Loads (PSF)		Area (SF)	Σw (k)
		Misc 15	Partitions 13	720

SEISMIC DESIGN PARAMETERS

Site Class = D $S_s = 1.448$
 Risk Cat. = II $S_1 = 0.503$
 $S_{DS} = 1.158$ $f_a = 1.20$
 $R = 6.50$ $f_v = 1.50$
 $C_s = 0.178$ $k = 1.0$

ASCE 7-16 Equivalent Lateral Force Procedure, 12.8

Level	Area (SF)	Unit DL (PSF)	w (k)	h ^k (ft)	(w)(h ^k)	C _{vx}	F _x (k)	ASD 0.7E (k)	
ROOF	834	21.5	17.9	16.3	291	62%	4.2	3.0	
FLOOR	720	28.0	20.2	8.8	176	38%	2.6	1.8	
Σ			38.1	6.8	468	100%			
Base Shear								6.8	

WIND DESIGN PARAMETERS

V (mph) = 97 $G = 0.85$ $L/B = 1.12$ $L/B = 0.89$
 Exposure Cat. = B $G_{cpi} = 0.18$ $C_p =$ Windward Wall 0.80 $C_p =$ Windward Wall 0.80
 $K_{zt} = 1.60$ $K_x = 0.98$ Leeward Wall -0.48 Leeward Wall -0.50
 $K_d = 0.85$ $q_z = 32.1$ Side Wall -0.70 Side Wall -0.70
 Roof Slope (in/ft) = 1:12 $h/L = 0.67$ Roof -0.90 -0.18 $h/L = 0.75$ Roof -0.90 -0.18

ASCE 7-16 MWFRS Directional Procedure 27.3.1

Level	h (ft)	Direction	Wall Area	K_h	q_h	Wall (PSF)	Roof (PSF)	Roof (k)	F _x (k)	06W (k)
ROOF										
HORIZONTAL PROJECTION	16.3	PARALLEL TO WL-A	105	0.62	20.3	30.0	21.5	3.1	3.2	1.9
		PARALLEL TO WL-1	94	0.62	20.3	30.5	21.5	2.7	2.9	1.7
FLOOR										
HORIZONTAL PROJECTION	8.8	PARALLEL TO WL-A	211	0.57	18.7	29.4			6.2	3.7
		PARALLEL TO WL-1	203	0.57	18.7	29.8			6.0	3.6
Base Shear - Parallel to Grid A									9.4	
Base Shear - Parallel to Grid 1									9.0	

LEVEL	0.6W	0.7E
ROOF	1.9	3.0
FLOOR	3.7	1.8

SW Height	
ROOF	6.9
FLOOR	8.1

0.6-0.14Sds=	0.44
--------------	------

1. Shear wall demands have been increased where seismic controls design and h/L is greater than 2:1 per SDPWS Table 4.3.4. Where wind controls design, shearwall demands have been decreased 40% per IBC 2306.3.

WALL LINE A

ROOF		WIND TRIB = 50%		ΣL = 16.00								
		0.6W (k) = 0.97										
		SEISMIC TRIB = 50%										
		0.7E (k) = 1.48										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
2	6.9	8.0	0.86	1.00	43	92	SW 1	240	0.6	0.44	0.2	0.5
FLOOR		WIND TRIB = 50%		ΣL = 9.00								
		0.6W (k) = 2.83										
		SEISMIC TRIB = 50%										
		0.7E (k) = 2.38										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	8.1	3.3	2.50	0.80	224	330	SW 2	355	2.1	0.44	0.1	2.1
1	8.1	5.8	1.41	1.00	224	264	SW 2	355	2.1	0.44	0.2	2.0
<i>Concrete</i>												

WALL LINE B

ROOF		WIND TRIB = 50%		ΣL = 12.00								
		0.6W (k) = 0.97										
		SEISMIC TRIB = 50%										
		0.7E (k) = 1.48										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	6.9	12.0	0.57	1.00	58	123	SW 1	240	0.8	0.44	0.4	0.7
FLOOR		WIND TRIB = 50%		ΣL = 15.00								
		0.6W (k) = 2.83										
		SEISMIC TRIB = 50%										
		0.7E (k) = 2.38										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	8.1	15.0	0.54	1.00	135	158	SW 1	240	1.3	0.44	0.5	1.0
<i>Concrete</i>												

LEVEL	0.6W	0.7E
ROOF	1.7	3.0
FLOOR	3.6	1.8

SW Height	
ROOF	6.9
FLOOR	8.1

0.6-0.14Sds=	0.44
--------------	------

1. Shear wall demands have been increased where seismic controls design and h/L is greater than 2:1 per SDPWS Table 4.3.4. Where wind controls design, shearwall demands have been decreased 40% per IBC 2306.3.

WALL LINE 1

ROOF		WIND TRIB = 50%		ΣL = 28.00									
		0.6W (k) = 0.87											
		SEISMIC TRIB = 50%											
		0.7E (k) = 1.48										Wall weight	
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)	
1	6.9	28.0	0.25	1.00	22	53	SW 1	240	0.4	0.44	0.8	0.0	
FLOOR		WIND TRIB = 50%		ΣL = 28.00									
		0.6W (k) = 2.69											
		SEISMIC TRIB = 50%											
		0.7E (k) = 2.38										Wall weight	
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)	
1	8.1	28.0	0.29	1.00	69	85	SW 1	240	0.7	0.44	1.0	0.2	
Concrete													

WALL LINE 2

ROOF		WIND TRIB = 50%		ΣL = 28.00									
		0.6W (k) = 0.87											
		SEISMIC TRIB = 50%											
		0.7E (k) = 1.48										Wall weight	
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)	
1	6.9	28.0	0.25	1.00	22	53	SW 1	240	0.4	0.44	0.8	0.0	
FLOOR		WIND TRIB = 50%		ΣL = 15.50									
		0.6W (k) = 2.69											
		SEISMIC TRIB = 50%											
		0.7E (k) = 2.38										Wall weight	
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)	
1	8.1	15.5	0.52	1.00	124	153	SW 1	240	1.2	0.44	0.6	1.0	
Concrete													



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1. Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-14
Units: Imperial units

Anchor Information:

Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.625
Effective Embedment depth, h_{ef} (inch): 5.000
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
 h_{min} (inch): 6.38
 c_{ac} (inch): 10.57
 C_{min} (inch): 1.75
 S_{min} (inch): 3.00

Base Material

Concrete: Normal-weight
Concrete thickness, h (inch): 8.00
State: Cracked
Compressive strength, f'_c (psi): 2500
 $\Psi_{c,v}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Continuous
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Recommended Anchor

Anchor Name: SET-3G - SET-3G w/ 5/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057





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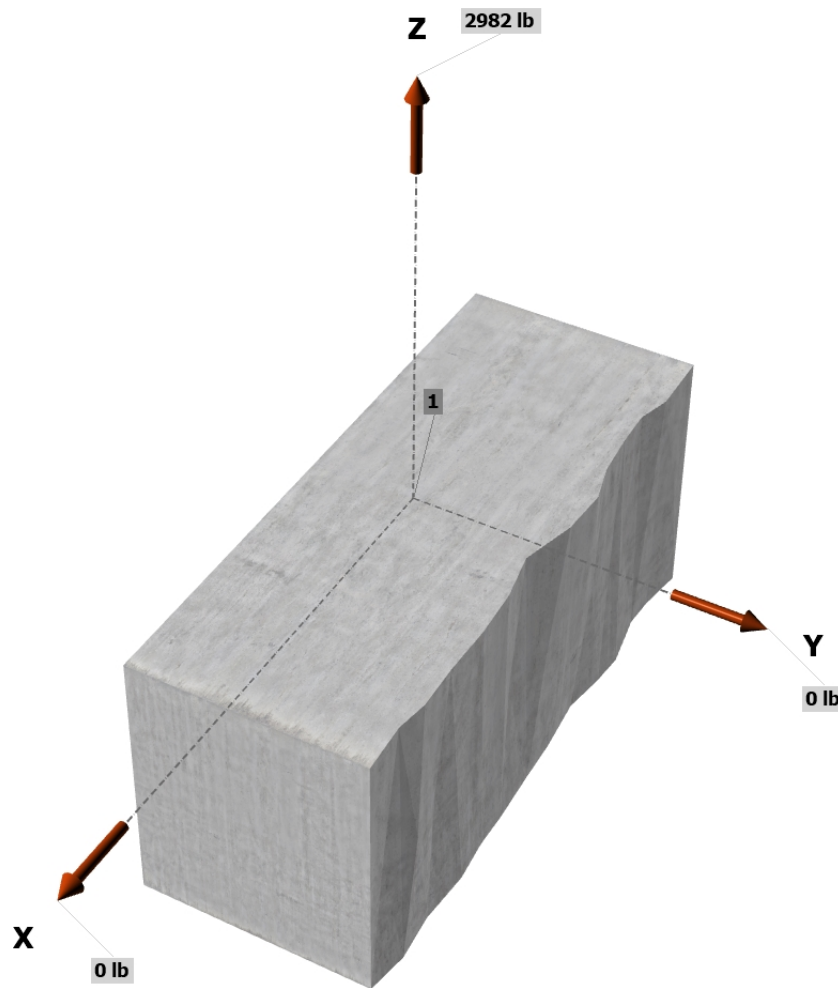
Load and Geometry

Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: No
Ductility section for tension: 17.2.3.4.2 not applicable
Ductility section for shear: 17.2.3.5.2 not applicable
 Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 2982
 V_{uax} [lb]: 0
 V_{uay} [lb]: 0

<Figure 1>

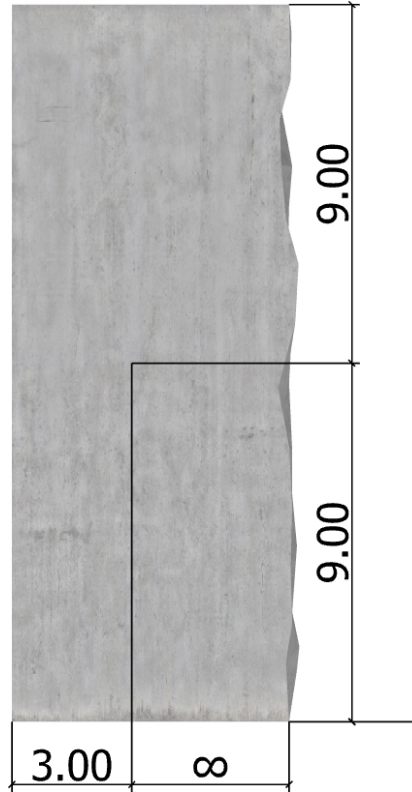


Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



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<Figure 2>





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3. Resulting Anchor Forces

Anchor	Tension load, N _{ua} (lb)	Shear load x, V _{uax} (lb)	Shear load y, V _{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	2982.0	0.0	0.0	0.0
Sum	2982.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00
 Maximum concrete compression stress (psi): 0
 Resultant tension force (lb): 2982
 Resultant compression force (lb): 0
 Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
 Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N _{sa} (lb)	φ	φN _{sa} (lb)
13110	0.75	9833

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \text{ (Eq. 17.4.2.2a)}$$

k _c	λ _a	f' _c (psi)	h _{ef} (in)	N _b (lb)
17.0	1.00	2500	5.000	9503

$$0.75 \phi N_{cb} = 0.75 \phi (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 \& Eq. 17.4.2.1a)}$$

A _{Nc} (in ²)	A _{Nco} (in ²)	c _{a,min} (in)	Ψ _{ed,N}	Ψ _{c,N}	Ψ _{cp,N}	N _b (lb)	φ	0.75 φN _{cb} (lb)
157.50	225.00	3.00	0.820	1.00	1.000	9503	0.75	3068

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

$$\tau_{k,cr} = \tau_{k,cr} f_{short-term} K_{sat} (f'_c / 2,500)^n \alpha_{N,seis}$$

τ _{k,cr} (psi)	f _{short-term}	K _{sat}	α _{N,seis}	f' _c (psi)	n	τ _{k,cr} (psi)
1356	1.00	1.00	1.00	2500	0.24	1356

$$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef} \text{ (Eq. 17.4.5.2)}$$

λ _a	τ _{cr} (psi)	d _a (in)	h _{ef} (in)	N _{ba} (lb)
1.00	1356	0.63	5.000	13312

$$0.75 \phi N_a = 0.75 \phi (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{cp,Na} N_{ba} \text{ (Sec. 17.3.1 \& Eq. 17.4.5.1a)}$$

A _{Na} (in ²)	A _{Na0} (in ²)	c _{Na} (in)	c _{a,min} (in)	Ψ _{ed,Na}	Ψ _{cp,Na}	N _{a0} (lb)	φ	0.75 φN _a (lb)
206.12	307.10	8.76	3.00	0.803	1.000	13312	0.65	3497

Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



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11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	2982	9833	0.30	Pass
Concrete breakout	2982	3068	0.97	Pass (Governs)
Adhesive	2982	3497	0.85	Pass

SET-3G w/ 5/8"Ø F1554 Gr. 36 with hef = 5.000 inch meets the selected design criteria.

12. Warnings

- Per designer input, the tensile component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor tensile force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.4.2 for tension need not be satisfied – designer to verify.
- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.5.2 for shear need not be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.