STRUCTURAL Engineering

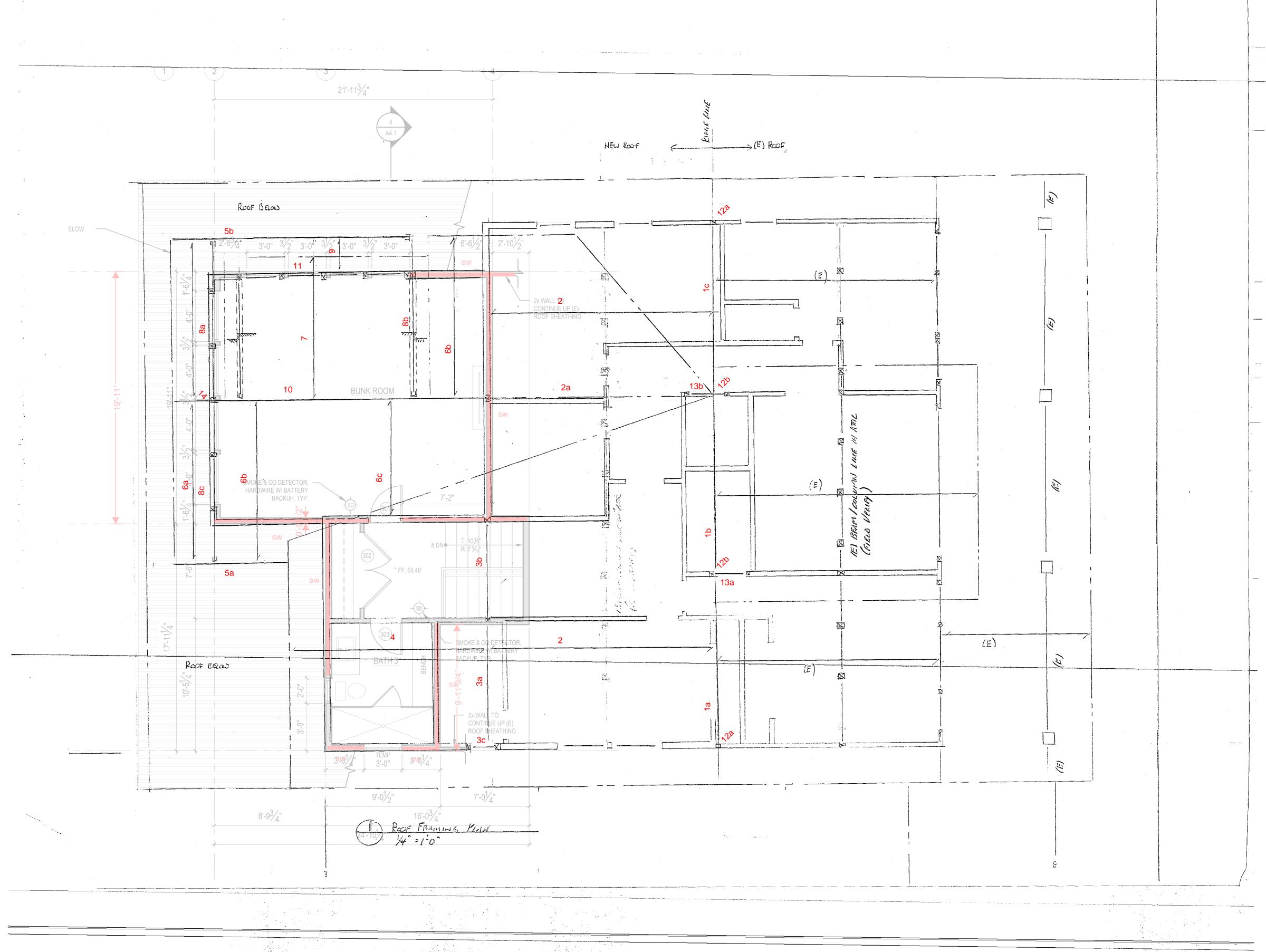
# STRUCTURAL CALCULATIONS

**Mounger Remodel** 4006 E Mercer Way Mercer Island, WA 98040

**Sturman Architects** 9-103<sup>rd</sup> AVE NE Suite 203 Bellevue, WA 98004

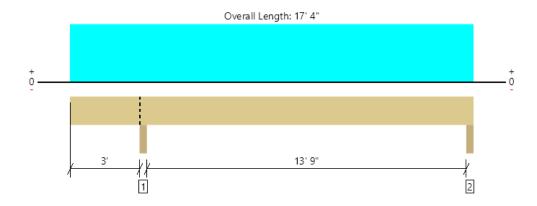
09/20/2021







# Roof Framing, Roof: Beam #1a 1 piece(s) 5 1/4" 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)	8658 @ 3' 1 3/4"	11484 (3.50")	Passed (75%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	5131 @ 4' 3 3/8"	13861	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	18787 @ 10' 4 15/16"	34332	Passed (55%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.269 @ 10' 2 5/8"	0.701	Passed (L/624)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.483 @ 10' 3"	0.935	Passed (L/348)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Column - HF	3.50"	3.50"	2.64"	3962	4696	8658	Blocking
2 - Column - HF	3.50"	3.50"	1.74"	2573	3128	5701	None

<sup>•</sup> 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)	17' 4" o/c	
Bottom Edge (Lu)	17' 4" o/c	

<sup>•</sup>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 17' 4"	N/A	19.5		
1 - Uniform (PSF)	0 to 17' 4" (Front)	17' 10 1/2"	20.0	25.0	Roof Loading

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

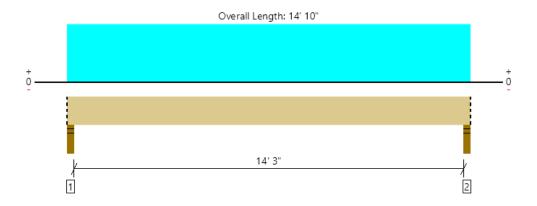
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File Name: Mounger Remodel



# Roof Framing, Roof: Beam #1b 1 piece(s) 5 1/4" 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)	6110 @ 2"	7442 (3.50")	Passed (82%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	5055 @ 1' 3 3/8"	13861	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	21652 @ 7' 5"	34332	Passed (63%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.325 @ 7' 5"	0.725	Passed (L/535)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.599 @ 7' 5"	0.967	Passed (L/290)		1.0 D + 1.0 S (All Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.87"	2796	3314	6110	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.87"	2796	3314	6110	Blocking

<sup>•</sup> 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' 10" o/c	
Bottom Edge (Lu)	14' 10" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 14' 10"	N/A	19.5		
1 - Uniform (PSF)	0 to 14' 10" (Front)	17' 10 1/2"	20.0	25.0	Roof Loading

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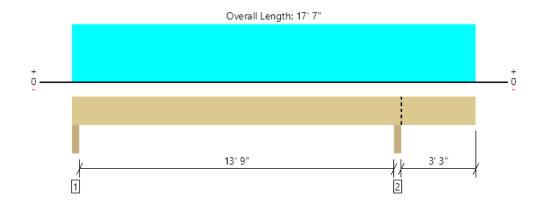
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File Name: Mounger Remodel



# Roof Framing, Roof: Beam #1c 1 piece(s) 5 1/4" 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)	8912 @ 14' 2 1/4"	11484 (3.50")	Passed (78%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	5179 @ 13' 5/8"	13861	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	18551 @ 6' 10 1/2"	34332	Passed (54%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.267 @ 7' 1 1/4"	0.701	Passed (L/631)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.476 @ 7' 13/16"	0.935	Passed (L/353)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 0/12

**PASSED** 

- 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.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.73"	2551	3115	5666	None
2 - Column - HF	3.50"	3.50"	2.72"	4078	4834	8912	Blocking

<sup>•</sup> 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)	17' 7" o/c	
Bottom Edge (Lu)	17' 7" o/c	

<sup>•</sup>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 17' 7"	N/A	19.5		
1 - Uniform (PSF)	0 to 17' 7" (Front)	17' 10 1/2"	20.0	25.0	Roof Loading

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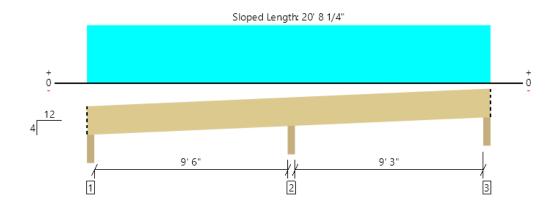
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# Roof Framing, Roof: Joist #2 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL @ 24" OC



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)	1107 @ 9' 11 1/4"	2615 (3.50")	Passed (42%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	458 @ 8' 10 1/4"	4939	Passed (9%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1063 @ 9' 11 1/4"	9540	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.021 @ 4' 7 3/8"	0.513	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.035 @ 4' 6 1/8"	0.684	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length: 21' 3/16"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	164	209	373	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	506	600	1106	None
3 - Beveled Plate - HF	3.50"	3.50"	1.50"	157	202	359	Blocking

<sup>•</sup> 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)	20' 8" o/c	
Bottom Edge (Lu)	20' 8" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.15)	Comments
1 - Uniform (PSF)	0 to 19' 7 1/2"	24"	20.0	25.0	Roof Loading

#### Weyerhaeuser Notes

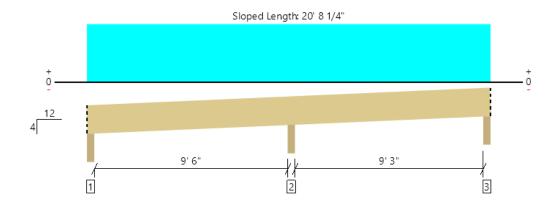
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# Roof Framing, Roof: Joist #2a 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL @ 24" OC



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)	1360 @ 9' 11 1/4"	2615 (3.50")	Passed (52%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	562 @ 8' 10 1/4"	4939	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1306 @ 9' 11 1/4"	9540	Passed (14%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.021 @ 4' 7 3/8"	0.513	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.042 @ 4' 5 13/16"	0.684	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length: 21' 3/16"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- . Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	246	209	455	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.82"	759	600	1359	None
3 - Beveled Plate - HF	3.50"	3.50"	1.50"	236	202	438	Blocking

<sup>•</sup> 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)	20' 8" o/c	
Bottom Edge (Lu)	20' 8" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Loads	Location (Side)	Spacing	(0.90)	(1.15)	Comments
1 - Uniform (PSF)	0 to 19' 7 1/2"	24"	20.0	25.0	Roof Loading
2 - Uniform (PSF)	0 to 19' 7 1/2"	24"	10.0	-	Overframing

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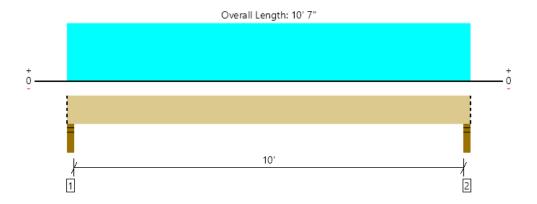
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Roof Framing, Roof: Beam #3a 1 piece(s) 4 x 12 HF No.2



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)	2672 @ 2"	4961 (3.50")	Passed (54%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	2051 @ 1' 2 3/4"	4528	Passed (45%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6632 @ 5' 3 1/2"	6615	Passed (100%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.127 @ 5' 3 1/2"	0.512	Passed (L/972)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.232 @ 5' 3 1/2"	0.683	Passed (L/529)		1.0 D + 1.0 S (All Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.89"	1217	1455	2672	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.89"	1217	1455	2672	Blocking

<sup>•</sup> 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)	6" o/c	
Bottom Edge (Lu)	10' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 7"	N/A	10.0		
1 - Uniform (PSF)	0 to 10' 7" (Front)	11'	20.0	25.0	Roof Loading

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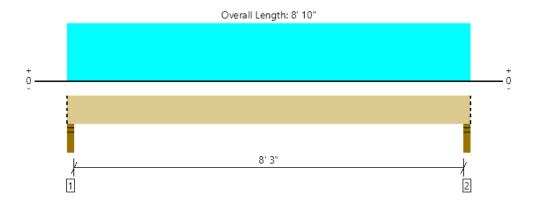
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Roof Framing, Roof: Beam #3b 1 piece(s) 4 x 12 HF No.2



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)	2230 @ 2"	4961 (3.50")	Passed (45%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1610 @ 1' 2 3/4"	4528	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4561 @ 4' 5"	6615	Passed (69%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.060 @ 4' 5"	0.425	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.110 @ 4' 5"	0.567	Passed (L/928)		1.0 D + 1.0 S (All Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.57"	1016	1215	2231	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.57"	1016	1215	2231	Blocking

<sup>•</sup> 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)	8' 10" o/c	
Bottom Edge (Lu)	8' 10" o/c	

<sup>•</sup>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 8' 10"	N/A	10.0		
1 - Uniform (PSF)	0 to 8' 10" (Front)	11'	20.0	25.0	Roof Loading

#### Weyerhaeuser Notes

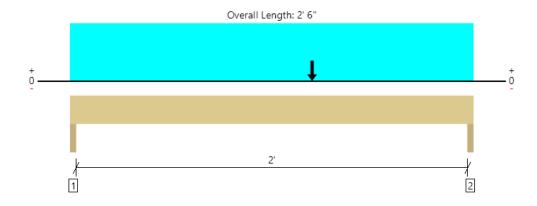
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Roof Framing, Roof: Header #3c 2 piece(s) 2 x 8 HF No.2



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)	1690 @ 2' 4 1/2"	3645 (3.00")	Passed (46%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1651 @ 1' 7 3/4"	2501	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1456 @ 1' 6"	2569	Passed (57%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.005 @ 1' 3 5/16"	0.075	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.008 @ 1' 3 5/16"	0.112	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - HF	3.00"	3.00"	1.50"	499	597	1096	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	769	920	1689	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	2' 6" o/c	
Bottom Edge (Lu)	2' 6" o/c	

<sup>•</sup>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 2' 6"	N/A	5.5		
1 - Uniform (PSF)	0 to 2' 6"	1'	15.0	25.0	Roof Loading
2 - Point (lb)	1' 6"	N/A	1217	1455	Linked from: Roof: Beam #3a, Support 1

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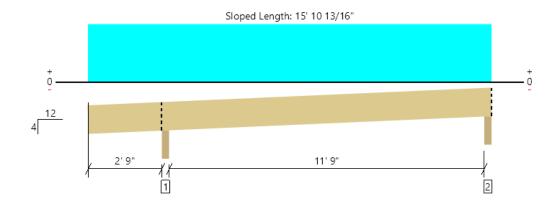
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# Roof Framing, Roof: Joist #4 1 piece(s) 1 3/4" x 11 7/8" 1.55E TimberStrand® LSL @ 24" OC



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)	851 @ 2' 10 3/4"	2615 (3.50")	Passed (33%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	484 @ 3' 11 3/4"	4939	Passed (10%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1515 @ 9' 1 11/16"	9540	Passed (16%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.070 @ 8' 11 5/16"	0.631	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.124 @ 8' 11 11/16"	0.842	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 16' 2 3/4"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- 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.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	389	462	851	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	247	301	548	Blocking

<sup>•</sup> 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' 11" o/c	
Bottom Edge (Lu)	15' 11" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 15' 1"	24"	20.0	25.0	Roof Loading

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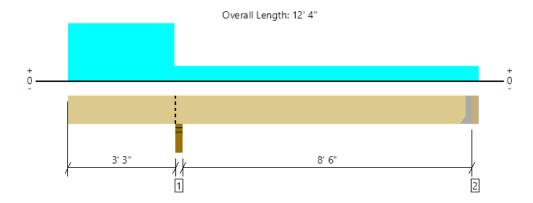
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Roof Framing, Roof: Beam #5a 1 piece(s) 2 x 12 HF No.2



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)	1578 @ 3' 4 3/4"	2126 (3.50")	Passed (74%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	713 @ 2' 3 3/4"	1941	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1775 @ 3' 4 3/4"	2577	Passed (69%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.076 @ 0	0.340	Passed (2L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.126 @ 0	0.453	Passed (2L/646)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Flush Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- · Applicable calculations are based on NDS.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.60"	731	848	1579	Blocking
2 - Hanger on 11 1/4" HF ledgerOnMasonry	3.50"	Hanger <sup>1</sup>	1.50"	86	146/-4	232/-4	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)	12' 1" o/c	
Bottom Edge (Lu)	6' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie								
Support Model Seat Length Top Fasteners Face Fasteners Member Fasteners Acce								
2 - Face Mount Hanger	LUS28	1.75"	N/A	6-10dx1.5	3-10d			

<sup>•</sup> 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)	0 to 12' 1/2"	N/A	4.3		
1 - Uniform (PSF)	3' 3" to 12' 4" (Front)	1' 9"	20.0	25.0	Roof Loading
2 - Uniform (PLF)	0 to 3' 3" (Front)	N/A	137.5	166.5	Linked from: Roof: Joist #6a, Support 1

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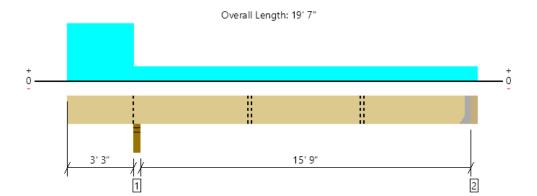
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Roof Framing, Roof: Beam #5b 1 piece(s) 2 x 12 HF No.2



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)	1767 @ 3' 4 3/4"	2126 (3.50")	Passed (83%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	713 @ 2' 3 3/4"	1941	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-1775 @ 3' 4 3/4"	1933	Passed (92%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.201 @ 11' 7 9/16"	0.795	Passed (L/947)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.350 @ 11' 9 3/8"	1.060	Passed (L/545)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Flush Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Moment capacity over cantilever support 1 has been reduced by 25% to lessen the effects of buckling.
- Applicable calculations are based on NDS.
- Permanent bracing at third points In the back span or a direct applied ceiling over the entire back span length is required at the Left end of the member. See literature detail (PB1) For clarification.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.91"	830	937	1767	Blocking
2 - Hanger on 11 1/4" HF beam	3.50"	Hanger <sup>1</sup>	1.50"	271	312	583	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)	5' 4" o/c	
Bottom Edge (Lu)	6' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-T	ie					
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LUS28	1.75"	N/A	6-10dx1.5	3-10d	

<sup>•</sup> 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)	0 to 19' 3 1/2"	N/A	4.3		
1 - Uniform (PLF)	0 to 3' 3" (Front)	N/A	137.5	166.5	Linked from: Roof: Joist #6a, Support 1
2 - Uniform (PLF)	3' 3" to 19' 7" (Front)	N/A	35.0	41.5	Linked from: Roof: Joist #9, Support 1

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# Roof Framing, Roof: Joist #6a 1 piece(s) 2 x 12 HF No.2 @ 24" OC

Sloped Length: 13' 8 15/16"

12' 9"

12' 9"

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)	608 @ 2 1/2"	2126 (3.50")	Passed (29%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	499 @ 1' 2 7/16"	1941	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1903 @ 6' 8"	2964	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.144 @ 6' 8"	0.666	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.262 @ 6' 8"	0.888	Passed (L/609)		1.0 D + 1.0 S (All Spans)

Member Length : 13' 11 3/4"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 3/12

- . Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	275	333	608	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	275	333	608	Blocking

<sup>•</sup> 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)	5' 10" o/c	
Bottom Edge (Lu)	13' 9" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 13' 4"	24"	20.0	25.0	Roof Loading

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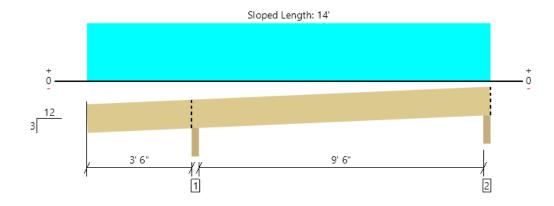
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# Roof Framing, Roof: Joist #6b 1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	839 @ 3' 7 3/4"	2192 (3.50")	Passed (38%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	410 @ 4' 8 7/16"	1941	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	871 @ 9' 1/16"	2964	Passed (29%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.039 @ 8' 7 3/4"	0.501	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.064 @ 8' 8 5/8"	0.669	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 14' 2 13/16"

System: Roof Member Type: Joist Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD Member Pitch: 3/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length		Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	379	460	839	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	181	237	418	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' o/c	
Bottom Edge (Lu)	14' o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
vertical Load	Location (Side)	opaomg	(0.70)	(1110)	Comments
1 - Uniform (PSF)	0 to 13' 7"	24"	20.0	25.0	Roof Loading

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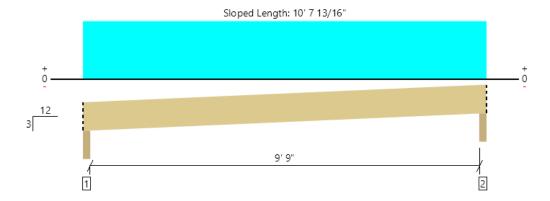
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File Name: Mounger Remodel



# Roof Framing, Roof: Joist #6c 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	471 @ 2 1/2"	2126 (3.50")	Passed (22%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	362 @ 1' 2 7/16"	1941	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1121 @ 5' 2"	2964	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.050 @ 5' 2"	0.511	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.091 @ 5' 2"	0.681	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

Member Length : 10' 10 5/8"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 3/12

- Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	213	258	471	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	213	258	471	Blocking

<sup>•</sup> 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' 8" o/c	
Bottom Edge (Lu)	10' 8" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 10' 4"	24"	20.0	25.0	Roof Loading

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

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File Name: Mounger Remodel



# Roof Framing, Roof: Joist #7 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	640 @ 1' 10 3/4"	2241 (3.50")	Passed (29%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	370 @ 2' 11 3/16"	1941	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1031 @ 6' 10 3/4"	2964	Passed (35%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.046 @ 6' 9 1/2"	0.513	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.083 @ 6' 9 11/16"	0.684	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 12' 9 7/16"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	293	347	640	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	206	249	455	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	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 11' 10"	24"	20.0	25.0	Roof Loading

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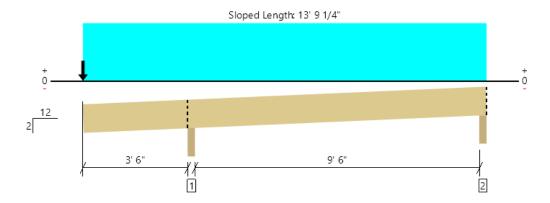
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Roof Framing, Roof: Beam #8a

3 piece(s) 2 x 12 HF No.2

MEMBER REPORT



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)	3380 @ 3' 7 3/4"	6467 (3.50")	Passed (52%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	2034 @ 2' 6 7/8"	5822	Passed (35%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-7130 @ 3' 7 3/4"	7732	Passed (92%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.146 @ 0	0.370	Passed (2L/606)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.267 @ 0	0.493	Passed (2L/332)		1.0 D + 1.0 S (Alt Spans)

Member Length: 13' 11 1/8"

System: Roof Member Type : Drop Beam Building Use: Residential Building Code: IBC 2018 Design Methodology : ASD Member Pitch: 2/12

- 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.
- -333 lbs uplift at support located at 13' 5". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.83"	1633	1747	3380	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	-76	61/-257	61/-333	Blocking

<sup>•</sup> 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)	13' 9" o/c	
Bottom Edge (Lu)	6' 8" o/c	

<sup>•</sup>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 13' 7"	N/A	12.8		
1 - Uniform (PSF)	0 to 13' 7"	2'	20.0	25.0	Roof Loading
2 - Point (lb)	0	N/A	830	937	Linked from: Roof: Flush Beam #5b, Support 1

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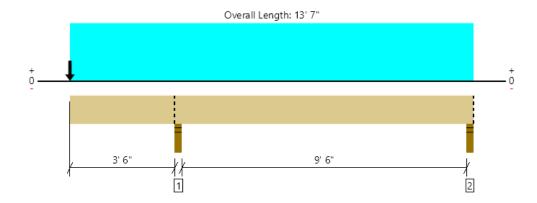
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Roof Framing, Roof: Beam #8b 2 piece(s) 2 x 12 HF No.2



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)	1708 @ 3' 7 3/4"	4253 (3.50")	Passed (40%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	836 @ 2' 6 3/4"	3881	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-2780 @ 3' 7 3/4"	5155	Passed (54%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.075 @ 0	0.365	Passed (2L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.128 @ 0	0.486	Passed (2L/686)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- · Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	819	889	1708	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	111	177/-24	288/-24	Blocking

<sup>•</sup> 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)	13' 7" o/c	
Bottom Edge (Lu)	13' 7" o/c	

<sup>•</sup>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 13' 7"	N/A	8.6		
1 - Uniform (PSF)	0 to 13' 7" (Front)	2'	20.0	25.0	Roof Loading
2 - Point (lb)	0 (Front)	N/A	271	312	Linked from: Roof: Flush Beam #5b, Support 2

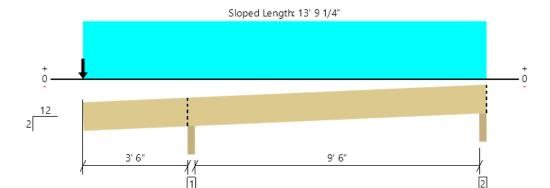
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Roof Framing, Roof: Beam #8c 3 piece(s) 2 x 12 HF No.2



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)	3122 @ 3' 7 3/4"	6467 (3.50")	Passed (48%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1846 @ 2' 6 7/8"	5822	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-6445 @ 3' 7 3/4"	7732	Passed (83%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.133 @ 0	0.370	Passed (2L/668)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.238 @ 0	0.493	Passed (2L/372)		1.0 D + 1.0 S (Alt Spans)

Member Length : 13' 11 1/8"

System: Roof
Member Type: Drop Beam
Building Use: Residential
Building Code: IBC 2018
Design Methodology: ASD
Member Pitch: 2/12

- 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.
- -263 lbs uplift at support located at 13' 5". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.69"	1497	1625	3122	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	-39	77/-224	77/-263	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)	13' 9" o/c	
Bottom Edge (Lu)	10' 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 13' 7"	N/A	12.8		
1 - Uniform (PSF)	0 to 13' 7"	2'	20.0	25.0	Roof Loading
2 - Point (lb)	0	N/A	731	848	Linked from: Roof: Flush Beam #5a, Support 1

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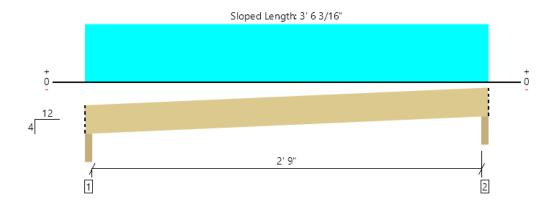
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# Roof Framing, Roof: Joist #9 1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	154 @ 2 1/2"	2126 (3.50")	Passed (7%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	45 @ 1' 2 3/16"	1941	Passed (2%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	98 @ 1' 8"	2964	Passed (3%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.000 @ 1' 8"	0.154	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.001 @ 1' 8"	0.205	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

Member Length : 3' 9 15/16"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- . Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	70	83	153	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	70	83	153	Blocking

<sup>•</sup> 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)	3' 6" o/c	
Bottom Edge (Lu)	3' 6" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 3' 4"	24"	20.0	25.0	Roof Loading

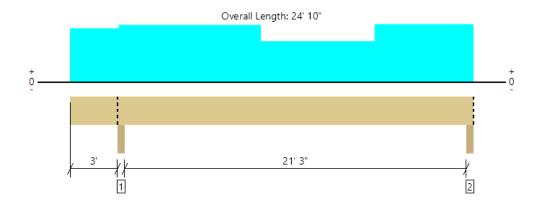
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# Roof Framing, Roof: Beam #10 1 piece(s) 5 1/4" x 14" 2.0E Parallam® PSL



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)	8788 @ 3' 1 3/4"	11484 (3.50")	Passed (77%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	5918 @ 4' 5 1/2"	16342	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	32075 @ 13' 9 9/16"	46854	Passed (68%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.626 @ 13' 10 13/16"	1.076	Passed (L/413)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	1.174 @ 13' 11 1/16"	1.435	Passed (L/220)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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 cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on left cantilever exceeds 0.4".

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Column - HF	3.50"	3.50"	2.68"	4152	4636	8788	Blocking
2 - Column - HF	3.50"	3.50"	1.99"	3070	3461	6531	Blocking

<sup>•</sup> 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)	24' 10" o/c	
Bottom Edge (Lu)	24' 10" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 10"	N/A	23.0		
1 - Uniform (PLF)	0 to 3' (Front)	N/A	137.5	166.5	Linked from: Roof: Joist #6a, Support 2
2 - Uniform (PLF)	0 to 3' (Front)	N/A	137.5	166.5	Linked from: Roof: Joist #6a, Support 1
3 - Uniform (PLF)	3' to 11' 9" (Front)	N/A	189.5	230.0	Linked from: Roof: Joist #6b, Support 1
4 - Uniform (PLF)	18' 9" to 24' 10" (Front)	N/A	189.5	230.0	Linked from: Roof: Joist #6b, Support 1
5 - Uniform (PLF)	11' 9" to 24' 10" (Front)	N/A	106.5	129.0	Linked from: Roof: Joist #6c, Support 1
6 - Uniform (PLF)	3' to 18' 9" (Front)	N/A	103.0	124.5	Linked from: Roof: Joist #7, Support 2

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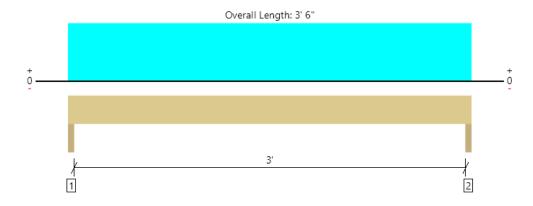
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Roof Framing, Roof: Header #11 2 piece(s) 2 x 8 HF No.2



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)	570 @ 1 1/2"	3645 (3.00")	Passed (16%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	292 @ 10 1/4"	2501	Passed (12%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	430 @ 1' 9"	2569	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.004 @ 1' 9"	0.108	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.007 @ 1' 9"	0.162	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - HF	3.00"	3.00"	1.50"	266	304	570	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	266	304	570	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 6" o/c	
Bottom Edge (Lu)	3' 6" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Loads	Location	Tributary Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	5.5		
1 - Uniform (PLF)	0 to 3' 6"	N/A	146.5	173.5	Linked from: Roof: Joist #7, Support 1

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Roof Framing, Roof: Post #12b 1 piece(s) 6 x 6 DF No.1

Post Height: 9' 3"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	20	50	Passed (40%)		
Compression (lbs)	11811	24249	Passed (49%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	11811	12251	Passed (96%)		1.0 D + 1.0 S
Bending/Compression	0.69	1	Passed (69%)	1.15	1.0 D + 1.0 S

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced Length Comments
Full Member Length No bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

Vertical Loads	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	2573	3128	Linked from: Roof: Beam #1a, Support 2
2 - Point (lb)	2796	3314	Linked from: Roof: Beam #1b, Support 1

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Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD



#### MEMBER REPORT

Roof Framing, Roof: Post #12a 1 piece(s) 4 x 8 HF No.2

Post Height: 9' 3"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	32	50	Passed (63%)		
Compression (lbs)	8658	9195	Passed (94%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	8658	10277	Passed (84%)		1.0 D + 1.0 S
Bending/Compression	N/A	1	Passed (N/A)		N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

#### Drawing is Conceptual

	Dead	Snow	
Vertical Load	(0.90)	(1.15)	Comments
1 - Point (lb)	3962	4696	Linked from: Roof: Beam #1a, 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	
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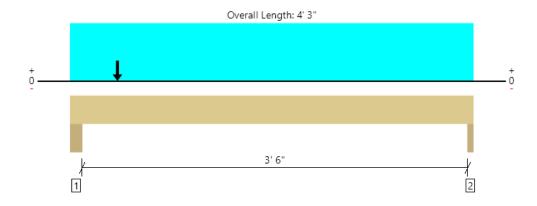


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ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16



# Roof Framing, Roof: Header #13a 1 piece(s) 3 1/2" x 9 1/2" 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)	12014 @ 4 1/2"	13125 (6.00")	Passed (92%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	87 @ 1' 3 1/2"	7393	Passed (1%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	159 @ 2' 3"	15016	Passed (1%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.001 @ 2' 3"	0.125	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.001 @ 2' 3"	0.188	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - HF	6.00"	6.00"	5.49"	5460	6555	12015	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	81	100	181	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 3" o/c	
Bottom Edge (Lu)	4' 3" 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 4' 3"	N/A	10.4		
1 - Uniform (PSF)	0 to 4' 3"	2'	15.0	25.0	Roof Loading
2 - Point (lb)	6"	N/A	5369	6442	Linked from: Roof: Post #12b, Support 1

# Weyerhaeuser Notes

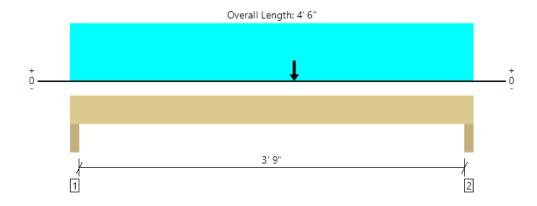
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# Roof Framing, Roof: Header #13b 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	6847 @ 4' 3"	9844 (4.50")	Passed (70%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	6742 @ 3' 4"	7393	Passed (91%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	11804 @ 2' 6"	15016	Passed (79%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.052 @ 2' 6"	0.133	Passed (L/930)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.095 @ 2' 6"	0.200	Passed (L/507)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - HF	4.50"	4.50"	2.46"	2440	2931	5371	None
2 - Trimmer - HF	4.50"	4.50"	3.13"	3111	3736	6847	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 6" o/c	
Bottom Edge (Lu)	4' 6" 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 4' 6"	N/A	10.4		
1 - Uniform (PSF)	0 to 4' 6"	2'	15.0	25.0	Roof Loading
2 - Point (lb)	2' 6"	N/A	5369	6442	Linked from: Roof: Post #12b, Support 1

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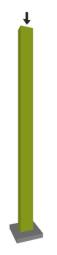
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# Roof Framing, Roof: Post #14 1 piece(s) 6 x 6 HF No.2

Post Height: 5' 3"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	11	50	Passed (23%)		
Compression (lbs)	8788	18768	Passed (47%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	8788	12251	Passed (72%)		1.0 D + 1.0 S
Bending/Compression	0.73	1	Passed (73%)	1.15	1.0 D + 1.0 S

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

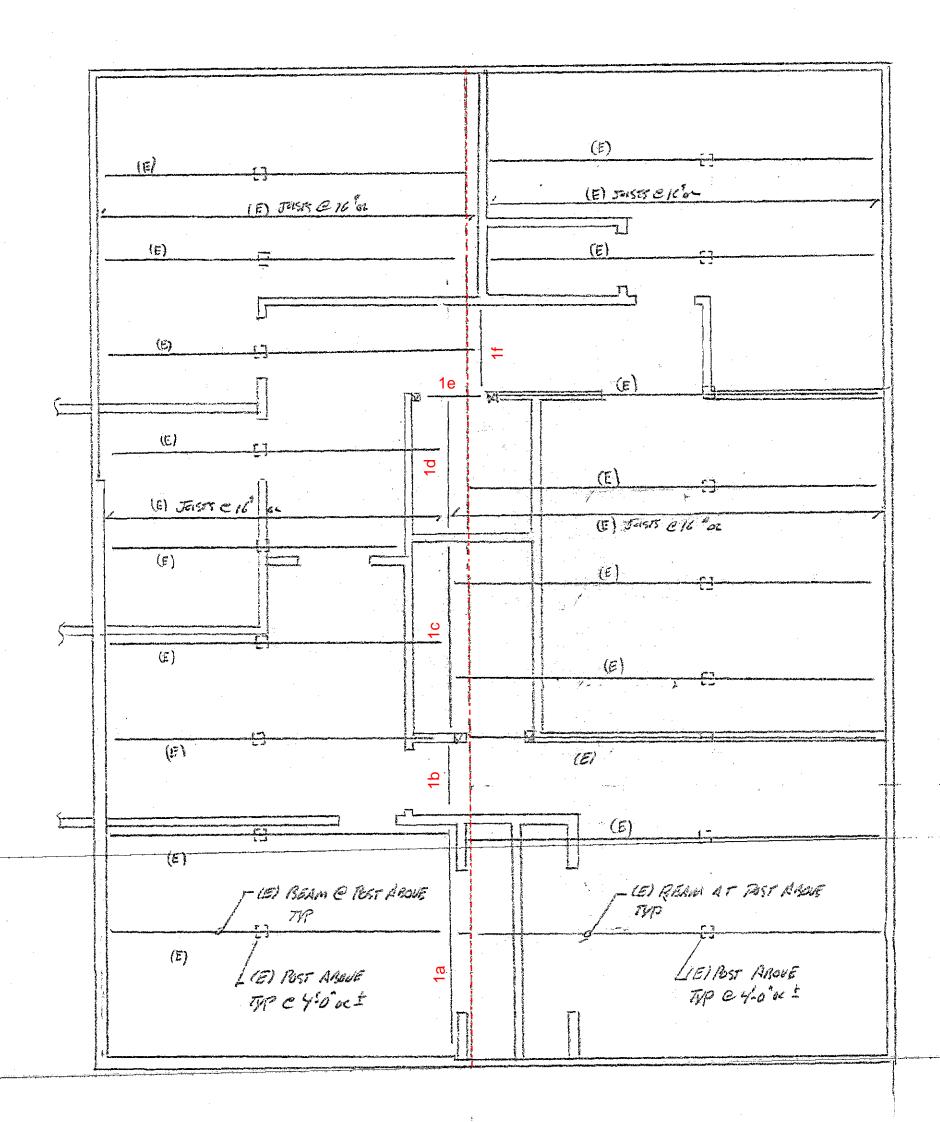
Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	4152	4636	Linked from: Roof: Beam #10, Support 1

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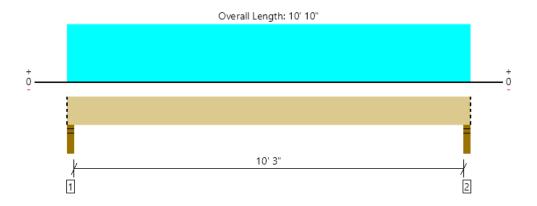


AMIC FRAMILIA PLAN

Y4"=1-0"



# Attic Framing, Attic: Beam #1a 1 piece(s) 3 1/2" x 9 1/2" 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)	3232 @ 2"	4961 (3.50")	Passed (65%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2585 @ 1' 1"	6428	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	8222 @ 5' 5"	13057	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.199 @ 5' 5"	0.350	Passed (L/633)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.355 @ 5' 5"	0.525	Passed (L/355)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead Floor Live Total		Accessories	
1 - Stud wall - HF	3.50"	3.50"	2.28"	1417	1815	3232	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.28"	1417	1815	3232	Blocking

<sup>•</sup> 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' 10" o/c	
Bottom Edge (Lu)	10' 10" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 10"	N/A	10.4		
1 - Uniform (PSF)	0 to 10' 10" (Front)	16' 9"	15.0	20.0	Uninhabitable Attic with Storage

#### Weyerhaeuser Notes

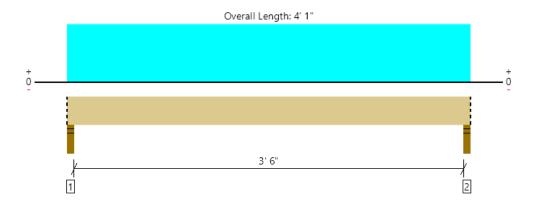
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# Attic Framing, Attic: Beam #1b 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	1218 @ 2"	4961 (3.50")	Passed (25%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	572 @ 1' 1"	6428	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1049 @ 2' 1/2"	13057	Passed (8%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.005 @ 2' 1/2"	0.125	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.009 @ 2' 1/2"	0.188	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	534	684	1218	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	534	684	1218	Blocking

<sup>•</sup> 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)	4' 1" o/c	
Bottom Edge (Lu)	4' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 1"	N/A	10.4		
1 - Uniform (PSF)	0 to 4' 1" (Front)	16' 9"	15.0	20.0	Uninhabitable Attic with Storage

#### Weverhaeuser Notes

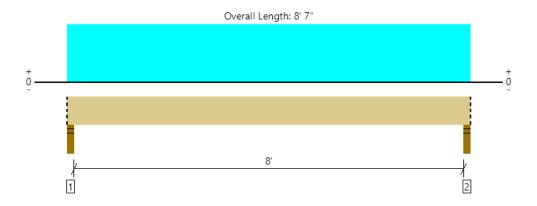
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# Attic Framing, Attic: Beam #1c 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	2560 @ 2"	4961 (3.50")	Passed (52%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1914 @ 1' 1"	6428	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5076 @ 4' 3 1/2"	13057	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.080 @ 4' 3 1/2"	0.275	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.142 @ 4' 3 1/2"	0.412	Passed (L/698)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.81"	1123	1438	2561	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.81"	1123	1438	2561	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

<sup>•</sup>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 8' 7"	N/A	10.4		
1 - Uniform (PSF)	0 to 8' 7" (Front)	16' 9"	15.0	20.0	Uninhabitable Attic with Storage

#### Weyerhaeuser Notes

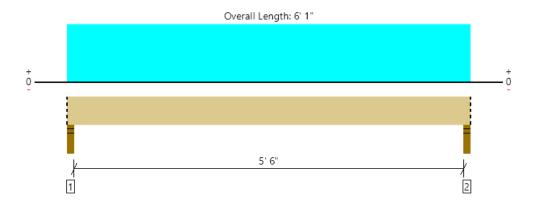
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# Attic Framing, Attic: Beam #1d 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	1815 @ 2"	4961 (3.50")	Passed (37%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1168 @ 1' 1"	6428	Passed (18%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2466 @ 3' 1/2"	13057	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.021 @ 3' 1/2"	0.192	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.038 @ 3' 1/2"	0.287	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	796	1019	1815	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	796	1019	1815	Blocking

<sup>•</sup> 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)	6' 1" o/c	
Bottom Edge (Lu)	6' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 6' 1"	N/A	10.4		
1 - Uniform (PSF)	0 to 6' 1" (Front)	16' 9"	15.0	20.0	Uninhabitable Attic with Storage

#### Weyerhaeuser Notes

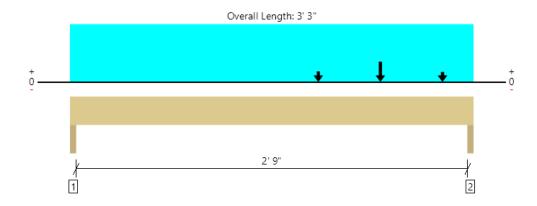
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# Attic Framing, Attic: Header #1e 3 piece(s) 1 3/4" x 9 1/2" 2.0E Microllam® LVL



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)	10443 @ 3' 1 1/2"	11419 (3.00")	Passed (91%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	5502 @ 2' 2 1/2"	10898	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6163 @ 2' 6"	20312	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.011 @ 2' 6"	0.100	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.022 @ 2'	0.150	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length		Loads to Supports (lbs)					
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Trimmer - HF	3.00"	3.00"	1.50"	1469	425	1339	3233	None
2 - Trimmer - HF	3.00"	3.00"	2.74"	5354	1406	5090	11850	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 3" o/c	
Bottom Edge (Lu)	3' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	Snow	
Vertical Loads	Location	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	14.5			
1 - Uniform (PSF)	0 to 3' 3"	1' 4"	15.0	20.0	-	Uninhabitable Attic with Storage
2 - Point (lb)	2' 6"	N/A	2796	1	3314	Linked from: Roof: Beam #1b, Support 1
3 - Point (lb)	2' 6"	N/A	2551	-	3115	Linked from: Roof: Beam #1c, Support 1
4 - Point (lb)	2'	N/A	796	1019	-	Linked from: Floor: Drop Beam #1d, Support 1
5 - Point (lb)	3'	N/A	567	726	-	Linked from: Attic: Beam #1f, Support 1

# Weyerhaeuser Notes

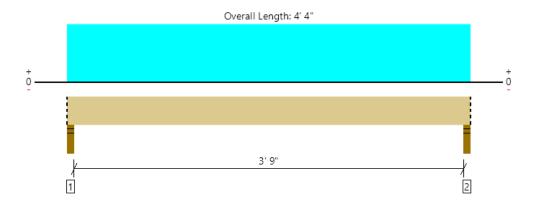
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## Attic Framing, Attic: Beam #1f 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	1293 @ 2"	4961 (3.50")	Passed (26%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	646 @ 1' 1"	6428	Passed (10%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1193 @ 2' 2"	13057	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.006 @ 2' 2"	0.133	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.011 @ 2' 2"	0.200	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	567	726	1293	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	567	726	1293	Blocking

<sup>•</sup> 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)	4' 4" o/c	
Bottom Edge (Lu)	4' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

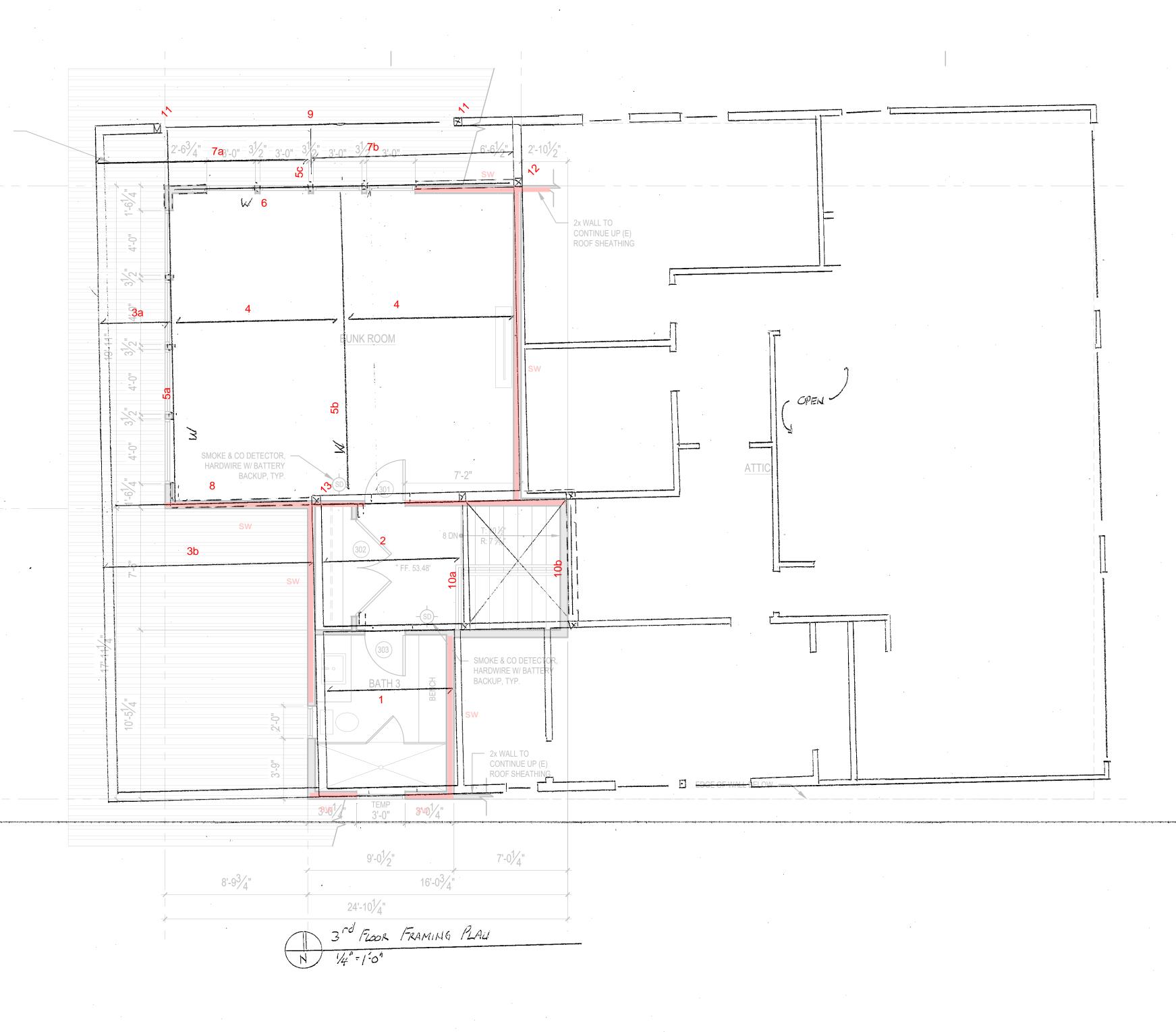
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 4"	N/A	10.4		
1 - Uniform (PSF)	0 to 4' 4" (Front)	16' 9"	15.0	20.0	Uninhabitable Attic with Storage

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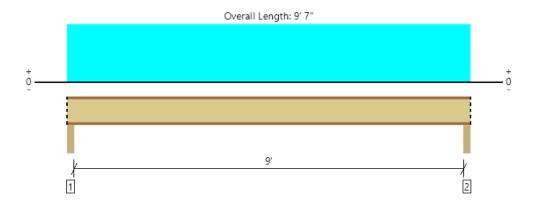
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## 3rd Floor Framing, 3rd: Joist #1 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	351 @ 2 1/2"	1375 (3.50")	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	330 @ 3 1/2"	1560	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	770 @ 4' 9 1/2"	3160	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.035 @ 4' 9 1/2"	0.306	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.049 @ 4' 9 1/2"	0.458	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	62	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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<sup>™</sup> Rating include: None.

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	96	256	352	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	96	256	352	Blocking

<sup>•</sup> 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)	6' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

- $\bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.
- $\bullet {\sf Maximum\ allowable\ bracing\ intervals\ based\ on\ applied\ load}.$

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 9' 7"	16"	15.0	40.0	Residential Load

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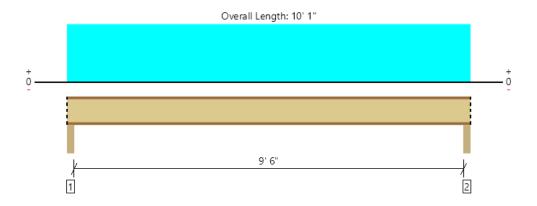
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## 3rd Floor Framing, 3rd: Joist #2 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	370 @ 2 1/2"	1375 (3.50")	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	348 @ 3 1/2"	1560	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	857 @ 5' 1/2"	3160	Passed (27%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.042 @ 5' 1/2"	0.322	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.058 @ 5' 1/2"	0.483	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	61	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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<sup>™</sup> Rating include: None.

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	101	269	370	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	101	269	370	Blocking

<sup>•</sup> 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)	6' 2" o/c	
Bottom Edge (Lu)	10' 1" o/c	

- $\bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.
- $\bullet {\sf Maximum\ allowable\ bracing\ intervals\ based\ on\ applied\ load}.$

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 10' 1"	16"	15.0	40.0	Residential Load

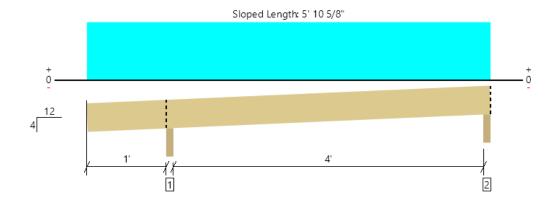
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## 3rd Floor Framing, 3rd: Joist #3a 1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	315 @ 1' 1 3/4"	2241 (3.50")	Passed (14%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	114 @ 2' 2 3/16"	1941	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	185 @ 3' 4 1/2"	2964	Passed (6%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.002 @ 3' 3 3/8"	0.223	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.003 @ 3' 3 1/2"	0.297	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 6' 2 3/8"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	144	171	315	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	91	112	203	Blocking

<sup>•</sup> 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)	5' 11" o/c	
Bottom Edge (Lu)	5' 11" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 7"	24"	20.0	25.0	Roof Loading

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## 3rd Floor Framing, 3rd: Joist #3b 1 piece(s) 2 x 12 HF No.2 @ 24" OC

Sloped Length: 15' 1 5/16" 12' 9'

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)	708 @ 1' 1 3/4"	2241 (3.50")	Passed (32%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	507 @ 2' 2 3/16"	1941	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1919 @ 7' 8 1/16"	2964	Passed (65%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.152 @ 7' 7 3/4"	0.684	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.279 @ 7' 7 3/4"	0.912	Passed (L/589)		1.0 D + 1.0 S (Alt Spans)

Member Length: 15' 5 1/16"

System: Roof Member Type : Joist Building Use: Residential Building Code: IBC 2018 Design Methodology : ASD Member Pitch: 4/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	324	384	708	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	280	334	614	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)	5' 9" o/c	
Bottom Edge (Lu)	15' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Lacation (Cida)	Spacing	Dead (0.90)	Snow (1.15)	Comments
Vertical Load	Location (Side)	Spacing	(0.70)	(1.13)	Comments
1 - Uniform (PSF)	0 to 14' 4"	24"	20.0	25.0	Roof Loading

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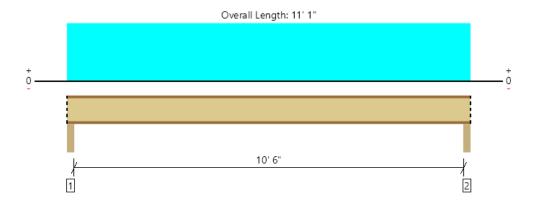
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## 3rd Floor Framing, 3rd: Joist #4 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	406 @ 2 1/2"	1375 (3.50")	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	385 @ 3 1/2"	1560	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1043 @ 5' 6 1/2"	3160	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.060 @ 5' 6 1/2"	0.356	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.082 @ 5' 6 1/2"	0.533	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	58	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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<sup>™</sup> Rating include: None.

	В	earing Lengt	th	Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	111	296	407	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	111	296	407	Blocking

<sup>•</sup> 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)	5' 7" o/c	
Bottom Edge (Lu)	11' 1" o/c	

 $<sup>\</sup>bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load. } \\$ 

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 11' 1"	16"	15.0	40.0	Residential Load

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Project Title: Mounger Residence

Engineer: Project ID: Project Descr:

Printed: 20 SEP 2021, 12:53PM

Steel Beam Lic. #: KW-06003456 File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

BYKONEN CARTER QUINN

DESCRIPTION: 3rd: Beam #5a

## **CODE REFERENCES**

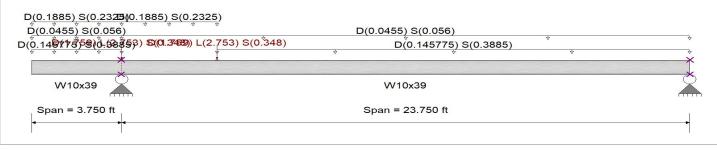
Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10

Load Combination Set: ASCE 7-16

#### **Material Properties**

Analysis Method: Load Resistance Factor Design Fy: Steel Yield: 50.0 ksi
Beam Bracing: Completely Unbraced E: Modulus: 29,000.0 ksi

Bending Axis: Major Axis Bending



### **Applied Loads**

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load: D = 0.08330, S = 0.2220 ksf, Extent = 0.0 -->> 3.750 ft, Tributary Width = 1.750 ft, (3rd: Joist #4, Support 1)

Uniform Load: D = 0.04550, S = 0.0560 k/ft, Extent = 0.0 -->> 3.750 ft, Tributary Width = 1.0 ft, (3rd: Joist #3a, Support 2)

Uniform Load: D = 0.1885, S = 0.2325 k/ft, Extent = 0.0 -->> 3.750 ft, Tributary Width = 1.0 ft, (3rd: Joist #7a, Support 2)

Point Load: D = 1.759, L = 2.753, S = 0.3480 k @ 3.750 ft, (3rd: Drop Beam #6, Support 1)

Load for Span Number 2

Uniform Load: D = 0.08330, S = 0.2220 ksf, Extent = 4.0 -->> 23.750 ft, Tributary Width = 1.750 ft, (3rd: Joist #4, Support 1)

Uniform Load: D = 0.04550, S = 0.0560 k/ft, Extent = 0.0 -->> 23.750 ft, Tributary Width = 1.0 ft, (3rd: Joist #3a, Support 2)

Uniform Load: D = 0.1885, S = 0.2325 k/ft, Extent = 0.0 -->> 4.0 ft, Tributary Width = 1.0 ft, (3rd: Joist #7a, Support 2)

Point Load: D = 1.759, L = 2.753, S = 0.3480 k @ 4.0 ft, (3rd: Drop Beam #6, Support 1)

#### **DESIGN SUMMARY Design OK** 0.561:1 Maximum Shear Stress Ratio = Maximum Bending Stress Ratio = 0.164:1 Section used for this span Section used for this span W10x39 W10x39 Mu: Applied Vu: Applied 15.408 k 71.047 k-ft Mn \* Phi : Allowable 126.654 k-ft Vn \* Phi : Allowable 93.744 k Load Combination +1.20D+L+1.60S+1.60H **Load Combination** +1.20D+L+1.60S+1.60H Location of maximum on span 11.495ft Location of maximum on span 3.750 ft Span # where maximum occurs Span # where maximum occurs Span #1 Span # 2 Maximum Deflection Max Downward Transient Deflection 0.481 in Ratio = 592 >= 360 Max Upward Transient Deflection -0.220 in Ratio = 408 >= 360 Max Downward Total Deflection 0.753 in Ratio = 378 >= 240. -0.357 in Ratio = Max Upward Total Deflection 252 >= 240.

## **Maximum Forces & Stresses for Load Combinations**

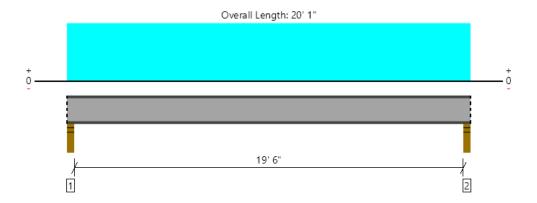
Load Combination		Max Stress	Ratios	Summary of Moment Values				ary of Moment Values Summary of Shear Values					
Segment Length	Span #	М	V	max Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+1.40D+1.60H													
Dsgn. L = 3.75 ft	1	0.021	0.060		-3.74	3.74	195.00	175.50	1.00	1.00	5.60	93.74	93.74

Project Title: Mounger Residence Engineer: Project ID: Project Descr:

Steel Beam								Software co	pyright	ENERCA	Printed: 20 \$ File: LC, INC. 1983-2	Retaining W	/all.ec6
Lic. # : KW-06003456	D "5										BYKON	EN CARTE	R QUINN
DESCRIPTION: 3rd:	Beam #5	а											
Load Combination		Max Stres	ss Ratios		Ç	Summary of M	oment Value	es			Summ	ary of Shea	r Values
Segment Length	Span #	M	V	max Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
Dsgn. L = 23.75 ft	2	0.177	0.060	22.32	-3.74	22.32	139.73	125.76	1.12	1.00	5.60	93.74	93.74
+1.20D+0.50Lr+1.60L+1.60H Dsgn. L = 3.75 ft	1	0.018	0.090		-3.20	3.20	195.00	175.50	1 00	1.00	8.47	93.74	93.74
Dsgn. L = 3.75 ft Dsgn. L = 23.75 ft	2	0.234	0.070	29.91	-3.20	29.91	141.98	127.78		1.00	8.47	93.74	93.74
+1.20D+1.60L+0.50S+1.60H	_												
Dsgn. L = 3.75 ft Dsgn. L = 23.75 ft	1 2	0.032 0.344	0.118 0.118	43.20	-5.58 -5.58	5.58 43.20	195.00 139.35	175.50 125.42		1.00 1.00	11.07 11.07	93.74 93.74	93.74 93.74
+1.20D+1.60Lr+L+1.60H	2	0.344	0.110	43.20	-3.30	45.20	137.33	123.42	1.12	1.00	11.07	73.74	73.74
Dsgn. L = 3.75 ft	1	0.018	0.076		-3.20	3.20	195.00	175.50		1.00	7.09	93.74	93.74
Dsgn. L = 23.75 ft +1.20D+1.60Lr+0.50W+1.60H	2	0.203	0.076	25.59	-3.20	25.59	140.10	126.09	1.12	1.00	7.09	93.74	93.74
Dsqn. L = 3.75 ft	1	0.018	0.051		-3.20	3.20	195.00	175.50	1.00	1.00	4.80	93.74	93.74
Dsgn. L = 23.75 ft	2	0.152	0.051	19.13	-3.20	19.13	139.73	125.76		1.00	4.80	93.74	93.74
+1.20D+L+1.60S+1.60H	1	0.0/0	0.1/4		10.00	10.00	105.00	175 50	1.00	1.00	15 41	00.74	00.74
Dsgn. L = 3.75 ft Dsgn. L = 23.75 ft	1 2	0.062 0.561	0.164 0.164	71.05	-10.82 -10.82	10.82 71.05	195.00 140.73	175.50 126.65		1.00 1.00	15.41 15.41	93.74 93.74	93.74 93.74
+1.20D+1.60S+0.50W+1.60H	2	0.501	0.104	71.00	10.02	71.00	140.73	120.00	1.15	1.00	13.41	75.74	75.74
Dsgn. L = 3.75 ft	1	0.062	0.140		-10.82	10.82	195.00	175.50		1.00	13.12	93.74	93.74
Dsgn. L = 23.75 ft +1.20D+0.50Lr+L+W+1.60H	2	0.511	0.140	65.46	-10.82	65.46	142.23	128.00	1.14	1.00	13.12	93.74	93.74
Dsgn. L = 3.75 ft	1	0.018	0.076		-3.20	3.20	195.00	175.50	1.00	1.00	7.09	93.74	93.74
Dsgn. L = 23.75 ft	2	0.203	0.076	25.59	-3.20	25.59	140.10	126.09		1.00	7.09	93.74	93.74
+1.20D+L+0.50S+W+1.60H	1	0.022	0.100		F F0	г го	105.00	175 50	1 00	1.00	0.70	02.74	02.74
Dsgn. L = 3.75 ft Dsgn. L = 23.75 ft	1 2	0.032 0.314	0.103 0.103	39.43	-5.58 -5.58	5.58 39.43	195.00 139.48	175.50 125.53		1.00 1.00	9.69 9.69	93.74 93.74	93.74 93.74
+0.90D+W+1.60H	_	0.514	0.103	37.43	3.30	37.43	137.40	120.00	1.12	1.00	7.07	75.74	75.74
Dsgn. L = 3.75 ft	1	0.014	0.038		-2.40	2.40	195.00	175.50		1.00	3.60	93.74	93.74
Dsgn. L = 23.75 ft +1.20D+L+0.20S+E+1.60H	2	0.114	0.038	14.35	-2.40	14.35	139.73	125.76	1.12	1.00	3.60	93.74	93.74
Dsgn. L = 3.75 ft	1	0.024	0.087		-4.16	4.16	195.00	175.50	1.00	1.00	8.13	93.74	93.74
Dsgn. L = 23.75 ft	2	0.247	0.087	31.01	-4.16	31.01	139.35	125.42	1.12	1.00	8.13	93.74	93.74
+0.90D+E+0.90H Dsgn. L = 3.75 ft	1	0.014	0.038		-2.40	2.40	195.00	175.50	1 00	1.00	3.60	93.74	93.74
Dsgn. L = 3.75 ft Dsgn. L = 23.75 ft	2	0.014	0.038	14.35	-2.40 -2.40	14.35	139.73	125.76		1.00	3.60	93.74	93.74
Overall Maximum	Deflec												
Load Combination		Span	Max. "-" Def	I Locatio	n in Span	Load Com	nbination			Ma	ıx. "+" Defl	Location i	n Span
		1	0.0000		0.000	+D+S+F					-0.3569		.000
+D+S+H		2	0.7534		11.970	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					0.0000		.000
Vertical Reactions	S				Support	notation : Far	left is #1			Values	in KIPS		
Load Combination		Support 1	Support 2	Suppo									
Overall MAXimum		- ' '	17.031		554								
Overall MINimum			4.312		464								
+D+H			7.186		470								
+D+L+H			12.229		933								
+D+Lr+H +D+S+H			7.186 15.270		470 554								
+D+0.750Lr+0.750L+H			10.968		817								
+D+0.750L+0.750S+H			17.031		630								
+D+0.60W+H			7.186	2.4	470								
+D+0.750Lr+0.750L+0.450			10.968		817								
+D+0.750L+0.750S+0.450	)W+H		17.031		630								
+0.60D+0.60W+0.60H			4.312		482 470								
+D+0.70E+0.60H +D+0.750L+0.750S+0.525	i0F+H		7.186 17.031		470 630								
+0.60D+0.70E+H	-UL111		4.312		482								
D Only			7.186		470								
L Only			5.042		464								
S Only			8.084	5.0	084								
H Only													



## 3rd Floor Framing, 3rd: Beam #5b 1 piece(s) W10X26 (A992) ASTM Steel



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)	6392 @ 2"	8179 (3.50")	Passed (78%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	6206 @ 3 1/2"	53560	Passed (12%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	31034 @ 10' 1/2"	33437	Passed (93%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.364 @ 10' 1/2"	0.658	Passed (L/651)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.522 @ 10' 1/2"	0.988	Passed (L/454)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	В	earing Lengt	th	Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1933	4459	6392	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	1933	4459	6392	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 20' 1"	N/A	26.0		
1 - Uniform (PLF)	0 to 20' 1"	N/A	83.3	222.0	Linked from: 3rd: Joist #4, Support 1
2 - Uniform (PLF)	0 to 20' 1"	N/A	83.3	222.0	Linked from: 3rd: Joist #4, Support 1

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## 3rd Floor Framing, 3rd: Beam #5c 1 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)	1056 @ 2"	2126 (3.50")	Passed (50%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	457 @ 1' 2 3/4"	1941	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	975 @ 2' 2"	2577	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.007 @ 2' 2"	0.200	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.012 @ 2' 2"	0.267	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.74"	476	580	1056	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.74"	476	580	1056	Blocking

<sup>•</sup> 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)	4' 4" o/c	
Bottom Edge (Lu)	4' 4" o/c	

<sup>•</sup>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 4' 4"	N/A	4.3		
1 - Uniform (PLF)	0 to 4' 4" (Front)	N/A	78.0	97.5	Linked from: 3rd: Joist #7a, Support 3
2 - Uniform (PLF)	0 to 4' 4" (Front)	N/A	137.5	170.0	Linked from: 3rd: Joist #7b, Support 1

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

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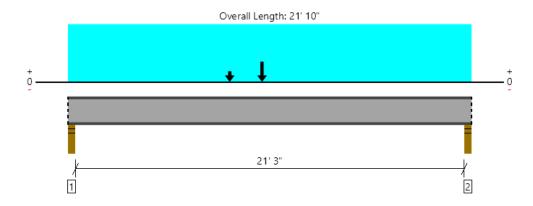


File Name: Mounger Remodel



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## 3rd Floor Framing, 3rd: Beam #6 1 piece(s) W10X33 (A992) ASTM Steel



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)	4534 @ 2"	11283 (3.50")	Passed (40%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	4509 @ 3 1/2"	56434	Passed (8%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	41331 @ 10' 6"	61787	Passed (67%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.360 @ 10' 9 3/4"	0.717	Passed (L/717)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.575 @ 10' 9 7/16"	1.075	Passed (L/449)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1781	2753	348	4882	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	1610	2580	232	4422	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 10"	N/A	33.0			
1 - Uniform (PSF)	0 to 21' 10"	1'	12.0	40.0	-	Default Load
2 - Point (lb)	8' 9"	N/A	476	-	580	Linked from: 3rd: Drop Beam #5c, Support 1
3 - Point (lb)	10' 6"	N/A	1933	4459	-	Linked from: Floor: Drop Beam #5b, Support 1

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Member Length: 14' 5 11/16"

System: Roof
Member Type: Joist
Building Use: Residential
Building Code: IBC 2018
Design Methodology: ASD
Member Pitch: 2/12

## 3rd Floor Framing, 3rd: Joist #7a 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.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	842 @ 4' 11 1/4"	2156 (3.50")	Passed (39%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	386 @ 6' 1/8"	1941	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-685 @ 4' 11 1/4"	2964	Passed (23%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.019 @ 9' 9 13/16"	0.455	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.034 @ 9' 10 1/16"	0.607	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	39	84/-11	123/-11	Blocking
2 - Beveled Plate - SPF	3.50"	3.50"	1.50"	377	465	842	None
3 - Beveled Plate - HF	3.50"	3.50"	1.50"	156	195	351	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' 4" o/c	
Bottom Edge (Lu)	14' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Snow	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.15)	Comments
1 - Uniform (PSF)	0 to 14' 1 1/2"	24"	20.0	25.0	Roof Loading

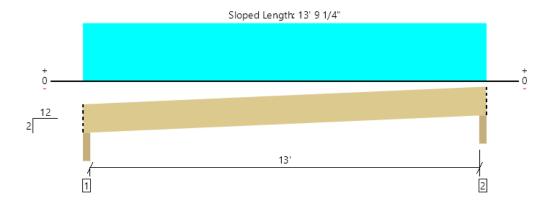
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## 3rd Floor Framing, 3rd: Joist #7b 1 piece(s) 2 x 12 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	615 @ 2 1/2"	2126 (3.50")	Passed (29%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	505 @ 1' 2 5/8"	1941	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1962 @ 6' 9 1/2"	2964	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.150 @ 6' 9 1/2"	0.667	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.272 @ 6' 9 1/2"	0.890	Passed (L/589)		1.0 D + 1.0 S (All Spans)

Member Length : 13' 11 1/8"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	275	340	615	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	275	340	615	Blocking

<sup>•</sup> 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)	5' 7" o/c	
Bottom Edge (Lu)	13' 9" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 13' 7"	24"	20.0	25.0	Roof Loading

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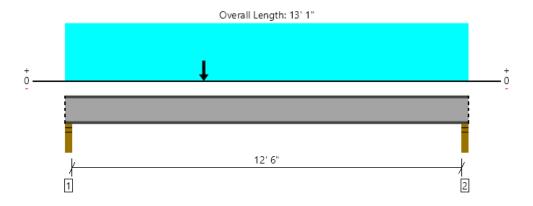
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## 3rd Floor Framing, 3rd: Beam #8 1 piece(s) W10X17 (A992) ASTM Steel



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)	2995 @ 2"	5684 (3.50")	Passed (53%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2968 @ 3 1/2"	48480	Passed (6%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	12047 @ 4' 6"	17448	Passed (69%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.071 @ 6' 15/16"	0.425	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.122 @ 6' 1 3/16"	0.637	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1260	1735	499	3494	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	814	1020	336	2170	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 1"	N/A	17.0			
1 - Uniform (PSF)	0 to 13' 1"	1'	15.0	40.0	-	Residential Loading
2 - Uniform (PSF)	0 to 13' 1"	1'	20.0	-	25.0	Roof Loading
3 - Point (lb)	4' 6"	N/A	1393	2232	508	Linked from: 3rd: Beam #5a, Support 2

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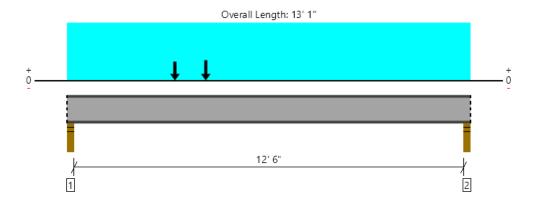
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## 3rd Floor Framing, 3rd: Beam #8 (Lateral-West) 1 piece(s) W10X17 (A992) ASTM Steel



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)	4445 @ 2"	5684 (3.50")	Passed (78%)		1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4416 @ 3 1/2"	48480	Passed (9%)		1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	16200 @ 4' 6"	17448	Passed (93%)		1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.115 @ 5' 11 15/16"	0.425	Passed (L/999+)		1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.166 @ 6' 7/16"	0.637	Passed (L/923)		1.0 D + 0.525 E + 0.75 L + 0.75 S (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- -225 lbs uplift at support located at 12' 11". Strapping or other restraint may be required.
- Applicable calculations are based on ANSI/AISC 360-16.
- $\bullet\,$  A lateral-torsional buckling factor (Cb) of 1.0 has been assumed.

	В	earing Lengt	th		Loads t	o Supports	(lbs)		
Supports	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1260	1735	499	2877/-2877	6371/- 2877	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	814	1020	336	1018/-1018	3188/- 1018	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	Seismic	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	(1.60)	Comments
0 - Self Weight (PLF)	0 to 13' 1"	N/A	17.0				
1 - Uniform (PSF)	0 to 13' 1"	1'	15.0	40.0	-	-	Residential Loading
2 - Uniform (PSF)	0 to 13' 1"	1'	20.0	-	25.0	-	Roof Loading
3 - Point (lb)	3' 6"	N/A	-	-	-	3895	Shear Wall Uplift
4 - Point (lb)	4' 6"	N/A	1393	2232	508	-	Linked from: 3rd: Beam #5a, Support 2

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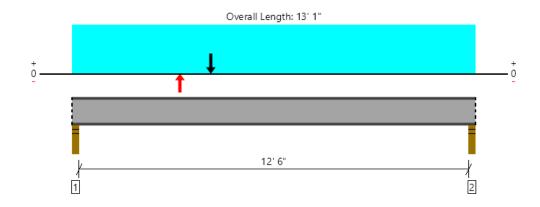
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## 3rd Floor Framing, 3rd: Beam #8 (Lateral-East) 1 piece(s) W10X17 (A992) ASTM Steel



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)	4445 @ 2"	5684 (3.50")	Passed (78%)		1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4416 @ 3 1/2"	48480	Passed (9%)		1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	16200 @ 4' 6"	17448	Passed (93%)		1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.115 @ 5' 11 15/16"	0.425	Passed (L/999+)		1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.166 @ 6' 7/16"	0.637	Passed (L/923)		1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- -225 lbs uplift at support located at 12' 11". Strapping or other restraint may be required.
- Applicable calculations are based on ANSI/AISC 360-16.
- $\bullet\,$  A lateral-torsional buckling factor (Cb) of 1.0 has been assumed.

	В	earing Lengt	th		Loads t	o Supports	(lbs)		
Supports	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1260	1735	499	2877/-2877	6371/- 2877	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	814	1020	336	1018/-1018	3188/- 1018	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	Seismic	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	(1.60)	Comments
0 - Self Weight (PLF)	0 to 13' 1"	N/A	17.0				
1 - Uniform (PSF)	0 to 13' 1"	1'	15.0	40.0	-	-	Residential Loading
2 - Uniform (PSF)	0 to 13' 1"	1'	20.0	-	25.0	-	Roof Loading
3 - Point (lb)	3' 6"	N/A	-	-	-	-3895	Shear Wall Uplift
4 - Point (lb)	4' 6"	N/A	1393	2232	508	-	Linked from: 3rd: Beam #5a, Support 2

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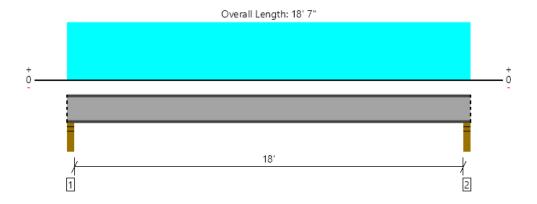
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## 3rd Floor Framing, 3rd: Beam #9 1 piece(s) W10X26 (A992) ASTM Steel



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)	1078 @ 2"	8179 (3.50")	Passed (13%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1044 @ 3 1/2"	53560	Passed (2%)		1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4829 @ 9' 3 1/2"	37044	Passed (13%)		1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.030 @ 9' 3 1/2"	0.608	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.069 @ 9' 3 1/2"	0.913	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	613	465	1078	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	613	465	1078	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 7"	N/A	26.0		
1 - Uniform (PSF)	0 to 18' 7"	2'	20.0	25.0	Roof Loading

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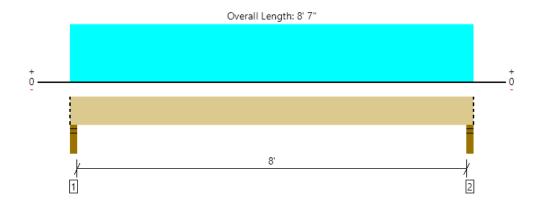
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## 3rd Floor Framing, 3rd: Drop Beam #10a 1 piece(s) 4 x 12 HF No.2



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)	2060 @ 2"	4961 (3.50")	Passed (42%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1470 @ 1' 2 3/4"	3938	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4084 @ 4' 3 1/2"	5752	Passed (71%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.066 @ 4' 3 1/2"	0.275	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.093 @ 4' 3 1/2"	0.412	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	593	1467	2060	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	593	1467	2060	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 8' 7"	N/A	10.0		
1 - Uniform (PSF)	0 to 8' 7" (Front)	3' 6"	15.0	40.0	Residential Loading
2 - Uniform (PLF)	0 to 8' 7" (Front)	N/A	75.8	201.8	Linked from: 3rd: Joist #2, Support 1

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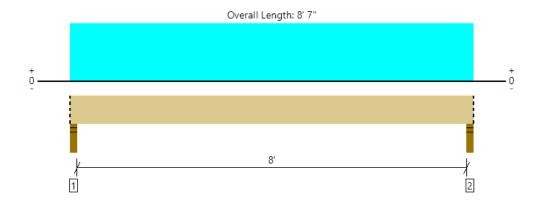
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## 3rd Floor Framing, 3rd: Drop Beam #10b 1 piece(s) 4 x 12 HF No.2



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)	869 @ 2"	4961 (3.50")	Passed (18%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	620 @ 1' 2 3/4"	3938	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1723 @ 4' 3 1/2"	5752	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.027 @ 4' 3 1/2"	0.275	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.039 @ 4' 3 1/2"	0.412	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	268	601	869	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	268	601	869	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

<sup>•</sup>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 8' 7"	N/A	10.0		
1 - Uniform (PSF)	0 to 8' 7" (Front)	3' 6"	15.0	40.0	Residential Loading

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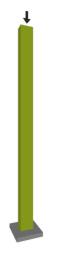
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## 3rd Floor Framing, 3rd: Post #11 1 piece(s) 6 x 6 HF No.2

Post Height: 10' 6"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	23	50	Passed (46%)		
Compression (lbs)	1078	13443	Passed (8%)	1.15	1.0 D + 1.0 S
Base Bearing (lbs)	1078	12251	Passed (9%)		1.0 D + 1.0 S
Bending/Compression	0.06	1	Passed (6%)	1.15	1.0 D + 1.0 S

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

Vertical Load	Dead (0.90)	Snow (1.15)	Comments
1 - Point (lb)	613	465	Linked from: 3rd: Beam #9***, Support 1

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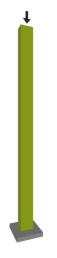
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## 3rd Floor Framing, 3rd: Post #12 1 piece(s) 6 x 6 HF No.2

Post Height: 10' 6"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	23	50	Passed (46%)		
Compression (lbs)	4190	12520	Passed (33%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	4190	12251	Passed (34%)		1.0 D + 1.0 L
Bending/Compression	0.44	1	Passed (44%)	1.00	1.0 D + 1.0 L

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

	Dead	Floor Live	Snow	
Vertical Load	(0.90)	(1.00)	(1.15)	Comments
1 - Point (lb)	1610	2580	232	Linked from: 3rd: Beam #6, Support 2

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## 3rd Floor Framing, 3rd: Post #13 1 piece(s) 6 x 6 HF No.2

Post Height: 10' 6"



Design Results	Actual	Allowed	Result	LDF	Load: Combination [Load Group]
Slenderness	23	50	Passed (46%)		
Compression (lbs)	2365	15252	Passed (16%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S [1]
Base Bearing (lbs)	2365	12251	Passed (19%)		1.0 D + 0.525 E + 0.75 L + 0.75 S [1]
Bending/Compression	0.14	1	Passed (14%)	1.00	1.0 D + 1.0 L [1]

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Member connection at both ends must be checked against an uplift of -204.
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

Max Unbraced Length	Comments		
Full Member Length	No bracing assumed.		

#### Drawing is Conceptual

	Dead	Floor Live	Snow	Seismic	
Vertical Load	(0.90)	(1.00)	(1.15)	(1.60)	Comments
1 - Point (lb)	814	1020	336		Linked from: 3rd: Beam #8 (Lateral-West), Support 2

#### Weyerhaeuser Notes

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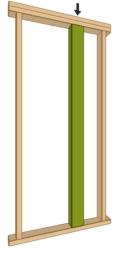
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## FORTE WEB

## 3rd Floor Framing, 3rd: Column #13 2 piece(s) 2 x 4 HF No.2

Wall Height: 6' 3" Member Height: 5' 10 1/2" Tributary Width: 1'



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination [Load Group]
Slenderness	24	50	Passed (47%)		
Compression (lbs)	2365	4101	Passed (58%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S [1]
Plate Bearing (lbs)	2365	4253	Passed (56%)		1.0 D + 0.525 E + 0.75 L + 0.75 S [1]
Lateral Reaction (lbs)	0				N/A
Lateral Shear (lbs)	0	N/A	Passed (N/A)		N/A
Lateral Moment (ft-lbs)	0 @ mid-span	N/A	Passed (N/A)		N/A
Total Deflection (in)	0.03 @ mid-span	0.59	Passed (L/2233)		1.0 D + 0.525 E + 0.75 L + 0.75 S [1]
Bending/Compression	0.49	1	Passed (49%)	1.60	1.0 D + 0.525 E + 0.75 L + 0.75 S [1]

- · Lateral deflection criteria: Wind (L/120)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Member connection at both ends must be checked against an uplift of -204.
- · Applicable calculations are based on NDS.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

Supports	Туре	Material
Тор	Dbl 2X	Hem Fir
Base	2X	Hem Fir

System : Wall Member Type : Column Building Code : IBC 2018 Design Methodology : ASD

Max Unbraced Length	Comments
5' 10 1/2"	

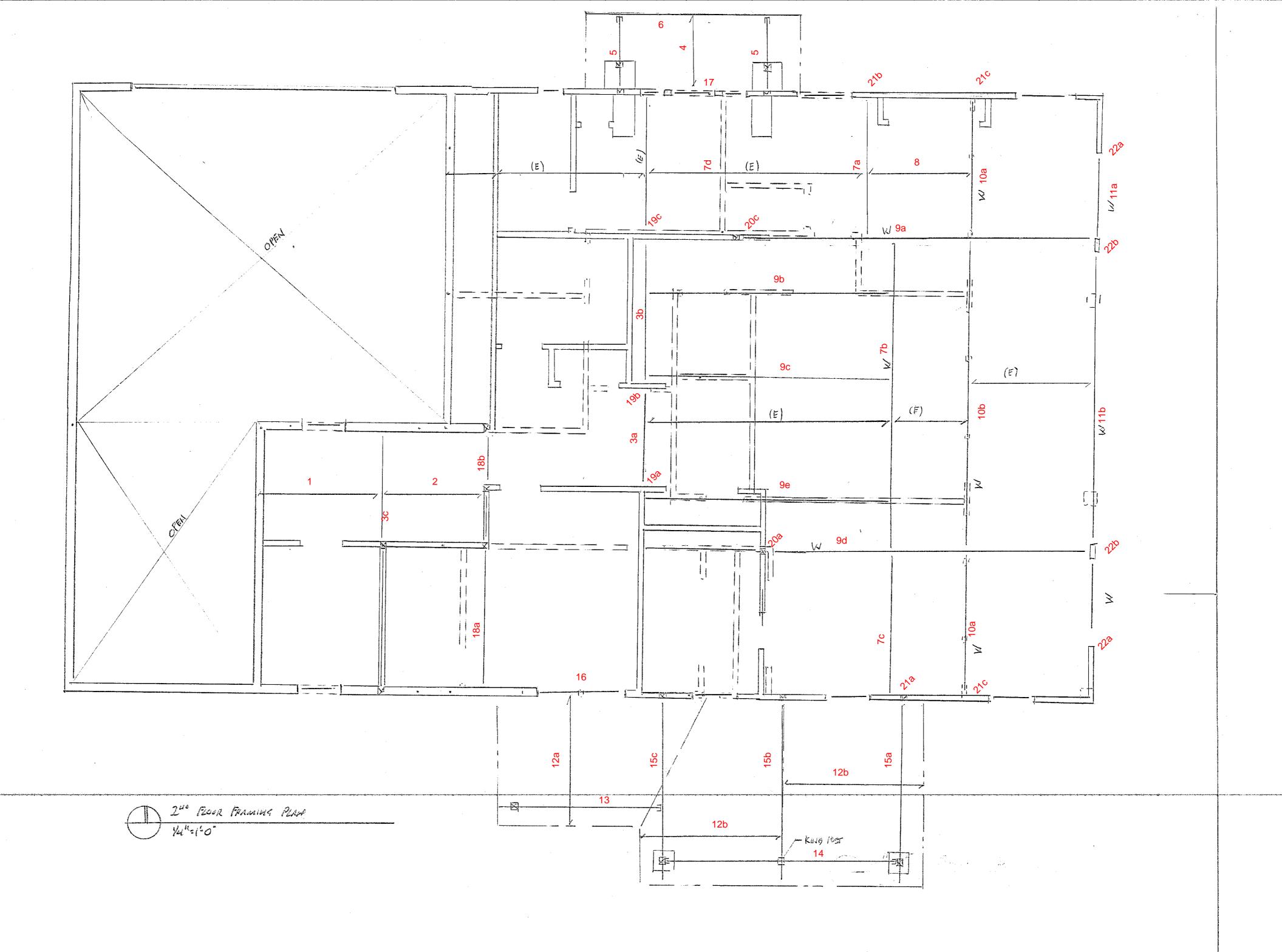
		Dead	Floor Live	Snow	Seismic	
Vertical Load	Tributary Width	(0.90)	(1.00)	(1.15)	(1.60)	Comments
1 - Point (lb)	N/A	814	1020	336	1018/-1018	Linked from: 3rd: Beam #8 (Lateral-West), Support 2

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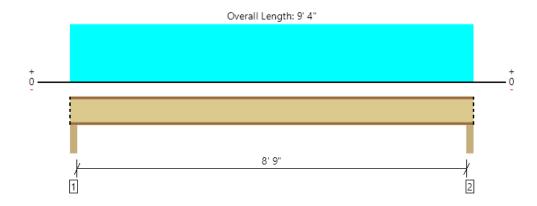
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## 2nd Floor Framing, 2nd: Joist #1 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	342 @ 2 1/2"	1375 (3.50")	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	321 @ 3 1/2"	1560	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	729 @ 4' 8"	3160	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.032 @ 4' 8"	0.297	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.044 @ 4' 8"	0.446	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	63	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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<sup>™</sup> Rating include: None.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	93	249	342	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	93	249	342	Blocking

<sup>•</sup> 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)	6' 9" o/c	
Bottom Edge (Lu)	9' 4" o/c	

- $\bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.
- $\bullet {\sf Maximum\ allowable\ bracing\ intervals\ based\ on\ applied\ load}.$

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 9' 4"	16"	15.0	40.0	Residential Load

#### Weyerhaeuser Notes

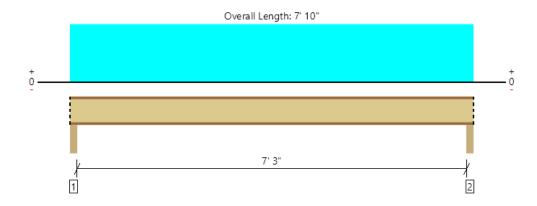
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## 2nd Floor Framing, 2nd: Joist #2 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	287 @ 2 1/2"	1375 (3.50")	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	266 @ 3 1/2"	1560	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	504 @ 3' 11"	3160	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 3' 11"	0.247	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.024 @ 3' 11"	0.371	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	65	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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<sup>™</sup> Rating include: None.

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	78	209	287	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	78	209	287	Blocking

<sup>•</sup> 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)	7' 4" o/c	
Bottom Edge (Lu)	7' 10" o/c	

- $\bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.
- $\bullet {\sf Maximum\ allowable\ bracing\ intervals\ based\ on\ applied\ load}.$

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 7' 10"	16"	15.0	40.0	Residential Load

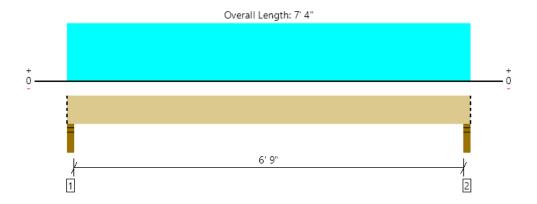
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## 2nd Floor Framing, 2nd: Beam #3a 1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	2871 @ 2"	4961 (3.50")	Passed (58%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1868 @ 1' 3 3/8"	8590	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4796 @ 3' 8"	15953	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.052 @ 3' 8"	0.233	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.073 @ 3' 8"	0.350	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.03"	818	2053	2871	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.03"	818	2053	2871	Blocking

<sup>•</sup> 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)	7' 4" o/c	
Bottom Edge (Lu)	7' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 7' 4"	N/A	13.0		
1 - Uniform (PSF)	0 to 7' 4" (Front)	14'	15.0	40.0	Residential Loading

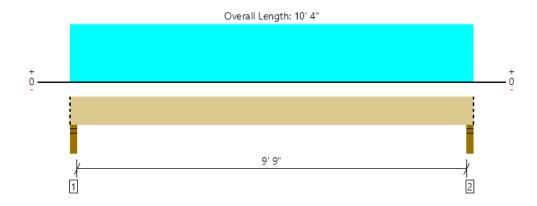
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MEMBER REPORT PASSED

## 2nd Floor Framing, 2nd: Beam #3b 1 piece(s) 3 1/2" x 11 7/8" 1.55E 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)	4045 @ 2"	4961 (3.50")	Passed (82%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	3042 @ 1' 3 3/8"	8590	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	9787 @ 5' 2"	15953	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.191 @ 5' 2"	0.333	Passed (L/627)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.268 @ 5' 2"	0.500	Passed (L/448)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.85"	1152	2893	4045	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.85"	1152	2893	4045	Blocking

<sup>•</sup> 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' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 4"	N/A	13.0		
1 - Uniform (PSF)	0 to 10' 4" (Front)	14'	15.0	40.0	Residential Loading

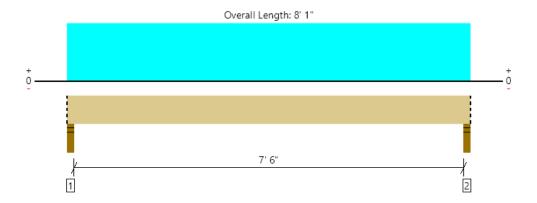
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## 2nd Floor Framing, 2nd: Beam #3c 1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	1831 @ 2"	4961 (3.50")	Passed (37%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1250 @ 1' 3 3/8"	8590	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3401 @ 4' 1/2"	15953	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.043 @ 4' 1/2"	0.258	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.061 @ 4' 1/2"	0.387	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	538	1293	1831	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	538	1293	1831	Blocking

<sup>•</sup> 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)	8' 1" o/c	
Bottom Edge (Lu)	8' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

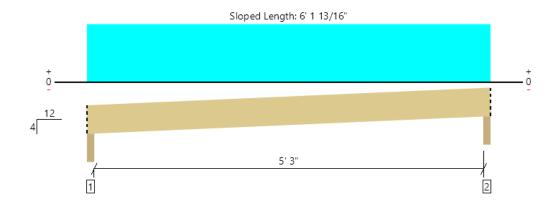
			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 8' 1"	N/A	13.0		
1 - Uniform (PSF)	0 to 8' 1" (Front)	8'	15.0	40.0	Residential Loading

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## 2nd Floor Framing, 2nd: Joist #4 1 piece(s) 2 x 10 HF No.2 @ 24" 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)	269 @ 2 1/2"	2126 (3.50")	Passed (13%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	175 @ 1' 1/4"	1596	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	338 @ 2' 11"	2204	Passed (15%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.008 @ 2' 11"	0.285	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.015 @ 2' 11"	0.381	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

Member Length: 6' 4 7/8"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- Deflection criteria: LL (L/240) and TL (L/180).
- 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.

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	123	146	269	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	123	146	269	Blocking

<sup>•</sup> 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)	6' 2" o/c	
Bottom Edge (Lu)	6' 2" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 10"	24"	20.0	25.0	Roof Loading

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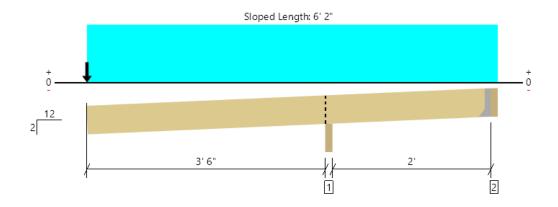
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## 2nd Floor Framing, 2nd: Beam #5 1 piece(s) 4 x 10 HF No.2



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)	3590 @ 3' 7 3/4"	5030 (3.50")	Passed (71%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	2113 @ 4' 6 5/8"	3723	Passed (57%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-4502 @ 3' 7 3/4"	4879	Passed (92%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.097 @ 0	0.370	Passed (2L/918)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.183 @ 0	0.493	Passed (2L/484)		1.0 D + 1.0 S (Alt Spans)

Member Length : 6'

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- · Applicable calculations are based on NDS.

	В	earing Lengt	th	Loads t	o Supports	(lbs)	
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	2.50"	1685	1905	3590	Blocking
2 - Hanger on 9 1/4" SPF beam	3.50"	Hanger <sup>1</sup>	1.50"	-940	-1067	-2007	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
- $\bullet\,\,^{\text{1}}$  See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 10" o/c	
Bottom Edge (Lu)	5' 10" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-T	-ie					
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

<sup>•</sup> 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)	0 to 5' 9 1/2"	N/A	8.2		
1 - Uniform (PSF)	0 to 6' 1"	2'	15.0	25.0	Roof Loading
2 - Point (lb)	0	N/A	512	561	Linked from: Roof: Drop Beam #6, Support 1

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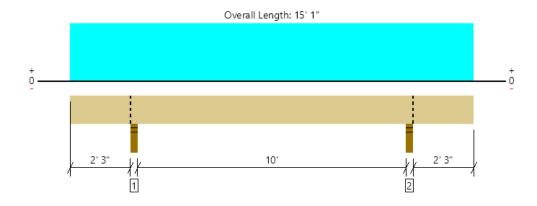
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## 2nd Floor Framing, 2nd: Beam #6 1 piece(s) 4 x 8 HF No.2



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)	1073 @ 2' 4 3/4"	4961 (3.50")	Passed (22%)		1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	630 @ 3' 1 3/4"	2918	Passed (22%)	1.15	1.0 D + 1.0 S (Adj Spans)
Moment (Ft-lbs)	1566 @ 7' 6 1/2"	3247	Passed (48%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.111 @ 7' 6 1/2"	0.515	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.199 @ 7' 6 1/2"	0.686	Passed (L/621)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- · Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	В	earing Lengt	th	Loads t	o Supports (	(lbs)	
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	512	561	1073	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	512	561	1073	Blocking

<sup>•</sup> 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' 1" o/c	
Bottom Edge (Lu)	15' 1" o/c	

<sup>•</sup>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 15' 1"	N/A	6.4		
1 - Uniform (PLF)	0 to 15' 1" (Front)	N/A	61.5	73.0	Linked from: Roof: Joist #4, Support 1

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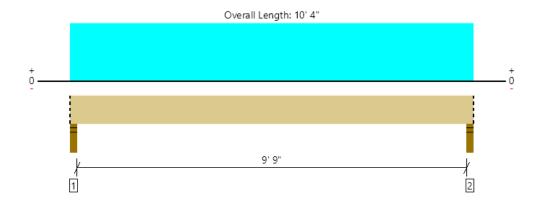
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## 2nd Floor Framing, 2nd: Beam #7a 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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)	3335 @ 2"	4961 (3.50")	Passed (67%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2508 @ 1' 3 3/8"	8035	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	8068 @ 5' 2"	19902	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.122 @ 5' 2"	0.333	Passed (L/984)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.171 @ 5' 2"	0.500	Passed (L/702)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.35"	958	2377	3335	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.35"	958	2377	3335	Blocking

<sup>•</sup> 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' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 4"	N/A	13.0		
1 - Uniform (PSF)	0 to 10' 4" (Front)	11' 6"	15.0	40.0	Residential Loading

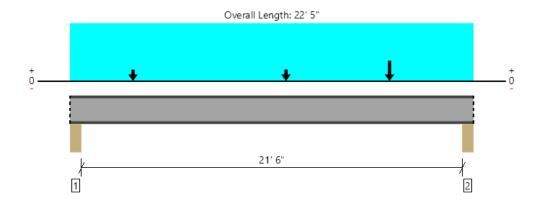
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## 2nd Floor Framing, 2nd: Beam #7b 1 piece(s) W12X40 (A992) ASTM Steel



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)	16816 @ 22' 1"	28636 (5.50")	Passed (59%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	16561 @ 21' 11 1/2"	70210	Passed (24%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	82353 @ 12'	86314	Passed (95%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.430 @ 11' 3 1/4"	0.725	Passed (L/607)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.774 @ 11' 5 1/4"	1.087	Passed (L/337)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length		Loads to Supports (lbs)					
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Beam - GLB	5.50"	5.50"	5.50"	5577	8351	950	14878	Blocking
2 - Beam - GLB	5.50"	5.50"	5.50"	7871	8108	3820	19799	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 5"	N/A	40.0			
1 - Uniform (PSF)	0 to 22' 5"	11' 6"	15.0	40.0	-	Residential Loading
2 - Point (lb)	3' 6"	N/A	1593	2143	-	Linked from: 2nd: Beam #9c, Support 1
3 - Point (lb)	12'	N/A	1593	2143	-	Linked from: 2nd: Beam #9c, Support 1
4 - Point (lb)	17' 9"	N/A	5498	1861	4770	Linked from: 2nd: Beam #9b, Support 1

## Weyerhaeuser Notes

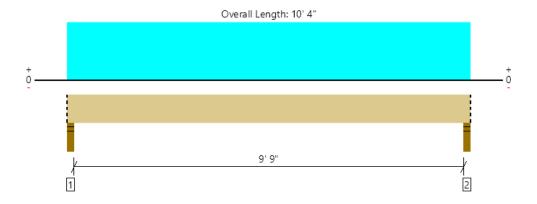
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# 2nd Floor Framing, 2nd: Beam #7c 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL

MEMBER REPORT



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)	3335 @ 2"	4961 (3.50")	Passed (67%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2508 @ 1' 3 3/8"	8035	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	8068 @ 5' 2"	19902	Passed (41%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.122 @ 5' 2"	0.333	Passed (L/984)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.171 @ 5' 2"	0.500	Passed (L/702)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

**PASSED** 

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.35"	958	2377	3335	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.35"	958	2377	3335	Blocking

<sup>•</sup> 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' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 4"	N/A	13.0		
1 - Uniform (PSF)	0 to 10' 4" (Front)	11' 6"	15.0	40.0	Residential Loading

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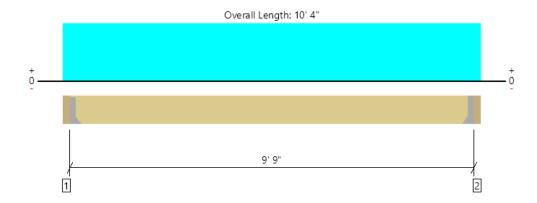
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# FORTE WEB

### 2nd Floor Framing, 2nd: Beam #7d 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)	4999 @ 3 1/2"	4999 (2.29")	Passed (100%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	3984 @ 1' 3 3/8"	8035	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	12185 @ 5' 2"	19902	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.156 @ 5' 2"	0.325	Passed (L/752)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.247 @ 5' 2"	0.488	Passed (L/473)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Hanger on 11 7/8" HF beam	3.50"	Hanger <sup>1</sup>	2.29"	1962	3333	5295	See note 1
2 - Hanger on 11 7/8" HF beam	3.50"	Hanger <sup>1</sup>	2.29"	1962	3333	5295	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' 9" o/c	
Bottom Edge (Lu)	9' 9" o/c	

<sup>•</sup>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	HGUS410	4.00"	N/A	46-10d	16-10d					
2 - Face Mount Hanger	HGUS410	4.00"	N/A	46-10d	16-10d					

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)	Comments
0 - Self Weight (PLF)	3 1/2" to 10' 1/2"	N/A	13.0		
1 - Uniform (PSF)	0 to 10' 4" (Front)	16' 9"	15.0	20.0	Attic Loading
2 - Uniform (PSF)	0 to 10' 4" (Front)	7' 9"	15.0	40.0	Residential Loading

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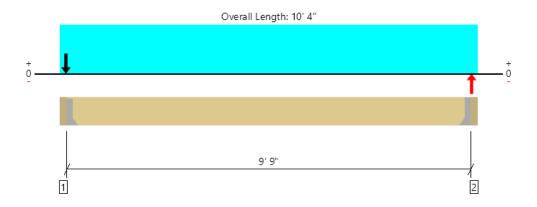
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# MEMBER REPORT

# 2nd Floor Framing, 2nd: Beam #7d (Lateral) 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)	4999 @ 3 1/2"	4999 (2.29")	Passed (100%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	3984 @ 1' 3 3/8"	8035	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	12185 @ 5' 2"	19902	Passed (61%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.156 @ 5' 2"	0.325	Passed (L/752)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.247 @ 5' 2"	0.488	Passed (L/473)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Seismic	Total	Accessories
1 - Hanger on 11 7/8" HF beam	3.50"	Hanger <sup>1</sup>	2.29"	1962	3333	5615/-5615	10910/- 5615	See note 1
2 - Hanger on 11 7/8" HF beam	3.50"	Hanger <sup>1</sup>	2.29"	1962	3333	-	5295	See note 1

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

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

<sup>•</sup>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	HGUS410	4.00"	N/A	46-10d	16-10d				
2 - Face Mount Hanger	HGUS410	4.00"	N/A	46-10d	16-10d				

<sup>•</sup> Refer to manufacturer notes and instructions for proper installation and use of all connectors.

			Dead	Floor Live	Seismic	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.60)	Comments
0 - Self Weight (PLF)	3 1/2" to 10' 1/2"	N/A	13.0			
1 - Uniform (PSF)	0 to 10' 4" (Front)	16' 9"	15.0	20.0	-	Attic Loading
2 - Uniform (PSF)	0 to 10' 4" (Front)	7' 9"	15.0	40.0	-	Residential Loading
3 - Point (lb)	3" (Front)	N/A	-	-	5615	Shear Wall Uplift
4 - Point (lb)	10' 1" (Front)	N/A	-	-	-5615	

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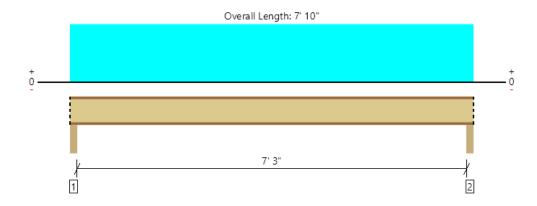
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### 2nd Floor Framing, 2nd: Joist #8 1 piece(s) 11 7/8" TJI ® 110 @ 16" OC



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)	287 @ 2 1/2"	1375 (3.50")	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	266 @ 3 1/2"	1560	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	504 @ 3' 11"	3160	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 3' 11"	0.247	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.024 @ 3' 11"	0.371	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	65	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/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.

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.75"	78	209	287	Blocking
2 - Beam - HF	3.50"	3.50"	1.75"	78	209	287	Blocking

<sup>•</sup> 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)	7' 4" o/c	
Bottom Edge (Lu)	7' 10" o/c	

 $<sup>\</sup>bullet \mathsf{TJI}$  joists are only analyzed using Maximum Allowable bracing solutions.

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load. } \\$ 

			Dead	Floor Live	
Vertical Load	Location	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 7' 10"	16"	15.0	40.0	Residential Load

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

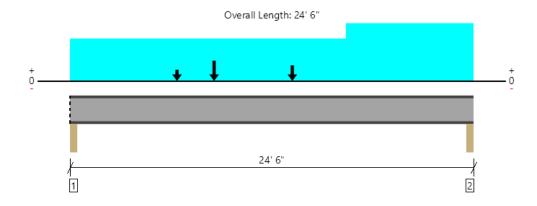
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File Name: Mounger Remodel



# 2nd Floor Framing, 2nd: Beam #9a 1 piece(s) W10X68 (A992) ASTM Steel



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)	17124 @ 2"	25629 (3.50")	Passed (67%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	17082 @ 3 1/2"	97760	Passed (17%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	134065 @ 8' 9"	174387	Passed (77%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.727 @ 11' 10 5/16"	0.806	Passed (L/399)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	1.138 @ 11' 9 13/16"	1.208	Passed (L/255)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Column - HF	3.50"	3.50"	3.50"	6415	10708	613	17736	Blocking
2 - Column - HF	3.50"	3.50"	3.50"	4583	7967	337	12887	None

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 6"	N/A	68.0			
1 - Uniform (PSF)	0 to 16' 9"	1' 4"	15.0	40.0	-	Residential Loading
2 - Uniform (PSF)	16' 9" to 24' 6"	1' 4"	15.0	60.0	-	Deck Loading
3 - Point (lb)	6' 6"	N/A	958	2377	-	Linked from: Floor: Drop Beam #7a, Support 1
4 - Point (lb)	13' 6"	N/A	671	2017	-	Linked from: 2nd: Beam #10a, Support 1
5 - Point (lb)	13' 6"	N/A	1636	4417	-	Linked from: 2nd: Beam #10b, Support 1
6 - Point (lb)	8' 9"	N/A	5577	8351	950	Linked from: Floor: Drop Beam #7b, Support 1

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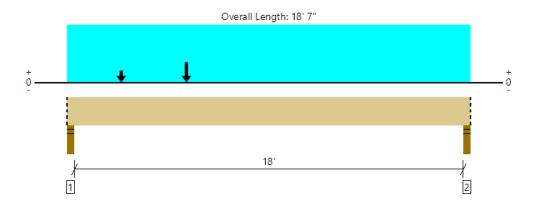
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### MEMBER REPORT

### 2nd Floor Framing, 2nd: Beam #9b 1 piece(s) 7" 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)	10472 @ 2"	9923 (3.50")	Failed (106%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	10362 @ 1' 3 3/8"	18481	Passed (56%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	46174 @ 5' 6"	45776	Passed (101%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.561 @ 8' 5 1/8"	0.608	Passed (L/390)		1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	1.181 @ 8' 5 3/16"	0.913	Failed (L/185)		1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.69"	5498	1861	4770	12129	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	2180	961	1659	4800	Blocking

<sup>•</sup> 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)	6" o/c	
Bottom Edge (Lu)	18' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 7"	N/A	26.0			
1 - Uniform (PSF)	0 to 18' 7" (Front)	1' 4"	15.0	40.0	-	Residential Loading
2 - Point (lb)	2' 6" (Front)	N/A	1469	425	1339	Linked from: Attic: Header #1e, Support 1
3 - Point (lb)	5' 6" (Front)	N/A	5354	1406	5090	Linked from: Attic: Header #1e, Support 2

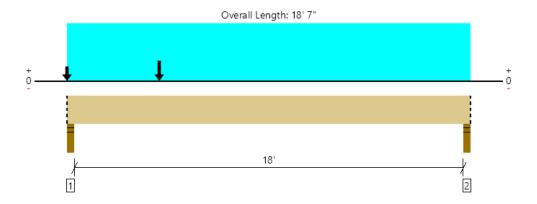
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# 2nd Floor Framing, 2nd: Beam #9c 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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)	4605 @ 2"	4961 (3.50")	Passed (93%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2679 @ 1' 3 3/8"	8035	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	10614 @ 4' 3"	19902	Passed (53%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.355 @ 8' 7 5/8"	0.608	Passed (L/617)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.609 @ 8' 7 5/16"	0.913	Passed (L/359)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

**PASSED** 

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.25"	1974	2631	4605	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	558	817	1375	Blocking

<sup>•</sup> 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)	18' 7" o/c	
Bottom Edge (Lu)	18' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 18' 7"	N/A	13.0		
1 - Uniform (PSF)	0 to 18' 7" (Front)	1' 4"	15.0	40.0	Residential Loading
2 - Point (lb)	4' 3" (Front)	N/A	1123	1438	Linked from: Attic: Beam #1c, Support 1
3 - Point (lb)	0 (Front)	N/A	796	1019	Linked from: Attic: Beam #1d, Support 1

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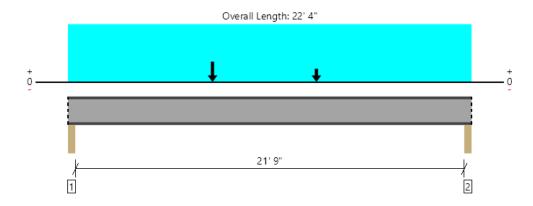
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# 2nd Floor Framing, 2nd: Beam #9d 1 piece(s) W10X54 (A992) ASTM Steel



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)	15882 @ 2"	25375 (3.50")	Passed (63%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	15845 @ 3 1/2"	74740	Passed (21%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	120339 @ 8'	133807	Passed (90%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.707 @ 10' 11 1/8"	0.733	Passed (L/373)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	1.098 @ 10' 10 7/16"	1.100	Passed (L/240)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Bearing reinforcement may be required for support located at 2".
- Bearing reinforcement may be required for point load located at 8'.
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	В	Bearing Length			oads to Sup			
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Column - HF	3.50"	3.50"	3.50"	5917	9965	612	16494	Blocking
2 - Column - HF	3.50"	3.50"	3.50"	4578	8388	338	13304	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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	Snow	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 22' 4"	N/A	54.0			
1 - Uniform (PSF)	0 to 22' 4"	1' 4"	15.0	40.0	-	Residential Loading
2 - Point (lb)	8'	N/A	958	2377	-	Linked from: 2nd: Beam #7c, Support 1
3 - Point (lb)	13' 9"	N/A	671	2017	-	Linked from: 2nd: Beam #10a, Support 1
4 - Point (lb)	13' 9"	N/A	1636	4417	-	Linked from: 2nd: Beam #10b, Support 1
5 - Point (lb)	8,	N/A	5577	8351	950	Linked from: 2nd: Beam #7b, Support 1

### Weyerhaeuser Notes

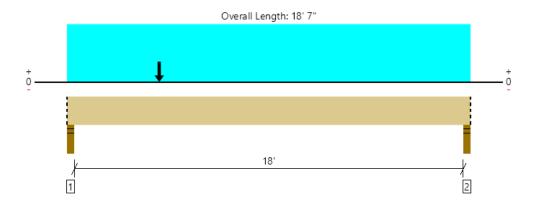
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# 2nd Floor Framing, 2nd: Beam #9e 1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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)	3735 @ 2"	4961 (3.50")	Passed (75%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	3625 @ 1' 3 3/8"	8035	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	14474 @ 4' 3"	19902	Passed (73%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.457 @ 8' 6 3/8"	0.608	Passed (L/479)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.791 @ 8' 6 1/8"	0.913	Passed (L/277)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.64"	1593	2143	3736	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	677	970	1647	Blocking

<sup>•</sup> 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)	18' 7" o/c	
Bottom Edge (Lu)	18' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 18' 7"	N/A	13.0		
1 - Uniform (PSF)	0 to 18' 7" (Front)	1' 4"	15.0	40.0	Residential Loading
2 - Point (lb)	4' 3" (Front)	N/A	534	684	Linked from: Attic: Beam #1b, Support 1
3 - Point (lb)	4' 3" (Front)	N/A	1123	1438	Linked from: Attic: Beam #1c, Support 1

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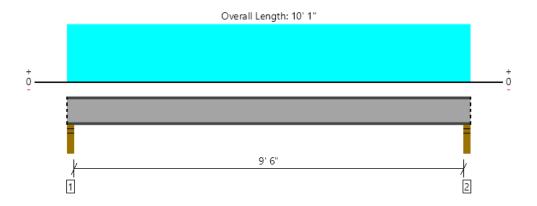
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# 2nd Floor Framing, 2nd: Beam #10a 1 piece(s) W10X15 (A992) ASTM Steel

MEMBER REPORT



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)	2688 @ 2"	5670 (3.50")	Passed (47%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	2532 @ 3 1/2"	45954	Passed (6%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6335 @ 5' 1/2"	19769	Passed (32%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.041 @ 5' 1/2"	0.325	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.054 @ 5' 1/2"	0.488	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	671	2017	2688	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	671	2017	2688	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 10' 1"	N/A	15.0		
1 - Uniform (PSF)	0 to 10' 1"	3' 7 1/2"	15.0	40.0	Residential Loading
2 - Uniform (PSF)	0 to 10' 1"	4' 3"	15.0	60.0	Deck Loading

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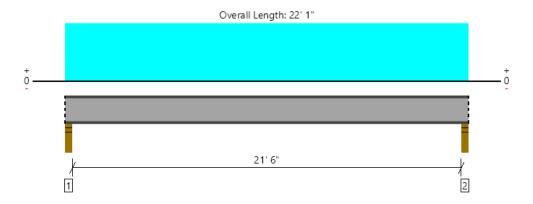
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# 2nd Floor Framing, 2nd: Beam #10b 1 piece(s) W10X30 (A992) ASTM Steel

MEMBER REPORT



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)	6052 @ 2"	8236 (3.50")	Passed (73%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	5892 @ 3 1/2"	63000	Passed (9%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	32412 @ 11' 1/2"	38841	Passed (83%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.409 @ 11' 1/2"	0.725	Passed (L/639)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.560 @ 11' 1/2"	1.087	Passed (L/466)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	В	Bearing Length			o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	1636	4417	6053	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	1636	4417	6053	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 22' 1"	N/A	30.0		
1 - Uniform (PSF)	0 to 22' 1"	3' 7 1/2"	15.0	40.0	Residential Loading
2 - Uniform (PSF)	0 to 22' 1"	4' 3"	15.0	60.0	Deck Loading

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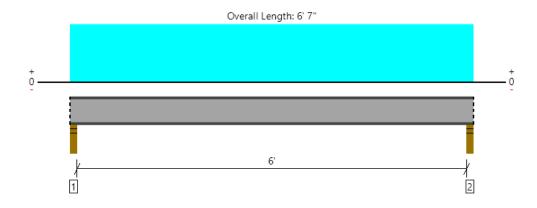
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### 2nd Floor Framing, 2nd: Beam #11a 1 piece(s) W16X26 (A992) ASTM Steel



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)	1197 @ 2"	7796 (3.50")	Passed (15%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1091 @ 3 1/2"	70509	Passed (2%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1775 @ 3' 3 1/2"	96533	Passed (2%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.001 @ 3' 3 1/2"	0.208	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.001 @ 3' 3 1/2"	0.313	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	308	889	1197	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	308	889	1197	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 6' 7"	N/A	26.0		
1 - Uniform (PSF)	0 to 6' 7"	4' 6"	15.0	60.0	Deck Loading

### Weyerhaeuser Notes

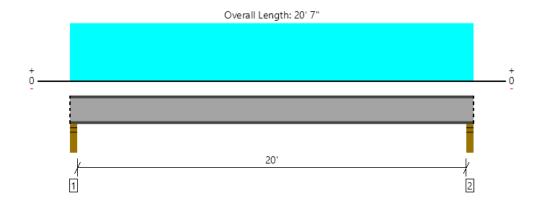
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### 2nd Floor Framing, 2nd: Beam #11b 1 piece(s) W16X26 (A992) ASTM Steel



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)	3548 @ 2"	7796 (3.50")	Passed (46%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	3448 @ 3 1/2"	70509	Passed (5%)		1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	17671 @ 10' 3 1/2"	25458	Passed (69%)		1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.111 @ 10' 3 1/2"	0.338	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.149 @ 10' 3 1/2"	0.338	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/720) and TL (L/720).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (Сь) of 1.0 has been assumed.

	В	Bearing Length			o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	3.50"	924	2624	3548	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	924	2624	3548	Blocking

<sup>•</sup> 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)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 20' 7"	N/A	26.0		
1 - Uniform (PSF)	0 to 20' 7"	4' 3"	15.0	60.0	Deck Loading

### Member Notes

Nanawall Door (1/4" Deflection)

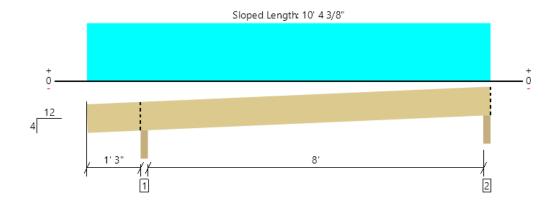
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# 2nd Floor Framing, 2nd: Joist #12a 1 piece(s) 2 x 10 HF No.2 @ 24" OC



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)	519 @ 1' 4 3/4"	2241 (3.50")	Passed (23%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	309 @ 2' 3 1/4"	1596	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	748 @ 5' 7 3/16"	2204	Passed (34%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.043 @ 5' 6 5/16"	0.434	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.078 @ 5' 6 7/16"	0.578	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 10' 7 7/16"

System: Roof
Member Type: Joist
Building Use: Residential
Building Code: IBC 2018
Design Methodology: ASD
Member Pitch: 4/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length			o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	237	281	518	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	177	213	390	Blocking

<sup>•</sup> 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' 4" o/c	
Bottom Edge (Lu)	10' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 9' 10"	24"	20.0	25.0	Roof Loading

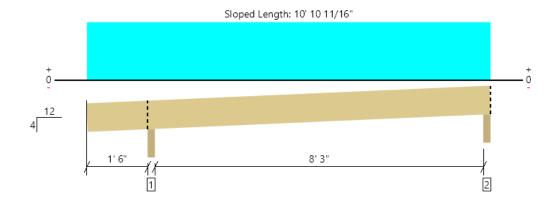
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# 2nd Floor Framing, 2nd: Joist #12b 1 piece(s) 2 x 10 HF No.2 @ 24" OC



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)	557 @ 1' 7 3/4"	2241 (3.50")	Passed (25%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	325 @ 2' 6 1/4"	1596	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	783 @ 6'	2204	Passed (36%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.048 @ 5' 10 15/16"	0.447	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.087 @ 5' 11 1/16"	0.596	Passed (L/999+)		1.0 D + 1.0 S (Alt Spans)

Member Length : 11' 1 13/16"

System : Roof Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD Member Pitch : 4/12

- 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.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	Bearing Length			to Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	255	302	557	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	181	218	399	Blocking

<sup>•</sup> 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' 11" o/c	
Bottom Edge (Lu)	10' 11" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 10' 4"	24"	20.0	25.0	Roof Loading

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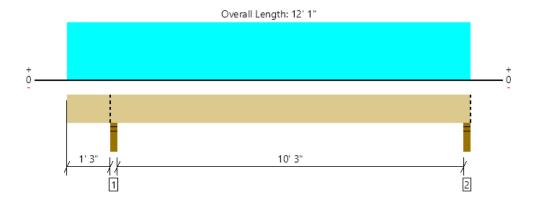
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### MEMBER REPORT

### 2nd Floor Framing, 2nd: Beam #13 1 piece(s) 4 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)	954 @ 1' 4 3/4"	4961 (3.50")	Passed (19%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	651 @ 2' 1 3/4"	2918	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1907 @ 6' 8 11/16"	3247	Passed (59%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.140 @ 6' 8 1/16"	0.526	Passed (L/901)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.261 @ 6' 8 3/16"	0.701	Passed (L/483)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- · Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	448	506	954	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	354	404	758	Blocking

<sup>•</sup> 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' 1" o/c	
Bottom Edge (Lu)	12' 1" o/c	

<sup>•</sup>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 12' 1"	N/A	6.4		
1 - Uniform (PSF)	0 to 12' 1" (Front)	3'	20.0	25.0	Roof Loading

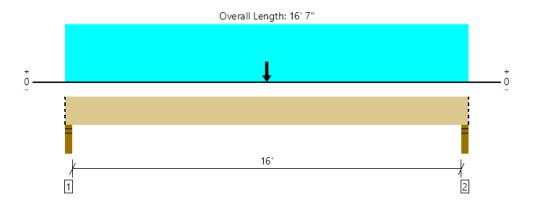
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# 2nd Floor Framing, 2nd: Beam #14 1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	2180 @ 2"	4961 (3.50")	Passed (44%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	2086 @ 1' 3 3/8"	9878	Passed (21%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	15202 @ 8' 3 1/2"	18346	Passed (83%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.440 @ 8' 3 1/2"	0.813	Passed (L/444)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.848 @ 8' 3 1/2"	1.083	Passed (L/230)		1.0 D + 1.0 S (All Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.54"	1065	1115	2180	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.54"	1065	1115	2180	Blocking

<sup>•</sup> 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)	16' o/c	
Bottom Edge (Lu)	16' 7" o/c	

<sup>•</sup>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 16' 7"	N/A	13.0		
1 - Uniform (PSF)	0 to 16' 7" (Front)	1' 4"	20.0	25.0	Roof Loading
2 - Point (lb)	8' 3 1/2" (Front)	N/A	1472	1677	Linked from: Roof: Drop Beam #15b, Support 1

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# 2nd Floor Framing, 2nd: Beam #15a 1 piece(s) 3 1/2" x 9 1/2" 1.55E 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)	2222 @ 1' 10 3/4"	4961 (3.50")	Passed (45%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1403 @ 2' 10"	7902	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4398 @ 7' 7 13/16"	11985	Passed (37%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.147 @ 7' 6 11/16"	0.564	Passed (L/918)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.278 @ 7' 6 13/16"	0.751	Passed (L/487)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.57"	1061	1161	2222	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	778	864	1642	Blocking

<sup>•</sup> 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)	13' 4" o/c	
Bottom Edge (Lu)	13' 4" o/c	

<sup>•</sup>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 13' 4"	N/A	10.4		
1 - Uniform (PLF)	0 to 13' 4" (Front)	N/A	127.5	151.0	Linked from: Roof: Joist #12b, Support 1

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# 2nd Floor Framing, 2nd: Beam #15b 1 piece(s) 3 1/2" x 9 1/2" 1.55E 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)	3149 @ 1' 10 3/4"	4961 (3.50")	Passed (63%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1989 @ 2' 10"	7902	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6234 @ 7' 7 3/4"	11985	Passed (52%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.213 @ 7' 6 11/16"	0.564	Passed (L/636)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.393 @ 7' 6 13/16"	0.751	Passed (L/344)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	2.22"	1472	1677	3149	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.64"	1080	1247	2327	Blocking

<sup>•</sup> 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)	13' 4" o/c	
Bottom Edge (Lu)	13' 4" o/c	

<sup>•</sup>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 13' 4"	N/A	10.4		
1 - Uniform (PLF)	0 to 13' 4" (Front)	N/A	90.5	109.0	Linked from: Roof: Joist #12b, Support 2
2 - Uniform (PLF)	0 to 13' 4" (Front)	N/A	90.5	109.0	Linked from: Roof: Joist #12b, Support 2

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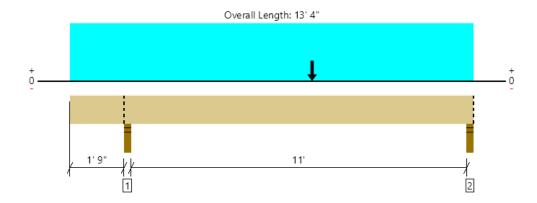
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# 2nd Floor Framing, 2nd: Beam #15c 1 piece(s) 3 1/2" x 9 1/2" 1.55E TimberStrand® LSL



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)	2569 @ 1' 10 3/4"	4961 (3.50")	Passed (52%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	1751 @ 2' 10"	7902	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6501 @ 8'	11985	Passed (54%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.205 @ 7' 7"	0.564	Passed (L/659)		1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.386 @ 7' 7 1/16"	0.751	Passed (L/350)		1.0 D + 1.0 S (Alt Spans)

System : Roof Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 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).
- Allowed moment does not reflect the adjustment for the beam stability factor.

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.81"	1223	1346	2569	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	970	1083	2053	Blocking

<sup>•</sup> 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)	13' 4" o/c	
Bottom Edge (Lu)	13' 4" o/c	

<sup>•</sup>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 13' 4"	N/A	10.4		
1 - Point (lb)	8' (Front)	N/A	354	404	Linked from: Roof: Drop Beam #13, Support 2
2 - Uniform (PLF)	0 to 13' 4" (Front)	N/A	127.5	151.0	Linked from: Roof: Joist #12b, Support 1

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

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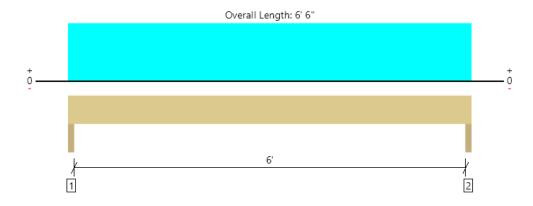


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### MEMBER REPORT

# 2nd Floor Framing, 2nd: Header #16 2 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)	652 @ 1 1/2"	3645 (3.00")	Passed (18%)		1.0 D + 1.0 S (All Spans)
Shear (lbs)	480 @ 10 1/4"	2501	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	979 @ 3' 3"	2569	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.030 @ 3' 3"	0.208	Passed (L/999+)		1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.056 @ 3' 3"	0.313	Passed (L/999+)		1.0 D + 1.0 S (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads t	o Supports		
Supports	Total	Available	Required	Dead	Snow	Total	Accessories
1 - Trimmer - HF	3.00"	3.00"	1.50"	306	346	652	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	306	346	652	None

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

<sup>•</sup>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 6' 6"	N/A	5.5		
1 - Uniform (PLF)	0 to 6' 6"	N/A	88.5	106.5	Linked from: 2nd: Joist #12a, Support 2

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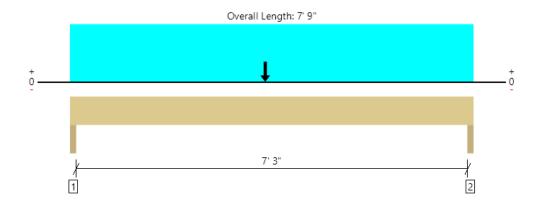
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# 2nd Floor Framing, 2nd: Header #17 3 piece(s) 2 x 12 HF No.2



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)	2237 @ 1 1/2"	5468 (3.00")	Passed (41%)		1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1728 @ 1' 2 1/4"	5063	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5191 @ 3' 9"	6724	Passed (77%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.024 @ 3' 10 5/16"	0.250	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.069 @ 3' 10 3/8"	0.375	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System: Wall Member Type: Header Building Use: Residential Building Code: IBC 2018 Design Methodology: ASD

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

	Bearing Length			Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Floor Live	Snow	Total	Accessories
1 - Trimmer - HF	3.00"	3.00"	1.50"	1511	685	283	2479	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	1492	661	283	2436	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 9" o/c	
Bottom Edge (Lu)	7' 9" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	Snow	
Vertical Loads	Location	Tributary Width	(0.90)	(1.00)	(1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 9"	N/A	12.8			
1 - Uniform (PSF)	0 to 7' 9"	1' 4"	15.0	40.0	-	Residential Loading
2 - Uniform (PSF)	0 to 7' 9"	20'	10.0	-	-	Wall Weight
3 - Uniform (PSF)	0 to 7' 9"	1' 4"	15.0	20.0	-	Attic Loading
4 - Uniform (PLF)	0 to 7' 9"	N/A	61.5	-	73.0	Linked from: 2nd: Joist #4, Support 1
5 - Point (lb)	3' 9"	N/A	567	726	•	Linked from: Attic: Beam #1f, Support 1

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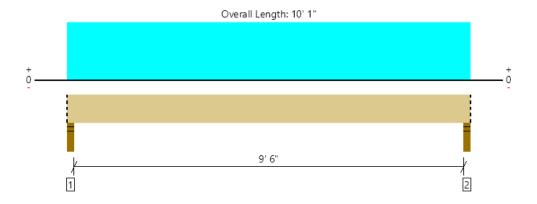
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### 2nd Floor Framing, 2nd: Drop Beam #18a 1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	1151 @ 2"	4961 (3.50")	Passed (23%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	858 @ 1' 3 3/8"	8590	Passed (10%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2712 @ 5' 1/2"	15953	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.049 @ 5' 1/2"	0.325	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.071 @ 5' 1/2"	0.488	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	360	790	1150	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	360	790	1150	Blocking

<sup>•</sup> 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' 1" o/c	
Bottom Edge (Lu)	10' 1" o/c	

<sup>•</sup>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' 1"	N/A	13.0		
1 - Uniform (PLF)	0 to 10' 1" (Front)	N/A	58.5	156.8	Linked from: 2nd: Joist #2, Support 1

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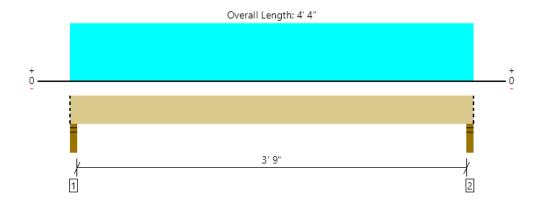
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### 2nd Floor Framing, 2nd: Drop Beam #18b 1 piece(s) 3 1/2" x 11 7/8" 1.55E TimberStrand® LSL



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)	495 @ 2"	4961 (3.50")	Passed (10%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	202 @ 1' 3 3/8"	8590	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	456 @ 2' 2"	15953	Passed (3%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.002 @ 2' 2"	0.133	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.003 @ 2' 2"	0.200	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Stud wall - HF	3.50"	3.50"	1.50"	155	340	495	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	155	340	495	Blocking

<sup>•</sup> 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)	4' 4" o/c	
Bottom Edge (Lu)	4' 4" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Loads	Location (Side)	Tributary Width	(0.90)	(1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 4"	N/A	13.0		
1 - Uniform (PLF)	0 to 4' 4" (Front)	N/A	58.5	156.8	Linked from: 2nd: Joist #2, Support 1

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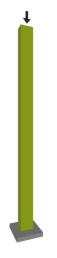




### MEMBER REPORT

# 2nd Floor Framing, 2nd: Post #19a 1 piece(s) 4 x 4 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	2871	6095	Passed (47%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	2871	4961	Passed (58%)		1.0 D + 1.0 L
Bending/Compression	0.58	1	Passed (58%)	1.00	1.0 D + 1.0 L

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

	Dead	Floor Live	
Vertical Load	(0.90)	(1.00)	Comments
1 - Point (lb)	818		Linked from: 2nd: Beam #3a, Support 1

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

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### MEMBER REPORT

# 2nd Floor Framing, 2nd: Post #19b 1 piece(s) 4 x 6 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	6916	9525	Passed (73%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	6916	7796	Passed (89%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- . Input axial load eccentricity for the design is zero
- · Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

Vertical Loads	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	818	2053	Linked from: 2nd: Beam #3a, Support 1
2 - Point (lb)	1152	2893	Linked from: 2nd: Beam #3b, Support 1

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Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD



### MEMBER REPORT

# 2nd Floor Framing, 2nd: Post #19c 1 piece(s) 4 x 6 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	7520	9525	Passed (79%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	7520	7796	Passed (96%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- . Input axial load eccentricity for the design is zero
- · Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

 Max Unbraced Length
 Comments

 Full Member Length
 No bracing assumed.

### Drawing is Conceptual

	Dead	Floor Live	
Vertical Loads	(0.90)	(1.00)	Comments
1 - Point (lb)	950	2525	(e) beam
2 - Point (lb)	1152	2893	Linked from: 2nd: Beam #3b, Support 1

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ForteWEB Software Operator	Job Notes	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com		





# MEMBER REPORT 2nd Floor Framing, 2nd: Post #20

1 piece(s) 4 x 12 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	15882	19231	Passed (83%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	15882	15947	Passed (100%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced Length Comments Full Member Length No bracing assumed. Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology: ASD

#### Drawing is Conceptual

	Dead	Floor Live	Snow	
Vertical Load	(0.90)	(1.00)	(1.15)	Comments
1 - Point (lb)	5917	9965	612	Linked from: 2nd: Beam #9d, Support 1

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ForteWEB Software Operator	Job Notes	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com		



Project Title: Mounger Residence

Engineer: Project ID: Project Descr:

Printed: 20 SEP 2021, 12:53PM

Steel Column Lic. #: KW-06003456 File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

BYKONEN CARTER QUINN

DESCRIPTION: 2nd: Post #20a

### Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used: ASCE 7-16

**General Information** 

Steel Section Name : HSS3-1/2x3-1/2x3/16
Analysis Method : Load Resistance Factor

Steel Stress Grade

Fy: Steel Yield 36.0 ksi E: Elastic Bending Modulus 29,000.0 ksi Overall Column Height 7.0 ft
Top & Bottom Fixity Top & Bottom Pinned

Service loads entered. Load Factors will be applied for calculations.

Brace condition for deflection (buckling) along columns:

X-X (width) axis:

Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

Y-Y (depth) axis:

Fully braced against buckling ABOUT X-X Axis

### **Applied Loads**

Column self weight included : 57.050 lbs \* Dead Load Factor

AXIAL LOADS . . .

2nd: Beam #9d: Axial Load at 7.0 ft, D = 5.926, L = 9.885, S = 0.5890 k

### **DESIGN SUMMARY**

**Bending & Shear Check Results** 

PASS Max. Axial+Bending Stress Ratio =	<b>0.4864</b> : 1	Maximum Load R	eactions			
Load Combination	+1.20D+1.60L+0.50S	Top along 2	<b>⟨-X</b>		0.0 k	
Location of max.above base	0.0 ft	Bottom alor			0.0 k	
At maximum location values are		Top along \		0.0 k 0.0 k		
Pu	23.290 k	Bottom alor				
0.9 * Pn	47.879 k	Dottom alo.	.9			
Mu-x	0.0 k-ft	Maximum Load D	eflections			
0.9 * Mn-x :	7.452 k-ft	Along Y-Y	0.0 in	at	0.0ft	above base
Mu-y	0.0 k-ft	for load comb	oination :			
0.9 * Mn-y :	7.452 k-ft	Along X-X	0.0 in	at	0.0ft	above base
		for load com	bination :			
PASS Maximum Shear Stress Ratio =	<b>0.0</b> : 1					
Load Combination	0.0					
Location of max.above base	0.0 ft					

0.0 k 0.0 k

# Load Combination Results

					<u>Maximum</u>	Shear Ra	atios			
Load Combination	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Stress Ratio	Status	Location
+1.40D	0.175	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.480	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L+0.50S	0.486	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.356	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D	0.150	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+1.60S	0.376	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60S	0.170	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.50S	0.363	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+0.90D	0.112	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.20S	0.359	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
Maximum Reactions							Note	e: Only non-zei	ro reactio	ns are listed.

maximum reactions								,		
	Axial Reaction X-X Axis Reaction k		k	Y-Y Axis Reaction		Mx - End Mo	oments k-ft	My - End Moments		
Load Combination	@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top	@ Base	@ Top

D Only	5.983
+D+L	15.868
+D+S	6.572
+D+0.750L	13.397
+D+0.750L+0.750S	13.839

At maximum location values are . . . Vu : Applied Vn \* Phi : Allowable

Project Title: Mounger Residence Engineer: Project ID: Project Descr:

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Steel Column									Software copyr	ight EN	IERCALC, II		e: Retaining 33-2020, Build	
Lic. # : KW-06003456										J				TER QUINN
DESCRIPTION: 2nd	d: Post #20a													
Maximum Reactions	5								No	te: O	nly non-z	ero r	eactions a	are listed.
		Axial Reaction	X->	Axis Read	tion	k	Y-Y Axis	Reaction	Mx - E	nd Mo	oments	k-ft	My - End	Moments
Load Combination		@ Base	@ E	Base @	Тор		@ Base	@ Top	@ Bas	se	@ Top		@ Base	@ Top
+0.60D		3.590												
L Only S Only		9.885 0.589												
Extreme Reactions		0.307												
LATIETTIC REdCTIONS		Axial Reaction	Y_\	K Axis Read	rtion	k	V_V Avic	Reaction	Mx - E	nd Mo	ments	k-ft	My - End	Moments
Item	Extreme Value				Top	K	@ Base	@ Top			@ Top	K-II	@ Base	@ Top
Axial @ Base	Maximum	15.868						•						<u> </u>
п	Minimum	0.589												
Reaction, X-X Axis Base	Maximum	5.983												
II	Minimum	5.983												
Reaction, Y-Y Axis Base	Maximum	5.983												
Desetted V.V.Aude Ten	Minimum	5.983												
Reaction, X-X Axis Top	Maximum	5.983												
Reaction, Y-Y Axis Top	Minimum Maximum	5.983 5.983												
" Teachon, 1-1 Axis Top	Minimum	5.983												
Moment, X-X Axis Base	Maximum	5.983												
"	Minimum	5.983												
Moment, Y-Y Axis Base	Maximum	5.983												
п	Minimum	5.983												
Moment, X-X Axis Top	Maximum	5.983												
Mamont VV Avia Tan	Minimum	5.983												
Moment, Y-Y Axis Top	Maximum Minimum	5.983 5.983												
Marrian Defication														
Maximum Deflection	is for Load Cor			D' I				N (1 11	D: 1					
Load Combination		Max. X-X Defle		Distance			Max. Y-Y [		Distan					
D Only		0.0000	in in	0.000	ft		0.00		0.000	ft				
+D+L +D+S		0.0000 0.0000	in in	0.000	ft ft		0.00		0.000 0.000	ft ft				
+D+0.750L		0.0000	in	0.000	ft		0.00		0.000	ft				
+D+0.750L+0.750S		0.0000	in	0.000	ft		0.00		0.000	ft				
+0.60D		0.0000	in	0.000	ft		0.00		0.000	ft				
L Only		0.0000	in	0.000	ft		0.00	0 in	0.000	ft				
S Only		0.0000	in	0.000	ft		0.00	0 in	0.000	ft				
Steel Section Proper	rties :	HSS3-1/2x3-1	/2x3/16											
Depth	= 3.500	in I	XX	=		4.05	in^4		J		=		6.560 in^-	4
Design Thick	= 0.174	in S	S XX	=		2.31	in^3							
Width	= 3.500	in F	XX S	=		1.350	in							
Wall Thick	= 0.187	in Z	<b>Z</b> X	=		2.760	in^3							
Area	= 2.240		уу	=		4.050			С		=		3.830 in^:	3
Weight	= 8.150		S уу	=		2.310								
		F	R уу	=		1.350	in							
Ycg	= 0.000	in												

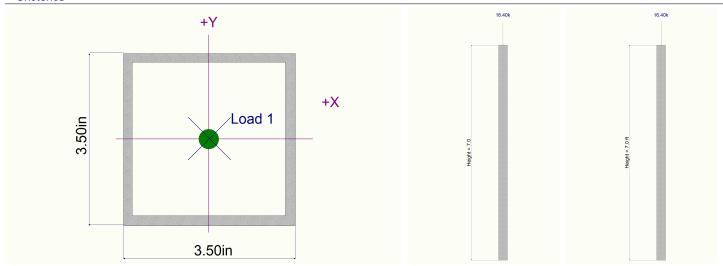
Project Title: Mounger Residence Engineer: Project ID: Project Descr:

**Steel Column** 

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BYKONEN CARTER QUINN

Lic. # : KW-06003456 DESCRIPTION: 2nd: Post #20a

# Sketches



Project Title: Mounger Residence

Engineer: Project ID: Project Descr:

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Steel Column Lic. #: KW-06003456 File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

BYKONEN CARTER QUINN

DESCRIPTION: 2nd: Post #20b

### Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used: ASCE 7-16

**General Information** 

Steel Section Name : HSS3-1/2x3-1/2x3/16
Analysis Method : Load Resistance Factor

Steel Stress Grade

Fy: Steel Yield 36.0 ksi E: Elastic Bending Modulus 29,000.0 ksi Overall Column Height 7.0 ft
Top & Bottom Fixity Top & Bottom Pinned

Service loads entered. Load Factors will be applied for calculations.

Brace condition for deflection (buckling) along columns:

X-X (width) axis:

Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

Y-Y (depth) axis:

Fully braced against buckling ABOUT X-X Axis

### **Applied Loads**

Column self weight included : 57.050 lbs \* Dead Load Factor

AXIAL LOADS . .

2nd: Beam #9d: Axial Load at 7.0 ft, D = 5.786, L = 9.352, S = 0.5230 k

### **DESIGN SUMMARY**

Bending & Shear Check Results						
PASS Max. Axial+Bending Stress Ratio =	0.4644	:1	Maximum Load Re	eactions		
Load Combination	+1.20D+1.60L+0.50S		Top along X	(-X	0.0 k	
Location of max.above base	0.0	ft	Bottom alon	ıq X-X	0.0 k	
At maximum location values are			Top along Y	•	0.0 k	
Pu	22.236	k	Bottom alon		0.0 k	
0.9 * Pn	47.879	k		9		
Mu-x	0.0	k-ft	Maximum Load De	eflections		
0.9 * Mn-x :			Along Y-Y	0.0 in at	0.0ft	above base
	7.452		for load comb	ination :		
Mu-y	0.0	k-ft	TOT TOUGH COTTED	mation .		
0.9 * Mn-y :	7.452	k-ft	Along X-X	0.0 in at	0.0ft	above base
			for load com	bination :		
PASS Maximum Shear Stress Ratio =	0.0	:1				
Load Combination	0.0	•				
Location of max.above base	0.0	ft				
At maximum location values are	0.0	11				

0.0 k 0.0 k

# Load Combination Results

Vu : Applied Vn \* Phi : Allowable

	Maximum Axial +	Bending S	tress Ratios					Maximum	Shear Ra	atios
Load Combination	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Stress Ratio	Status	Location
+1.40D	0.171	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.459	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L+0.50S	0.464	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.342	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D	0.146	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+1.60S	0.359	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60S	0.164	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.50S	0.347	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+0.90D	0.110	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.20S	0.344	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
Maximum Reactions							Note	e: Only non-zer	o reactio	ns are listed.
	A! - 1 .		V V A.d. D	1.	\/ \/ A!	- D 11	M. F.	al Managarata III	CL N.A	Ford Managements

	Axial Reaction	X-X Axis Reaction k		k	Y-Y Axis Reaction		Mx - End Mo	oments k-ft	My - End Moments	
Load Combination	@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top	@ Base	@ Top
D Only	5.843									
+D+L	15.195									

+D+S 6.366 +D+0.750L +D+0.750L+0.750S 13.249

Project Title: Mounger Residence Engineer: Project ID: Project Descr:

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Steel Column									Software copy	right EN	NERCALC, II		le: Retaining 83-2020, Build	
Lic. # : KW-06003456									, , , , , , , , , , , , , , , , , , , ,	<u> </u>				TER QUINN
DESCRIPTION: 2nd	d: Post #20b													
Maximum Reactions	S								No	te: O	nly non-z	zero r	eactions a	are listed.
		Axial Reaction	1 X-	X Axis Re	action	k	Y-Y Axis	Reaction	Mx - E	nd Mo	oments	k-ft	My - End	Moments
Load Combination		@ Base		Base	@ Top		@ Base	@ Top	@ Ba	se	@ Top		@ Base	@ Top
+0.60D		3.506												
L Only S Only		9.352 0.523												
Extreme Reactions		0.323												
EXITETILE REACTIONS		Avial Departion	. V	V Avia Da	ootion	L,	V V Avio	Reaction	M <sub>V</sub> F	nd Ma	monto	l, ft	Mu End	Momente
Item	Extreme Valu	Axial Reaction  e @ Base		X Axis Re Base	@ Top	k	@ Base	@ Top			ments @ Top	k-ft	@ Base	Moments @ Top
Axial @ Base	Maximum	15.195			•									
II .	Minimum	0.523												
Reaction, X-X Axis Base	Maximum	5.843												
II .	Minimum	5.843												
Reaction, Y-Y Axis Base	Maximum	5.843												
	Minimum	5.843												
Reaction, X-X Axis Top	Maximum	5.843												
Desetion V V Avis Ten	Minimum	5.843												
Reaction, Y-Y Axis Top	Maximum	5.843												
Moment, X-X Axis Base	Minimum Maximum	5.843 5.843												
" A-A AXIS Dase	Minimum	5.843												
Moment, Y-Y Axis Base	Maximum	5.843												
"	Minimum	5.843												
Moment, X-X Axis Top	Maximum	5.843												
"	Minimum	5.843												
Moment, Y-Y Axis Top	Maximum	5.843												
п	Minimum	5.843												
Maximum Deflection	ns for Load Co	mbinations												
Load Combination		Max. X-X Defl	ection	Distan	ice		Max. Y-Y [	Deflection	n Distar	nce				
D Only		0.0000	in	0.00	0 ft		0.00	0 in	0.000	ft				
+D+L		0.0000	in	0.00			0.00		0.000	ft				
+D+S		0.0000	in	0.00			0.00		0.000	ft				
+D+0.750L		0.0000	in	0.00			0.00		0.000	ft				
+D+0.750L+0.750S		0.0000	in :	0.00			0.00		0.000	ft				
+0.60D L Only		0.0000 0.0000	in in	0.00			0.00		0.000 0.000	ft ft				
S Only		0.0000	in	0.00			0.00		0.000	ft				
-					U II		0.00	0 111	0.000	п				
Steel Section Proper		HSS3-1/2x3-1				1.0	F ! A 4						( E(O !~A	4
Depth Decima Thick	= 3.500		XX	=			5 in^4		J		=		6.560 in^	4
Design Thick	= 0.174		S XX	=			1 in^3							
Width Wall Thick	= 3.500		R xx	=		1.35								
Wall Thick	= 0.187		Zx	=			0 in^3		C				2 020 164	2
Area Weight	= 2.240 = 8.150		yy S yy	=			0 in^4 0 in^3		С		=		3.830 in^:	J
weign	= 8.150			=		1.35								
		ļ	R yy	=		1.33	U III							
Ycg	= 0.000	in												

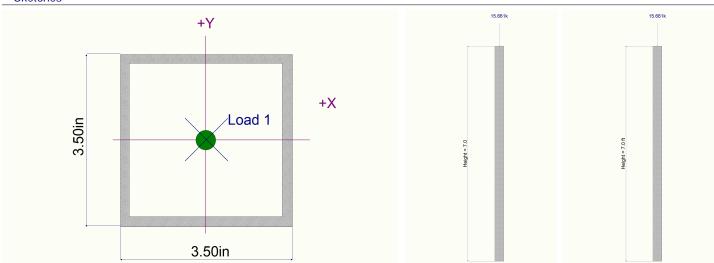
Project Title: Mounger Residence Engineer: Project ID: Project Descr:

**Steel Column** 

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BYKONEN CARTER QUINN

Lic. # : KW-06003456 DESCRIPTION: 2nd: Post #20b

Sketches



**PASSED** 





# 2nd Floor Framing, 2nd: Post #21a 1 piece(s) 4 x 4 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	3335	6095	Passed (55%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	3335	4961	Passed (67%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- · Input axial load eccentricity for the design is zero
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

#### Drawing is Conceptual

	Dead	Floor Live	
Vertical Load	(0.90)	(1.00)	Comments
1 - Point (lb)	958	2377	Linked from: 2nd: Beam #7c, Support 1

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ForteWEB Software Operator	Job Notes	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 Jjs@bcq-se.com		

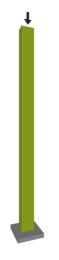




### MEMBER REPORT

## 2nd Floor Framing, 2nd: Post #21b 1 piece(s) 4 x 4 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	3335	6095	Passed (55%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	3335	4961	Passed (67%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- . Input axial load eccentricity for the design is zero
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

### Drawing is Conceptual

	Dead	Floor Live	
Vertical Load	(0.90)	(1.00)	Comments
1 - Point (lb)	958	2377	Linked from: 2nd: Beam #7a, Support 1

### Weyerhaeuser Notes

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ForteWEB Software Operator	Job Notes	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 Jjs@bcq-se.com		





## 2nd Floor Framing, 2nd: Post #21c 1 piece(s) 4 x 4 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	2688	6095	Passed (44%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	2688	4961	Passed (54%)		1.0 D + 1.0 L
Bending/Compression	N/A	1	Passed (N/A)		N/A

- . Input axial load eccentricity for the design is zero
- Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

### Drawing is Conceptual

Vertical Load	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	671	2017	Linked from: 2nd: Beam #10a, 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	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com		



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File Name: Mounger Remodel

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## 2nd Floor Framing, 2nd: Post #22a 1 piece(s) 4 x 4 HF No.2

Post Height: 7' 9"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	27	50	Passed (53%)		
Compression (lbs)	1197	6095	Passed (20%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	1197	4961	Passed (24%)		1.0 D + 1.0 L
Bending/Compression	0.14	1	Passed (14%)	1.00	1.0 D + 1.0 L

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- · Applicable calculations are based on NDS.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

### Drawing is Conceptual

	Dead	Floor Live	
Vertical Load	(0.90)	(1.00)	Comments
1 - Point (lb)	308	889	Linked from: 2nd: Beam #11a, Support 1

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Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com		



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File Name: Mounger Remodel

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Engineer: Project ID: Project Descr:

Printed: 20 SEP 2021, 12:54PM

Steel Column
Lic. #: KW-06003456

File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

BYKONEN CARTER QUINN

DESCRIPTION: 2nd: Post #22b

### Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used: ASCE 7-16

**General Information** 

Steel Section Name : HSS3-1/2x3-1/2x3/16
Analysis Method : Load Resistance Factor

Steel Stress Grade

Fy: Steel Yield 36.0 ksi E: Elastic Bending Modulus 29,000.0 ksi Overall Column Height 7.0 ft
Top & Bottom Fixity Top & Bottom Pinned

Brace condition for deflection (buckling) along columns:

X-X (width) axis:

Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0

Y-Y (depth) axis:

Fully braced against buckling ABOUT X-X Axis

### **Applied Loads**

Column self weight included: 57.050 lbs \* Dead Load Factor

AXIAL LOADS . . .

2nd: Beam #9d: Axial Load at 7.0 ft, D = 5.926, L = 9.885, S = 0.5890 k

2nd: Beam #11a: Axial Load at 7.0 ft, D = 0.3080, L = 0.8890 k 2nd: Beam #11b: Axial Load at 7.0 ft, D = 1.027, L = 2.624 k

### **DESIGN SUMMARY**

Bendin	g & S	hear Cl	heck F	Results	
PASS	Max A	xial+Rer	ndina St	ress Ratio	=

Г	ASS II	viax. Axiai+Deliuilly Stress Ratio =	0.0373	. !
		Load Combination	+1.20D+1.60L+0.50S	
		Location of max.above base At maximum location values are	0.0	ft
		Pu	30.513	k
		0.9 * Pn	47.879	k
		Mu-x	0.0	k-ft
		0.9 * Mn-x :	7.452	k-ft
		Mu-y	0.0	k-ft
		0.9 * Mn-y :	7.452	k-ft
	PASS	Maximum Shear Stress Ratio =	0.0	:1

Load Combination	0.0
Location of max.above base	0.0 ft
At maximum location values are	
Vu : Applied	0.0 k
Vn * Phi : Allowable	0.0 k

Maximum Load Reactions . .

 Top along X-X
 0.0 k

 Bottom along X-X
 0.0 k

 Top along Y-Y
 0.0 k

 Bottom along Y-Y
 0.0 k

Service loads entered. Load Factors will be applied for calculations.

Maximum Load Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base

for load combination :

Along X-X 0.0 in at 0.0 ft above base

for load combination:

### **Load Combination Results**

	Maximum Axial + B	Bending S	tress Ratios					Maximum	Shear Ra	atios_
Load Combination	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Stress Ratio	Status	Location
+1.40D	0.214	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.631	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L+0.50S	0.637	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.463	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D	0.183	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+1.60S	0.483	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+1.60S	0.203	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.50S	0.469	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+0.90D	0.138	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft
+1.20D+L+0.20S	0.466	PASS	0.00 ft	1.00	1.00	88.89	0.00	0.000	PASS	0.00 ft

0.6373 - 1

**Maximum Reactions** Note: Only non-zero reactions are listed. X-X Axis Reaction **Axial Reaction** Y-Y Axis Reaction Mx - End Moments My - End Moments **Load Combination** @ Base @ Base @ Top @ Base @ Top @ Base @ Top @ Base @ Top

D Only 7.318 +D+L 20.716 +D+S 7.907

Project Title: Mounger Residence Engineer: Project ID: Project Descr:

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Steel Column											Sof	flwaro copyrie	aht ENI	EDCALC I		e: Retaining 33-2020, Build	
Lic. # : KW-06003456	_										501	itware copyriç	JIII EIN	ERCALC, I		ONEN CAR	
DESCRIPTION: 2nd	d: Post #22b																
Maximum Reactions	5											Note	e: Or	nly non-	zero r	eactions a	are listed.
		Axia	I Reaction	n	X-X Axis I	Reacti	ion	k	Y-Y Axis	Reactio	n	Mx - Er	nd Mo		k-ft	My - End	
Load Combination		(	Base	(	@ Base	@	Top		@ Base	@ To	p	@ Bas	е	@ Top		@ Base	@ Top
+D+0.750L			17.367	'													
+D+0.750L+0.750S			17.808														
+0.60D			4.391														
L Only			13.398														
S Only			0.589	'													
Extreme Reactions					.,,,,,,,,										1.6		
lt			Reaction		X-X Axis			k	Y-Y Axis			Mx - En			k-ft		Moments
Item	Extreme Va	lue <sup>©</sup>	Base		@ Base	@	Тор		@ Base	@ To	)p	@ Bas	e	@ Top		@ Base	@ Top
Axial @ Base	Maximum		20.716														
"	Minimum		0.589														
Reaction, X-X Axis Base	Maximum		7.318														
Reaction, Y-Y Axis Base	Minimum Maximum		7.318 7.318														
" T-1 AXIS DASE	Minimum		7.318														
Reaction, X-X Axis Top	Maximum		7.318														
"	Minimum		7.318														
Reaction, Y-Y Axis Top	Maximum		7.318														
"	Minimum		7.318														
Moment, X-X Axis Base	Maximum		7.318	}													
п	Minimum		7.318	}													
Moment, Y-Y Axis Base	Maximum		7.318														
"	Minimum		7.318														
Moment, X-X Axis Top	Maximum		7.318														
Moment V V Avis Ton	Minimum Maximum		7.318 7.318														
Moment, Y-Y Axis Top	Minimum		7.318														
Massius and Daffa attac				'													
Maximum Deflection	is for Load C																
Load Combination		Max.	. X-X Def			ance			Max. Y-Y [		n	Distanc					
D Only			0.0000	in		000	ft		0.00			0.000	ft				
+D+L			0.0000	in		000	ft		0.00			0.000	ft				
+D+S +D+0.750L			0.0000	in in		000	ft ft		0.00			0.000	ft ft				
+D+0.750L +D+0.750L+0.750S			0.0000	in in		000	ft		0.00			0.000	ft				
+0.60D			0.0000	in		000	ft		0.00			0.000	ft				
L Only			0.0000	in		000	ft		0.00			0.000	ft				
S Only			0.0000	in		000	ft		0.00			0.000	ft				
Steel Section Prope	rtias ·	HSS3	-1/2x3-	1/2v2/	116												
Depth		00 in		I xx		=		4 O	5 in^4			J		=		6.560 in^4	1
Design Thick		74 in		S xx					l in^3			J		_		0.500 111	•
Width		00 in		R xx		-		1.350									
Wall Thick		87 in		Zx		-			) in^3								
Area		40 in^2		L yy		-			) in^4			С		=		3.830 in^3	3
Weight		50 plf		S yy		-			) in^3			J				5.550 iii v	-
<del>-</del>	3.11	- r -"		R yy		=		1.350									
				,,													
Ycg	= 0.00	00 in															
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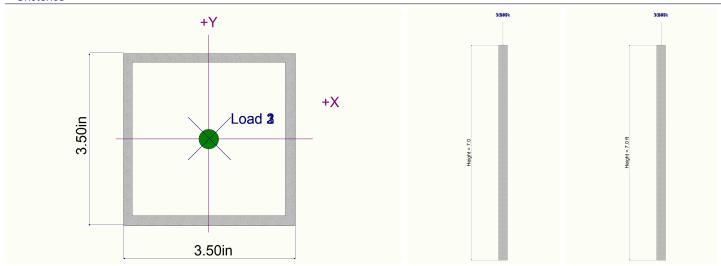
Project Title: Mounger Residence Engineer: Project ID: Project Descr:

**Steel Column** 

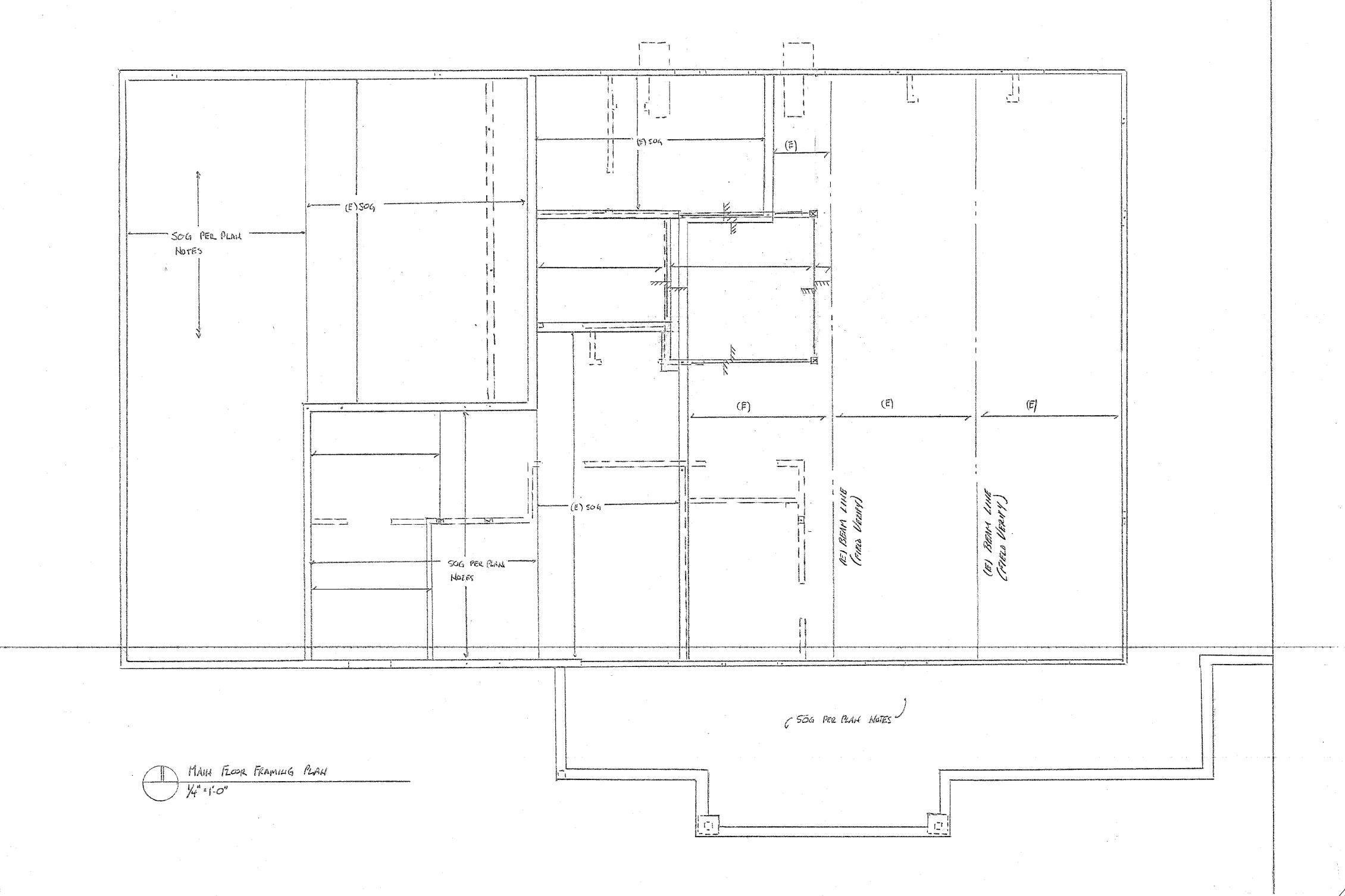
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BYKONEN CARTER QUINN

Lic. # : KW-06003456 DESCRIPTION: 2nd: Post #22b

Sketches

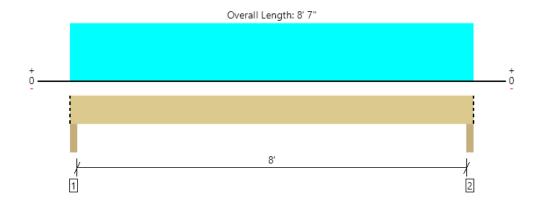








## Main Floor Framing, Main: Joist #1a 1 piece(s) 2 x 10 HF No.2 @ 16" OC



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)	315 @ 2 1/2"	2126 (3.50")	Passed (15%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	237 @ 1' 3/4"	1388	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	611 @ 4' 3 1/2"	1917	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.042 @ 4' 3 1/2"	0.272	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.057 @ 4' 3 1/2"	0.408	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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	В	earing Lengt	th	Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load.}$ 

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 8' 7"	16"	15.0	40.0	Residential Load

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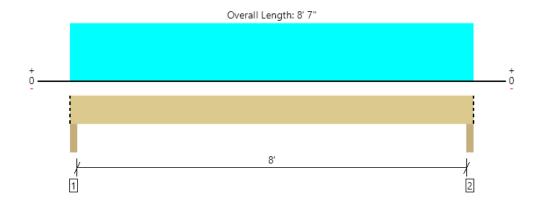
ForteWEB Software Operator	Job Notes
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### Main Floor Framing, Main: Joist #1b 1 piece(s) 2 x 10 HF No.2 @ 16" OC



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)	315 @ 2 1/2"	2126 (3.50")	Passed (15%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	237 @ 1' 3/4"	1388	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	611 @ 4' 3 1/2"	1917	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.042 @ 4' 3 1/2"	0.272	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.057 @ 4' 3 1/2"	0.408	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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	В	earing Lengt	th	Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load.}$ 

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 8' 7"	16"	15.0	40.0	Residential Load

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

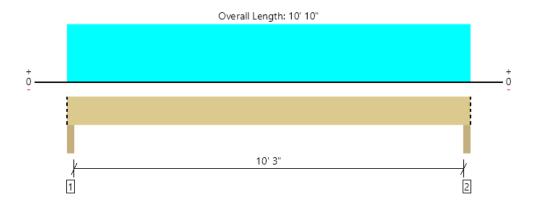
ForteWEB Software Operator	Job Notes
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com	



File Name: Mounger Remodel

# MEMBER REPORT Main Floor Framing, Main: Joist #2

## 2 piece(s) 1 3/4" x 5 1/2" 1.55E TimberStrand® LSL @ 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)	397 @ 2 1/2"	4961 (3.50")	Passed (8%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	342 @ 9"	3978	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	995 @ 5' 5"	3820	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.193 @ 5' 5"	0.347	Passed (L/646)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.266 @ 5' 5"	0.521	Passed (L/470)		1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	41	40	Passed		

System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage
- · A structural analysis of the deck has not been performed.
- No composite action between deck and joist was considered in analysis.
- Additional considerations for the TJ-Pro™ Rating include: None.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	108	289	397	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	108	289	397	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' 10" o/c	
Bottom Edge (Lu)	10' 10" o/c	

Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 10' 10"	16"	15.0	40.0	Residential Load

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ForteWEB Software Operator	Job Notes
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com	





### Main Floor Framing, Main: Beam #3a 1 piece(s) 3 1/2" x 14" 1.55E 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)	2332 @ 2"	8881 (3.50")	Passed (26%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1491 @ 1' 5 1/2"	10127	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4333 @ 4' 1/2"	21840	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.036 @ 4' 1/2"	0.258	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.051 @ 4' 1/2"	0.387	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	680	1652	2332	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	680	1652	2332	Blocking

<sup>•</sup> 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)	8' 1" o/c	
Bottom Edge (Lu)	8' 1" o/c	

<sup>•</sup>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 8' 1"	N/A	15.3		
1 - Uniform (PLF)	0 to 8' 1" (Front)	N/A	81.0	216.8	Linked from: Main: Joist #2, Support 1
2 - Uniform (PLF)	0 to 8' 1" (Front)	N/A	72.0	192.0	Linked from: Main: Joist #4b, Support 1

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



File Name: Mounger Remodel



## Main Floor Framing, Main: Beam #3b 1 piece(s) 3 1/2" x 14" 1.55E 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)	1657 @ 2"	8881 (3.50")	Passed (19%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1200 @ 1' 5 1/2"	10127	Passed (12%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4111 @ 5' 3 1/2"	21840	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.052 @ 5' 3 1/2"	0.342	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.075 @ 5' 3 1/2"	0.512	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	510	1147	1657	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	510	1147	1657	Blocking

<sup>•</sup> 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' 7" o/c	
Bottom Edge (Lu)	10' 7" o/c	

<sup>•</sup>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' 7"	N/A	15.3		
1 - Uniform (PLF)	0 to 10' 7" (Front)	N/A	81.0	216.8	Linked from: Main: Joist #2, Support 1

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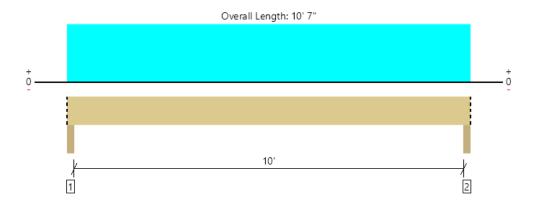
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### MEMBER REPORT

### Main Floor Framing, Main: Joist #4a 1 piece(s) 2 x 10 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)	388 @ 2 1/2"	2126 (3.50")	Passed (18%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	310 @ 1' 3/4"	1388	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	947 @ 5' 3 1/2"	1917	Passed (49%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.100 @ 5' 3 1/2"	0.339	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.137 @ 5' 3 1/2"	0.508	Passed (L/890)		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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	106	282	388	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	106	282	388	Blocking

<sup>•</sup> 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' 7" o/c	
Bottom Edge (Lu)	10' 7" o/c	

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load.}$ 

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 10' 7"	16"	15.0	40.0	Residential Load

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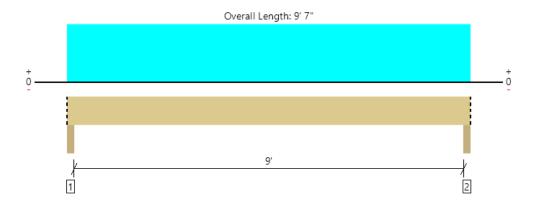
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### Main Floor Framing, Main: Joist #4b 1 piece(s) 2 x 10 HF No.2 @ 16" OC



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)	351 @ 2 1/2"	2126 (3.50")	Passed (17%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	273 @ 1' 3/4"	1388	Passed (20%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	770 @ 4' 9 1/2"	1917	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.066 @ 4' 9 1/2"	0.306	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.091 @ 4' 9 1/2"	0.458	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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	96	256	352	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	96	256	352	Blocking

<sup>•</sup> 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)	9' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

 $<sup>\</sup>bullet \mbox{Maximum allowable bracing intervals based on applied load.}$ 

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 9' 7"	16"	15.0	40.0	Residential Load

### Weyerhaeuser Notes

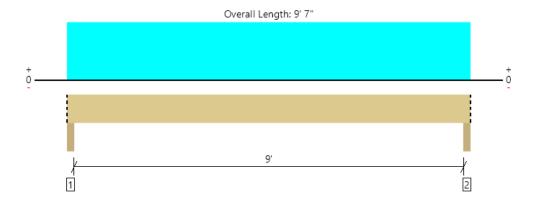
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### Main Floor Framing, Main: Beam #5a 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	2576 @ 2"	7656 (3.50")	Passed (34%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1994 @ 1' 1"	6428	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5750 @ 4' 9 1/2"	13057	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.140 @ 4' 9 1/2"	0.308	Passed (L/790)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.197 @ 4' 9 1/2"	0.463	Passed (L/563)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	740	1836	2576	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	740	1836	2576	Blocking

<sup>•</sup> 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)	9' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

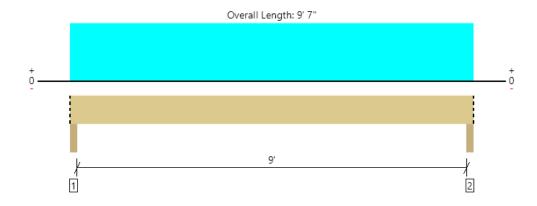
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 9' 7"	N/A	10.4		
1 - Uniform (PLF)	0 to 9' 7" (Front)	N/A	64.5	171.8	Linked from: Main: Joist #1, Support 1
2 - Uniform (PLF)	0 to 9' 7" (Front)	N/A	79.5	211.5	Linked from: Main: Joist #4a, Support 1

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## Main Floor Framing, Main: Beam #5b 1 piece(s) 3 1/2" x 9 1/2" 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)	1379 @ 2"	7656 (3.50")	Passed (18%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1068 @ 1' 1"	6428	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3079 @ 4' 9 1/2"	13057	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.074 @ 4' 9 1/2"	0.308	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.105 @ 4' 9 1/2"	0.463	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	413	967	1380	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	413	967	1380	Blocking

<sup>•</sup> 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)	9' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

<sup>•</sup>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 9' 7"	N/A	10.4		
1 - Uniform (PLF)	0 to 9' 7" (Front)	N/A	75.8	201.8	Linked from: Main: Joist #6a, Support 1

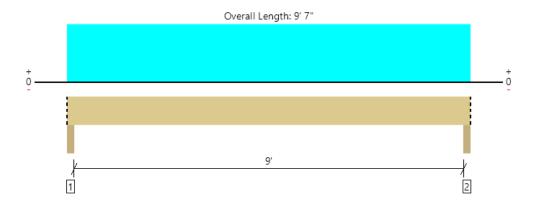
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## Main Floor Framing, Main: Beam #5c 1 piece(s) 3 1/2" x 9 1/2" 2.0E Parallam® PSL



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)	2314 @ 2"	7656 (3.50")	Passed (30%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	1791 @ 1' 1"	6428	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5164 @ 4' 9 1/2"	13057	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.126 @ 4' 9 1/2"	0.308	Passed (L/882)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.177 @ 4' 9 1/2"	0.463	Passed (L/627)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads t	o Supports (		
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	668	1646	2314	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	668	1646	2314	Blocking

<sup>•</sup> 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)	9' 7" o/c	
Bottom Edge (Lu)	9' 7" o/c	

<sup>•</sup>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 9' 7"	N/A	10.4		
1 - Uniform (PLF)	0 to 9' 7" (Front)	N/A	64.5	171.8	Linked from: Main: Joist #1a, Support 1
2 - Uniform (PLF)	0 to 9' 7" (Front)	N/A	64.5	171.8	Linked from: Main: Joist #1b, Support 1

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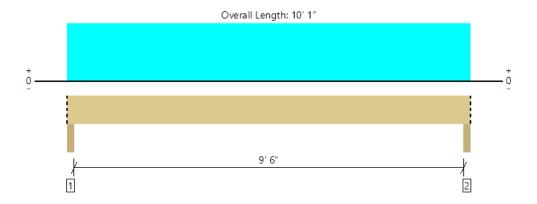
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Main Floor Framing, Main: Joist #6a 1 piece(s) 2 x 10 HF No.2 @ 16" OC



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)	370 @ 2 1/2"	2126 (3.50")	Passed (17%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	292 @ 1' 3/4"	1388	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	857 @ 5' 1/2"	1917	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.081 @ 5' 1/2"	0.322	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.112 @ 5' 1/2"	0.483	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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Beam - HF	3.50"	3.50"	1.50"	101	269	370	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	101	269	370	Blocking

<sup>•</sup> 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' 1" o/c	
Bottom Edge (Lu)	10' 1" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 10' 1"	16"	15.0	40.0	Residential Load

### Weyerhaeuser Notes

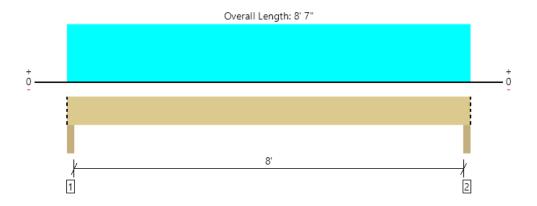
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Main Floor Framing, Main: Joist #6b 1 piece(s) 2 x 10 HF No.2 @ 16" OC



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)	315 @ 2 1/2"	2126 (3.50")	Passed (15%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	237 @ 1' 3/4"	1388	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	611 @ 4' 3 1/2"	1917	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.042 @ 4' 3 1/2"	0.272	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.057 @ 4' 3 1/2"	0.408	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 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) 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.

	Bearing Length			Loads t	o Supports (		
Supports	Total Available Required		Dead Floor Live Tot		Total	Accessories	
1 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking
2 - Beam - HF	3.50"	3.50"	1.50"	86	229	315	Blocking

<sup>•</sup> 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)	8' 7" o/c	
Bottom Edge (Lu)	8' 7" o/c	

<sup>•</sup>Maximum allowable bracing intervals based on applied load.

			Dead	Floor Live	
Vertical Load	Location (Side)	Spacing	(0.90)	(1.00)	Comments
1 - Uniform (PSF)	0 to 8' 7"	16"	15.0	40.0	Residential Load

### Weyerhaeuser Notes

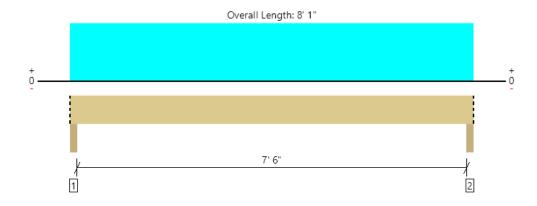
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ForteWEB Software Operator	Job Notes	
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com		





## Main Floor Framing, Main: Beam #7 1 piece(s) 4 x 10 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)	1155 @ 2"	4961 (3.50")	Passed (23%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	851 @ 1' 3/4"	3238	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2145 @ 4' 1/2"	4242	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.055 @ 4' 1/2"	0.258	Passed (L/999+)		1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.077 @ 4' 1/2"	0.387	Passed (L/999+)		1.0 D + 1.0 L (All Spans)

System : Floor Member Type : Drop Beam Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Floor Live	Total	Accessories
1 - Column - HF	3.50"	3.50"	1.50"	339	815	1154	Blocking
2 - Column - HF	3.50"	3.50"	1.50"	339	815	1154	Blocking

<sup>•</sup> 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)	8' 1" o/c	
Bottom Edge (Lu)	8' 1" o/c	

<sup>•</sup>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 8' 1"	N/A	8.2		
1 - Uniform (PLF)	0 to 8' 1" (Front)	N/A	75.8	201.8	Linked from: Main: Joist #6a, Support 1

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ForteWEB Software Operator	Job Notes
Joshua Shin Bykonen Carter Quinn (206) 264-7784 jjs@bcq-se.com	





### MEMBER REPORT

Main Floor Framing, Main: Post #8 1 piece(s) 4 x 4 HF No.2

Post Height: 4'



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	14	50	Passed (27%)		
Compression (lbs)	4628	14432	Passed (32%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	4628	4961	Passed (93%)		1.0 D + 1.0 L
Bending/Compression	0.48	1	Passed (48%)	1.00	1.0 D + 1.0 L

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- Bearing shall be on a metal plate or strap, or on other equivalently durable, rigid, homogeneous material with sufficient stiffness to distribute applied load.

Supports	Туре	Material
Base	Plate	Hem Fir

Max Unbraced LengthCommentsFull Member LengthNo bracing assumed.

Member Type : Free Standing Post Building Code : IBC 2018 Design Methodology : ASD

### Drawing is Conceptual

	Dead	Floor Live	
Vertical Loads	(0.90)	(1.00)	Comments
1 - Point (lb)	668	1646	Linked from: Main: Beam #5c, Support 1
2 - Point (lb)	668	1646	Linked from: Main: Beam #5c, Support 1

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Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Criteria

DESCRIPTION: 9.5 Ft

# Soil Data

Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10

Retained Height 9.50 ft Wall height above soil 0.00 ft Slope Behind Wall 0.00:1Height of Soil over Toe 6.00 in Water height over heel 0.0 ft Vertical component of active Lateral soil pressure options: NOT USED for Soil Pressure.

NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

J	UII	υa	ιa

.5!

Allow Soil Bearing 2,000.0 psf Equivalent Fluid Pressure Method Heel Active Pressure 35.0 psf/ft

Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf Friction Coeff btwn Ftg & Soil = 0.350 Soil height to ignore

for passive pressure 12.00 in

# **Design Summary**

Wall Stability Ratios Overturning Sliding	=	2.33 OK 1.39 Ratio < 1
Total Bearing Loadresultant ecc.	= =	3,724 lbs 9.63 in
Soil Pressure @ Toe Soil Pressure @ Heel Allowable Soil Pressure Lee	= = = ss Than Al	945 psf OK 158 psf OK 2,000 psf lowable

ACI Factored @ Toe 1,134 psf ACI Factored @ Heel 190 psf Footing Shear @ Toe 16.0 psi OK Footing Shear @ Heel 9.4 psi OK Allowable 75.0 psi Sliding Calcs (Vertical Component NOT Used)

Lateral Sliding Force 1.968.8 lbs less 100% Passive Force 1,434.4 lbs less 100% Friction Force 1,30**0.0** lbs 0.0 lbs OK Added Force Reg'd ....for 1.5 : 1 Stability 215.4 lbs NG

Load Factors	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

# Stem Construction

Fy

m Construction		Top Stem	
B 1 11 1 1 1 1 1 5		Stem OK	
Design Height Above Ftg	ft =	0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 5	
Rebar Spacing	in =	6.00	
Rebar Placed at	=	Center	
Design Data ————			
fb/FB + fa/Fa	=	0.877	
Total Force @ Section	lbs =	2,520.0	
MomentActual	ft-l =	8,001.0	
MomentAllowable	ft-l =	9,118.8	
ShearActual	psi =	52.5	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	23.40	
Lap splice if below	in =	8.91	
Hook embed into footing	in =	8.91	
Concrete Data			
f'c	psi =	2,500.0	

psi =

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Toe Width

Heel Width

Key Width

Key Depth

Min. As %

Cover @ Top

**Total Footing Width** 

Footing Thickness

Key Distance from Toe

Footing Concrete Density

DESCRIPTION: 9.5 Ft

Footing Dimensions & Strengths

2,500 psi

2.00

## **Footing Design Results**

5.13 ft 1.63	
6.75	
15.00 in	
12.00 in 18.00 in 1.00 ft	
60,000 psi 150.00 pcf	

0.0018

@ Btm.= 3.00 in

<u>Toe</u> <u>Heel</u> 190 psf Factored Pressure 1,134 Mu' : Upward Mu' : Downward 0 ft-lb 11,756 3,822 679 ft-lb Mu: Design 7,934 679 ft-lb Actual 1-Way Shear 15.99 9.45 psi Allow 1-Way Shear 75.00 75.00 psi Toe Reinforcing = #5@11.75 in

Heel Reinforcing None Spec'd Key Reinforcing = # 4 @ 12.00 in

Other Acceptable Sizes & Spacings

Toe: #4@ 9.75 in, #5@ 15.00 in, #6@ 21.50 in, #7@ 29.00 in, #8@ 38.25 in, #9@ 48

Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

# Summary of Overturning & Resisting Forces & Moments

	OVERTURNING				RESISTING				
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	2,022.3	3.58	7,246.7	Soil Over Heel	=	1,001.5	6.27	6,280.0
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-53.6	0.58	-31.3	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=				* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	281.9	2.56	722.3
					Surcharge Over Toe	=			
					Stem Weight(s)	=	950.0	5.46	5,185.4
					Earth @ Stem Transitions	=			
Total	=	1,968.8	O.T.M. =	7,215.5	Footing Weight	=	1,265.6	3.38	4,271.5
Resisting/Overturning			=	2.33	Key Weight	=	225.0	1.50	337.5
Vertical Loads used	I for S	oil Pressure	= 3,724	.0 lbs	Vert. Component	=		_	
					Tota	l =	3,724.0 I	bs R.M. =	16,796.7

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

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Calculations per ACI 318-11, ACI 530-11, IBC 2012,

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CBC 2013, ASCE 7-10

# Cantilevered Retaining Wall

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active

Lateral soil pressure options:

NOT USED for Soil Pressure.

NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 9.5 Ft (Seismic)

## Soil Data

Allow Soil Bearing 2,000.0 psf

Equivalent Fluid Pressure Method

Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf

# Surcharge Loads

0.0 psf Surcharge Over Heel Used To Resist Sliding & Overturning 0.0 psf Surcharge Over Toe Used for Sliding & Overturning

### Axial Load Applied to Stem

Axial Dead Load 0.0 lbs Axial Live Load 0.0 lbs **Axial Load Eccentricity** 0.0 in

9.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

## **Design Summary**

Wall Stability Ratios Overturning 0.88 UNSTABLE! Slidina 5.82 OK

15,330 lbs **Total Bearing Load** ...resultant ecc. 46.20 in Resultant Exceeds Ftg. Width!

Soil Pressure @ Toe 0 psf OK

Soil Pressure @ Heel 0 psf OK 2,000 psf Allowable Soil Pressure Less Than Allowable

ACI Factored @ Toe 0 psf ACI Factored @ Heel 0 psf Footing Shear @ Toe 9.7 psi OK Footing Shear @ Heel 1.9 psi OK Allowable 75.0 psi

Sliding Calcs (Vertical Component NOT Used) Lateral Sliding Force 6,313.3 lbs less 100% Passive Force 31,387.5 lbs less 100% Friction Force = 5,36**0.0** lbs

Added Force Rea'd 0.0 lbs OK ....for 1.5: 1 Stability 0.0 lbs OK

Load Factors Dead Load 1.200 Live Load 1.600 1.600 Earth, H 1.600 Wind, W 1.000 Seismic, E

Friction Coeff btwn Ftg & Soil 0.350

Soil height to ignore

for passive pressure 12.00 in

### Lateral Load Applied to Stem

Lateral Load 76.0 plf 9.50 ft ...Height to Top 0.00 ft ...Height to Bottom

Wind on Exposed Stem 0.0 psf

Adjacent Footing Load

0.0 lbs Adjacent Footing Load 0.00 ft Footing Width 0.00 in **Eccentricity** 0.00 ft Wall to Ftg CL Dist Footing Type Line Load

Base Above/Below Soil 0.0 ft at Back of Wall 0.300 Poisson's Ratio

### **Stem Construction**

Stem OK Design Height Above Ftg ft = 0.00 Wall Material Above "Ht" Concrete Thickness in = 8.00 Rebar Size 5 Rebar Spacing in = 6.00 Rebar Placed at Edge Design Data 0.751 fb/FB + fa/Fa Total Force @ Section lbs = 3,242.0 Moment....Actual 11,430.5 ft-l = Moment.....Allowable 15,222.0 ft-I = Shear.....Actual psi = 43.7 Shear.....Allowable 75.0 psi = Wall Weight psf = 100.0 Rebar Depth 'd' in = 6.19 Lap splice if above in = 17.57

Top Stem

Concrete Data f'c psi = 2,500.0

in =

in =

10.50

10.50

Fy psi =

Lap splice if below

Hook embed into footing

Engineer: Project ID: Project Descr:

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**Cantilevered Retaining Wall** Lic. # : KW-06003456

DESCRIPTION: 9.5 Ft (Seismic)

Footing Dimensions & Strengths

2,500 psi

2.00

Toe Width

Heel Width

Key Width

Key Depth

Min. As %

Cover @ Top

**Total Footing Width** 

Footing Thickness

Key Distance from Toe

Footing Concrete Density

# **Footing Design Results**

5.13 ft 1.63 6.75	
153.00 in	
12.00 in 15.00 in 1.00 ft	
60,000 psi 150.00 pcf 0.0018	

@ Btm.= 3.00 in

<u>Toe</u> <u>Heel</u> 0 psf Factored Pressure 0 Mu' : Upward Mu' : Downward 0 ft-lb 0 0 1,630 ft-lb Mu: Design 11,431 1,630 ft-lb Actual 1-Way Shear 9.74 1.88 psi Allow 1-Way Shear 75.00 75.00 psi Toe Reinforcing # 5 @ 12.00 in Heel Reinforcing None Spec'd = #5@19.25 in

Key Reinforcing Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr

Heel: Not req'd, Mu < S \* Fr Key: #4@ 12.50 in, #5@ 19.25 in, #6@ 27.25 in, #7@ 37.25 in,

# Summary of Overturning & Resisting Forces & Moments

OVERTURNING					RESISTING					
Item		Force lbs	Distance ft	<del>)</del>	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	8,663.6	7.42		64,255.0	Soil Over Heel	=	1,001.5	6.27	6,280.0
Surcharge over Heel	=					Sloped Soil Over Heel	=			
Toe Active Pressure	=	-3,072.3	4.42		-13,569.5	Surcharge Over Heel	=			
Surcharge Over Toe	=					Adjacent Footing Load	=			
Adjacent Footing Load	=					Axial Dead Load on Stem	=			
Added Lateral Load	=	722.0	17.50		12,635.0	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=					Soil Over Toe	=	281.9	2.56	722.3
						Surcharge Over Toe	=			
						Stem Weight(s)	=	950.0	5.46	5,185.4
						Earth @ Stem Transitions	=			
Total	=	6,313.3	O.T.M.	=	63,320.5	Footing Weight	=	12,909.4	3.38	43,569.1
Resisting/Overturning I			=		0.88	Key Weight	=	187.5	1.50	281.3
Vertical Loads used	for S	oil Pressure	= 15,	330.2	2 lbs	Vert. Component	=		_	
						Tota	ıl =	15,330.2 I	bs R.M. =	56,038.1

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

2,000.0 psf

35.0 psf/ft

35.0 psf/ft

300.0 psf/ft

110.00 pcf

110.00 pcf

0.350

psi =

psi =

2,500.0

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Criteria

DESCRIPTION: 8.5 Ft

# Soil Data

Allow Soil Bearing

Heel Active Pressure

Toe Active Pressure

Passive Pressure

Soil Density, Heel

Equivalent Fluid Pressure Method

Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10

Retained Height 8.50 ft Wall height above soil 0.00 ft Slope Behind Wall 0.00:1Height of Soil over Toe 6.00 in Water height over heel 0.0 ft Vertical component of active Lateral soil pressure options:

NOT USED for Soil Pressure. NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

## Soil Density, Toe Friction Coeff btwn Ftg & Soil =

Soil height to ignore for passive pressure 12.00 in

Stem	Constru	uctio

f'c

Fy

em Construction		Top Stem	
Design Height Above Ftg	ft =	Stem OK 0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 5	
Rebar Spacing	in =	9.00	
Rebar Placed at	=	Center	
Design Data ————		0.077	
fb/FB + fa/Fa	=	0.877	
Total Force @ Section	lbs =	2,016.0	
MomentActual	ft-l =	5,730.7	
MomentAllowable	ft-l =	6,532.8	
ShearActual	psi =	42.0	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	23.40	
Lap splice if below	in =	9.03	
Hook embed into footing	in =	9.03	
Concrete Data ————			

Design Summary		
Wall Stability Ratios Overturning Sliding	= =	2.43 OK 1.32 Ratio < 1.5!
Total Bearing Loadresultant ecc.	= =	3,262 lbs 7.67 in
Soil Pressure @ Toe Soil Pressure @ Heel Allowable Soil Pressure Less	= = = Than A	891 psf OK 196 psf OK 2,000 psf Illowable
ACI Factored @ Toe ACI Factored @ Heel	=	1,069 psf 235 psf
Footing Shear @ Toe Footing Shear @ Heel Allowable	= = =	12.8 psi OK 8.6 psi OK 75.0 psi
Sliding Calcs (Vertical Co	ompon	
Lateral Sliding Force	=	1,610.0 lbs

less 100% Passive Force

less 100% Friction Force

....for 1.5 : 1 Stability

Added Force Reg'd

Load Factors Dead Load

> Live Load Earth, H

Wind, W

Seismic, E

1,14**0.6** lbs

984.4 lbs

1.200 1.600

1.600

1.600

1.000

0.0 lbs OK

289.0 lbs NG

Engineer:
Project ID:
Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 8.5 Ft

Footing Dimensions & Strengths

# **Footing Design Results**

Toe Width Heel Width Total Footing Wi		= = _ =	4.38 ft 1.63 6.00
Footing Thickne	SS	=	15.00 in
Key Width Key Depth Key Distance fro	ım Toe	= =	12.00 in 12.00 in 1.00 ft
f'c = 2,50 Footing Concrete Min. As % Cover @ Top	00 psi e Density 2.00	Fy = = = @ Bt	60,000 psi 150.00 pcf 0.0018 m.= 3.00 ii

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,069	235 psf
Mu' : Upward	=	8,294	0 ft-lb
Mu' : Downward	=	2,785	619 ft-lb
Mu: Design	=	5,509	619 ft-lb
Actual 1-Way Shear	=	12.85	8.61 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 4 @ 13.25 in	•
Heel Reinforcing	=	None Spec'd	

= None Spec'd = # 4 @ 12.00 in Heel Reinforcing Key Reinforcing

Other Acceptable Sizes & Spacings

Toe: #4@ 9.75 in, #5@ 15.00 in, #6@ 21.50 in, #7@ 29.00 in, #8@ 38.25 in, #9@ 48 Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

# Summary of Overturning & Resisting Forces & Moments

	OVERTURNING						RESISTING			
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb	
Heel Active Pressure	=	1,663.6	3.25	5,406.7	Soil Over Heel	=	896.0	5.52	4,946.9	
Surcharge over Heel	=				Sloped Soil Over Heel	=				
Toe Active Pressure	=	-53.6	0.58	-31.3	Surcharge Over Heel	=				
Surcharge Over Toe	=				Adjacent Footing Load	=				
Adjacent Footing Load	=				Axial Dead Load on Stem	=				
Added Lateral Load	=				* Axial Live Load on Stem	=				
Load @ Stem Above Soil	=				Soil Over Toe	=	240.6	2.19	526.4	
					Surcharge Over Toe	=				
					Stem Weight(s)	=	850.0	4.71	4,002.1	
					Earth @ Stem Transitions	=				
Total	=	1,610.0	O.T.M. =	5,375.4	Footing Weight	=	1,125.0	3.00	3,375.0	
Resisting/Overturning I			=	2.43	Key Weight	=	150.0	1.50	225.0	
Vertical Loads used	for S	oil Pressure	= 3,261	.7 lbs	Vert. Component	=		_		
					Tota	ıl =	3,261.7	lbs R.M. =	13,075.3	

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

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Calculations per ACI 318-11, ACI 530-11, IBC 2012,

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CBC 2013, ASCE 7-10

# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active Lateral soil pressure options: NOT USED for Soil Pressure. NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 8.5 Ft (Siesmic)

### Soil Data

8.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

for passive pressure 12.00 in

# Surcharge Loads

Surcharge Over Heel = Used To Resist Sliding & Overturning = 0.0 psf Surcharge Over Heel Surcharge Over Toe Used for Sliding & Overturning

## Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

# **Design Summary** Wall Stability Ratios

Overturning Sliding	= =	1.53 OK 0.97 UNSTABLE!
Total Bearing Loadresultant ecc.	= =	3,262 lbs 19.37 in
Soil Pressure @ Toe Soil Pressure @ Heel	= =	1,569 psf OK 0 psf OK
Allowable Soil Pressure Less	= Than <i>l</i>	2,000 psf Allowable

ACI Factored @ Toe	=	1,883 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	19.7 psi OK
Footing Shear @ Heel	=	8.6 psi OK
Allowable	=	75.0 psi
Sliding Calcs (Vertical	Compon	ent NOT Used)

Lateral Sliding Force	=	2,188.0 lbs
less 100% Passive Force	= -	984.4 lbs
less 100% Friction Force	= -	1,14 <b>0.6</b> lbs
Added Force Req'd	=	62.0 lbs NG

1,156.0 lbs NG

Load Factors ———	
	1 000
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

....for 1.5: 1 Stability

Allow Soil Bearing	=	2,000.0 psf
Equivalent Fluid Pressure Me	thod	
Heel Active Pressure	=	35.0 psf/ft
Toe Active Pressure	=	35.0 psf/ft
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Friction Coeff btwn Ftg & Soil	=	0.350
Soil height to ignore		

## Lateral Load Applied to Stem

Lateral Load	=	68.0 plf
Height to Top	=	8.50 ft
Height to Bottom	=	0.00 ft

Wind on Exposed Stem 0.0 psf

Adjacent Footing Load		
Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

### Top Stem **Stem Construction**

Design Height Above Ftg	ft =	Stem OK 0.00
Wall Material Above "Ht"	=	Concrete
Thickness	in =	8.00
Rebar Size	=	# 5
Rebar Spacing	in =	6.00
Rebar Placed at	=	Center
Design Data ———		0.000
fb/FB + fa/Fa	=	0.898
Total Force @ Section	lbs =	2,594.0
MomentActual	ft-l =	8,187.2
MomentAllowable	ft-l =	9,118.8
ShearActual	psi =	54.0
ShearAllowable	psi =	75.0
Wall Weight	psf =	100.0
Rebar Depth 'd'	in =	4.00
Lap splice if above	in =	21.01
Lap splice if below	in =	9.16
Hook embed into footing	in =	9.16
Concrete Data		
f'c	psi =	2,500.0
Fy	psi =	

Engineer:
Project ID:
Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 8.5 Ft (Siesmic)

Footing Dimensions & Strengths

## **Footing Design Results**

Toe Width	=	4.38 ft
Heel Width	=	1.63
Total Footing Width	=	6.00
Footing Thickness	=	15.00 in
Key Width	=	12.00 in
Key Depth	=	12.00 in
Key Distance from Toe	=	1.00 ft
f'c = 2,500 psi	Fy =	60,000 psi 150.00 pcf
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top 2.00	@ Rt	m = 3.00 ir

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,883	0 psf
Mu' : Upward	=	0	0 ft-lb
Mu' : Downward	=	0	619 ft-lb
Mu: Design	=	8,187	619 ft-lb
Actual 1-Way Shear	=	19.71	8.61 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 5 @ 11.75 in	
Heel Reinforcing	=	None Spec'd	
Key Reinforcing	=	# 4 @ 12.00 in	

Other Acceptable Sizes & Spacings

Toe: #4@ 9.75 in, #5@ 15.00 in, #6@ 21.50 in, #7@ 29.00 in, #8@ 38.25 in, #9@ 48 Heel: Not req'd, Mu < S  $^*$  Fr Key: Not req'd, Mu < S  $^*$  Fr

# Summary of Overturning & Resisting Forces & Moments

		0	VERTURNING				RI	SISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	1,663.6	3.25	5,406.7	Soil Over Heel	=	896.0	5.52	4,946.9
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-53.6	0.58	-31.3	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=	578.0	5.50	3,179.0	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	240.6	2.19	526.4
					Surcharge Over Toe	=			
					Stem Weight(s)	=	850.0	4.71	4,002.1
					Earth @ Stem Transitions	=			
Total	=	2,188.0	O.T.M. =	8,554.4	Footing Weight	=	1,125.0	3.00	3,375.0
Resisting/Overturning F			=	1.53	Key Weight	=	150.0	1.50	225.0
Vertical Loads used	for S	oil Pressure	= 3,261.	.7 lbs	Vert. Component	=		_	
					Tota	al =	3,261.7 I	bs R.M. =	13,075.3

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

0.350

7.96

7.96

2,500.0

in =

in =

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 7.5 Ft

Soil Data

Calculations per ACI 318-11, ACI 530-11, IBC 2012,

Criteria Retained Height 7.50 ft Wall height above soil 0.00 ft Slope Behind Wall 0.00:1Height of Soil over Toe 6.00 in Water height over heel 0.0 ft Vertical component of active Lateral soil pressure options:

NOT USED for Soil Pressure. NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

Allow Soil Bearing 2,000.0 psf Equivalent Fluid Pressure Method

Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf

Soil height to ignore

for passive pressure 12.00 in

**Design Summary** 

Wall Stability Ratios Overturning 2.45 OK 1.24 Ratio < 1.5! Sliding 2,589 lbs **Total Bearing Load** ...resultant ecc. 6.13 in 835 psf OK Soil Pressure @ Toe Soil Pressure @ Heel 200 psf OK 2,000 psf Allowable

Soil Pressure Less Than Allowable ACI Factored @ Toe 1,002 psf ACI Factored @ Heel 241 psf Footing Shear @ Toe 13.9 psi OK Footing Shear @ Heel 9.8 psi OK Allowable 75.0 psi Sliding Calcs (Vertical Component NOT Used)

Lateral Sliding Force 1,225.0 lbs less 100% Passive Force 609.4 lbs less 100% Friction Force 90**6.0** lbs 0.0 lbs OK Added Force Rea'd ....for 1.5 : 1 Stability 322.1 lbs NG

Load Factors Dead Load 1.200 Live Load 1.600 Earth, H 1.600 Wind, W 1.600 Seismic, E 1.000 **Stem Construction** 

Friction Coeff btwn Ftg & Soil

Top Stem Stem OK Design Height Above Ftg ft = 0.00 Wall Material Above "Ht"

Concrete Thickness in = 8.00 Rebar Size # 5 Rebar Spacing 12.00 in = Rebar Placed at Center Design Data 0.776 fb/FB + fa/Fa = Total Force @ Section lbs = 1,568.0 Moment....Actual ft-l = 3.936.3 Moment.....Allowable ft-l = 5,069.7 Shear.....Actual psi = 32.7 Shear.....Allowable 75.0 psi = Wall Weight psf = 100.0 Rebar Depth 'd' 4.00 in = Lap splice if above in = 23.40

f'c psi = Fy psi =

Lap splice if below

Concrete Data

Hook embed into footing

CBC 2013, ASCE 7-10

Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

**Total Footing Width** 

Footing Thickness

Key Distance from Toe

f'c = 2,500 psi Footing Concrete Density

Toe Width Heel Width

Key Width Key Depth

Min. As %

Cover @ Top

DESCRIPTION: 7.5 Ft

Footing Dimensions & Strengths

## **Footing Design Results**

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,002	241 psf
Mu' : Upward	=	4,731	0 ft-lb
Mu' : Downward	=	1,401	537 ft-lb
Mu: Design	=	3,330	537 ft-lb
Actual 1-Way Shear	=	13.88	9.84 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 5 @ 11.75 in	
Heel Reinforcing	=	None Spec'd	

Key Reinforcing = #4@12.00 in

Other Acceptable Sizes & Spacings

Toe: #4@ 13.25 in, #5@ 20.50 in, #6@ 29.00 in, #7@ 39.25 in, #8@ 48.25 in, #9@ 4 Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

# Summary of Overturning & Resisting Forces & Moments

3.38 ft

1.63

5.00

12.00 in

12.00 in

9.00 in

1.00 ft

60,000 psi

150.00 pcf

0.0018

@ Btm.= 3.00 in

		0	VERTURNING.				RI	ESISTING	
Item		Force lbs	Distance ft	Moment ft-lb	_		Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	1,264.4	2.83	3,582.4	Soil Over Heel	=	790.6	4.52	3,574.3
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50	-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=				* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	185.6	1.69	313.2
					Surcharge Over Toe	=			
					Stem Weight(s)	=	750.0	3.71	2,781.3
					Earth @ Stem Transitions	=			
Total	=	1,225.0	O.T.M. =	3,562.7	Footing Weight	=	750.0	2.50	1,875.0
Resisting/Overturning	Ratio		=	2.45	Key Weight	=	112.5	1.50	168.8
Vertical Loads used	for S	Soil Pressure	= 2,588	.8 lbs	Vert. Component	=			
					Tota	al =	2,588.8	bs R.M. =	8.712.5

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active

Lateral soil pressure options:

NOT USED for Soil Pressure.

NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 7.5 Ft (Siesmic)

### Soil Data

7.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

Allow Soil Bearing = 2,000.0 psf

**Equivalent Fluid Pressure Method** 

Heel Active Pressure = 35.0 psf/ft
Toe Active Pressure = 35.0 psf/ft
Passive Pressure = 300.0 psf/ft
Soil Density, Heel = 110.00 pcf
Soil Density, Toe = 110.00 pcf
Friction Coeff btwn Ftg & Soil = 0.350

Soil height to ignore

for passive pressure = 12.00 in

# Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10

# Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf Used for Sliding & Overturning

## Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

# Design Summary Wall Stability Ratios

Footing Shear @ Heel

Overturning Sliding	=	1.47 Ratio < 1.5! 1.12 Ratio < 1.5!
Total Bearing Loadresultant ecc.	= =	2,964 lbs 17.52 in
Soil Pressure @ Toe Soil Pressure @ Heel	= =	1,900 psf OK 0 psf OK
Allowable Soil Pressure Les	= s Than A	2,000 psf
ACI Factored @ Toe	=	2,280 psf
ACI Factored @ Heel	=	0 psf
Footing Shear @ Toe	=	14.1 psi OK

6.5 psi OK

Allowable		=	75.0 psi
Sliding Calcs	(Vertical Co	ompon	ent NOT Used)
Lateral Sliding	Force	=	1,797.5 lbs
less 100% Pas	ssive Force	= -	984.4 lbs
less 100% Frid	tion Force	= -	1,03 <b>0.0</b> lbs

		,	
Added Force Reg'd	=	0.0 lbs	OK
for 1.5 : 1 Stability	=	674.6 lbs	NG

Load Factors ———	
Dead Load	1.200
Deau Luau	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

# Lateral Load Applied to Stem

Lateral Load	=	60.0 plf
Height to Top	=	7.50 ft
Height to Bottom	=	0.00 ft

Wind on Exposed Stem = 0.0 psf

# Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Stem Construction	Top Stem
-------------------	----------

Design Height Above Ftg		Stem OK
Wall Material Above "Ht"	ft = =	0.00 Concrete
Thickness	= in =	8.00
Rebar Size	=	# 5
Rebar Spacing	in =	9.00
Rebar Placed at	=	Center
Design Data ————		
fb/FB + fa/Fa	=	0.861
Total Force @ Section	lbs =	2,018.0
MomentActual	ft-l =	5,623.8
MomentAllowable	ft-l =	6,532.8
ShearActual	psi =	42.0
ShearAllowable	psi =	75.0
Wall Weight	psf =	100.0
Rebar Depth 'd'	in =	4.00
Lap splice if above	in =	20.14
Lap splice if below	in =	8.84
Hook embed into footing	in =	8.84
Concrete Data ———		
f'c	psi =	2,500.0
Fy	psi =	

Engineer: Project ID: Project Descr:

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## BYKONEN CARTER QUINN

# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 7.5 Ft (Siesmic)

# Footing Dimensions & Strengths

3.38 ft Toe Width Heel Width 1.63 **Total Footing Width** 5.00 Footing Thickness 18.00 in Key Width Key Depth 12.00 in 9.00 in Key Distance from Toe 1.00 ft f'c = 2,500 psi Footing Concrete Density 60,000 psi 150.00 pcf Min. As % 0.0018 Cover @ Top 2.00 @ Btm.= 3.00 in

# **Footing Design Results**

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	2,280	0 psf
Mu' : Upward	=	0	0 ft-lb
Mu' : Downward	=	0	579 ft-lb
Mu: Design	=	5,624	579 ft-lb
Actual 1-Way Shear	=	14.08	6.49 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing		# 5 @ 11.75 in	
Heel Reinforcing	=	None Spec'd	

Key Reinforcing = #4@12.00 in

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

# Summary of Overturning & Resisting Forces & Moments

	OVERTURNING						RE	ESISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	1,417.5	3.00	4,252.5	Soil Over Heel	=	790.6	4.52	3,574.3
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-70.0	0.67	-46.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=	450.0	5.25	2,362.5	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	185.6	1.69	313.2
					Surcharge Over Toe	=			
					Stem Weight(s)	=	750.0	3.71	2,781.3
					Earth @ Stem Transitions	=			
Total	=	1,797.5	O.T.M. =	6,568.3	Footing Weight	=	1,125.0	2.50	2,812.5
Resisting/Overturning F			=	1.47	Key Weight	=	112.5	1.50	168.8
Vertical Loads used	for S	oil Pressure	= 2,963.	.8 lbs	Vert. Component	=		_	
					Tota	al =	2,963.8 I	bs R.M. =	9,650.0

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Top Stem

Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Criteria

DESCRIPTION: 6.5 Ft

Retained Height 6.50 ft Wall height above soil 0.00 ft Slope Behind Wall 0.00:1Height of Soil over Toe 6.00 in Water height over heel 0.0 ft

Vertical component of active Lateral soil pressure options:

NOT USED for Soil Pressure. NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

**Design Summary** 

Wall Stability Ratios 2.52 OK 1.29 Ratio < 1.5! Overturning Sliding 2.192 lbs **Total Bearing Load** ...resultant ecc. 5.12 in 827 psf OK 205 psf OK Soil Pressure @ Toe Soil Pressure @ Heel 2,000 psf Allowable Soil Pressure Less Than Allowable

992 psf ACI Factored @ Toe ACI Factored @ Heel 246 psf Footing Shear @ Toe 10.4 psi OK Footing Shear @ Heel 8.7 psi OK Allowable 75.0 psi Sliding Calcs (Vertical Component NOT Used)

Lateral Sliding Force 945.0 lbs less 100% Passive Force 450.0 lbs less 100% Friction Force 760.0 lbs Added Force Reg'd 0.0 lbs OK ....for 1.5: 1 Stability 200.3 lbs NG

Load Factors ————	
	1 200
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic F	1 000

### Soil Data

Allow Soil Bearing 2,000.0 psf Equivalent Fluid Pressure Method Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf Friction Coeff btwn Ftg & Soil = 0.350

Soil height to ignore for passive pressure 12.00 in

## **Stem Construction**

		Stem OK
Design Height Above Ftg	ft =	0.00
Wall Material Above "Ht"	=	Concrete
Thickness	in =	8.00
Rebar Size	=	# 4
Rebar Spacing	in =	12.00
Rebar Placed at	=	Center
Design Data ————		
fb/FB + fa/Fa	=	0.756
Total Force @ Section	lbs =	1,176.0
MomentActual	ft-l =	2,562.0
MomentAllowable	ft-l =	3,387.6
ShearActual	psi =	24.5
ShearAllowable	psi =	75.0
Wall Weight	psf =	100.0
Rebar Depth 'd'	in =	4.00
Lap splice if above	in =	18.72
Lap splice if below	in =	6.25
Hook embed into footing	in =	6.25
Concrete Data ————		
f'c	psi =	2,500.0
Fy	psi =	

Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10

Engineer:
Project ID:
Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 6.5 Ft

Footing Dimensions & Strengths

# **Footing Design Results**

Toe Width Heel Width	= _	2.63 ft 1.63
Total Footing Width	=	4.25
Footing Thickness	=	12.00 in
Key Width	=	12.00 in
Key Depth	=	6.00 in
Key Distance from Toe	=	1.00 ft
f'c = 2,500 psi	Fy =	60,000 psi 150.00 pcf
Footing Concrete Densit	y =	150.00 pcf
Min. As %	=	0.0018
Cover @ Top 2.00	0 @ B	tm.= 3.00 ir

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	992	246 psf
Mu' : Upward	=	2,889	0 ft-lb
Mu' : Downward	=	848	477 ft-lb
Mu: Design	=	2,041	477 ft-lb
Actual 1-Way Shear	=	10.44	8.73 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 5 @ 11.75 in	

Heel Reinforcing Key Reinforcing = None Spec'd = # 4 @ 12.00 in

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S  $^*$  Fr Heel: Not req'd, Mu < S  $^*$  Fr Key: Not req'd, Mu < S  $^*$  Fr

# Summary of Overturning & Resisting Forces & Moments

OVERTURNING							SISTING		
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	984.4	2.50	2,460.9	Soil Over Heel	=	685.2	3.77	2,583.8
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50	-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=				* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	144.4	1.31	189.5
					Surcharge Over Toe	=			
					Stem Weight(s)	=	650.0	2.96	1,922.9
					Earth @ Stem Transitions	=			
Total	=	945.0	O.T.M. =	2,441.3	Footing Weight	=	637.5	2.13	1,354.7
Resisting/Overturning I	Ratio		=	2.52	Key Weight	=	75.0	1.50	112.5
Vertical Loads used	for S	oil Pressure	= 2,192	2.1 lbs	Vert. Component	=		_	
					Tota	al =	2,192.1 l	bs R.M. =	6,163.4

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

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Calculations per ACI 318-11, ACI 530-11, IBC 2012,

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CBC 2013, ASCE 7-10

# Cantilevered Retaining Wall

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active

Lateral soil pressure options:

NOT USED for Soil Pressure.

NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 6.5 Ft (Siesmic)

### Soil Data

6.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

Allow Soil Bearing = 2,000.0 psf

**Equivalent Fluid Pressure Method** 

Heel Active Pressure = 35.0 psf/ft
Toe Active Pressure = 35.0 psf/ft
Passive Pressure = 300.0 psf/ft
Soil Density, Heel = 110.00 pcf
Soil Density, Toe = 110.00 pcf
Friction Coeff btwn Ftg & Soil = 0.350

Soil height to ignore

for passive pressure = 12.00 in

## Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf Used for Sliding & Overturning

### Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

### Design Summary

Allowable

Sliding Calcs	(Vertical Co	ompon	ent NOT Used)
Lateral Sliding	Force	=	1,388.0 lbs
less 100% Pas	ssive Force	= -	787.5 lbs
less 100% Frid	tion Force	= -	87 <b>0.0</b> lbs
			11

Added Force Req'd	=	0.0 lbs	OK
for 1.5 : 1 Stability	=	415.7 lbs	s NG

75.0 psi

Load Factors ———	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

# Lateral Load Applied to Stem

Lateral Load	=	52.0 plf
Height to Top	=	6.50 ft
Height to Bottom	=	0.00 ft

Wind on Exposed Stem = 0.0 psf

Adjacent Footing Load		
Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Stem Construction
-------------------

Design Height Above Ftg	 ft =	Stem OK 0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 5	
Rebar Spacing	in =	16.00	
Rebar Placed at	=	Center	
Design Data ———		0.020	
fb/FB + fa/Fa	=	0.939	
Total Force @ Section	lbs =	1,514.0	
MomentActual	ft-l =	3,660.5	
MomentAllowable	ft-l =	3,898.0	
ShearActual	psi =	31.5	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	21.97	
Lap splice if below	in =	9.81	
Hook embed into footing	in =	9.81	
Concrete Data —			
f'c	psi =	2,500.0	
Fy	psi =		

Top Stem

Engineer:
Project ID:
Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 6.5 Ft (Siesmic) Footing Dimensions & Strengths

### **Footing Design Results**

Toe Width Heel Width	= =	2.63 ft 1.63
Total Footing Width	=	4.25
Footing Thickness	=	18.00 in
Key Width	=	12.00 in
Key Depth	=	6.00 in
Key Distance from Toe	=	1.00 ft
f'c = 2,500 psi	Fy =	60,000 psi 150.00 pcf
Footing Concrete Density	y =	150.00 pcf
Min. As %	=	0.0018
Cover @ Top 2.00	) @ [	3.00  ir

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	2,197	0 psf
Mu' : Upward	=	0	0 ft-lb
Mu' : Downward	=	0	518 ft-lb
Mu: Design	=	3,661	518 ft-lb
Actual 1-Way Shear	=	10.35	5.81 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Too Doinforcing	_	# 5 @ 11 75 in	•

Toe Reinforcing Heel Reinforcing = #5@11.75 in None Spec'd = # 4 @ 12.00 in Key Reinforcing

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

### Summary of Overturning & Resisting Forces & Moments

			VERTURNING					SISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	1,120.0	2.67	2,986.7	Soil Over Heel	=	685.2	3.77	2,583.8
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-70.0	0.67	-46.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=	338.0	4.75	1,605.5	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	144.4	1.31	189.5
					Surcharge Over Toe	=			
					Stem Weight(s)	=	650.0	2.96	1,922.9
					Earth @ Stem Transitions	=			
Total	=	1,388.0	O.T.M. =	4,545.5	Footing Weight	=	956.3	2.13	2,032.0
Resisting/Overturning	Ratio		=	1.50	Key Weight	=	75.0	1.50	112.5
Vertical Loads used			= 2,510.8	B lbs	Vert. Component	=			
					Tota	 al =	2.510.8 I	bs R.M. =	6.840.7

 $<sup>\</sup>label{eq:total} \begin{array}{ll} Total = & 2,510.8 \;\; lbs \;\; R.M. = \\ ^* \; Axial \; live \; load \; NOT \; included \; in \; total \; displayed, \; or \; used \; for \; overturning \; resistance, \; but \; is \; included \; for \; soil \; pressure \; calculation. \end{array}$ 

Project Title: Mounger Residence Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Criteria

DESCRIPTION: 5.5 Ft

### Soil Data

Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10

Retained Height	=	5.50 ft				
Wall height above soil	=	0.00 ft				
Slope Behind Wall	=	0.00:1				
Height of Soil over Toe	=	6.00 in				
Water height over heel	=	0.0 ft				
Vertical component of active Lateral soil pressure options:						

NOT USED for Soil Pressure. NOT USED for Sliding Resistance. NOT USED for Overturning Resistance.

ΙΝΔεί	an	Summary
	QI I	Julillialy

Wall Stability Ratios Overturning Sliding	=	2.31 OK 1.53 OK
Total Bearing Loadresultant ecc.	= =	1,782 lbs 5.50 in
Soil Pressure @ Toe Soil Pressure @ Heel Allowable Soil Pressure Le:	= = = ss Than A	1,012 psf OK 84 psf OK 2,000 psf llowable
ACI Factored @ Toe	=	1,214 psf

ACI Factored @ Heel	=	101 psf
Footing Shear @ Toe	=	7.1 psi OK
Footing Shear @ Heel	=	7.6 psi OK
Allowable	=	75.0 psi
Sliding Calcs (Vertical	Compone	ent NOT Used)
Lateral Sliding Force	=	700.0 lbs

Lateral Sliding Force	=	700.0 lbs
less 100% Passive Force	= -	450.0 lbs
less 100% Friction Force	= -	62 <b>0.6</b> lbs
Added Force Reg'd	=	0.0 lbs OK
for 1.5 : 1 Stability	=	0.0 lbs OK

oad Factors ———	
	1 000
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Allow Soil Bearing	=	2,000.0 psf
Equivalent Fluid Pressure Me	thoc	i
Heel Active Pressure	=	35.0 psf/ft
Toe Active Pressure	=	35.0 psf/ft
Passive Pressure	=	300.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Friction Coeff btwn Ftg & Soil	=	0.350
Soil height to ignore for passive pressure	=	12.00 in

em Construction		Top Stem	
		Stem OK	
Design Height Above Ftg	ft =	0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 4	
Rebar Spacing	in =	18.00	
Rebar Placed at	=	Center	
Design Data ————			
fb/FB + fa/Fa	=	0.673	
Total Force @ Section	lbs =	840.0	
MomentActual	ft-l =	1,551.7	
MomentAllowable	ft-l =	2,305.6	
ShearActual	psi =	17.5	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	18.72	
Lap splice if below	in =	6.00	
Hook embed into footing	in =	6.00	
Concrete Data			
fc	psi =	2,500.0	
Fy	psi =	2,000.0	
· <i>J</i>	1		

Engineer:
Project ID:
Project Descr:

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Lic. # : KW-06003456

DESCRIPTION: 5.5 Ft

Footing Dimensions & Strengths

### **Footing Design Results**

Toe Width		=		.63 ft
Heel Width	_	= _		<u>.63</u>
Total Footing Width	1	=	3	.25
Footing Thickness		=	12.	.00 in
Key Width		=	12.	.00 in
Key Depth		=	6.	.00 in
Key Distance from	Toe	=	1.	.00 ft
f'c = 2,500	psi	Fy =	60,0	000 psi .00 pcf
Footing Concrete D	ensity	=	150	.00 pcf
Min. As %	_	=	0.00	118
Cover @ Top	2.00	@ B	stm.=	3.00 <b>in</b>

**Cantilevered Retaining Wall** 

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,214	101 psf
Mu' : Upward	=	1,359	0 ft-lb
Mu' : Downward	=	325	416 ft-lb
Mu: Design	=	1,034	416 ft-lb
Actual 1-Way Shear	=	7.10	7.62 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcina	=	None Spec'd	

Heel Reinforcing Key Reinforcing = None Spec'd = # 4 @ 12.00 in

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

### Summary of Overturning & Resisting Forces & Moments

		0	<b>VERTURNING</b>					ESISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	739.4	2.17	1,602.0	Soil Over Heel	=	579.8	2.77	1,606.5
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50	-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=				* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	89.4	0.81	72.6
					Surcharge Over Toe	=			
					Stem Weight(s)	=	550.0	1.96	1,077.1
					Earth @ Stem Transitions	=			
Total	=	700.0	O.T.M. =	1,582.3	Footing Weight	=	487.5	1.63	792.2
Resisting/Overturning I			=	2.31	Key Weight	=	75.0	1.50	112.5
Vertical Loads used	for S	oil Pressure	= 1,781	.7 lbs	Vert. Component	=		_	
					Tota	ıl =	1,781.7	lbs R.M. =	3,660.9

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

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Calculations per ACI 318-11, ACI 530-11, IBC 2012,

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CBC 2013, ASCE 7-10

# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active

Lateral soil pressure options:

NOT USED for Soil Pressure.

NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 5.5 Ft (Siesmic)

### Soil Data

Soil height to ignore

for passive pressure 12.00 in

## Surcharge Loads

Surcharge Over Heel = Used To Resist Sliding & Overturning = 0.0 psf Surcharge Over Heel Surcharge Over Toe Used for Sliding & Overturning

### Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

### **Design Summary**

Wall Stability Ratios Overturning Sliding	= =	1.45 Ratio < 1.5! 0.98 UNSTABLE
Total Bearing Load	=	1,744 lbs

...resultant ecc. 11.83 in Soil Pressure @ Toe 1,819 psf OK Soil Pressure @ Heel 0 psf OK

2,000 psf Allowable Soil Pressure Less Than Allowable

ACI Factored @ Toe ACI Factored @ Heel 0 psf Footing Shear @ Toe 12.5 psi OK Footing Shear @ Heel 7.6 psi OK Allowable 75.0 psi

Sliding Calcs (Vertical Component NOT Used) Lateral Sliding Force 942.0 lbs less 100% Passive Force 309.4 lbs less 100% Friction Force 610.0 lbs Added Force Reg'd 22.2 lbs NG

....for 1.5: 1 Stability 493.2 lbs NG

Load Factors Dead Load 1.200 Live Load 1.600 1.600 Earth, H Wind, W 1.600 1.000 Seismic, E

5.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

Allow Soil Bearing 2,000.0 psf Equivalent Fluid Pressure Method Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf Friction Coeff btwn Ftg & Soil = 0.350

## Lateral Load Applied to Stem

Lateral Load	=	44.0 plf
Height to Top	=	5.50 ft
Height to Bottom	=	0.00 ft

Wind on Exposed Stem 0.0 psf

## Adjacent Footing Load

0.0 lbs Adjacent Footing Load Footing Width 0.00 ft 0.00 in Eccentricity 0.00 ft Wall to Ftg CL Dist Footing Type Line Load Base Above/Below Soil 0.0 ft at Back of Wall Poisson's Ratio 0.300

### **Stem Construction**

III COHSHUCHOH		TOP Stelli	
		Stem OK	
Design Height Above Ftg	ft =	0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 5	
Rebar Spacing	in =	16.00	
Rebar Placed at	=	Center	
Design Data ————			
fb/FB + fa/Fa	=	0.569	
Total Force @ Section	lbs =	1,082.0	
MomentActual	ft-l =	2,217.2	
MomentAllowable	ft-l =	3,898.0	
ShearActual	psi =	22.5	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	13.31	
Lap splice if below	in =	6.00	
Hook embed into footing	in =	6.00	
Concrete Data			
f'c	psi =	2,500.0	
Fy	psi =	,	
,	•		

Top Stem

Engineer: Project ID: Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 5.5 Ft (Siesmic)

Footing Dimensions & Strengths

### **Footing Design Results**

Toe Width Heel Width Total Footing Width		= = _ =	1	.63 ft . <u>63</u> .25
Footing Thickness		=	12.	.00 in
Key Width Key Depth Key Distance from T	oe	= = =	3.	.00 in .00 in .00 ft
f'c = 2,500 p Footing Concrete De Min. As % Cover @ Top	si ensity 2.00	Fy = = = = @ B	0.00	000 psi .00 pcf 018 3.00 in

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	2,183	0 psf
Mu' : Upward	=	2,068	0 ft-lb
Mu' : Downward	=	325	416 ft-lb
Mu: Design	=	1,743	416 ft-lb
Actual 1-Way Shear	=	12.52	7.62 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 5 @ 11 75 in	·

Toe Reinforcing Heel Reinforcing = # 5 @ 11.75 in = None Spec'd Key Reinforcing = # 4 @ 12.00 in

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: Not req'd, Mu < S \* Fr

## Summary of Overturning & Resisting Forces & Moments

			VERTURNING.					ESISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	739.4	2.17	1,602.0	Soil Over Heel	=	579.8	2.77	1,606.5
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50	-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=	242.0	3.75	907.5	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	89.4	0.81	72.6
					Surcharge Over Toe	=			
					Stem Weight(s)	=	550.0	1.96	1,077.1
					Earth @ Stem Transitions	=			
Total	=	942.0	O.T.M. =	2,489.8	Footing Weight	=	487.5	1.63	792.2
Resisting/Overturning I	Ratio		=	1.45	Key Weight	=	37.5	1.50	56.3
Vertical Loads used			= 1,744.	2 lbs	Vert. Component	=			
					Tota	al =	1,744.2 I	lbs R.M. =	3,604.6

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

0.350

Top Stem

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# **Cantilevered Retaining Wall**

4.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Slope Behind Wall

Criteria

DESCRIPTION: 4.5 Ft

### Soil Data

Calculations per ACI 318-11, ACI 530-11, IBC 2012, CBC 2013, ASCE 7-10 Allow Soil Bearing 2,000.0 psf

Equivalent Fluid Pressure Method

Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf

Friction Coeff btwn Ftg & Soil = Soil height to ignore

f'c

Fy

57.9 lbs NG

for passive pressure 12.00 in

Vertical component of active Lateral soil pressure options: NOT USED for Soil Pressure. NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

### **Design Summary**

Wall Stability Ratios Overturning Sliding	=	2.46 OK 1.38 Ratio < 1.5!
Total Bearing Loadresultant ecc.	= =	1,399 lbs 4.62 in
Soil Pressure @ Toe Soil Pressure @ Heel	= =	936 psf OK 81 psf OK 2 000 psf

Allowable	=	2,000 psf
Soil Pressure Less	Than	Allowable '
ACI Factored @ Toe	=	1,123 psf
ACI Factored @ Heel	=	98 psf
Footing Shear @ Toe	=	3.2 psi OK
Footing Shear @ Heel	=	6.5 psi OK
Allowable	=	75.0 psi
		LNOTH N

Sliding Calcs (Vertical Co	ompone	ent NOT Used)
Lateral Sliding Force	=	490.0 lbs
less 100% Passive Force	= -	187.5 lbs
less 100% Friction Force	= -	48 <b>9.6</b> lbs
Added Force Rea'd	=	0.0 lbs OK

Load Factors ——	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

....for 1.5: 1 Stability

### **Stem Construction**

III COHSHUCHOH		r op otein	
D ' 11'11A1 FI		Stem OK	
Design Height Above Ftg	ft =	0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 4	
Rebar Spacing	in =	18.00	
Rebar Placed at	=	Center	
Design Data ————			
fb/FB + fa/Fa	=	0.368	
Total Force @ Section	lbs =	560.0	
MomentActual	ft-l =	849.3	
MomentAllowable	ft-l =	2,305.6	
ShearActual	psi =	11.7	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	18.72	
Lap splice if below	in =	6.00	
Hook embed into footing	in =	6.00	
Concrete Data			

psi =

psi =

2,500.0

Engineer:
Project ID:
Project Descr:

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# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

DESCRIPTION: 4.5 Ft

Footing Dimensions & Strengths

### **Footing Design Results**

Toe Width	=	1.13 ft
Heel Width Total Footing Width	= .	<u>1.63</u> 2.75
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth Key Distance from Toe	=	0.00 in 0.00 ft
key distance noin rue	=	
f'c = 2,500 psi	Fy =	60,000 psi 150.00 pcf
Footing Concrete Density	y =	
Min. As %	=	0.0018
Cover @ Top 2.00	) @ l	3.00 in

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	1,123	98 psf
Mu' : Upward	=	622	0 ft-lb
Mu' : Downward	=	156	355 ft-lb
Mu: Design	=	467	355 ft-lb
Actual 1-Way Shear	=	3.18	6.51 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	None Spec'd	·

Heel Reinforcing Key Reinforcing = None Spec'd = # 4 @ 12.00 in

Other Acceptable Sizes & Spacings Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: No key defined

### Summary of Overturning & Resisting Forces & Moments

OVERTURNING			RESISTING							
Item		Force lbs	Distance ft	Mor ft-	ment lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	529.4	1.83		970.5	Soil Over Heel	=	474.4	2.27	1,077.2
Surcharge over Heel	=					Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50		-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=					Adjacent Footing Load	=			
Adjacent Footing Load	=					Axial Dead Load on Stem	=			
Added Lateral Load	=					* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=					Soil Over Toe	=	61.9	0.56	34.8
						Surcharge Over Toe	=			
						Stem Weight(s)	=	450.0	1.46	656.3
						Earth @ Stem Transitions	=			
Total	=	490.0	O.T.M.	=	950.8	Footing Weight	=	412.5	1.38	567.2
Resisting/Overturning	Ratio		=	2.46		Key Weight	=			
Vertical Loads used	I for S	oil Pressure	= 1,3	98.8 lbs		Vert. Component	=		_	
						Tota	al =	1,398.8	lbs R.M. =	2,335.5

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Engineer: Project ID: Project Descr:

Printed: 17 AUG 2021, 1:26PM

Calculations per ACI 318-11, ACI 530-11, IBC 2012,

File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24 **BYKONEN CARTER QUINN** 

CBC 2013, ASCE 7-10

# **Cantilevered Retaining Wall**

Lic. # : KW-06003456

Retained Height

Wall height above soil

Height of Soil over Toe

Water height over heel

Vertical component of active

Lateral soil pressure options:

NOT USED for Soil Pressure.

NOT USED for Sliding Resistance.

NOT USED for Overturning Resistance.

Slope Behind Wall

Criteria

DESCRIPTION: 4.5 Ft (Siesmic)

### Soil Data

Soil height to ignore

for passive pressure 12.00 in

# Surcharge Loads

Surcharge Over Heel = Used To Resist Sliding & Overturning = 0.0 psf Surcharge Over Heel Surcharge Over Toe Used for Sliding & Overturning

### Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

**Design Summary** 

Wall Stability Ratios Overturning 1.46 Ratio < 1.5! 0.98 UNSTABLE! Sliding

1,399 lbs **Total Bearing Load** ...resultant ecc. 10.14 in

Soil Pressure @ Toe 1,760 psf OK Soil Pressure @ Heel 0 psf OK 2,000 psf Allowable Soil Pressure Less Than Allowable

ACI Factored @ Toe 2,112 psf ACI Factored @ Heel 0 psf Footing Shear @ Toe 6.4 psi OK Footing Shear @ Heel 6.5 psi OK Allowable 75.0 psi

Sliding Calcs (Vertical Component NOT Used) Lateral Sliding Force 688.0 lbs less 100% Passive Force 187.5 lbs less 100% Friction Force 48**9.6** lbs

10.9 lbs NG Added Force Reg'd ....for 1.5: 1 Stability 354.9 lbs NG

Load Factors Dead Load 1.200 Live Load 1.600 Earth, H 1.600 Wind, W 1.600 1.000 Seismic, E

4.50 ft

0.00 ft

0.00:1

6.00 in

0.0 ft

Allow Soil Bearing 2,000.0 psf Equivalent Fluid Pressure Method Heel Active Pressure 35.0 psf/ft Toe Active Pressure 35.0 psf/ft Passive Pressure 300.0 psf/ft Soil Density, Heel 110.00 pcf Soil Density, Toe 110.00 pcf Friction Coeff btwn Ftg & Soil = 0.350

### Lateral Load Applied to Stem

Lateral Load 44.0 plf 4.50 ft ...Height to Top 0.00 ft ...Height to Bottom

Wind on Exposed Stem 0.0 psf

Adjacent Footing Load		
Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Footing Width Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

### **Stem Construction**

Fy

Design Height Above Ftg	ft =	Stem OK 0.00	
Wall Material Above "Ht"	=	Concrete	
Thickness	in =	8.00	
Rebar Size	=	# 5	
Rebar Spacing	in =	16.00	
Rebar Placed at	=	Center	
Design Data ———		0.000	
fb/FB + fa/Fa	=	0.332	
Total Force @ Section	lbs =	758.0	
MomentActual	ft-l =	1,294.8	
MomentAllowable	ft-l =	3,898.0	
ShearActual	psi =	15.8	
ShearAllowable	psi =	75.0	
Wall Weight	psf =	100.0	
Rebar Depth 'd'	in =	4.00	
Lap splice if above	in =	12.00	
Lap splice if below	in =	6.00	
Hook embed into footing	in =	6.00	
Concrete Data ———			
f'c	psi =	2,500.0	

psi =

Top Stem

Engineer: Project ID: Project Descr:

Printed: 17 AUG 2021, 1:26PM

File: Retaining Wall.ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24 BYKONEN CARTER QUINN

# Cantilevered Retaining Wall

Lic. # : KW-06003456

**Total Footing Width** 

Footing Thickness

Key Distance from Toe

f'c = 2,500 psi Footing Concrete Density

Toe Width Heel Width

Key Width Key Depth

Min. As %

Cover @ Top

DESCRIPTION: 4.5 Ft (Siesmic)
Footing Dimensions & Strengths

### **Footing Design Results**

		<u>Toe</u>	<u>Heel</u>
Factored Pressure	=	2,112	0 psf
Mu' : Upward	=	1,021	0 ft-lb
Mu' : Downward	=	156	355 ft-lb
Mu: Design	=	865	355 ft-lb
Actual 1-Way Shear	=	6.40	6.51 psi
Allow 1-Way Shear	=	75.00	75.00 psi
Toe Reinforcing	=	# 5 @ 11.75 in	•

Heel Reinforcing = #5@11.75 in Heel Reinforcing = None Spec'd Key Reinforcing = #4@12.00 in

Other Acceptable Sizes & Spacings

Toe: Not req'd, Mu < S \* Fr Heel: Not req'd, Mu < S \* Fr Key: No key defined

### Summary of Overturning & Resisting Forces & Moments

1.13 ft

1.63

2.75

12.00 in

0.00 in 0.00 in

0.00 ft

60,000 psi

150.00 pcf

0.0018

@ Btm.= 3.00 in

		0	VERTURNING	•••			RI	ESISTING	
Item		Force lbs	Distance ft	Moment ft-lb			Force lbs	Distance ft	Moment ft-lb
Heel Active Pressure	=	529.4	1.83	970.5	Soil Over Heel	=	474.4	2.27	1,077.2
Surcharge over Heel	=				Sloped Soil Over Heel	=			
Toe Active Pressure	=	-39.4	0.50	-19.7	Surcharge Over Heel	=			
Surcharge Over Toe	=				Adjacent Footing Load	=			
Adjacent Footing Load	=				Axial Dead Load on Stem	=			
Added Lateral Load	=	198.0	3.25	643.5	* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	61.9	0.56	34.8
					Surcharge Over Toe	=			
					Stem Weight(s)	=	450.0	1.46	656.3
					Earth @ Stem Transitions	=			
Total	=	688.0	O.T.M. =	1,594.3	Footing Weight	=	412.5	1.38	567.2
Resisting/Overturning	Ratio		=	1.46	Key Weight	=			
Vertical Loads used			= 1,398.	8 lbs	Vert. Component	=			
					Tota	l =	1 398 8 I	hs RM =	2 335 5

<sup>\*</sup> Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

# ATC Hazards by Location

### **Search Information**

Address: 4006 E Mercer Way, Mercer Island, WA 98040,

USA

**Coordinates:** 47.57430979999999, -122.2041217

Elevation: 41 ft

**Timestamp:** 2021-08-03T21:58:18.266Z

Hazard Type: Seismic

Reference ASCE7-16

**Document:** 

Risk Category:

Site Class: D-default



## **Basic Parameters**

Name	Value	Description
S <sub>S</sub>	1.4	MCE <sub>R</sub> ground motion (period=0.2s)
S <sub>1</sub>	0.487	MCE <sub>R</sub> ground motion (period=1.0s)
S <sub>MS</sub>	1.68	Site-modified spectral acceleration value
S <sub>M1</sub>	* null	Site-modified spectral acceleration value
S <sub>DS</sub>	1.12	Numeric seismic design value at 0.2s SA
S <sub>D1</sub>	* null	Numeric seismic design value at 1.0s SA

<sup>\*</sup> See Section 11.4.8

### **▼**Additional Information

Name	Value	Description
SDC	* null	Seismic design category
Fa	1.2	Site amplification factor at 0.2s
F <sub>v</sub>	* null	Site amplification factor at 1.0s
CR <sub>S</sub>	0.903	Coefficient of risk (0.2s)
CR <sub>1</sub>	0.898	Coefficient of risk (1.0s)
PGA	0.599	MCE <sub>G</sub> peak ground acceleration
F <sub>PGA</sub>	1.2	Site amplification factor at PGA
PGA <sub>M</sub>	0.719	Site modified peak ground acceleration

$T_L$	6	Long-period transition period (s)
SsRT	1.4	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.551	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.639	Factored deterministic acceleration value (0.2s)
S1RT	0.487	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.542	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.454	Factored deterministic acceleration value (1.0s)
PGAd	1.239	Factored deterministic acceleration value (PGA)

<sup>\*</sup> See Section 11.4.8

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.

### **Disclaimer**

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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### **Search Information**

Address: 4006 E Mercer Way, Mercer Island, WA 98040,

USA

**Coordinates:** 47.57430979999999, -122.2041217

Elevation: 41 ft

**Timestamp:** 2021-08-03T21:57:28.320Z

Hazard Type: Wind



ASCE 7-16	ASCE 7-10	ASCE 7-05
MRI 10-Year67 mph	MRI 10-Year 72 mph	ASCE 7-05 Wind Speed 85 mph
MRI 25-Year 73 mph	MRI 25-Year 79 mph	
MRI 50-Year 78 mph	MRI 50-Year 85 mph	
MRI 100-Year 83 mph	MRI 100-Year 91 mph	
Risk Category I 92 mph	Risk Category I 100 mph	
Risk Category II 98 mph	Risk Category II 110 mph	
Risk Category III 105 mph	Risk Category III-IV 115 mph	
Risk Category IV 108 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.

### **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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# <u>Seismic</u>

**Project:** Mounger Remodel

Seismic Design Para		
Site Class	D	
Risk Category	II	Table 1.5-1
Importance Factor	1	Table 1.5-2
Ss	1.400	From USGS
S1	0.487	110111 0303
Fa	1.200	Table 11.4-1
Fv	1.813	Table 11.4-2
Sms	1.680	Eq. 11.4-1
Sm1	0.883	Eq. 11.4-2
Sds	1.120	Eq. 11.4-3
Sd1	0.589	Eq. 11.4-4
R	6.5	Table 12.2-1
$C_s$	0.172	Eq. 12.8-2
k	1	12.8.3
Seismic Design Category	D	Table 11.6-1

Seismic Weight

Areas (ft <sup>2</sup> )				
Roof	3190			
L3	1065			
L2	2240			

Wall (ft)				
Roof	125.5			
L3	198			
L2	223.5			

Loads	
DL-Floor (psf)	15
DL-Solar (psf)	5

Loads			
DL-Wall (plf)	10		

Seismic Base Shea		
V <sub>ultimate</sub> (k)	20.5	Eq. 12.8-1
V <sub>allowable</sub> (k)	14.3	

Level	Weight (k)	Height (ft)	$w_x f_x^{\ k}$	C <sub>vx</sub>	F <sub>x</sub> (ult.)	F <sub>x</sub> (allow.)
Roof	65.06	26.91	1750.6	0.63	13.0	9.1
L3	17.96	21.86	392.5	0.14	2.9	2.0
L2	35.84	17.39	623.2	0.23	4.6	3.2
	0.00		0.0	0.00	0.0	0.0
	0		0.0	0.00	0.0	0.0
TOTAL	118.8	-	2766.3	1	20.5	14.3

All references are from ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

### Wind

# **Project:** Mounger Remodel

Wind Load Parameters -	Envelope Method	
Exposure	С	Sec. 26.7
Risk Category	II	Table 1.5-1
Mean Roof Height (ft)	26.91	
Roof Slope X/12	5	
Roof Angle (deg)	22.62	
a (ft)	4.775	Figure 28.3-1 Note "a"
K <sub>d</sub>	0.85	Table 26.6-1
K <sub>zt</sub>	1	
V (mph)	98	
K <sub>z</sub>	0.96	Table 26.10-1
q <sub>h</sub> (psf)	19.96	Eq. 26.10-1
Minimum Wind Pressure	16	
on Walls (psf)	16	Con 20 2 4
Minimum Wind Pressure	0	Sec. 28.3.4
on Roof (psf)	8	

**Building Geometry** 

Length Along Ridge (Parallel) (ft)	Length Perpendicular to Ridge (ft)	Roof trib (ft)	Wall trib (ft)
47.75	63.25	5	7.375
49	75	-	6.75
49	75	-	8.625
		-	
		=	
	(Parallel) (ft) 47.75 49	(Parallel) (ft) Ridge (ft) 47.75 63.25 49 75	(Parallel) (ft) Ridge (ft)  47.75 63.25 5  49 75 -  49 75 -  49 75 -

long short

### Wind

Perpendicular to Ridge

Parallel to Ridge

· c.pca.ca.a. toage		· ur umer te ruuge	
Roof		Roof	
Roof Area (sf)	191	Roof Area (sf)	268.5
Roof Area (corners, sf)	47.75	Roof Area (corners, sf)	47.75
Wall Area (sf)	281.73	Wall Area (sf)	396.04
Wall Area (corners, sf)	70.43	Wall Area (corners, sf)	70.43
Roof Wind Shear (k)	5.34	Roof Wind Shear (k)	6.92

L3		L3		
Wall Area (sf)	266.29	Wall Area (sf)	441.79	
Wall Area (corners, sf)	64.46	Wall Area (corners, sf)	64.46	
L3 Wind Shear (k)	5.01	L3 Wind Shear (k)	7.42	

L2		L2	
Wall Area (sf)	340.26	Wall Area (sf)	564.51
Wall Area (corners, sf)	82.37	Wall Area (corners, sf)	82.37
L2 Wind Shear (k)	6.40	L2 Wind Shear (k)	9.49

### **Check Minimum Pressure**

Level	Calculated Perpendicular Pressure (psf)	Calculated Parallel Pressure (psf)	Minimum Ultimate Perpendicular Shear (k)	Minimum Parallel Ultimate Shear (k)
Roof	9.04	8.84	7.54	9.99
L3	15.14	14.66	5.29	8.10
L2	15.14	14.66	6.76	10.35

Summary Table

Laval	Perpendicular Wind	Parallel Wind Shear	Perpendicular Wind	Parallel Wind Shear
Level	Shear (ultimate, k)	(ultimate, k)	Shear (allowable, k)	(allowable, k)
Roof	7.54	9.99	4.53	6.00
L3	5.29	8.10	3.18	4.86
L2	6.76	10.35	4.06	6.21
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
Base Shear	19.60	28.44	11.76	17.07

All references are from ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	0	0	0	8.5
L3	0	0	0	7.5
L2	41.75	0.373	0.718	9.75
	0			
	0			

3.5

L2

Longth (ft)	H/W Ratio	11	Force in Wal	II Elements	Dea	d Loads	Coismis Overturning (k)	Wind Overturning (k)
Length (ft)	n/ W Kalio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	wind Overturning (k)
41.75	0.23	1.00	9	17	4071	418	-1.26	-1.18
		Shear Wall	SW	1	ı	Ctron Tio	Strap Tie/Holdow	n Not Required
		Shear Wall	300	-1		Strap Tie	Strap rie/Holdow	ii Not Kequireu

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	16	2.75	1.82	8.5
L3	18	3.28	3.09	7.5
L2	18	3.86	4.20	7.75
	0			
	0			

3.5

ROOF

Length (ft)	H/W Ratio	Increase 1	Force in Wal	I Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (It)	n/ W Natio	increase	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willia Overtarning (k)
12.25	0.15	1.00	172	114	223	123	0.21	0.86
3.75	0.48	1.00	172	114	68	38	0.28	0.93
		Shear Wall	SW	-1		Strap Tie	Strap Tie/Holdow	n Not Required

L3

Longth (ft)	H/W Ratio		Force in Wa	II Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (ft)	n/W Kalio	Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	wind Overturning (k)
18	0.42	1.00	182	172	1350	180	0.91	0.83
		Shear Wall	SW	1	1	Strap Tie	Strap Tie/Holdow	n Not Required
		Snear Wall	SVV	-1		Strap He	Strap He/Holdow	n Not Required

L2

Longth (ft)	H/W Ratio	11	Force in Wal	I Elements	Dea	nd Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (ft)	n/ W Kalio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (K)	Wind Overturning (k)
18	0.43	1.00	214	233	1395	180	1.19	1.33
	<u> </u>	Shear Wall	SW-	-1		Holdown	HDU2 w/	′ (2) 2x

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	28.5	1.22	0.81	8.5
L3	23	1.54	1.55	7.5
L2	23.25	2.25	2.92	7.75
	0			
	0			

3.5

ROOF

Length (ft)	Length (ft) H/W Ratio		Force in Wal	l Elements	Dea	nd Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	11/ VV Natio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willa Overtarillig (k)
19	0.04	1.00	43	28	154	190	-0.07	0.14
9.5	0.09	1.00	43	28	77	95	-0.02	0.19
		Shear Wall	SW	-1	1	Strap Tie	Strap Tie/Holdow	n Not Required

L3

Longth (ft)	H/W Potio	11	Force in Wal	I Elements	Dead Loads		Colomic Overturning (k)	Mind Overturning (k)
Length (ft)	H/W Ratio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	Wind Overturning (k)
23	0.33	1.00	67	68	1725	230	-0.09	-0.08
		Shear Wall	SW	1	1	Strap Tie	Strap Tie/Holdow	n Not Poquirod
		Stiedt Wall	5VV-	-T		эн ар не	Strap He/Holdow	ii Not kequired

L2

Longth (ft)	H/W Ratio	11	Force in Wal	I Elements	Dea	ıd Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (ft)	n/ W Kalio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (K)	wind Overturning (k)
23.25	0.33	1.00	97	126	1802	233	0.14	0.36
		Shear Wall	SW-	-1		Strap Tie	Strap Tie/Holdow	n Not Required

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	0	0.00	0.00	8.5
L3	0	0.00	0.00	7.5
L2	14	5.58	6.42	7.75
	0			
	0			

3.5

L2

Length (ft)	H/W Ratio	1	Force in Wal	I Elements	De	ad Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	n/ w Natio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisiffic Overturning (k)	wind Overturning (K)
14	0.55	1.00	399	459	1085	140	2.72	3.19
		Charana (all	CW	2		Class T's	B ACT C	1440
		Shear Wall	SW-	-3		Strap Tie	MSTC	VI4U

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	19	5.10	3.37	8.5
L3	19	6.29	6.21	7.5
L2	0	0.00	0.00	7.75
	0			
	0			

3.5

### ROOF

Longth (ft)	Length (ft) H/W Ratio		Force in Wa	ll Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	n/ W Natio	Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisiffic Overturning (k)	willia Overturning (k)
9.75	0.87	1.00	268	177	829	98	2.00	1.23
9.25	0.92	1.00	268	177	786	93	2.02	1.24
		Shear Wall	SW	-2		Strap Tie	MSTO	C40

L3

Longth (ft)	H/W Ratio	11	Force in Wa	II Elements	Dea	nd Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (ft)	n/ W Kalio	Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	wind Overturning (k)
9.75	0.77	1.00	331	327	731	98	2.23	2.20
9.25	0.81	1.00	331	327	694	93	2.25	2.21
		Shear Wall	SW	-2		Strap Tie	MSTO	240

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	0	0.00	0.00	8.5
L3	0	0.00	0.00	7.5
L2	7.5	2.36	2.97	7.75
	0			
	0			

3.5

L2

Lamath (ft)	H/W Ratio	Increase 1	Force in Wal	l Elements	Dea	d Loads	Caiamaia Occambromaina (Is)	Wind Overturning (k)
Length (ft)	n/ w katio	increase	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	wind Overturning (k)
3.75	2.07	1.01	317	396	291	38	2.34	2.97
3.75	2.07	1.01	317	396	291	38	2.34	2.97
		Shear Wall	SW-	-2		Strap Tie	MSTCI	M60

 $<sup>^{1}</sup>$  Increase per 4.3.4.2 ANSI/AWC SDPWS-2015  $^{2}$  Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	23.5	2.39	1.19	8.5
L3	23.5	2.92	2.03	7.5
L2	20.5	3.77	3.09	7.75
	0			
	0			

3.5

ROOF

Length (ft)	H/W Ratio	Increase 1	Force in Wa	II Elements	Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
Length (it)	11/ VV Natio	increase	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willa Overtarillig (k)
4	2.13	1.02	103	51	340	40	0.75	0.32
3	2.83	1.12	113	51	255	30	0.78	0.35
4	2.13	1.02	103	51	340	40	0.75	0.32
12.5	0.68	1.00	102	51	1063	125	0.51	0.07
		<b>-</b> 1 11	1					
		Shear Wall	SW	-1		Strap Tie	Strap Tie/Holdow	n Not Required

L3

Length (ft)	H/W Ratio	In anna anna 1	Force in Wa	II Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	n/ W Natio	Increase 1	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willia Overturning (k)
4	1.88	1.00	124	86	300	40	0.83	0.54
3	2.50	1.07	133	86	225	30	0.86	0.57
4	1.88	1.00	124	86	300	40	0.83	0.54
12.5	0.60	1.00	124	86	938	125	0.61	0.33
		Shear Wall	SW	-1		Strap Tie	Strap Tie/Holdow	n Not Required

L2

Length (ft)	H/W Ratio	In anna anna 1	Force in Wal	I Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	n/ w Natio	Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisiffic Overturning (k)	willia Overturning (k)
9.5	0.82	1.00	184	151	736	95	1.18	0.92
11	0.70	1.00	184	151	853	110	1.14	0.88
		Shear Wall	SW	-1		Strap Tie	MSTO	340

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	22.25	4.54	2.26	8.5
L3	28.5	5.55	3.85	7.5
L2	12.5	7.17	5.88	7.75
	0			
	0			

3.5

ROOF

Length (ft)	H/W Ratio	Increase 1	Force in Wa	II Elements	Dea	d Loads	Seismic Overturning (k)	Wind Overturning (k)
Length (it)	11/ W Natio	increase	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willa Overturning (k)
12.25	0.69	1.00	204	102	1041	123	1.38	0.52
10	0.85	1.00	204	102	850	100	1.45	0.58
		Shear Wall	SW-	-1		Strap Tie	MSTO	240

L3

Length (ft)	H/W Ratio	tio Increase <sup>1</sup>	Force in Wall Elements		Dead Loads		Colomia Oscartsumina (Is)	Mind Oceantonian (II)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	Wind Overturning (k)
12.25	0.61	1.00	195	135	919	123	1.15	0.70
16.25	0.46	1.00	195	135	1219	163	1.05	0.60
		Shear Wall	SW-1			Holdown	HDU2 w/	′ (2) 2x

L2

LZ									
Length (ft)	H/W Ratio	Increase 1	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)	
Length (It)		increase	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisiffic Overturning (k)	willia Overtailing (k)	
9.5	0.82	1.00	573	470	736	95	4.19	3.40	
3	2.58	1.08	618	470	233	30	4.36	3.57	
		Shear Wall	SW-5		Holdown		HDU8 w/ (2) 2x		
		Jiical Wall	3VV-3			HOIDOWII	11006 W/ (2) ZX		

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

Level	Total Wall Line Lengths (ft)	Seismic Forces (k)	Wind Forces (k)	Story Heights (ft)
Roof	33	2.15	1.07	8.5
L3	8.5	2.63	1.82	7.5
L2	51.75	3.40	2.79	7.75
	0			
	0			

3.5

ROOF

Length (ft)	H/W Ratio	Increase 1	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
Length (it)		Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seisinic Overturning (k)	willa Overtailing (k)
17	0.50	1.00	65	32	1445	170	0.07	-0.21
5	1.70	1.00	65	32	425	50	0.41	0.13
11	0.77	1.00	65	32	935	110	0.24	-0.04
		Shear Wall	SW-1			Strap Tie	Strap Tie/Holdow	n Not Required

L3

Length (ft)	H/W Ratio	. 1	Force in Wall Elements		Dead Loads		Saismis Overtuning (k)	Mind Oceantonian (II)
Length (It)		Increase <sup>1</sup>	Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	Wind Overturning (k)
3	2.50	1.07	330	215	225	30	2.24	1.53
5.5	1.36	1.00	309	215	413	55	2.18	1.47
		Shear Wall	SW-2		Strap Tie		MSTC40	

L2

Length (ft)	H/W Ratio	Increase 1	Force in Wall Elements		Dead Loads		Seismic Overturning (k)	Wind Overturning (k)
			Seismic Shear (plf)	Wind Shear (plf)	Wall (lb)	Floor (lb)	Seismic Overturning (k)	willa Overtariling (k)
15.75	0.49	1.00	66	54	1221	158	0.09	0.00
13.25	0.58	1.00	66	54	1027	133	0.16	0.07
4.75	1.63	1.00	66	54	368	48	0.38	0.29
6	1.29	1.00	66	54	465	60	0.35	0.26
8	0.97	1.00	66	54	620	80	0.30	0.21
4	1.94	1.00	66	54	310	40	0.40	0.31
	•	Shear Wall	SW-1			Strap Tie	Strap Tie/Holdow	n Not Required

<sup>&</sup>lt;sup>1</sup> Increase per 4.3.4.2 ANSI/AWC SDPWS-2015

<sup>&</sup>lt;sup>2</sup> Per Table 4.3.4 ANSI/AWC SDPWS-2015

### **SW Schedule**

Mark	Sheathing	Blocking	Panel Nailing <sup>1</sup>	Attachment to top plate <sup>3</sup>	LSL Rim Joists	Nailing to wood below <sup>5</sup>	A. Bolts to concrete below <sup>6</sup>	Capacity (plf, Seismic)	Capacity (plf, wind)
SW 1	15/32" APA Sheathing	Yes	8d @ 6" oc	CLIP @ 24"oc	2x/1¾" LSL	16d @ 6"oc	5/8" @ 48"oc	240	336
SW 2	15/32" APA Sheathing	Yes	8d @ 4" oc <sup>2</sup>	CLIP @ 20"oc	2x/1¾" LSL	16d @ 4½"oc	5/8" @ 48"oc	355	497
SW 3	15/32" APA Sheathing	Yes	8d @ 3" oc <sup>2</sup>	CLIP @ 16"oc	2x/1¾" LSL	16d @ 3½"oc	5/8" @ 36"oc	455	637
SW 4	15/32" APA Sheathing	Yes	8d @ 2" oc <sup>2</sup>	CLIP @ 12"oc	4x/3½" LSL	(2) Rows 16d @ 5½"oc 4	5/8" @ 24"oc	595	833
SW 5	15/32" APA Sheathing (each side)	Yes	8d @ 4"oc <sup>2</sup>	CLIP @ 9"oc	4x/3½" LSL	(2) Rows 16d @ 4½"oc 4	5/8" @ 24"oc <sup>7</sup>	705	987
SW 6	15/32" APA Sheathing (each side)	Yes	8d @ 3" oc <sup>2</sup>	CLIP @ 8"oc	4x/3½" LSL	(2) Rows 16d @ 3½"oc 4	5/8" @ 18"oc <sup>7</sup>	910	1274
SW 7	15/32" APA Sheathing (each side)	Yes	8d @ 2" oc <sup>2</sup>	CLIP @ 6"oc	4x/3½" LSL	SDS Screws @ 4"oc <sup>4</sup>	5/8" @ 15"oc <sup>7</sup>	1190	1666

Nails shall be 8d box. Nailing applies to all panel edges (block all unsupported panel edges), top & bottom plates and blocking. Nail to intermediate framing members w/ 8d @ 12"oc. (Note: where stud spacing is 24"oc, nail to intermediate framing members with 8d@6"oc)

<sup>&</sup>lt;sup>2</sup> Framing at adjoining panel edges shall be 3-inch nominal or wider and nails shall be staggered.

<sup>&</sup>lt;sup>3</sup> Clip shall be either A35, LTP4

<sup>&</sup>lt;sup>4</sup> Rows must be offset at least 1/2" and staggered.

<sup>&</sup>lt;sup>5</sup> Nails shall be 16d box (0.135Øx3½") or 10d common (0.148Øx3½") Screws shall be Simpson SDS25500 (1/4"Øx5"min)

<sup>&</sup>lt;sup>6</sup> Provide 3"x3"x0.229" plate washer at all anchor bolts. Anchor bolts shall be positioned such that plate edge of plate washer is with 1/2" of the edge of the bottom plate. (Plate washers may be diagonally slotted with a width of up to 13/16" and a length not to exceed 1<sup>3</sup>/<sub>4</sub>")

<sup>&</sup>lt;sup>7</sup> Alternate plate washers to provide 1/2" dimension on each side of the shearwall