



STRUCTURAL CALCULATIONS

FOR

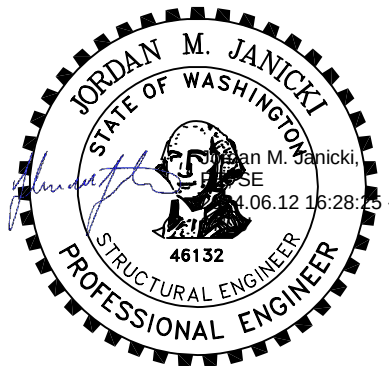
FLORENCE ADDITION
MERCER ISLAND, WA

June 14, 2024

ITEM

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STRUCTURAL CALCULATIONS

DESIGN CRITERIA

FLORENCE ADDITION
MERCER ISLAND, WA

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FACET

 Project:
Description:

Florence Family Addition
Design Criteria

 Date: 6/11/2024
Made By: NKP

Design Criteria

 Code: 2021 Seattle Building Code
2021 Existing Building Code

Seismic:

Latitude = 47.5478219 North
 Longitude = -122.2208538 West
 Spectral Response Acceleration, S_s & S_1 = 1.457 & 0.505
 Spectral Response Acceleration, S_{ds} & S_{d1} = 1.166 & 0.604
 Soil Site Class, F_a & F_v = 1.200 & 1.795
 Seismic Design Category, SDC D
 Response Modification Factor, R = 6.5

Wind:

Exposure = B
 Basic Wind Speed = 100 mph
 Topographical Terrain = Flat
 K_{zt} = 1.00

Live Loads:

Roof = 25 psf
 Floor = 40 psf

Dead Loads:

Roof = 15 psf
 Floor = 15 psf
 Exterior Wall = 10 psf
 Interior Wall = 7 psf

Soils:

Assumed By Owner
 Soil Bearing = 1,500 psf
 Active Soil Pressure = 35 pcf
 Passive Soil Pressure = 150 pcf
 IBC Soil Site Classification = D
 Frost Depth = 18 inches



Florence Residence

8818 SE 62nd St, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5478219, -122.2208538



Date	4/12/2024, 10:17:35 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S _S	1.457	MCE _R ground motion. (for 0.2 second period)
S ₁	0.505	MCE _R ground motion. (for 1.0s period)
S _{MS}	1.749	Site-modified spectral acceleration value
S _{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S _{DS}	1.166	Numeric seismic design value at 0.2 second SA
S _{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F _a	1.2	Site amplification factor at 0.2 second
F _v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.624	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.749	Site modified peak ground acceleration
T _L	6	Long-period transition period in seconds
SsRT	1.457	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.616	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	4.267	Factored deterministic acceleration value. (0.2 second)
S1RT	0.505	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.562	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.644	Factored deterministic acceleration value. (1.0 second)
PGA _d	1.422	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA _{UH}	0.624	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C _{RS}	0.902	Mapped value of the risk coefficient at short periods
C _{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s
C _V	1.391	Vertical coefficient



STRUCTURAL CALCULATIONS

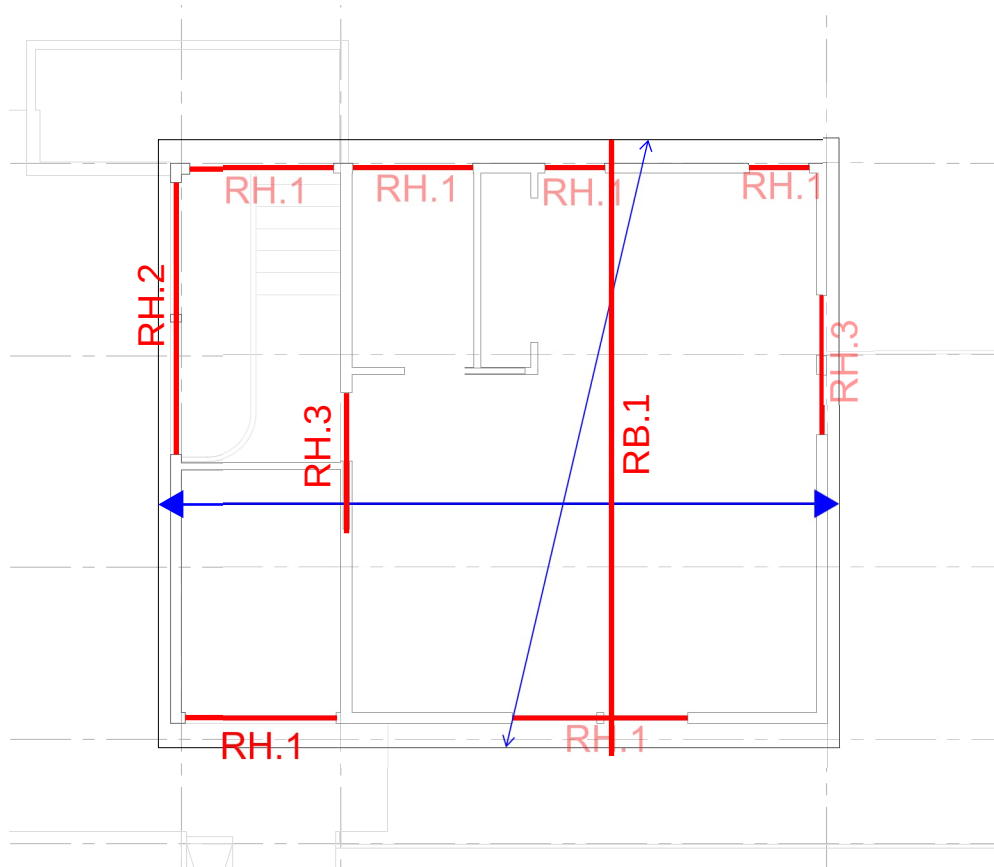
GRAVITY DESIGN

FLORENCE ADDITION
MERCER ISLAND, WA

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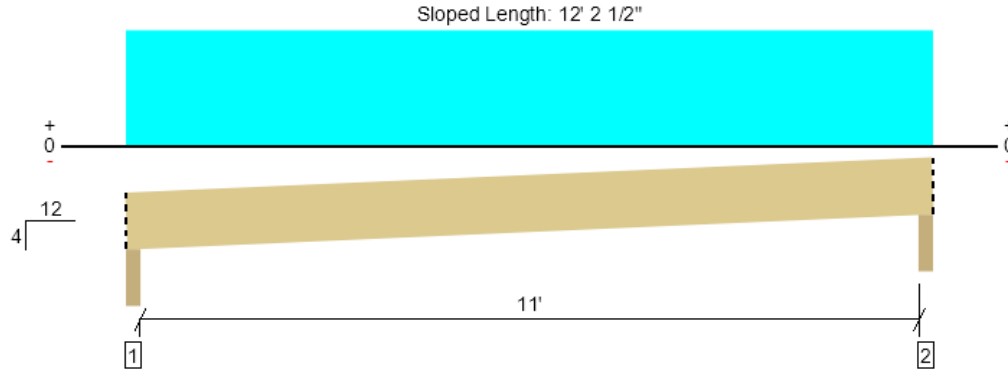
Florence Addition

scale: 1/8" = 1'-0"

Roof Gravity Key Plan

Upper Roof, RR.1

1 piece(s) 2 x 8 DF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	473 @ 2 1/2"	2126 (3.50")	Passed (22%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	402 @ 10 3/8"	1501	Passed (27%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1272 @ 5' 9 1/2"	1564	Passed (81%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.255 @ 5' 9 1/2"	0.392	Passed (L/554)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.416 @ 5' 9 1/2"	0.589	Passed (L/339)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 4 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/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.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.50"	183	290	290	473	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.50"	183	290	290	473	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)	6' 8" o/c	
Bottom Edge (Lu)	12' 3" o/c	

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 11' 7"	24"	15.0	25.0	25.0	Roof Load

Weyerhaeuser Notes

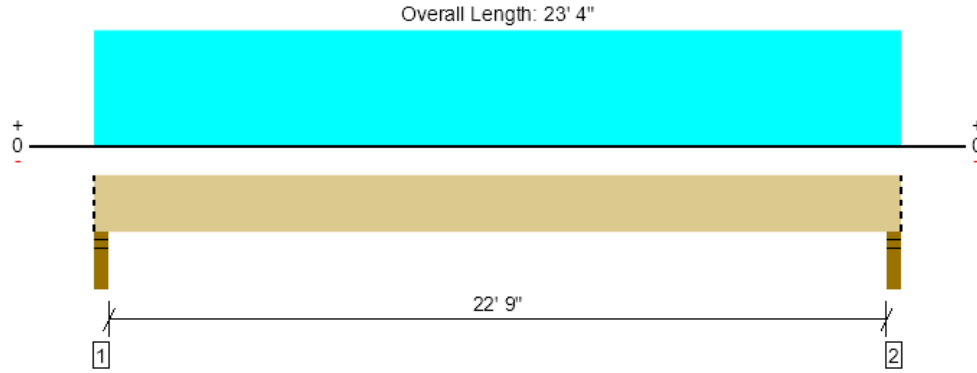
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 1:35:41 AM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4845 @ 2"	4961 (3.50")	Passed (98%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4101 @ 1' 9 1/2"	12800	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	27463 @ 11' 8"	42973	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.514 @ 11' 8"	0.767	Passed (L/537)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.854 @ 11' 8"	1.150	Passed (L/323)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 0.99 that was calculated using length L = 23'.
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

Member Length : 23' 4"
System : Roof
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 0/12

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.42"	1929	2917	2917	4845	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.42"	1929	2917	2917	4845	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)	17' 11" o/c	
Bottom Edge (Lu)	23' 4" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 23' 4"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 23' 4" (Front)	10'	15.0	25.0	25.0	Default Load

- Side loads are assumed to not induce cross-grain tension.

Weyerhaeuser Notes

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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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Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



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File Name: Florence Addition CD

CC/ECC/ECCU

Column Caps (cont.)

These products are available with additional corrosion protection. For more information, see p. 16.

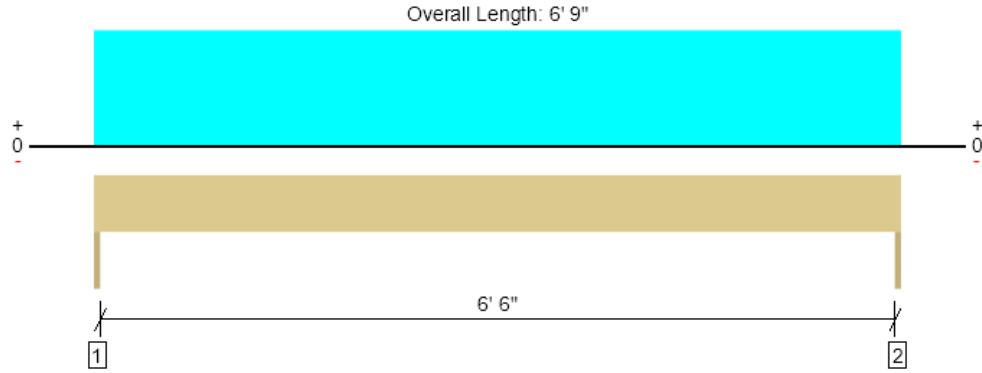
SS For stainless-steel fasteners, see p. 23.

	Model No.	Beam Width (in.)	Dimensions (in.)						Bolts					DF/SP Allowable Loads					Code Ref.	CCO/ECCO Model No. (No Legs)	
			W ₁	W ₂	L			H ₁	Size	Beam			Post	CC		ECC	ECCU				
					CC	ECC	ECCU			CC	ECC	ECCU		Uplift (160)	Down (100)	Down (100)	Uplift (160)	Down (100)			
SS	CC3 1/4-4	3½	3¼	3⅝	11	7½	9½	6⅞	⅝	4	2	4	2	3,150	16,980	6,835	3,150	6,835	IBC®, FL, LA	CC03 1/4 ECC03 1/4	
	CC3 1/4-6	3½	3¼	5½	11	7½	9½	6⅞	⅝	4	2	4	2	3,150	21,485	10,740	3,150	10,740		CC04 ECC04	
SS	CC44	3½	3⅝	3⅝	7	5½	6½	4	⅝	2	1	2	2	1,850	15,315	7,655	1,850	7,655		CC04/6 ECC04/6	
	CC46	3½	3⅝	5½	11	8½	9½	6½	⅝	4	2	4	2	3,530	24,065	12,030	3,530	12,030		CC04.62 ECC04.62	
	CC48	3½	3⅝	7½	11	8½	9½	6½	⅝	4	2	4	2	3,530	24,065	16,405	3,530	16,405		CC05 1/4 ECC05 1/4	
	CC4.62-3.62	4½	4⅝	3⅝	11	8½	9½	6½	⅝	4	2	4	2	4,535	23,390	9,845	4,535	9,845		CC06 ECC06	
	CC4.62-4.62	4½	4⅝	4⅝	11	8½	9½	6½	⅝	4	2	4	2	4,535	30,070	12,655	4,535	12,655		ECC068	
	CC4.62-5.50	4½	4⅝	5½	11	8½	9½	6½	⅝	4	2	4	2	4,535	30,940	15,470	4,535	15,470		CC07 ECC07	
	CC5 1/4-4	5⅝	5¼	3⅝	13	9½	10½	8	¾	4	2	4	2	6,300	26,635	11,210	6,300	11,210		CC07 1/8 ECC07 1/8	
	CC5 1/4-6	5⅝	5¼	5½	13	9½	10½	8	¾	4	2	4	2	6,500	28,190	17,615	6,500	17,615		CC08 ECC08	
	CC5 1/4-8	5⅝	5¼	7½	13	9½	10½	8	¾	4	2	4	2	6,645	35,235	24,025	6,645	24,025		CC09 ECC09	
	CC64	5¼, 5½	5½	3⅝	11	7½	9½	6½	⅝	4	2	4	2	5,545	28,585	12,030	5,545	12,030		CC010 ECC010	
SS	CC66	5¼, 5½	5½	5½	11	7½	9½	6½	⅝	4	2	4	2	5,545	30,250	18,905	5,545	18,905		CC012 ECC012	
	CC68	5¼, 5½	5½	7½	11	9½	9½	6½	⅝	4	2	4	2	5,545	37,815	25,780	5,545	25,780			
	CC6-7 1/8	5¼, 5½	5½	7⅞	11	9½	9½	6½	⅝	4	2	4	2	5,545	37,815	24,490	5,545	24,490			
	CC74	6¾	6⅞	3⅝	13	10½	10½	8	¾	4	2	4	2	6,330	33,490	15,355	6,330	15,355			
	CC76	6¾	6⅞	5½	13	10½	10½	8	¾	4	2	4	2	6,790	37,125	24,130	6,790	24,130			
	CC77	6¾	6⅞	6⅞	13	10½	10½	8	¾	4	2	4	2	7,020	48,265	29,615	7,020	29,615			
	CC78	6¾	6⅞	7½	13	10½	10½	8	¾	4	2	4	2	7,145	48,265	32,090	7,145	32,905			
	CC7 1/8-4	7	7⅞	3⅝	13	10½	10½	8	¾	4	2	4	2	6,360	34,730	18,375	6,360	18,375			
	CC7 1/8-6	7	7⅞	5½	13	10½	10½	8	¾	4	2	4	2	6,825	38,500	28,875	6,825	28,875			
	CC7 1/8-7 1/8	7	7⅞	7⅞	13	10½	10½	8	¾	4	2	4	2	7,105	57,750	36,750	7,105	36,750			
	CC7 1/8-8	7	7⅞	7½	13	10½	10½	8	¾	4	2	4	2	7,190	52,500	39,375	7,190	39,375			
	CC84	7½	7½	3⅝	13	10½	10½	8	¾	4	2	4	2	6,410	37,210	16,405	6,410	16,405			
	CC86	7½	7½	5½	13	10½	10½	8	¾	4	2	4	2	6,885	41,250	25,780	6,885	25,780			
	CC88	7½	7½	7½	13	10½	10½	8	¾	4	2	4	2	7,250	51,565	35,155	7,250	35,155			
	CC94	8¾	8⅞	3⅝	13	10½	10½	8	¾	4	4	4	2	6,580	47,545	19,905	6,580	19,905			
	CC96	8¾	8⅞	5½	13	10½	10½	8	¾	4	4	4	2	7,080	48,125	31,280	7,080	31,280			
	CC98	8¾	8⅞	7½	13	10½	10½	8	¾	4	4	4	2	7,455	62,565	42,655	7,455	42,655			
	CC106	9¼	9½	5½	13	10½	10½	8	¾	4	4	4	2	7,160	52,250	32,655	7,160	32,655			
	CC126	11½	11⅞	5⅞	13	10½	10½	8	¾	4	4	4	2	7,410	63,250	39,530	7,410	39,530		—	CC012 ECC012
	CC128	11½	11⅞	7⅞	13	10½	10½	8	¾	4	4	4	2	7,790	86,250	53,905	7,790	53,905			
	CC1210	11½	11⅞	9⅞	13	10½	10½	8	¾	4	4	4	2	8,080	93,440	68,280	8,080	68,280			

1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Downloads shall be reduced where limited by allowable loads of the post.
3. CC uplift loads do not apply to splice conditions.
4. Splice conditions with CCs must be detailed by the designer to transfer tension loads between spliced members by means other than the column cap.
5. Column sides are assumed to be aligned in the same vertical plane as the beam sides. CC4.62 models assume a minimum 3 1/2"-wide post.
6. Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers known as the narrow face. Values in the tables reflect installation into the wide face. See technical bulletin T-C-SCLCLM at strongtie.com for load reductions resulting from narrow-face installations.
7. Beam depth must be at least as tall as H₁.
8. CCO and ECCO welded to a steel column will achieve maximum load listed for the beam and the post cap as CC and ECC. The steel column width shall match the beam width. Weld by designer.
9. All references to bolts are for structural quality through bolts (not lag screws or carriage bolts) equal to or better than ASTM A307, Grade A.

FACET

Upper Roof, RH.1
1 piece(s) 4 x 6 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	286 @ 0	3281 (1.50")	Passed (9%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	237 @ 7"	2657	Passed (9%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	483 @ 3' 4 1/2"	1979	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.030 @ 3' 4 1/2"	0.135	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.051 @ 3' 4 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/600) and TL (5/16").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Member Length : 6' 9"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	118	169	169	286	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	118	169	169	286	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 9" o/c	
Bottom Edge (Lu)	6' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 9"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 6' 9"	2'	15.0	25.0	25.0	Roof Load

Weyerhaeuser Notes

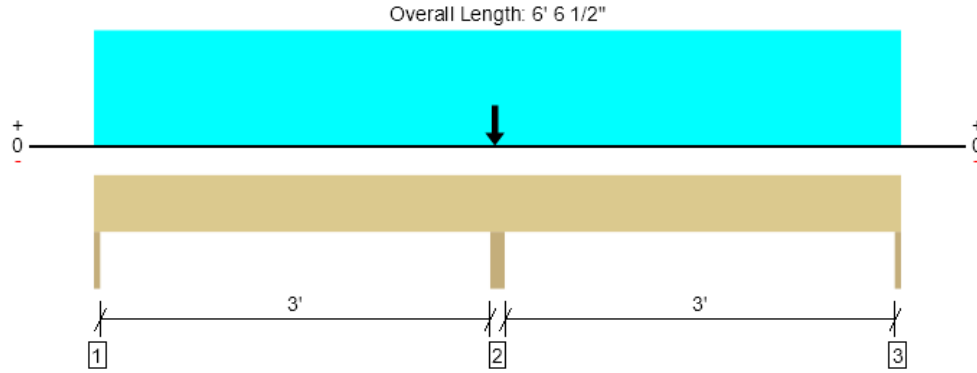
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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5193 @ 3' 3 1/4"	7656 (3.50")	Passed (68%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	122 @ 3' 10 1/2"	2657	Passed (5%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-114 @ 3' 3 1/4"	1979	Passed (6%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.001 @ 5' 1/4"	0.065	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.001 @ 1' 5 7/8"	0.164	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/600) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Member Length : 6' 6 1/2"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	43	66	66	109	None
2 - Trimmer - HF	3.50"	3.50"	2.37"	2072	3121	3121	5193	None
3 - Trimmer - HF	1.50"	1.50"	1.50"	43	66	66	109	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 6 1/2"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 6' 6 1/2"	2'	15.0	25.0	25.0	Roof Load
2 - Point (lb)	3' 3"	N/A	1929	2917	2917	Linked from: RB.1, Support 1

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

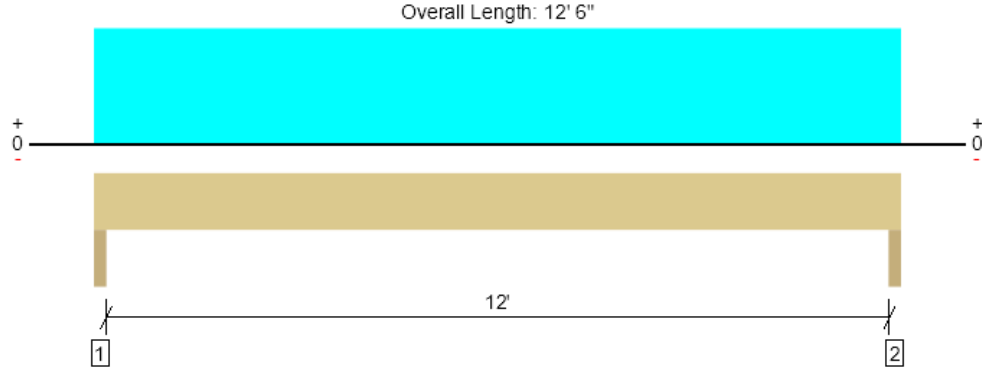
ForteWEB Software Operator	Job Notes
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



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File Name: Florence Addition CD

Upper Roof, RH.2

1 piece(s) 3 1/2" x 10 1/2" 24F-V8 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3556 @ 1 1/2"	6825 (3.00")	Passed (52%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2916 @ 1' 1 1/2"	7466	Passed (39%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	10672 @ 6' 3"	14792	Passed (72%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.292 @ 6' 3"	0.408	Passed (L/504)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.474 @ 6' 3"	0.613	Passed (L/310)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 12' 3".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Member Length : 12' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.56"	1368	2188	2188	3556	None
2 - Trimmer - HF	3.00"	3.00"	1.56"	1368	2188	2188	3556	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 6"	N/A	8.9	--	--	
1 - Uniform (PSF)	0 to 12' 6"	14'	15.0	25.0	25.0	Roof Load

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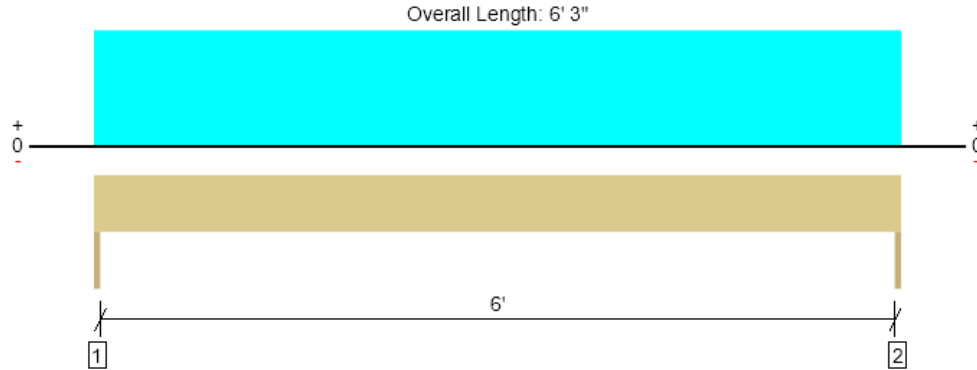
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Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1145 @ 0	3281 (1.50")	Passed (35%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	878 @ 8 3/4"	3502	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1789 @ 3' 1 1/2"	3438	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.043 @ 3' 1 1/2"	0.125	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.071 @ 3' 1 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/600) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Member Length : 6' 3"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	442	703	703	1145	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	442	703	703	1145	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 3"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 6' 3"	9'	15.0	25.0	25.0	Roof Load

Weyerhaeuser Notes

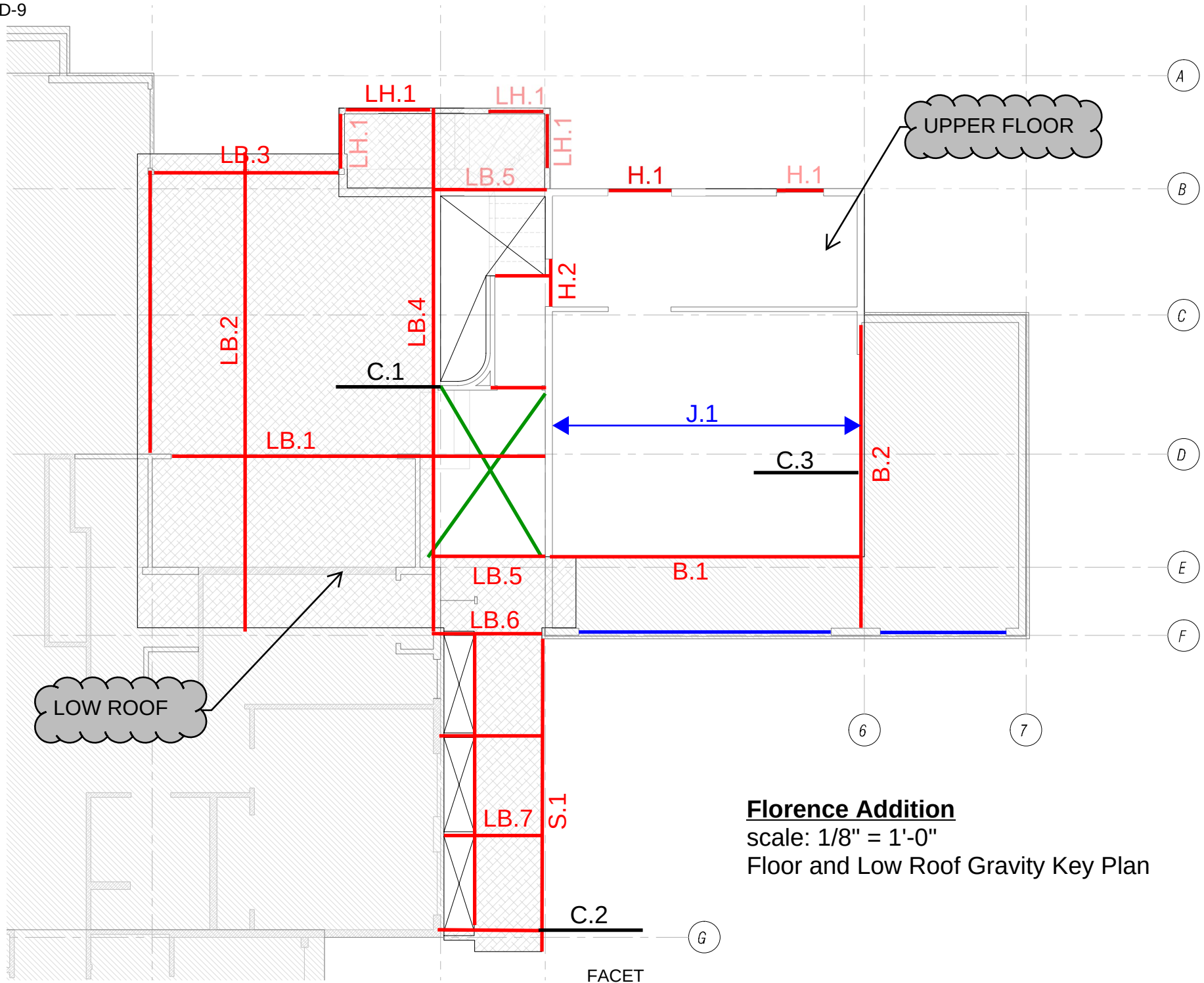
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Wood Beam

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: TYP T & G DECKING SPAN**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Hem-Fir

Wood Grade : Stud

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 675 psi

Fb - 675 psi

Fc - Prll 800 psi

Fc - Perp 405 psi

Fv 150 psi

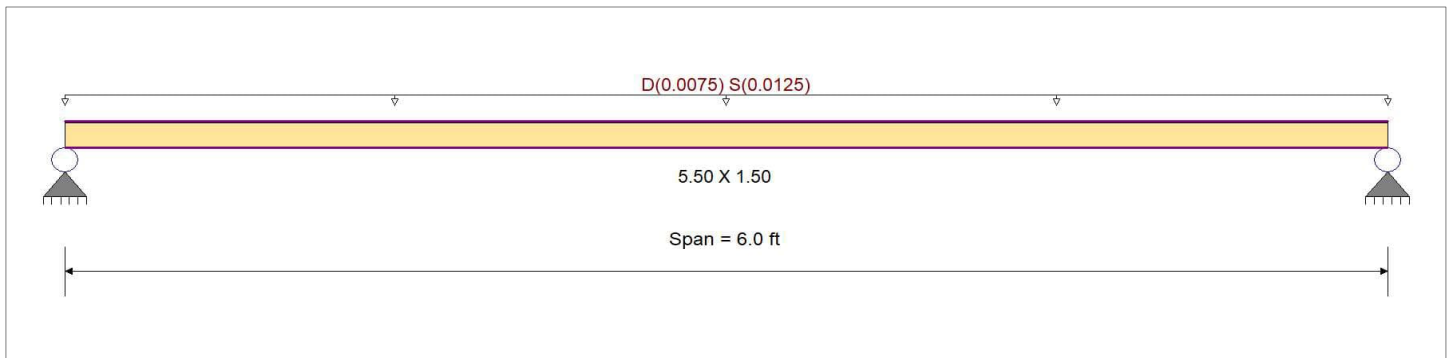
Ft 400 psi

E : Modulus of Elasticity

Ebend- xx 1200ksi

Eminbend - xx 440ksi

Density 26.84pcf

**Applied Loads**

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

Beam self weight NOT internally calculated and added

Uniform Load : D = 0.0150, S = 0.0250 ksf, Tributary Width = 0.50 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.675 : 1	Maximum Shear Stress Ratio	=	0.061 : 1
Section used for this span		5.50 X 1.50	Section used for this span		5.50 X 1.50
fb: Actual	=	523.64psi	fv: Actual	=	10.51 psi
F'b	=	776.25psi	F'v	=	172.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	3.000ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.197 in	Ratio = 364 >= 360	Span: 1 : S Only		
Max Upward Transient Deflection	0 in	Ratio = 0 < 360	n/a		
Max Downward Total Deflection	0.316 in	Ratio = 227 >= 180	Span: 1 : +D+S		
Max Upward Total Deflection	0 in	Ratio = 0 < 180	n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values				
		Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only																0.0	0.00	0.0	0.0
	Length = 6.0 ft	1	0.323	0.029	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.03	196.4	607.5	0.02	3.9	135.0	
+D+S						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0	
	Length = 6.0 ft	1	0.675	0.061	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.09	523.6	776.3	0.06	10.5	172.5	
+D+0.750S						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0	
	Length = 6.0 ft	1	0.569	0.051	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.08	441.8	776.3	0.05	8.9	172.5	
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0	
	Length = 6.0 ft	1	0.109	0.010	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.02	117.8	1,080.0	0.01	2.4	240.0	

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: TYP T & G DECKING SPAN

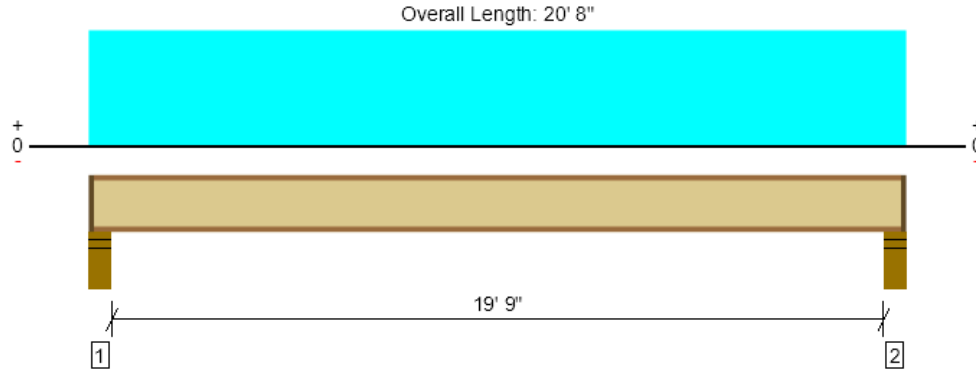
Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3160	3.022		0.0000	0.000

Vertical Reactions

		Support notation : Far left is #1		Values in KIPS	
Load Combination		Support 1	Support 2		
Max Upward from all Load Conditions		0.060	0.060		
Max Upward from Load Combinations		0.060	0.060		
Max Upward from Load Cases		0.038	0.038		
D Only		0.023	0.023		
+D+S		0.060	0.060		
+D+0.750S		0.051	0.051		
+0.60D		0.014	0.014		
S Only		0.038	0.038		

Upper Floor, J.1

1 piece(s) 11 7/8" TJI® 210 @ 10.6875" OC


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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	501 @ 4 1/2"	1460 (3.50")	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	484 @ 5 1/2"	1655	Passed (29%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2429 @ 10' 4"	3795	Passed (64%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.373 @ 10' 4"	0.498	Passed (L/640)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.513 @ 10' 4"	0.996	Passed (L/465)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	40	40	Passed	--	--

Member Length : 20' 5 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - DF	5.50"	4.25"	1.75"	138	368	506	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.75"	138	368	506	1 1/4" Rim Board

Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 8" o/c	
Bottom Edge (Lu)	20' 6" o/c	

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

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 20' 8"	10 11/16"	15.0	40.0	Floor Load

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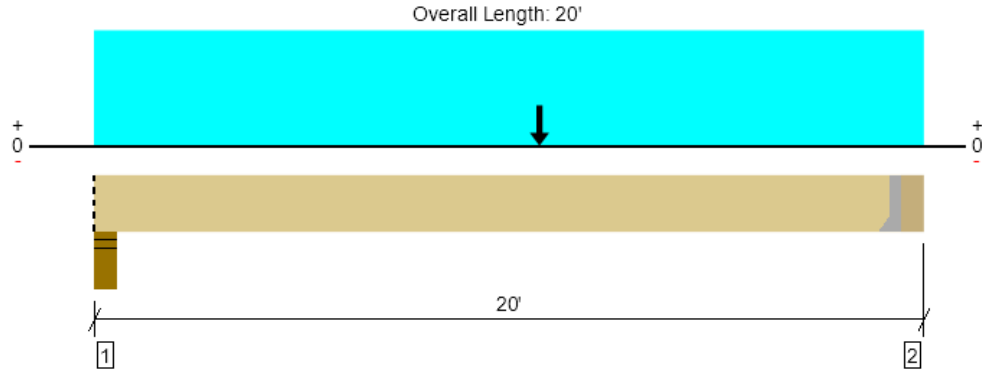
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Upper Floor, B.1

1 piece(s) 7" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4360 @ 19' 6 1/2"	6563 (1.50")	Passed (66%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	4147 @ 18' 6 5/8"	18481	Passed (22%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	30092 @ 11'	45776	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.357 @ 10' 2 3/4"	0.480	Passed (L/646)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.824 @ 10' 1 7/8"	0.960	Passed (L/280)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/480) 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.

Member Length : 19' 6 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	2408	795	1297	1297	3977	Blocking
2 - Hanger on 11 7/8" HF beam	5.50"	Hanger ¹	1.50"	2629	805	1620	1620	4447	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)	19' 7" o/c	
Bottom Edge (Lu)	19' 7" o/c	

• Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HHUS7.25/10	3.31"	N/A	30-10d	10-10d	

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

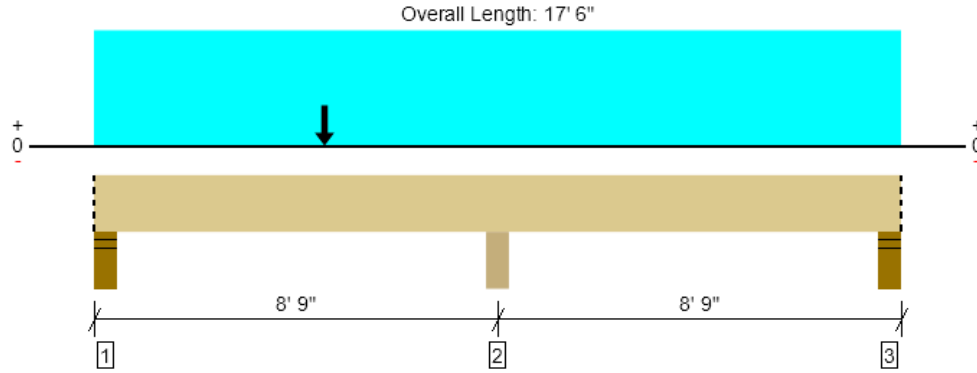
Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 19' 6 1/2"	N/A	26.0	--	--	--	
1 - Uniform (PSF)	0 to 20' (Front)	2'	15.0	40.0	-	-	Floor Load
2 - Uniform (PSF)	0 to 20' (Front)	10'	10.0	-	-	-	Wall Above
3 - Point (lb)	11' (Front)	N/A	1929	-	2917	2917	Linked from: RB.1, Support 1

• Side loads are assumed to not induce cross-grain tension.

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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12826 @ 8' 9"	18906 (5.50")	Passed (68%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	6573 @ 7' 6 3/4"	8244	Passed (80%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	11692 @ 5'	15684	Passed (75%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Live Load Defl. (in)	0.056 @ 4' 4 1/4"	0.210	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.108 @ 4' 3 3/4"	0.421	Passed (L/932)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Member Length : 17' 6"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	2.21"	2371	1888/-210	1504	1504	4915	Blocking
2 - Column - DF	5.50"	5.50"	3.73"	6339	4809	3839	3839	12826	None
3 - Stud wall - HF	5.50"	5.50"	1.50"	1199	1606/-288	860	860	3049	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)	17' 6" o/c	
Bottom Edge (Lu)	17' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 17' 6"	N/A	16.0	--	--	--	
1 - Uniform (PSF)	0 to 17' 6" (Front)	10'	15.0	40.0	-	-	Floor Load
2 - Uniform (PSF)	0 to 17' 6" (Front)	10'	10.0	-	-	-	Wall Above
3 - Uniform (PSF)	0 to 17' 6" (Front)	5'	15.0	-	25.0	25.0	Roof Load
4 - Uniform (PSF)	0 to 17' 6" (Front)	5'	15.0	-	25.0	25.0	Low Roof Load
5 - Point (lb)	5' (Front)	N/A	2629	805	1620	1620	Linked from: B.1, Support 2

• Side loads are assumed to not induce cross-grain tension.

Weyerhaeuser Notes

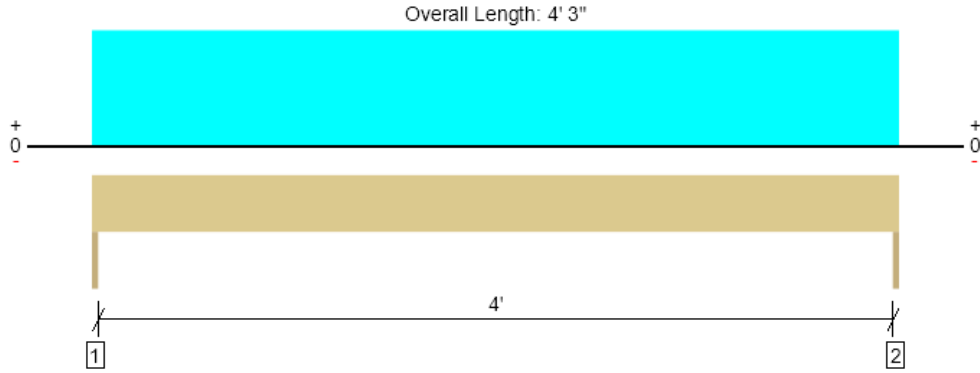
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 2:04:37 AM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	558 @ 0	3281 (1.50")	Passed (17%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	378 @ 7"	2310	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	553 @ 2' 1 1/2"	1720	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.009 @ 2' 1 1/2"	0.085	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.025 @ 2' 1 1/2"	0.213	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/600) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Member Length : 4' 3"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	350	170	106	106	558	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	350	170	106	106	558	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)	Floor Live (1.00)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	4.9	--	--	--	
1 - Uniform (PSF)	0 to 4' 3"	2'	15.0	40.0	-	-	Default Load
2 - Uniform (PSF)	0 to 4' 3"	10'	10.0	-	-	-	Wall above
3 - Uniform (PSF)	0 to 4' 3"	2'	15.0	-	25.0	25.0	Roof Load

Weyerhaeuser Notes

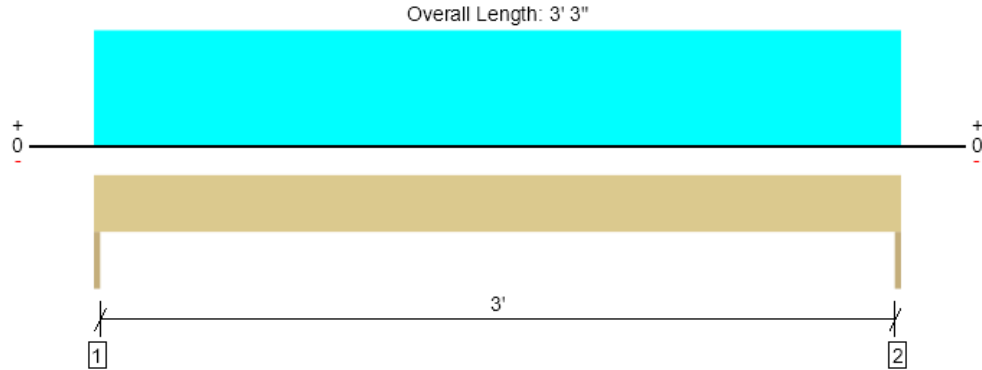
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File Name: Florence Addition CD



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1080 @ 0	3281 (1.50")	Passed (33%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	693 @ 7"	2310	Passed (30%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	878 @ 1' 7 1/2"	1720	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.016 @ 1' 7 1/2"	0.108	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.021 @ 1' 7 1/2"	0.162	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

- 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.

Member Length : 3' 3"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	300	780	1080	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	300	780	1080	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.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9	--	
1 - Uniform (PSF)	0 to 3' 3"	12'	15.0	40.0	Default Load

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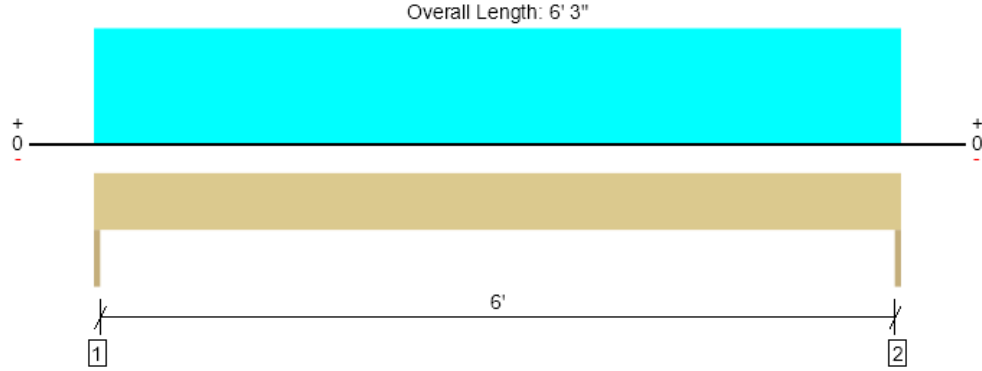
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 2:04:37 AM UTC
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File Name: Florence Addition CD

Low Roof, LH.1
1 piece(s) 4 x 6 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	515 @ 0	3281 (1.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	419 @ 7"	2657	Passed (16%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	805 @ 3' 1 1/2"	1979	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.044 @ 3' 1 1/2"	0.208	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.073 @ 3' 1 1/2"	0.313	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

- 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.

Member Length : 6' 3"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - HF	1.50"	1.50"	1.50"	203	313	313	515	None
2 - Trimmer - HF	1.50"	1.50"	1.50"	203	313	313	515	None

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 6' 3"	N/A	4.9	--	--	
1 - Uniform (PSF)	0 to 6' 3"	4'	15.0	25.0	25.0	Low Roof 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
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 1:56:51 AM UTC
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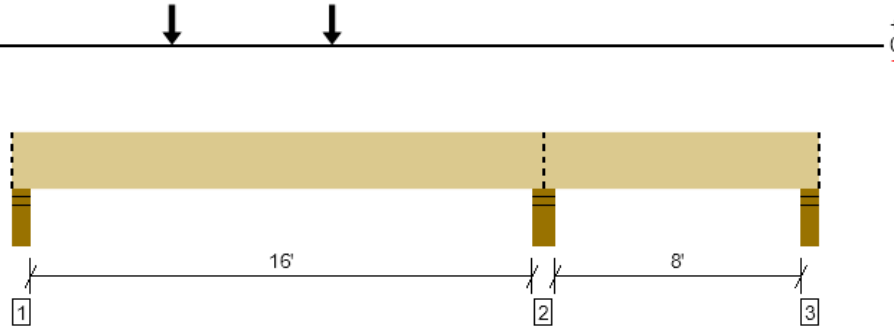
Low Roof, LB.1 (Point Loads)

1 piece(s) 5 1/2" x 12" 24F-V8 DF Glulam

An excessive uplift of ~1861 lbs at support located at 24' 11 1/2" failed this product.

Overall Length: 25' 2 1/2"

HANGER USED TO RESIST UPLIFT



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7084 @ 16' 7 1/4"	12251 (5.50")	Passed (58%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5064 @ 15' 4 1/2"	13409	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Pos Moment (Ft-lbs)	19409 @ 5'	30360	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Neg Moment (Ft-lbs)	-16144 @ 16' 7 1/4"	30360	Passed (53%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.325 @ 7' 8 1/8"	0.545	Passed (L/603)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.548 @ 7' 8 1/8"	0.818	Passed (L/358)	--	1.0 D + 1.0 S (All Spans)

Member Length : 25' 2 1/2"
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.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 13' 1 15/16".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 11' 6 9/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - HF	4.50"	4.50"	1.85"	1698	2430	2430	4128	Blocking
2 - Stud wall - HF	5.50"	5.50"	3.18"	2962	4121	4121	7084	Blocking
3 - Stud wall - HF	4.50"	4.50"	1.50"	-721	-1140	-1140	-1861	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)	25' 3" o/c	
Bottom Edge (Lu)	25' 3" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 25' 2 1/2"	N/A	16.0	--	--	
1 - Point (lb)	5' (Front)	N/A	1767	2706	2706	Linked from: LB.2, Support 2
2 - Point (lb)	10' (Front)	N/A	1767	2706	2706	Linked from: LB.2, Support 2

- Side loads are assumed to not induce cross-grain tension.

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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
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 2:02:47 AM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD

AC/ACHZ™/LPCZ™/LCE™/RTC™

Strong-Tie®

Post Caps

These adjustable, two-sided post caps provide design flexibility and easy connection in new construction or retrofit applications where a connection is needed between a beam and post.

- AC4 and AC6 provide convenient mid-beam connections with light or medium fastener choices
- ACHZ caps provide high capacity with the flexibility to be used mid beam or end beam when flanges are field bent
- LCE4 gives maximum versatility allowing for various member sizes and end-of-beam installations
- LPCZ caps can straddle wider posts, eliminating the need for shimming
- RTC connects two horizontal members at a corner to a vertical wood member

Material: LCE4 — 20 gauge; AC, LPC4Z — 18 gauge; ACHZ, LPC6Z — 16 gauge; RTC — 14 gauge

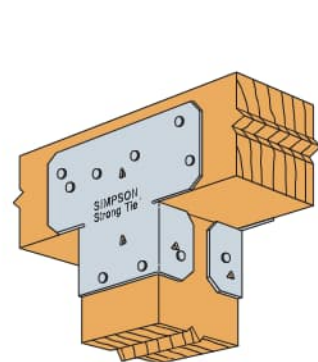
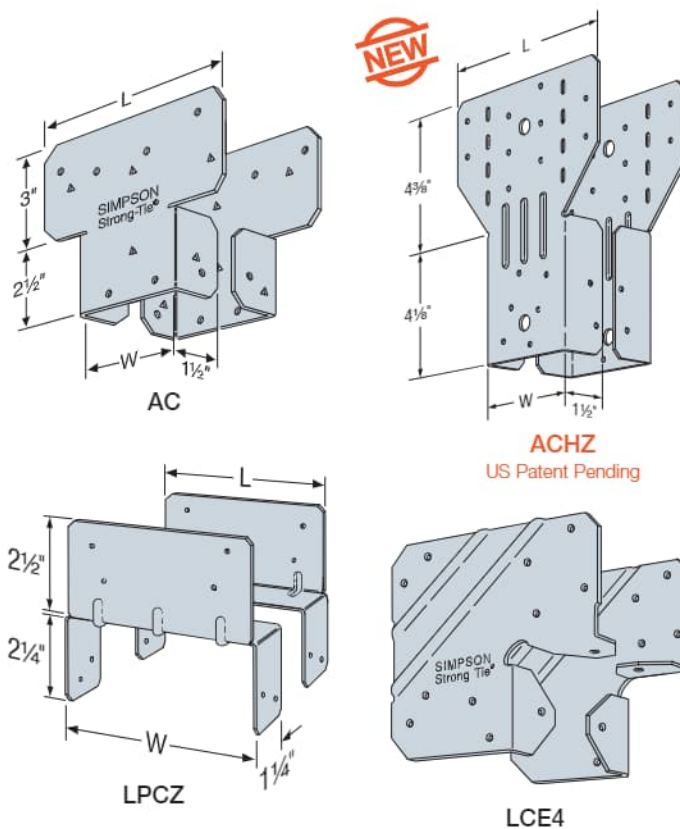
Finish: Galvanized. Some products available in ZMAX® coating and stainless steel.

Installation:

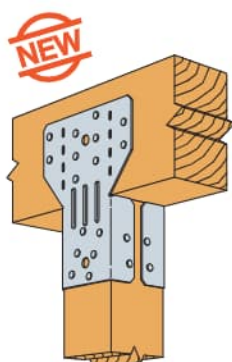
- Use all specified fasteners; see General Notes
- Install all models in pairs, except RTC.
LPCZ — 2½" beams may be used if 0.148" x 1½" nails are substituted for 0.148" x 3" nails
ACHZ — Field-adjustable flanges for end-of-beam installations (bend one time only)

Codes: See p. 13 for Code Reference Key Chart

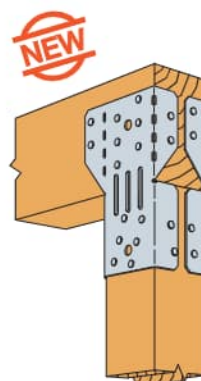
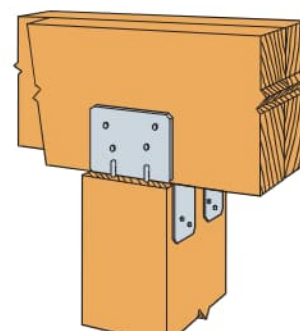
Web Applications: Visit app.strongtie.com/pbs to access our Post-to-Beam Selector web application.



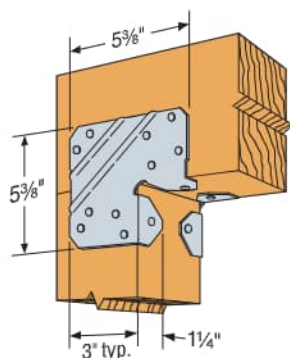
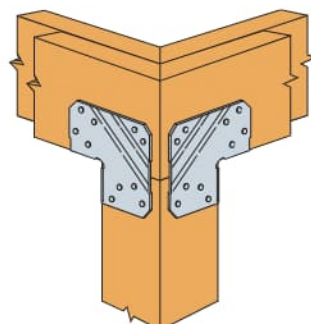
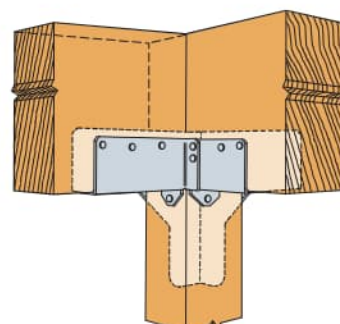
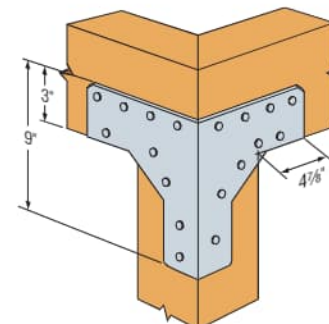
Typical AC4 Installation



Typical ACHZ Installation

Typical ACHZ Installation
(end of beam)

Typical LPC4Z Installation

Typical LCE4 Installation
(for 4x or 6x lumber)Typical LCE4 Corner Installation
(mitered corner)RTC44 Installation
(square cut)RTC44 Installation
(mitered corner)

FACET

AC/ACHZ™/LPCZ™/LCE™/RTC™

Post Caps (cont.)

These products are available with additional corrosion protection. For more information, see p. 16.

SS For stainless-steel fasteners, see p. 23.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 362–366 for more information.

	Model No.	Dimensions (in.)		Min. / Max.	Total No. Fasteners (in.)		DF/SP Allowable Loads (160)		Code Ref.
		W	L		Beam	Post	Uplift	Lateral	
SS	AC4	3 $\frac{3}{8}$	6 $\frac{1}{2}$	Min.	(8) 0.162 x 3 $\frac{1}{2}$	(8) 0.162 x 3 $\frac{1}{2}$	1,745	1,610	IBC®, FL, LA
		3 $\frac{3}{8}$	6 $\frac{1}{2}$	Max.	(14) 0.162 x 3 $\frac{1}{2}$	(14) 0.162 x 3 $\frac{1}{2}$	2,490	1,610	
	AC4RZ	4	7	Min.	(8) 0.162 x 3 $\frac{1}{2}$	(8) 0.162 x 3 $\frac{1}{2}$	1,745	1,610	
		4	7	Max.	(14) 0.162 x 3 $\frac{1}{2}$	(14) 0.162 x 3 $\frac{1}{2}$	2,490	2,075	
	ACH4Z	3 $\frac{3}{8}$	6 $\frac{1}{2}$	—	(20) 0.162 x 2 $\frac{1}{2}$	(20) 0.162 x 2 $\frac{1}{2}$	4,045	1,765	
		3 $\frac{3}{8}$	6 $\frac{1}{2}$	—	(20) SD10212	(20) SD10212	5,895	2,595	
	ACH4Z (end)	3 $\frac{3}{8}$	6 $\frac{1}{2}$	—	(20) 0.162 x 2 $\frac{1}{2}$	(20) 0.162 x 2 $\frac{1}{2}$	2,580	1,360	
		3 $\frac{3}{8}$	6 $\frac{1}{2}$	—	(20) SD10212	(20) SD10212	2,680	1,815	
SS	LCE4	—	5 $\frac{3}{8}$	—	(14) 0.162 x 3 $\frac{1}{2}$	(10) 0.162 x 3 $\frac{1}{2}$	1,950	1,350	
SS	AC6	5 $\frac{1}{2}$	8 $\frac{1}{2}$	Min.	(8) 0.162 x 3 $\frac{1}{2}$	(8) 0.162 x 3 $\frac{1}{2}$	1,665	1,565	
		5 $\frac{1}{2}$	8 $\frac{1}{2}$	Max.	(14) 0.162 x 3 $\frac{1}{2}$	(14) 0.162 x 3 $\frac{1}{2}$	2,815	2,075	
	AC6RZ	6	9	Min.	(8) 0.162 x 3 $\frac{1}{2}$	(8) 0.162 x 3 $\frac{1}{2}$	1,665	1,565	
		6	9	Max.	(14) 0.162 x 3 $\frac{1}{2}$	(14) 0.162 x 3 $\frac{1}{2}$	3,055	2,450	
	ACH6Z	5 $\frac{1}{2}$	8 $\frac{1}{2}$	—	(20) 0.162 x 2 $\frac{1}{2}$	(20) 0.162 x 2 $\frac{1}{2}$	4,045	2,640	
		5 $\frac{1}{2}$	8 $\frac{1}{2}$	—	(20) SD10212	(20) SD10212	5,895	4,130	
	ACH6Z (end)	5 $\frac{1}{2}$	8 $\frac{1}{2}$	—	(20) 0.162 x 2 $\frac{1}{2}$	(20) 0.162 x 2 $\frac{1}{2}$	2,580	1,965	
		5 $\frac{1}{2}$	8 $\frac{1}{2}$	—	(20) SD10212	(20) SD10212	2,680	2,200	
	LPC4Z	3 $\frac{3}{8}$	3 $\frac{1}{2}$	—	(8) 0.148 x 3	(8) 0.148 x 3	755	760	
	LPC6Z	5 $\frac{3}{8}$	5 $\frac{1}{2}$	—	(8) 0.148 x 3	(8) 0.148 x 3	920	885	

1. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.

2. Connector table loads and fastener quantities are listed for two parts.

3. Lateral load is in the direction parallel to the beam.

4. For minimum nailing quantity and load values, fill all round holes; for maximum nailing quantity and load values, fill all round and triangular holes.

5. Uplift loads do not apply to spliced conditions. Spliced conditions must be detailed by the Designer to transfer tension loads between spliced members by means other than the post cap.

6. Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers known as the narrow face. Values in the tables reflect installation into the wide face. See technical bulletin T-C-SCLCLM at strongtie.com for load reductions resulting from narrow-face installations.

7. **Fasteners:** Nail dimensions in the table are listed diameter by length. SD screws are Simpson Strong-Tie Strong-Drive SD Connector screws. See pp. 23–24 for fastener information.

AT END

Model No.	Dimensions (in.)		Total No. of Fasteners (in.)		DF/SP Uplift Loads (160)			SPF Uplift Loads (160)		
	W	L	Beam	Post	Side Beam	Main Beam	Post	Side Beam	Main Beam	Post
SS RTC44 ¹ (Mitered corner)	3 $\frac{3}{8}$	4 $\frac{3}{4}$	(16) 0.162 x 3 $\frac{1}{2}$	(10) 0.162 x 3 $\frac{1}{2}$	900	900	1,800	775	775	1,550
RTC44 ² (Square cut)	3 $\frac{3}{8}$	4 $\frac{3}{4}$	(16) 0.162 x 3 $\frac{1}{2}$	(10) 0.162 x 3 $\frac{1}{2}$	925	1,230	1,760	795	1,060	1,515
SS LCE4 ¹ (Mitered corner)	5 $\frac{3}{8}$	5 $\frac{3}{8}$	(14) 0.162 x 3 $\frac{1}{2}$	(10) 0.162 x 3 $\frac{1}{2}$	—	—	885	—	—	760

1. The allowable download for the mitered RTC44 and LCE4 connection is limited to the bearing of the mitered beams on the post and shall be determined by the designer.

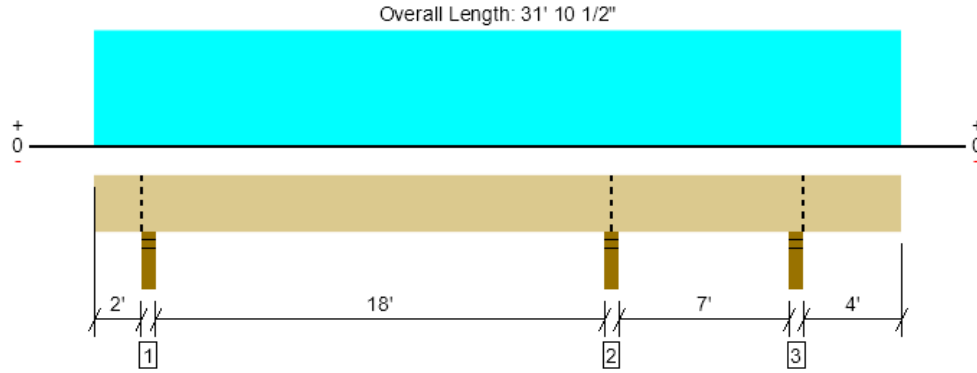
2. The allowable download for the main beam in the square-cut RTC44 connection is limited to the bearing of the beam on the post and shall be determined by the designer. The side beam allowable download is 1,170 lb.

3. The combined uplift loads applied to all the beams must not exceed the post allowable uplift load listed in the table.

4. **LCE4** connectors must be installed in pairs to achieve listed loads.

5. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 23–24 for fastener information.

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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4473 @ 20' 5 1/4"	4961 (3.50")	Passed (90%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	2356 @ 19' 1/2"	10666	Passed (22%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	6939 @ 9' 9 1/4"	30188	Passed (23%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-7673 @ 20' 5 1/4"	30188	Passed (25%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.122 @ 10' 6 3/16"	0.610	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.201 @ 10' 6 1/8"	0.915	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 31' 10 1/2"
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).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 14' 9 13/16".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 14' 9 9/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.75"	1006	1476	1476	2483	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.16"	1767	2706	2706	4473	Blocking
3 - Stud wall - HF	3.50"	3.50"	1.50"	503	1041	1041	1544	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)	31' 11" o/c	
Bottom Edge (Lu)	31' 11" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 31' 10 1/2"	N/A	12.8	--	--	
1 - Uniform (PSF)	0 to 31' 10 1/2" (Front)	6'	15.0	25.0	25.0	Default Load

- Side loads are assumed to not induce cross-grain tension.

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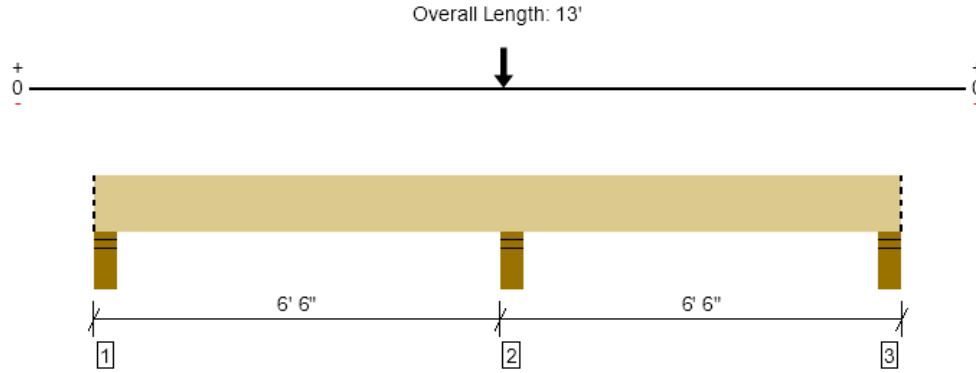
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Nicki Peden DCG (206) 523-0024 nicki@dcgengr.com	



6/12/2024 2:02:07 AM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD

Low Roof, LB.3
1 piece(s) 4 x 6 DF No.1



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2520 @ 6' 8 3/4"	8181 (5.50")	Passed (31%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	16 @ 6' 1/2"	2079	Passed (1%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	-23 @ 6' 8 3/4"	1720	Passed (1%)	0.90	1.0 D (All Spans)
Live Load Defl. (in)	0.000 @ 0	0.160	Passed (2L/999+)	--	1.0 D (All Spans)
Total Load Defl. (in)	0.001 @ 3' 1 1/8"	0.320	Passed (L/999+)	--	1.0 D (All Spans)

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

Member Length : 13'
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - SPF	5.50"	5.50"	1.50"	14	-	-	14	Blocking
2 - Stud wall - SPF	5.50"	5.50"	1.69"	1044	1476	1476	2520	None
3 - Stud wall - SPF	5.50"	5.50"	1.50"	12	-	-	12	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' o/c	
Bottom Edge (Lu)	13' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13'	N/A	4.9	--	--	
1 - Point (lb)	6' 7 3/16" (Front)	N/A	1006	1476	1476	Linked from: LB.2, Support 1

• Side loads are assumed to not induce cross-grain tension.

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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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6/12/2024 1:56:51 AM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD

Wood Beam

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

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DESCRIPTION: LB.3 Out of Plane**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

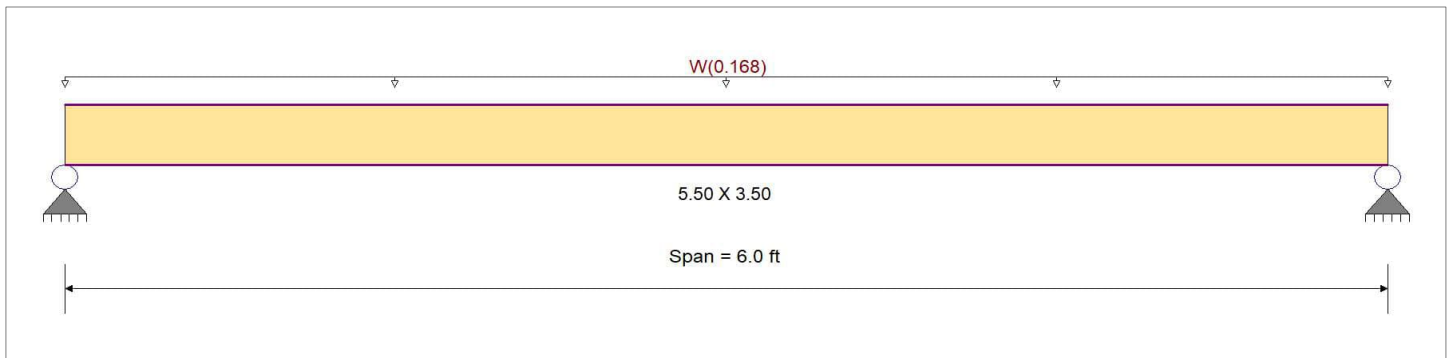
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination : IBC 2021

Wood Species : Douglas Fir-Larch
 Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 875 psi E : Modulus of Elasticity
 Fb - 875 psi Ebend- xx 1300ksi
 Fc - Prll 600 psi Eminbend - xx 470ksi
 Fc - Perp 625 psi
 Fv 170 psi
 Ft 425 psi Density 31.21pcf

**Applied Loads**

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.1680 , Tributary Width = 1.0 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	5.50 X 3.50		Section used for this span	=	5.50 X 3.50	
fb: Actual	=	484.74psi		fv: Actual	=	21.33 psi	
F'b	=	1,820.00psi		F'v	=	272.00 psi	
Load Combination	=	+0.60W		Load Combination	=	+0.60W	
Location of maximum on span	=	3.000ft		Location of maximum on span	=	0.000 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.193 in	Ratio =	373 >=360	Span: 1 : W Only			
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection	0.116 in	Ratio =	622 >=180	Span: 1 : +0.60W			
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.0 ft +0.60W	1			0.90	1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
					1.00	1.00	1.00	1.300	1.00	1.00	1.00			1,023.8	0.00	0.0	153.0
														0.0	0.00	0.0	0.0
Length = 6.0 ft +0.450W	1	0.266	0.078	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.45	484.7	1,820.0	0.27	21.3	272.0
					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.200	0.059	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.34	363.6	1,820.0	0.21	16.0	272.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.1929	3.022		0.0000	0.000

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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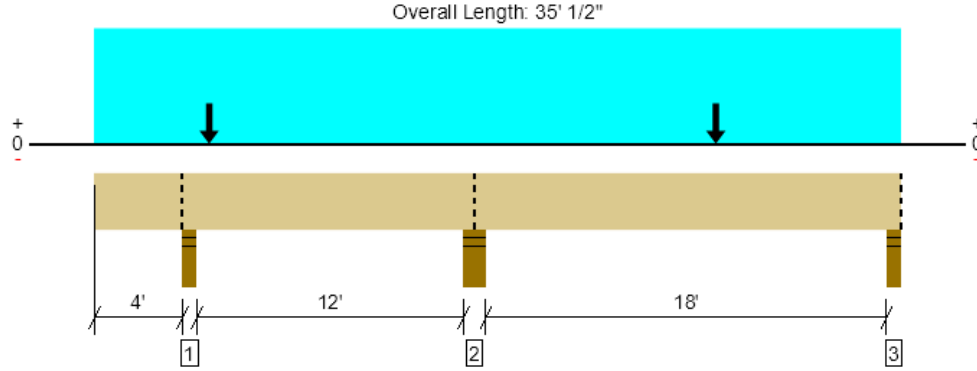
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DESCRIPTION: LB.3 Out of Plane

Vertical Reactions		Support notation : Far left is #1		Values in KIPS
Load Combination	Support 1	Support 2		
Max Upward from all Load Conditions	0.504	0.504		
Max Upward from Load Combinations	0.302	0.302		
Max Upward from Load Cases	0.504	0.504		
+0.60W	0.302	0.302		
+0.450W	0.227	0.227		
W Only	0.504	0.504		

Low Roof, LB.4

1 piece(s) 3 1/2" x 15" 24F-V8 DF Glulam



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12279 @ 16' 6 1/4"	12031 (5.50")	Passed (102%)	--	1.0 D + 1.0 S (Adj Spans)
Shear (lbs)	6241 @ 18'	10666	Passed (59%)	1.15	1.0 D + 1.0 S (Adj Spans)
Pos Moment (Ft-lbs)	21421 @ 27'	30188	Passed (71%)	1.15	1.0 D + 1.0 S (Alt Spans)
Neg Moment (Ft-lbs)	-21247 @ 16' 6 1/4"	30188	Passed (70%)	1.15	1.0 D + 1.0 S (Adj Spans)
Live Load Defl. (in)	0.307 @ 26' 5 5/16"	0.612	Passed (L/717)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.603 @ 26' 6 3/16"	0.918	Passed (L/365)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 35' 1/2"
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).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Critical positive moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 15' 1 1/8".
- Critical negative moment adjusted by a volume/size factor of 1.00 that was calculated using length L = 10' 2 1/16".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3.50"	3.50"	2.89"	3039	3274	3274	6313	Blocking
2 - Stud wall - DF	5.50"	5.50"	5.61"	6088	6190	6190	12279	Blocking
3 - Stud wall - DF	3.50"	3.50"	2.36"	2567	2586	2586	5153	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)	19' 2" o/c	
Bottom Edge (Lu)	19' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 35' 1/2"	N/A	12.8	--	--	
1 - Uniform (PSF)	0 to 35' 1/2" (Front)	6'	15.0	25.0	25.0	Low Roof
2 - Uniform (PSF)	0 to 35' 1/2" (Front)	6'	15.0	25.0	25.0	Roof Load
3 - Uniform (PSF)	0 to 35' 1/2" (Front)	10'	10.0	-	-	Wall Above
4 - Point (lb)	5' (Front)	N/A	718	495	495	Linked from: B.3, Support 1
5 - Point (lb)	27' (Front)	N/A	718	495	495	Linked from: B.3, Support 1

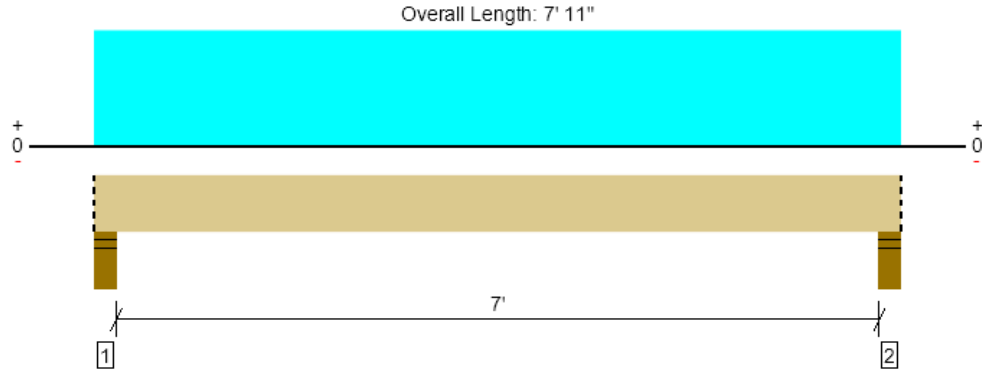
- Side loads are assumed to not induce cross-grain tension.

ForteWEB Software Operator	Job Notes
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6/12/2024 2:01:15 AM UTC
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File Name: Florence Addition CD

Low Roof, LB.5
1 piece(s) 4 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1213 @ 4"	7796 (5.50")	Passed (16%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	887 @ 1' 3/4"	3502	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2013 @ 3' 11 1/2"	3438	Passed (59%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.044 @ 3' 11 1/2"	0.181	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.107 @ 3' 11 1/2"	0.363	Passed (L/812)	--	1.0 D + 1.0 S (All Spans)

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

Member Length : 7' 11"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	1.50"	718	495	495	1213	Blocking
2 - Stud wall - HF	5.50"	5.50"	1.50"	718	495	495	1213	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)	7' 11" o/c	
Bottom Edge (Lu)	7' 11" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 11"	N/A	6.4	--	--	
1 - Uniform (PSF)	0 to 7' 11" (Front)	3'	15.0	25.0	25.0	Low Roof
2 - Uniform (PSF)	0 to 7' 11" (Front)	2'	15.0	25.0	25.0	Roof
3 - Uniform (PSF)	0 to 7' 11" (Front)	10'	10.0	-	-	Wall Above

- Side loads are assumed to not induce cross-grain tension.

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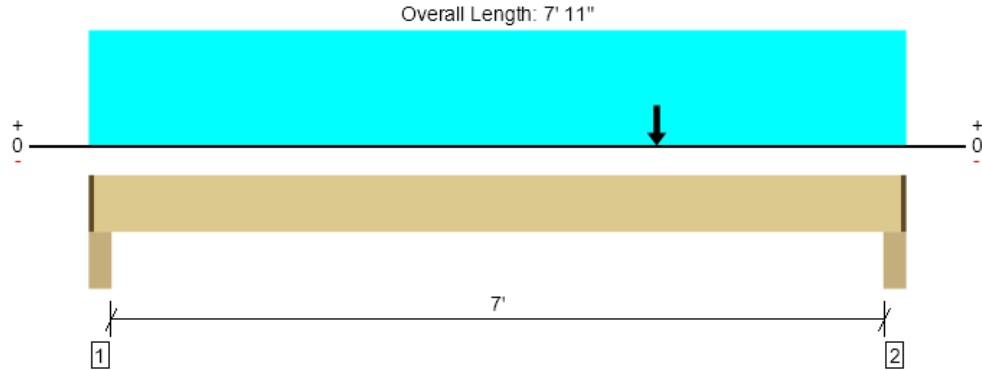
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File Name: Florence Addition CD

Low Roof, LB.6
1 piece(s) 4 x 10 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2046 @ 7' 7"	6024 (4.25")	Passed (34%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1924 @ 6' 8 1/4"	4468	Passed (43%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3976 @ 5' 6"	5166	Passed (77%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.046 @ 4' 3"	0.181	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.084 @ 4' 3 1/16"	0.363	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

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

Member Length : 7' 8 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Beam - HF	5.50"	4.25"	1.50"	484	601	601	1084	1 1/4" Rim Board
2 - Beam - HF	5.50"	4.25"	1.50"	933	1123	1123	2057	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

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

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 7' 9 3/4"	N/A	8.2	--	--	
1 - Point (lb)	5' 6" (Front)	N/A	1057	1229	1229	Linked from: S.1, Support 1
2 - Uniform (PSF)	0 to 7' 11" (Front)	2' 6"	15.0	25.0	25.0	

- Side loads are assumed to not induce cross-grain tension.

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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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File Name: Florence Addition CD

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: LB.7**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Western Cedars

Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 625 psi

Fb - 625 psi

Fc - Prll 475 psi

Fc - Perp 425 psi

Fv 140 psi

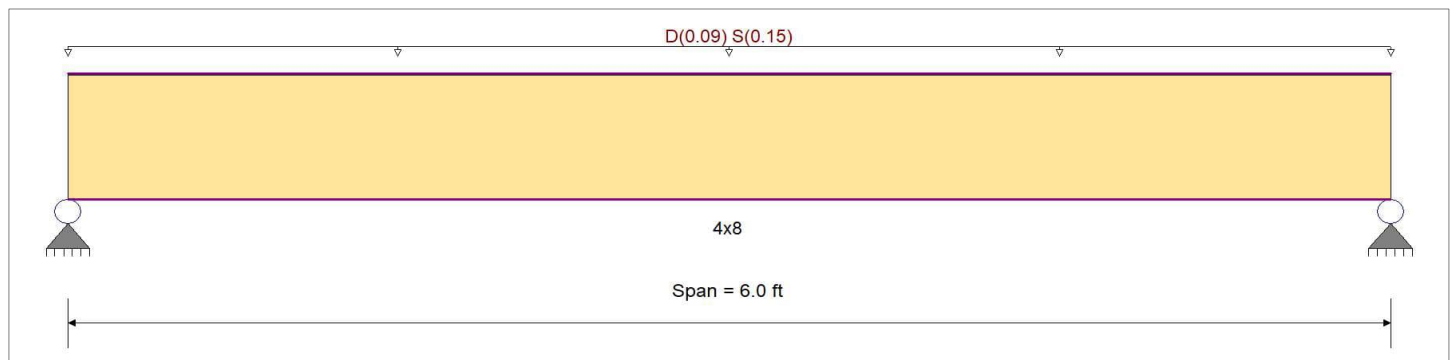
Ft 325 psi

E : Modulus of Elasticity

Ebend- xx 800ksi

Eminbend - xx 290ksi

Density 22.47pcf

**Applied Loads**

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

Beam self weight NOT internally calculated and added

Uniform Load : D = 0.0150, S = 0.0250 ksf, Tributary Width = 6.0 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio			=	0.565 : 1	Maximum Shear Stress Ratio			=	0.265 : 1
Section used for this span				4x8	Section used for this span				4x8
fb: Actual			=	422.68psi	fv: Actual			=	34.17 psi
F'b			=	747.50psi	F'v			=	128.80 psi
Load Combination				+D+S	Load Combination				+D+S
Location of maximum on span			=	3.000ft	Location of maximum on span			=	0.000 ft
Span # where maximum occurs			=	Span # 1	Span # where maximum occurs			=	Span # 1
Maximum Deflection									
Max Downward Transient Deflection			0.052 in	Ratio =	1382 >=360	Span: 1 : S Only			
Max Upward Transient Deflection			0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection			0.083 in	Ratio =	864 >=180	Span: 1 : +D+S			
Max Upward Total Deflection			0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only															0.0			
Length = 6.0 ft	1		0.271	0.127	0.90	1.00	1.00	1.00	1.300	1.00	0.80	1.00	0.41	158.5	585.0	0.22	12.8	100.8
+D+S						1.00	1.00	1.00	1.300	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.565	0.265	1.15	1.00	1.00	1.00	1.300	1.00	0.80	1.00	1.08	422.7	747.5	0.58	34.2	128.8
+D+0.750S						1.00	1.00	1.00	1.300	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.477	0.224	1.15	1.00	1.00	1.00	1.300	1.00	0.80	1.00	0.91	356.6	747.5	0.49	28.8	128.8
+0.60D						1.00	1.00	1.00	1.300	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.091	0.043	1.60	1.00	1.00	1.00	1.300	1.00	0.80	1.00	0.24	95.1	1,040.0	0.13	7.7	179.2

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: LB.7

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0833	3.022		0.0000	0.000

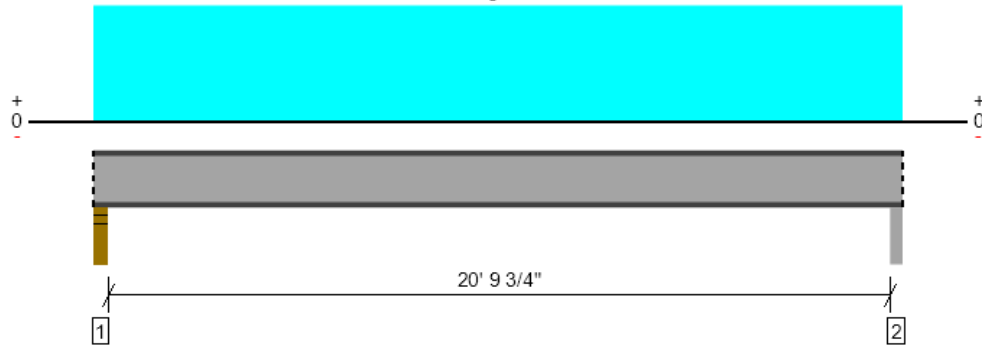
Vertical Reactions

		Support notation : Far left is #1		Values in KIPS	
Load Combination		Support 1	Support 2		
Max Upward from all Load Conditions		0.720	0.720		
Max Upward from Load Combinations		0.720	0.720		
Max Upward from Load Cases		0.450	0.450		
D Only		0.270	0.270		
+D+S		0.720	0.720		
+D+0.750S		0.608	0.608		
+0.60D		0.162	0.162		
S Only		0.450	0.450		

Low Roof, S.1

1 piece(s) W8X18 (A992) ASTM Steel

Overall Length: 21' 4 1/4"



Drawing is Conceptual, All locations are measured from the outside face of left support (or left cantilever end), All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1904 @ 2"	11484 (3,50")	Passed (17%)	—	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1852 @ 3 1/2"	37444	Passed (5%)	—	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9871 @ 10' 8 3/8"	14791	Passed (67%)	—	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0,247 @ 10' 8 3/8"	0,702	Passed (L/999+)	—	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0,439 @ 10' 8 3/8"	1,053	Passed (L/576)	—	1.0 D + 1.0 S (All Spans)

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

Member Length : 21' 4 1/4"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Stud wall - DF	3,50"	3,50"	3,50"	834	1070	1070	1904	Blocking
2 - Column - steel	3,00"	3,00"	3,00"	831	1066	1066	1897	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	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 21' 4 1/4"	N/A	18.0	—	—	
1 - Uniform (PSF)	0 to 21' 4 1/4" (Front)	4'	15.0	25.0	25.0	Default Load

- Side loads are assumed to not induce cross-grain tension.

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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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DCG/Weyerhaeuser



6/13/2024 4:59:23 PM UTC
ForteWEB v3.8, Engine: V8.4.1.22, Data: V8.1.6.2
File Name: Florence Addition CD

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: C.1**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	6x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	12 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Douglas Fir-Larch			Exact Width	5.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	
Fb +	750 psi	Fv	170 psi	Area	30.250 in^2	Cf or Cv for Bending 1.0
Fb -	750 psi	Ft	475 psi	Ix	76.255 in^4	Cf or Cv for Compression 1.0
Fc - Prll	700 psi	Density	31.21 pcf	Iy	76.255 in^4	Cf or Cv for Tension 1.0
Fc - Perp	625 psi					Cm : Wet Use Factor 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Ct : Temperature Fact 1.0
	Basic	1300	1300	1300 ksi		Cfu : Flat Use Factor 1.0
	Minimum	470	470			Kf : Built-up columns 1.0
				Column Buckling Condition:		Use Cr : Repetitive ? No
				ABOUT X-X Axis: Lux = 12 ft, Kx = 1.0		
				Fully braced against buckling ABOUT Y-Y Axis		

Applied Loads

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

Column self weight included : 78.675 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 12.0 ft, D = 6.088, S = 6.190 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = **0.9083 : 1**
 Load Combination +D+S
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 12.357 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 449.734 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 12.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 272.0 psi

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.651	0.4968	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+S	1.150	0.559	0.9083	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+0.750S	1.150	0.559	0.7945	PASS	0.0 ft	0.0	PASS	12.0 ft
+0.60D	1.600	0.436	0.2506	PASS	0.0 ft	0.0	PASS	12.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only					6.167				
+D+S					12.357				
+D+0.750S					10.809				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: C.1

Maximum Reactions

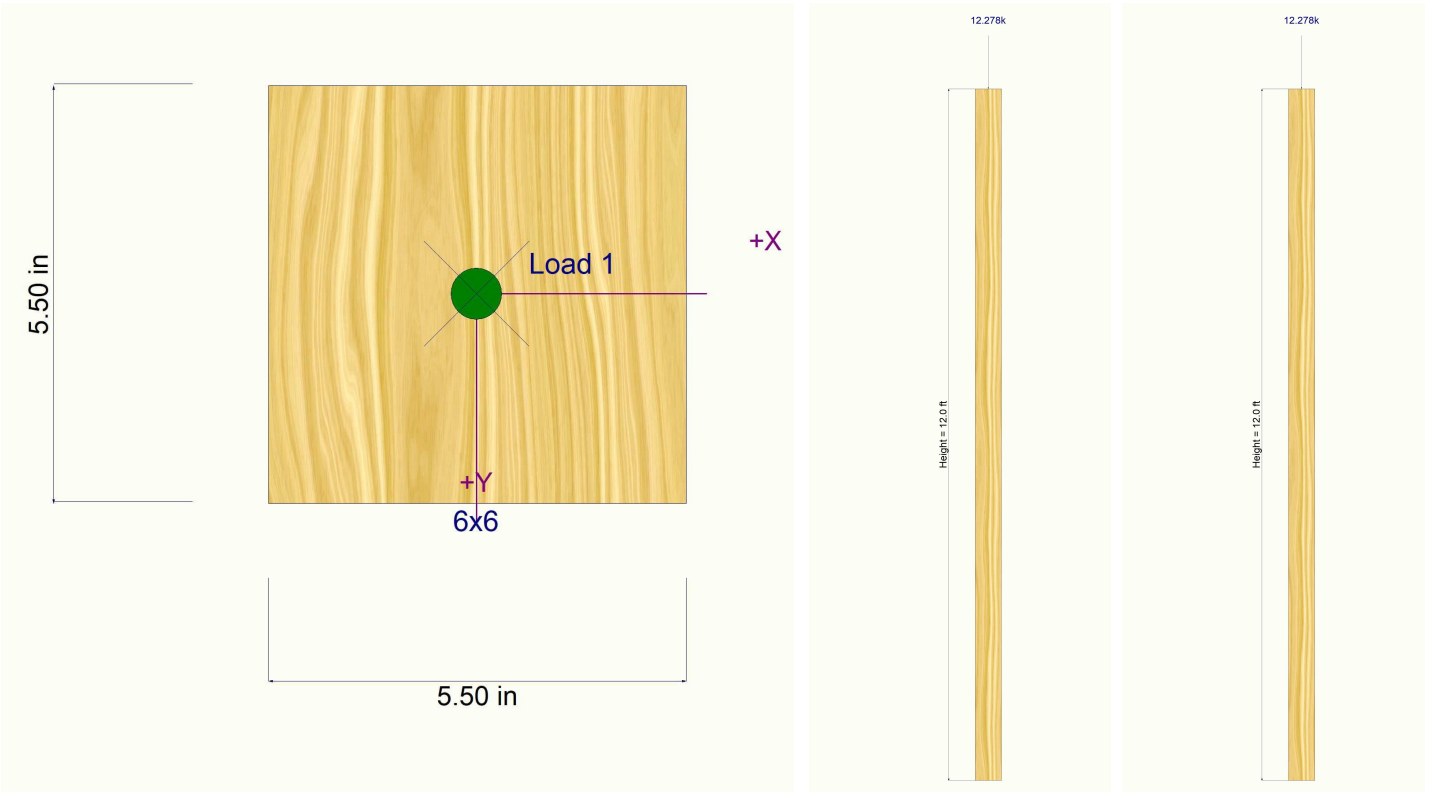
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
+0.60D						3.700					
S Only						6.190					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.750S	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft
S Only	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Steel Column

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: C.2

Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Steel Section Name : HSS3x3x1/4

Analysis Method : Load Resistance Factor

Steel Stress Grade

Fy : Steel Yield 46.0 ksi

E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height

12 ft

Top & Bottom Fixity

Top & Bottom Pinned

Brace condition :

Unbraced Length for buckling ABOUT X-X Axis = 12 ft, K = 1.0

Unbraced Length for buckling ABOUT Y-Y Axis = 12 ft, K = 1.0

Applied Loads

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

Column self weight included : 105.720 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 12.0 ft, D = 1.050, S = 1.229 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =

0.1024 : 1

Maximum Load Reactions . .

Load Combination

+1.20D+1.60S

Top along X-X

0.0 k

Location of max.above base

0.0 ft

Bottom along X-X

0.0 k

At maximum location values are . . .

Pu

3.353 k

Top along Y-Y

0.0 k

0.9 * Pn

32.753 k

Bottom along Y-Y

0.0 k

Mu-x

0.0 k-ft

Maximum Load Deflections . . .

0.9 * Mn-x :

8.556 k-ft

Along Y-Y

0.0 in at

0.0ft above base

Mu-y

0.0 k-ft

for load combination :

0.9 * Mn-y :

8.556 k-ft

Along X-X

0.0 in at

0.0ft above base

for load combination :

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

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cbz	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios			
	Stress Ratio	Status	Location						Stress Ratio	Status	Location	
+1.40D	0.049	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	
+1.20D	0.042	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	
+1.20D+0.50S	0.061	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	
+1.20D+1.60S	0.102	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	
+1.20D+0.70S	0.069	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	
+0.90D	0.032	PASS	0.00 ft		1.00	1.00	129.73	129.73	0.000	PASS	0.00 ft	

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction		X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
	@ Base		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
D Only	1.156											
+D+S	2.385											
+D+0.750S	2.077											
+0.60D	0.693											
S Only	1.229											

Extreme Reactions

Item	Extreme Value	Axial Reaction		X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Axial @ Base	Maximum	2.385											
"	Minimum	0.693											

Steel Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: C.2**Extreme Reactions**

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Reaction, X-X Axis Base	Maximum	1.156										
"	Minimum	1.156										
Reaction, Y-Y Axis Base	Maximum	1.156										
"	Minimum	1.156										
Reaction, X-X Axis Top	Maximum	1.156										
"	Minimum	1.156										
Reaction, Y-Y Axis Top	Maximum	1.156										
"	Minimum	1.156										
Moment, X-X Axis Base	Maximum	1.156										
"	Minimum	1.156										
Moment, Y-Y Axis Base	Maximum	1.156										
"	Minimum	1.156										
Moment, X-X Axis Top	Maximum	1.156										
"	Minimum	1.156										
Moment, Y-Y Axis Top	Maximum	1.156										
"	Minimum	1.156										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : HSS3x3x1/4

Depth	=	3.000 in	I xx	=	3.02 in^4	J	=	5.080 in^4
Design Thick	=	0.233 in	S xx	=	2.01 in^3			
Width	=	3.000 in	R xx	=	1.110 in			
Wall Thick	=	0.250 in	Zx	=	2.480 in^3			
Area	=	2.440 in^2	I yy	=	3.020 in^4	C	=	3.520 in^3
Weight	=	8.810 plf	S yy	=	2.010 in^3			
			R yy	=	1.110 in			
Ycg	=	0.000 in						

Steel Column

Project File: Florence Family Addition.ec6

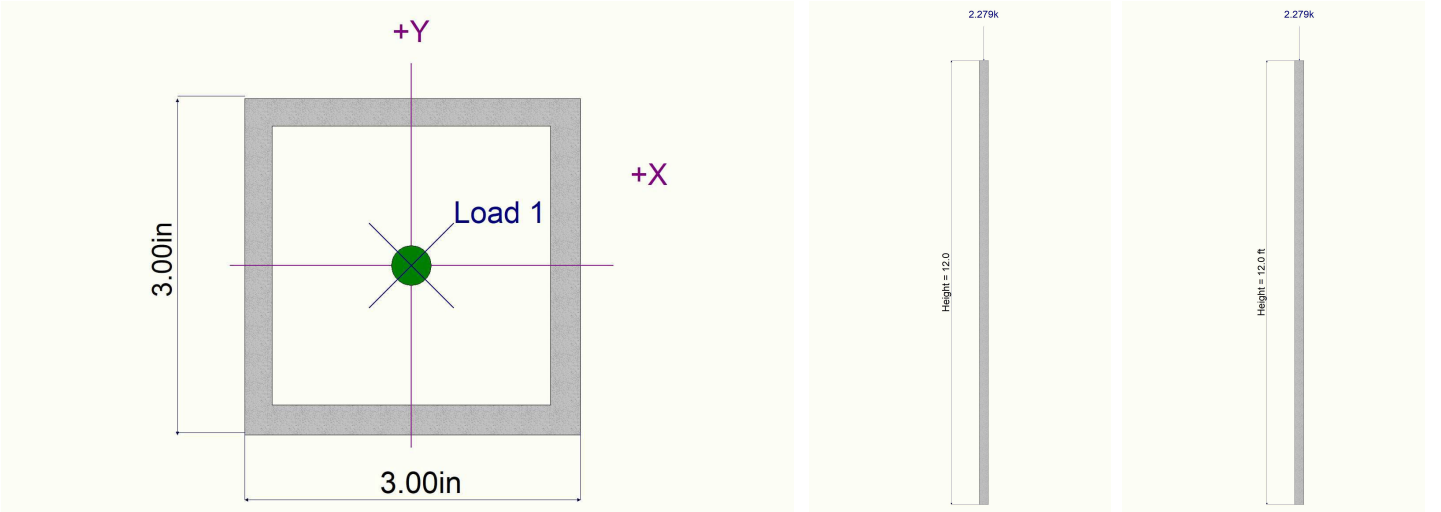
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DESCRIPTION: C.2

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: C.3

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	6x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	10 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Douglas Fir-Larch			Exact Width	5.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	750.0 psi	Fv	170.0 psi	Area	30.250 in^2	Cf or Cv for Compression 1.0
Fb -	750.0 psi	Ft	475.0 psi	Ix	76.255 in^4	Cf or Cv for Tension 1.0
Fc - Prll	700.0 psi	Density	31.210 pcf	Iy	76.255 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	625.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,300.0	1,300.0	1,300.0 ksi		Kf : Built-up columns 1.0
	Minimum	470.0	470.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 10 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 65.563 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 10.0 ft, D = 6.339, L = 4.809, S = 3.839 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7630 : 1**

Load Combination +D+0.750L+0.750S

Governing NDS Formula Comp Only, fc/Fc'

Location of max.above base 0.0 ft

At maximum location values are .

Applied Axial 12.891 k

Applied Mx 0.0 k-ft

Applied My 0.0 k-ft

Fc : Allowable 558.50 psi

PASS Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination +0.60D

Location of max.above base 10.0 ft

Applied Design Shear 0.0 psi

Allowable Shear 272.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k

Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base

for load combination : n/a

Along X-X 0.0 in at 0.0 ft above base

for load combination : n/a

Other Factors used to calculate allowable stresses . . .

Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.771	0.4361	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+L	1.000	0.740	0.7161	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.150	0.694	0.6063	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L	1.250	0.664	0.5693	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S	1.150	0.694	0.7630	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.60D	1.600	0.572	0.1983	PASS	0.0 ft	0.0	PASS	10.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						6.405				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: C.3

Maximum Reactions

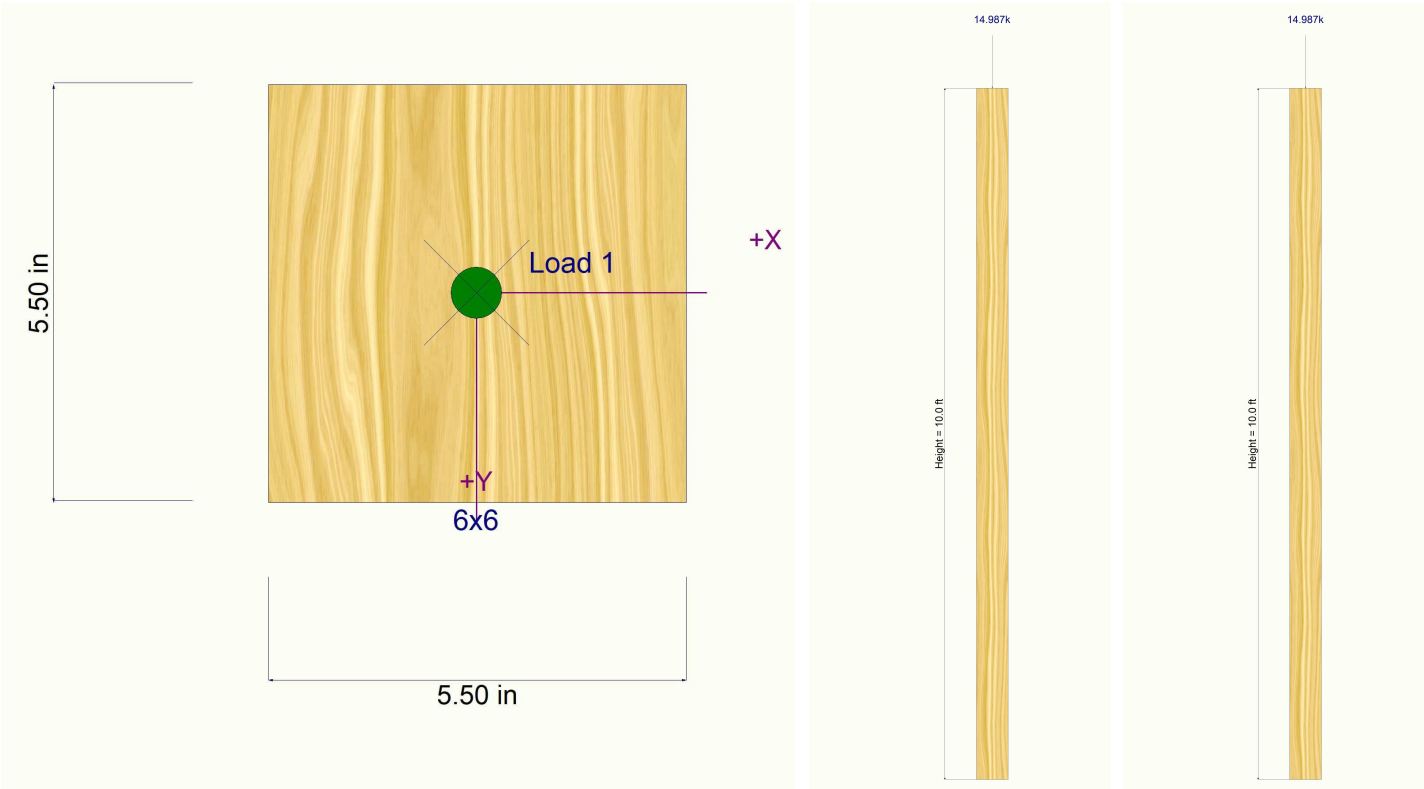
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
+D+L						11.214					
+D+S						10.244					
+D+0.750L						10.011					
+D+0.750L+0.750S						12.891					
+0.60D						3.843					
L Only						4.809					
S Only						3.839					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+D+L	0.0000 in	0.000ft	0.000 in	0.000ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.750L	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.750L+0.750S	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft
L Only	0.0000 in	0.000ft	0.000 in	0.000ft
S Only	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



BC/BCS

Post Caps

The BCS allows for the connection of (2) 2x's to a 4x post or (3) 2x's to a 6x post. Double-shear nailing between beam and post gives added strength. The BC series offers dual purpose post cap/base for light cap or base connections.

Material: 18 gauge

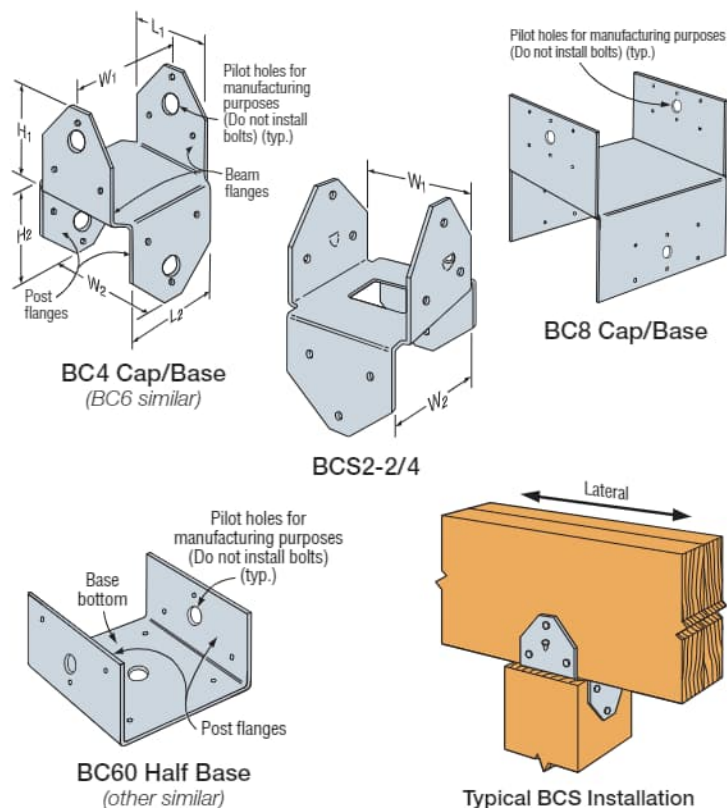
Finish: Galvanized. Some products available in ZMAX® coating.

Installation:

- Use all specified fasteners; see General Notes
- Do not install bolts into pilot holes
- BCS — Install dome nails on beam; drive nails at an angle through the beam into the post below to achieve the table loads
- BC — Install with 0.162" x 3½" nails or 0.162" x 2½" nails
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non-top-supported installations (such as fences or unbraced carports)
- To tie multiple 2x members together, the designer must determine the fasteners required to join members to act as one unit without splitting the wood

Codes: See p. 13 for Code Reference Key Chart

Web Applications: Visit app.strongtie.com/pbs to access our Post-to-Beam Selector web application.



These products are available with additional corrosion protection. For more information, see p. 16.

SS For stainless-steel fasteners, see p. 23.

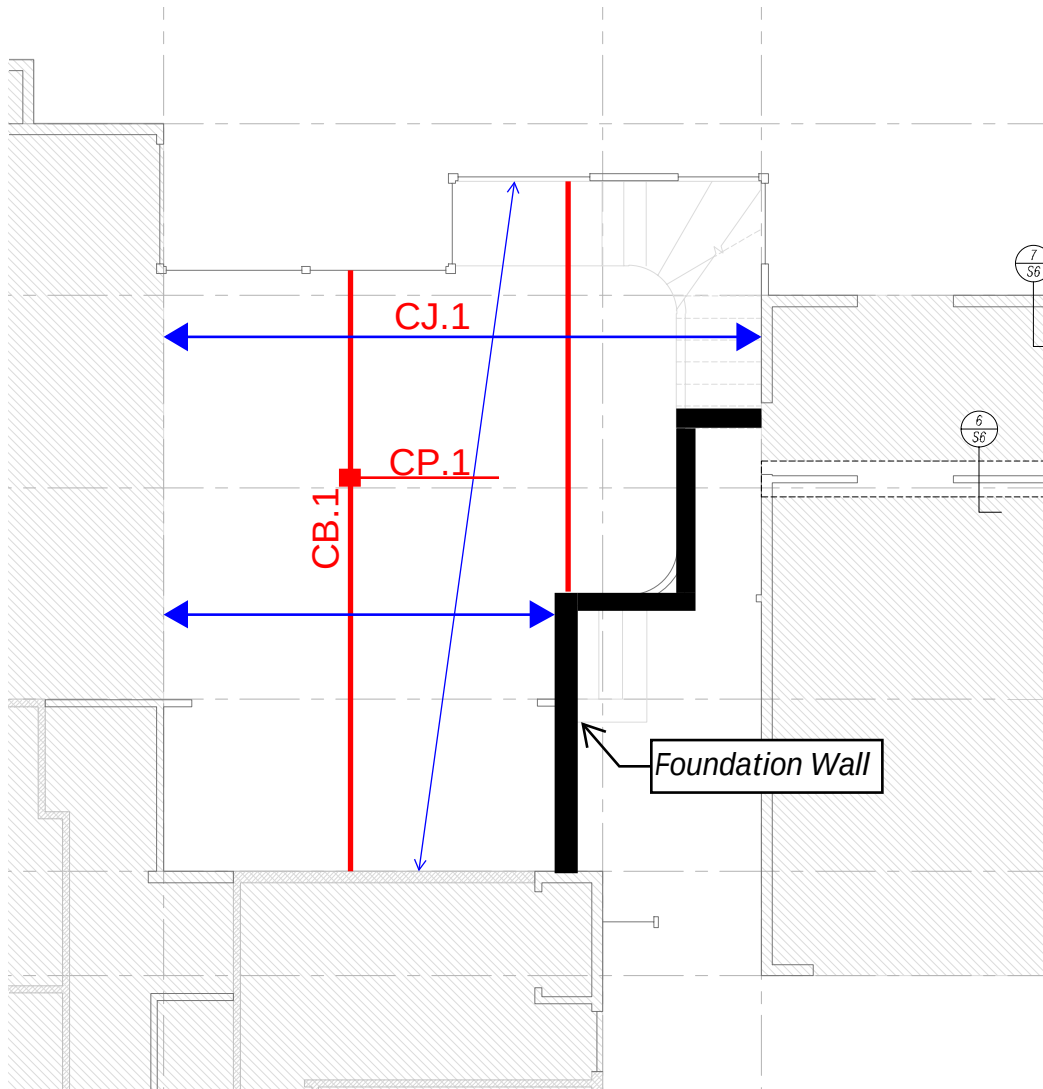
SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 362–366 for more information.

Model No.	Dimensions (in.)						Fasteners (in.)			DF/SP Allowable Loads (160)		Code Ref.
	W ₁	W ₂	L ₁	L ₂	H ₁	H ₂	Beam Flange	Post Flange	Base Bottom	Uplift	Lateral	
Caps												
BC4	3⅞	3⅞	2⅞	2⅞	3	3	(6) 0.162 x 3½	(6) 0.162 x 3½	—	605	1,000	IBC®, FL, LA
BC46	3⅞	5½	4⅞	2⅞	3½	2½	(12) 0.162 x 3½	(6) 0.162 x 3½	—	945	1,000	
BC4R	4	4	4	4	3	3	(12) 0.162 x 3½	(12) 0.162 x 3½	—	605	1,000	
BC6	5½	5½	4⅞	4⅞	3⅞	3⅞	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,185	1,825	
BC6R	6	6	6	6	3	3	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,185	1,825	
BC8	7½	7½	7½	7½	4	4	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,660	1,825	
BCS2-2/4	3⅞	3⅞	2⅞	2⅞	2⅞⅞	2⅞⅞	(8) 0.148 x 3	(6) 0.148 x 3	—	895	890	
BCS2-3/6	4⅞	5⅞	4⅞	2⅞	3⅞	2⅞⅞	(12) 0.162 x 3½	(6) 0.162 x 3½	—	895	1,330	
Bases												
BC40	3⅞	—	3¼	—	2¼	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	510	735	—
BC40R	4	—	4	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	510	735	
BC460	5½	—	3⅞	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
BC60	5½	—	5½	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
BC60R	6	—	6	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
BC80	7½	—	7½	—	4	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
BC80R	8	—	8	—	4	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	

1. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
2. Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers known as the narrow face. Values in the tables reflect installation into the wide face. See technical bulletin T-C-SCLCLM at strongtie.com for load reductions resulting from narrow-face installations.
3. Base allowable loads assume that nails have full penetration into the supporting member. Loads do not apply to end-grain post installations.
4. Spliced beams, where the ends of two beams are supported by the wood post and connected to the BC post cap connector, are not permitted.
5. Fasteners: Nail dimensions are listed diameter by length. See pp. 23–24 for fastener information.

Florence Addition

scale: 1/8" = 1'-0"

Crawl Space Gravity Key Plan

Wood Beam

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CJ.1**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Hem-Fir

Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 675.0 psi

Fb - 675.0 psi

Fc - Prll 500.0 psi

Fc - Perp 405.0 psi

Fv 140.0 psi

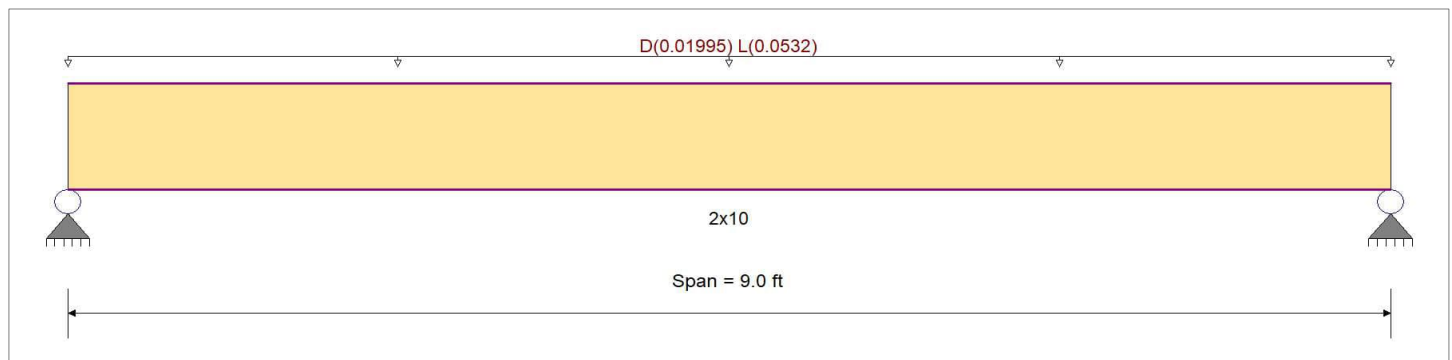
Ft 350.0 psi

E : Modulus of Elasticity

Ebend- xx 1,100.0ksi

Eminbend - xx 400.0ksi

Density 26.840pcf

**Applied Loads**

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

Beam self weight NOT internally calculated and added

Uniform Load : D = 0.0150, L = 0.040 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	0.699	1	Section used for this span	=	0.264	1
fb: Actual	=	415.50psi		fv: Actual	=	29.61 psi	
F'b	=	594.00psi		F'v	=	112.00 psi	
Load Combination	=	+D+L		Load Combination	=	+D+L	
Location of maximum on span	=	4.500ft		Location of maximum on span	=	8.245 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.076 in	Ratio =	1413 >=360	Span: 1 : L Only			
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection	0.105 in	Ratio =	1027 >=180	Span: 1 : +D+L			
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.212	0.080	0.90	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.20	113.3	534.6	0.07	8.1	100.8
+D+L					1.00	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.699	0.264	1.00	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.74	415.5	594.0	0.27	29.6	112.0
+D+0.750L					1.00	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.458	0.173	1.25	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.61	340.0	742.5	0.22	24.2	140.0
+0.60D					1.00	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.072	0.027	1.60	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.12	68.0	950.4	0.04	4.8	179.2

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CJ.1

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1051	4.533		0.0000	0.000

Vertical Reactions

		Support notation : Far left is #1		Values in KIPS	
Load Combination		Support 1	Support 2		
Max Upward from all Load Conditions		0.329	0.329		
Max Upward from Load Combinations		0.329	0.329		
Max Upward from Load Cases		0.239	0.239		
D Only		0.090	0.090		
+D+L		0.329	0.329		
+D+0.750L		0.269	0.269		
+0.60D		0.054	0.054		
L Only		0.239	0.239		

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CJ.1 - 3 span**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Hem-Fir

Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 675.0 psi

Fb - 675.0 psi

Fc - Prll 500.0 psi

Fc - Perp 405.0 psi

Fv 140.0 psi

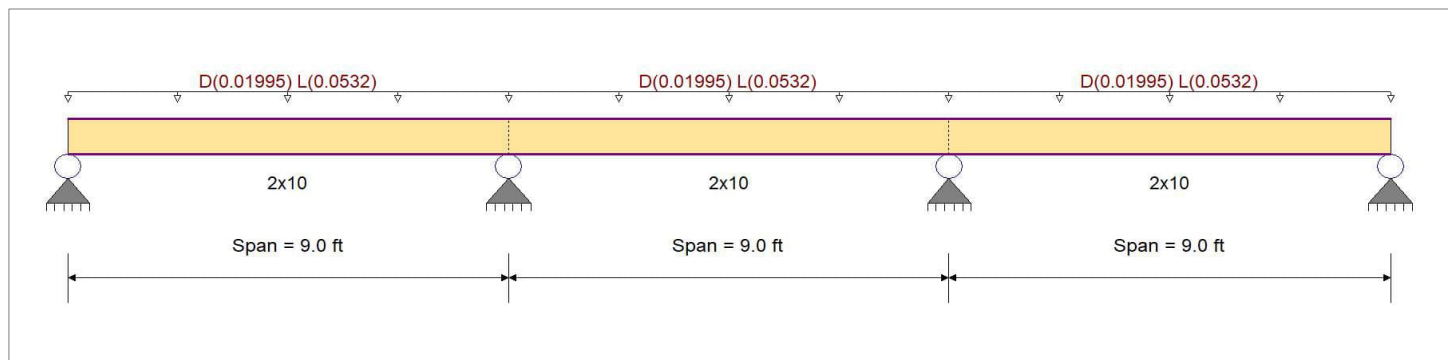
Ft 350.0 psi

E : Modulus of Elasticity

Ebend- xx 1,100.0ksi

Eminbend - xx 400.0ksi

Density 26.840pcf

**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 = 0.0150, L = 0.040 ksf, Tributary Width = 1.330 ft

Load for Span Number 2

Uniform Load : D = 0.0150, L = 0.040 ksf, Tributary Width = 1.330 ft

Load for Span Number 3

Uniform Load : D = 0.0150, L = 0.040 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	0.560	1	Section used for this span	=	0.328	1
fb: Actual	=	332.40psi		fv: Actual	=	36.72 psi	
F'b	=	594.00psi		F'v	=	112.00 psi	
Load Combination	=	+D+L		Load Combination	=	+D+L	
Location of maximum on span	=	9.000ft		Location of maximum on span	=	9.000 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 2	
Maximum Deflection							
Max Downward Transient Deflection	0.041 in	Ratio =	2648 >=360	Span: 1 : L Only			
Max Upward Transient Deflection	-0.003 in	Ratio =	40922 >=360	Span: 2 : L Only			
Max Downward Total Deflection	0.056 in	Ratio =	1926 >=180	Span: 1 : +D+L			
Max Upward Total Deflection	-0.004 in	Ratio =	29761 >=180	Span: 2 : +D+L			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only																	
Length = 9.0 ft	1	0.170	0.099	0.90	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.16	90.7	534.6	0.09	10.0	100.8
Length = 9.0 ft	2	0.170	0.099	0.90	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.16	90.7	534.6	0.09	10.0	100.8
Length = 9.0 ft	3	0.170	0.099	0.90	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.16	90.7	534.6	0.09	10.0	100.8
+D+L																	
Length = 9.0 ft	1	0.560	0.328	1.00	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.59	332.4	594.0	0.34	36.7	112.0

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CJ.1 - 3 span**Maximum Forces & Stresses for Load Combinations**

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 9.0 ft		2	0.560	0.328	1.00	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.59	332.4	594.0	0.34	36.7	112.0
Length = 9.0 ft		3	0.560	0.328	1.00	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.59	332.4	594.0	0.34	36.7	112.0
+D+0.750L							1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft		1	0.366	0.215	1.25	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.48	272.0	742.5	0.28	30.0	140.0
Length = 9.0 ft		2	0.366	0.215	1.25	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.48	272.0	742.5	0.28	30.0	140.0
Length = 9.0 ft		3	0.366	0.215	1.25	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.48	272.0	742.5	0.28	30.0	140.0
+0.60D							1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft		1	0.057	0.034	1.60	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.10	54.4	950.4	0.06	6.0	179.2
Length = 9.0 ft		2	0.057	0.034	1.60	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.10	54.4	950.4	0.06	6.0	179.2
Length = 9.0 ft		3	0.057	0.034	1.60	1.00	1.00	1.00	1.100	1.00	0.80	1.00	0.10	54.4	950.4	0.06	6.0	179.2

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0561	4.084		0.0000	0.000
+D+L	2	0.0039	4.538	+D+L	-0.0036	1.059
+D+L	3	0.0555	4.992		0.0000	1.059

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	0.263	0.724	0.724	0.263
Max Upward from Load Combinations	0.263	0.724	0.724	0.263
Max Upward from Load Cases	0.192	0.527	0.527	0.192
D Only	0.072	0.198	0.198	0.072
+D+L	0.263	0.724	0.724	0.263
+D+0.750L	0.215	0.593	0.593	0.215
+0.60D	0.043	0.119	0.119	0.043
L Only	0.192	0.527	0.527	0.192

Wood Beam

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CB.1**CODE REFERENCES**

Calculations per NDS 2018, IBC 2021, ASCE 7-16

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

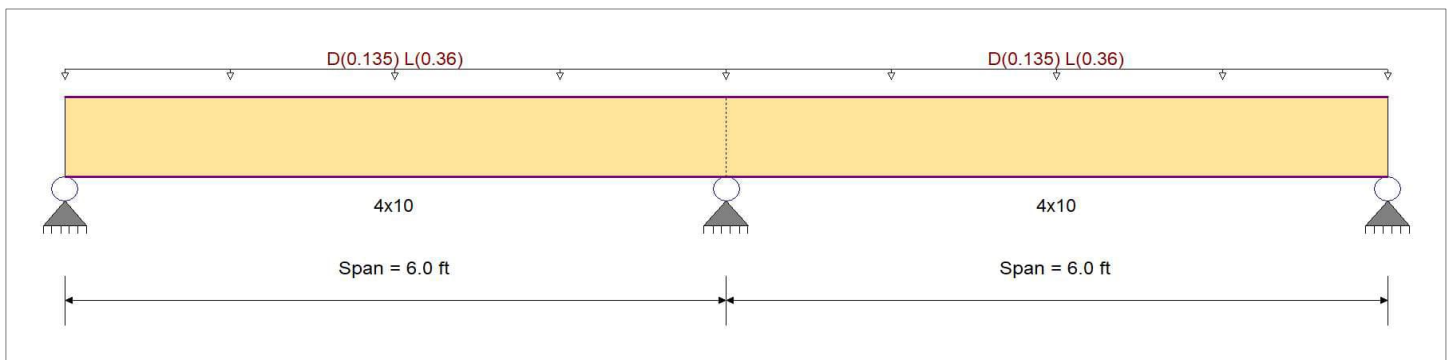
Load Combination : IBC 2021

Wood Species : Hem-Fir

Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	675.0 psi	E : Modulus of Elasticity	
Fb -	675.0 psi	Ebend- xx	1,100.0ksi
Fc - Prll	500.0 psi	Eminbend - xx	400.0ksi
Fc - Perp	405.0 psi		
Fv	140.0 psi		
Ft	350.0 psi	Density	26.840pcf

**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 = 0.0150, L = 0.040 ksf, Tributary Width = 9.0 ft

Load for Span Number 2

Uniform Load : D = 0.0150, L = 0.040 ksf, Tributary Width = 9.0 ft

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	0.826	1	Section used for this span	=	0.617	1
fb: Actual	=	535.55	psi	fv: Actual	=	69.09	psi
F'b	=	648.00	psi	F'v	=	112.00	psi
Load Combination	=	+D+L		Load Combination	=	+D+L	
Location of maximum on span	=	6.000	ft	Location of maximum on span	=	5.263	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.018 in	Ratio =	3935 >= 360	Span: 1 : L Only			
Max Upward Transient Deflection	0 in	Ratio =	0 < 360	n/a			
Max Downward Total Deflection	0.025 in	Ratio =	2861 >= 180	Span: 1 : +D+L			
Max Upward Total Deflection	0 in	Ratio =	0 < 180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.250	0.187	0.90	1.00	1.00	1.00	1.200	1.00	0.80	1.00	0.61	146.1	583.2	0.41	18.8	100.8
Length = 6.0 ft	2	0.250	0.187	0.90	1.00	1.00	1.00	1.200	1.00	0.80	1.00	0.61	146.1	583.2	0.41	18.8	100.8
+D+L														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.826	0.617	1.00	1.00	1.00	1.00	1.200	1.00	0.80	1.00	2.23	535.5	648.0	1.49	69.1	112.0
Length = 6.0 ft	2	0.826	0.617	1.00	1.00	1.00	1.00	1.200	1.00	0.80	1.00	2.23	535.5	648.0	1.49	69.1	112.0
+D+0.750L														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.541	0.404	1.25	1.00	1.00	1.00	1.200	1.00	0.80	1.00	1.82	438.2	810.0	1.22	56.5	140.0

Wood Beam

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CB.1

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F ^b	V	f _v	F ^v
Length = 6.0 ft +0.60D	2		0.541	0.404	1.25	1.00	1.00	1.00	1.200	1.00	0.80	1.00	1.82	438.2	810.0	1.22	56.5	140.0
Length = 6.0 ft	1		0.085	0.063	1.60	1.00	1.00	1.00	1.200	1.00	0.80	1.00	0.36	87.6	1,036.8	0.24	11.3	179.2
Length = 6.0 ft	2		0.085	0.063	1.60	1.00	1.00	1.00	1.200	1.00	0.80	1.00	0.36	87.6	1,036.8	0.24	11.3	179.2

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0252	2.547		0.0000	0.000
+D+L	2	0.0249	3.486		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	1.114	3.712	1.114
Max Upward from Load Combinations	1.114	3.712	1.114
Max Upward from Load Cases	0.810	2.700	0.810
D Only	0.304	1.012	0.304
+D+L	1.114	3.712	1.114
+D+0.750L	0.911	3.037	0.911
+0.60D	0.182	0.607	0.182
L Only	0.810	2.700	0.810

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: CP.1**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	4x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	4 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	3.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	Cf or Cv for Bending 1.30
Fb +	575.0 psi	Fv	140.0 psi	Area	19.250 in^2	Cf or Cv for Compression 1.10
Fb -	575.0 psi	Ft	375.0 psi	Ix	48.526 in^4	Cf or Cv for Tension 1.30
Fc - Prll	575.0 psi	Density	26.840 pcf	Iy	19.651 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,100.0	1,100.0	1,100.0 ksi		Kf : Built-up columns 1.0
	Minimum	400.0	400.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 4 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 14.352 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 4.0 ft, D = 1.010, L = 2.70 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.3160 : 1
Load Combination	+D+L
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	3.724 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	612.26 psi

Maximum SERVICE Lateral Load Reactions . .	
Top along Y-Y	0.0 k
Top along X-X	0.0 k
Bottom along Y-Y	0.0 k
Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .	
Along Y-Y	0.0 in at 0.0 ft above base
for load combination : n/a	
Along X-X	0.0 in at 0.0 ft above base
for load combination : n/a	

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	4.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	224.0 psi

Other Factors used to calculate allowable stresses . . .

Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.971	0.09623	PASS	0.0 ft	0.0	PASS	4.0 ft
+D+L	1.000	0.968	0.3160	PASS	0.0 ft	0.0	PASS	4.0 ft
+D+0.750L	1.250	0.959	0.2089	PASS	0.0 ft	0.0	PASS	4.0 ft
+0.60D	1.600	0.946	0.03335	PASS	0.0 ft	0.0	PASS	4.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only					1.024				
+D+L					3.724				
+D+0.750L					3.049				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: CP.1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top		@ Base	@ Top
+0.60D						0.615					
L Only						2.700					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+D+L	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.750L	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft
L Only	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



	FACET	Date: 6/12/2024 Made By: NKP Project: Description: Florence Family Addition Stud and Load Tracking Design
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Stud Information		
Stud Species	HF	
Stud Fpc =	405	psi
Post Fpc =	625	psi

Height	11	ft
--------	----	----

Stud Spacing (in)	16	o.c. spacing
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Stud Wall Dead Loads	
Source	Unit Wt
Exterior	10
Interior	7

Plate Crushing Capacity		
Stud Size	Area (in ²)	Capacity (kips)
2x4	5.25	2.13
(2) 2x4	10.50	4.25
(3) 2x4	15.75	6.38
(4) 2x4	21.00	8.51
2x6	8.25	3.34
(2) 2x6	16.50	6.68
(3) 2x6	24.75	10.02
(4) 2x6	33.00	13.37
4x6	19.25	12.03
6x6	30.25	18.91

Enercalc Capacity	
Stud Size	Capacity (kips)
2x4	1.22
(2) 2x4	2.44
(3) 2x4	3.67
(4) 2x4	4.89
2x6	3.81
(2) 2x6	7.62
(3) 2x6	11.37
(4) 2x6	15.25
4x6	9.05
6x6	13.57

Design Values	
Stud Size	Capacity (kips)
2x4	1.22
(2) 2x4	2.44
(3) 2x4	3.67
(4) 2x4	4.89
2x6	3.34
(2) 2x6	6.68
(3) 2x6	10.02
(4) 2x6	13.37
4x6	9.05
6x6	13.57

Load Tracking

Balloon Framed Studs

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	Total Load	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Low Roof	15.0	0.0	25.0	10.0	4.0	13.0	290	190	0	100
Total:							290	190	0	100

At Existing Walls

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	TOTAL	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Roof	15.0	0.0	25.0	10.0	8.0	10.0	420	220	0	200
Upper Floor	15.0	40.0	0.0	10.0	13.0	10.0	815	295	520	0
Total:							1235	515	520	200

At New Walls

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	TOTAL	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Roof	15.0	0.0	25.0	10.0	6.0	10.0	340	190	0	150
Low Roof	15.0	0.0	25.0	10.0	5.0	10.0	300	175	0	125
Crawl Space	15.0	40.0	0.0	10.0	5.0	4.0	315	115	200	0
Total:							955	480	200	275

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x6 Balloon Frame Studs at Low Roof Pop Up

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	13 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	1.50 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	675.0 psi	Fv	150.0 psi	Area	8.250 in^2	Cf or Cv for Compression 1.0
Fb -	675.0 psi	Ft	400.0 psi	Ix	20.797 in^4	Cf or Cv for Tension 1.0
Fc - Prll	800.0 psi	Density	26.840 pcf	Iy	1.547 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,200.0	1,200.0	1,200.0 ksi		Kf : Built-up columns 1.0
	Minimum	440.0	440.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 13 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 19.990 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 13.0 ft, D = 0.190, S = 0.1330 k

BENDING LOADS . . .

Lat. Uniform Load creating Mx-x, W = 0.03724 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9540 : 1**
 Load Combination +D+0.60W
 Governing NDS Formula Comp + Mxx, NDS Eq. 3.9-3
 Location of max.above base 6.456 ft
 At maximum location values are .
 Applied Axial 0.210 k
 Applied Mx 0.4720 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 410.754 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.2421 k Bottom along Y-Y 0.2421 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.9693 in at 6.544 ft above base
 for load combination : W Only
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

PASS Maximum Shear Stress Ratio = **0.110 : 1**
 Load Combination +D+0.60W
 Location of max.above base 13.0 ft
 Applied Design Shear 39.610 psi
 Allowable Shear 240.0 psi

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.515	0.06864	PASS	0.0 ft	0.0	PASS	13.0 ft
+D+S	1.150	0.426	0.1062	PASS	0.0 ft	0.0	PASS	13.0 ft
+D+0.750S	1.150	0.426	0.09589	PASS	0.0 ft	0.0	PASS	13.0 ft
+D+0.60W	1.600	0.321	0.9540	PASS	6.456 ft	0.110	PASS	13.0 ft
+D+0.450W	1.600	0.321	0.7165	PASS	6.456 ft	0.08252	PASS	13.0 ft
+D+0.750S+0.450W	1.600	0.321	0.7419	PASS	6.456 ft	0.08252	PASS	13.0 ft
+0.60D+0.60W	1.600	0.321	0.9293	PASS	6.456 ft	0.110	PASS	13.0 ft
+0.60D	1.600	0.321	0.03718	PASS	0.0 ft	0.0	PASS	13.0 ft

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x6 Balloon Frame Studs at Low Roof Pop Up

Maximum Reactions

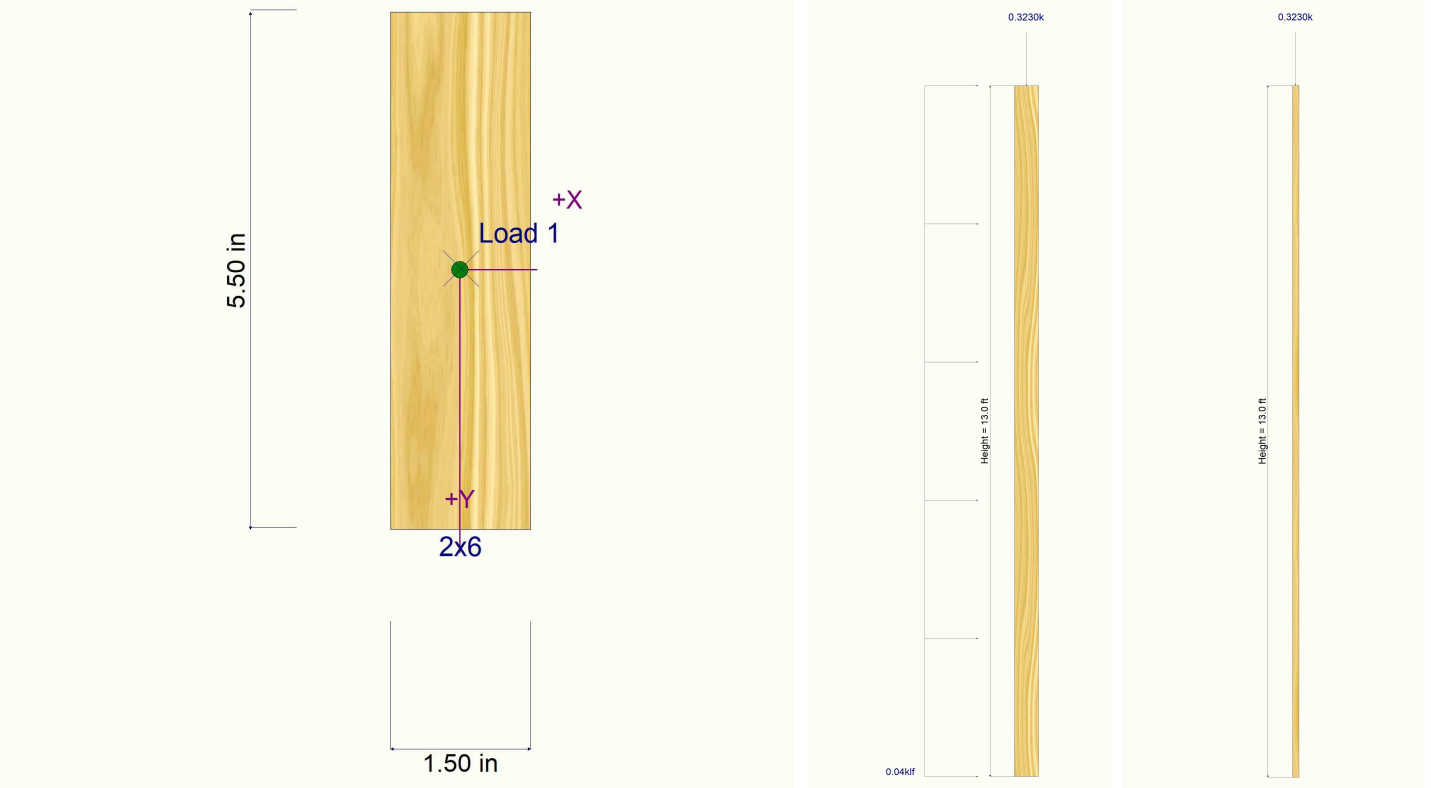
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top		@ Base	@ Top
D Only						0.210					
+D+S						0.343					
+D+0.750S						0.310					
+D+0.60W				0.145	0.145	0.210					
+D+0.450W				0.109	0.109	0.210					
+D+0.750S+0.450W				0.109	0.109	0.310					
+0.60D+0.60W				0.145	0.145	0.126					
+0.60D						0.126					
S Only						0.133					
W Only				0.242	0.242						

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.750S	0.0000 in	0.000ft	0.000 in	0.000ft
+D+0.60W	0.0000 in	0.000ft	0.582 in	6.544 ft
+D+0.450W	0.0000 in	0.000ft	0.436 in	6.544 ft
+D+0.750S+0.450W	0.0000 in	0.000ft	0.436 in	6.544 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.582 in	6.544 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft
S Only	0.0000 in	0.000ft	0.000 in	0.000ft
W Only	0.0000 in	0.000ft	0.969 in	6.544 ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x6 HF studs at 16" o.c. Bearing Wall

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	12 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	1.50 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	5.50 in	
Fb +	675.0 psi	Fv	150.0 psi	Area	8.250 in^2	Cf or Cv for Bending 1.0
Fb -	675.0 psi	Ft	400.0 psi	Ix	20.797 in^4	Cf or Cv for Compression 1.0
Fc - Prll	800.0 psi	Density	26.840 pcf	Iy	1.547 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,200.0	1,200.0	1,200.0 ksi		Kf : Built-up columns 1.0
	Minimum	440.0	440.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 12 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 18.453 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 12.0 ft, D = 0.6840, L = 0.6910, S = 0.2660 k

BENDING LOADS . . .

Lat. Uniform Load creating Mx-x, W = 0.03724 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9831 : 1**
 Load Combination +D+0.750L+0.750S+0.450W
 Governing NDS Formula Comp + Mxx, NDS Eq. 3.9-3
 Location of max.above base 5.960 ft
 At maximum location values are .
 Applied Axial 1.420 k
 Applied Mx 0.3016 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 472.369 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.2234 k Bottom along Y-Y 0.2234 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.7037 in at 6.040 ft above base
 for load combination : W Only
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

PASS Maximum Shear Stress Ratio = **0.1016 : 1**
 Load Combination +D+0.60W
 Location of max.above base 12.0 ft
 Applied Design Shear 36.563 psi
 Allowable Shear 240.0 psi

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.576	0.2053	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+L	1.000	0.536	0.3940	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+S	1.150	0.483	0.2641	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+0.750L	1.250	0.453	0.3268	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+0.750L+0.750S	1.150	0.483	0.3873	PASS	0.0 ft	0.0	PASS	12.0 ft
+D+0.60W	1.600	0.369	0.9433	PASS	5.960 ft	0.1016	PASS	12.0 ft
+D+0.750L+0.450W	1.600	0.369	0.8942	PASS	5.960 ft	0.07617	PASS	12.0 ft
+D+0.750L+0.750S+0.450W	1.600	0.369	0.9831	PASS	5.960 ft	0.07617	PASS	12.0 ft
+0.60D+0.60W	1.600	0.369	0.8574	PASS	5.960 ft	0.1016	PASS	12.0 ft

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: 2x6 HF studs at 16" o.c. Bearing Wall**Load Combination Results**

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
+0.60D	1.600	0.369	0.1082	PASS	0.0 ft	0.0	PASS	12.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						0.702				
+D+L						1.393				
+D+S						0.968				
+D+0.750L						1.221				
+D+0.750L+0.750S						1.420				
+D+0.60W				0.134	0.134	0.702				
+D+0.750L+0.450W				0.101	0.101	1.221				
+D+0.750L+0.750S+0.450W				0.101	0.101	1.420				
+0.60D+0.60W				0.134	0.134	0.421				
+0.60D						0.421				
L Only						0.691				
S Only						0.266				
W Only				0.223	0.223					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance	Max. Y-Y Deflection		Distance
D Only	0.0000 in	0.000ft		0.000 in	0.000ft	
+D+L	0.0000 in	0.000ft		0.000 in	0.000ft	
+D+S	0.0000 in	0.000ft		0.000 in	0.000ft	
+D+0.750L	0.0000 in	0.000ft		0.000 in	0.000ft	
+D+0.750L+0.750S	0.0000 in	0.000ft		0.000 in	0.000ft	
+D+0.60W	0.0000 in	0.000ft		0.422 in	6.040ft	
+D+0.750L+0.450W	0.0000 in	0.000ft		0.317 in	6.040ft	
+D+0.750L+0.750S+0.450W	0.0000 in	0.000ft		0.317 in	6.040ft	
+0.60D+0.60W	0.0000 in	0.000ft		0.422 in	6.040ft	
+0.60D	0.0000 in	0.000ft		0.000 in	0.000ft	
L Only	0.0000 in	0.000ft		0.000 in	0.000ft	
S Only	0.0000 in	0.000ft		0.000 in	0.000ft	
W Only	0.0000 in	0.000ft		0.704 in	6.040ft	

Wood Column

Project File: Florence Family Addition.ec6

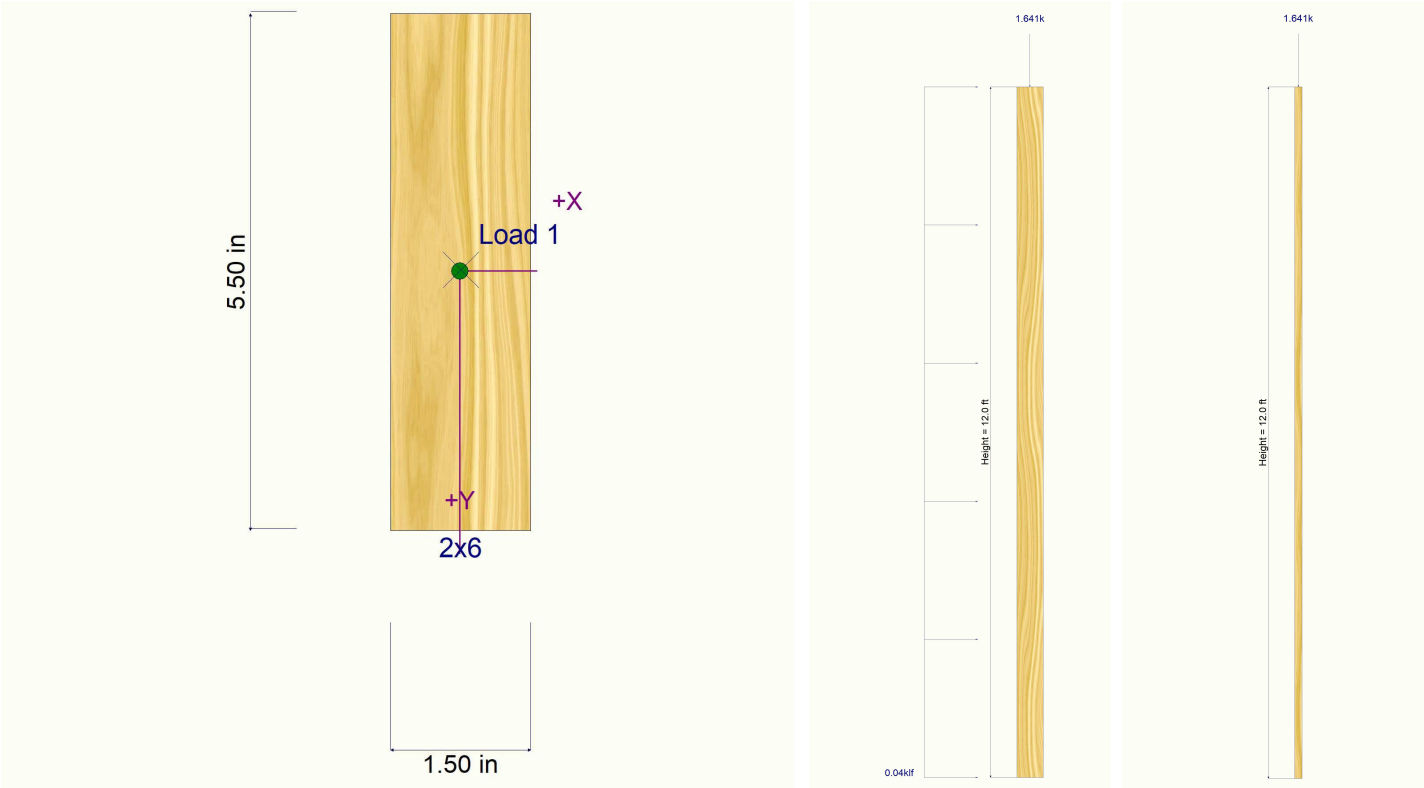
LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: 2x6 HF studs at 16" o.c. Bearing Wall

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x4 stud 11ft - 1.22 kips

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method		Allowable Stress Design		Wood Section Name		2x4	
End Fixities		Top & Bottom Pinned		Wood Grading/Manuf.		Graded Lumber	
Overall Column Height		11 ft		Wood Member Type		Sawn	
(Used for non-slender calculations)							
Wood Species		Hem-Fir		Exact Width		1.50 in	
Wood Grade		Stud		Exact Depth		3.50 in	
Fb +		675.0 psi		Fv		150.0 psi	
Fb -		675.0 psi		Ft		400.0 psi	
Fc - Prll		800.0 psi		Density		26.840 pcf	
Fc - Perp		405.0 psi					
E : Modulus of Elasticity . . .		x-x Bending		y-y Bending		Axial	
		Basic		1,200.0		1,200.0	
		Minimum		440.0		440.0	
						1,200.0 ksi	
Column Buckling Condition:							
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0							
Fully braced against buckling ABOUT Y-Y Axis							
Allow Stress Modification Factors							
Cf or Cv for Bending 1.10							
Cf or Cv for Compression 1.050							
Cf or Cv for Tension 1.10							
Cm : Wet Use Factor 1.0							
Ct : Temperature Fact 1.0							
Cfu : Flat Use Factor 1.0							
Kf : Built-up columns 1.0							
Use Cr : Repetitive ? No							

Applied Loads

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

Column self weight included : 10.764 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 1.210 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9961 : 1**
 Load Combination D Only
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 1.221 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 233.427 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 11.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 240.0 psi

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.309	0.9961	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.181	0.5730	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						1.221				
+0.60D						0.732				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

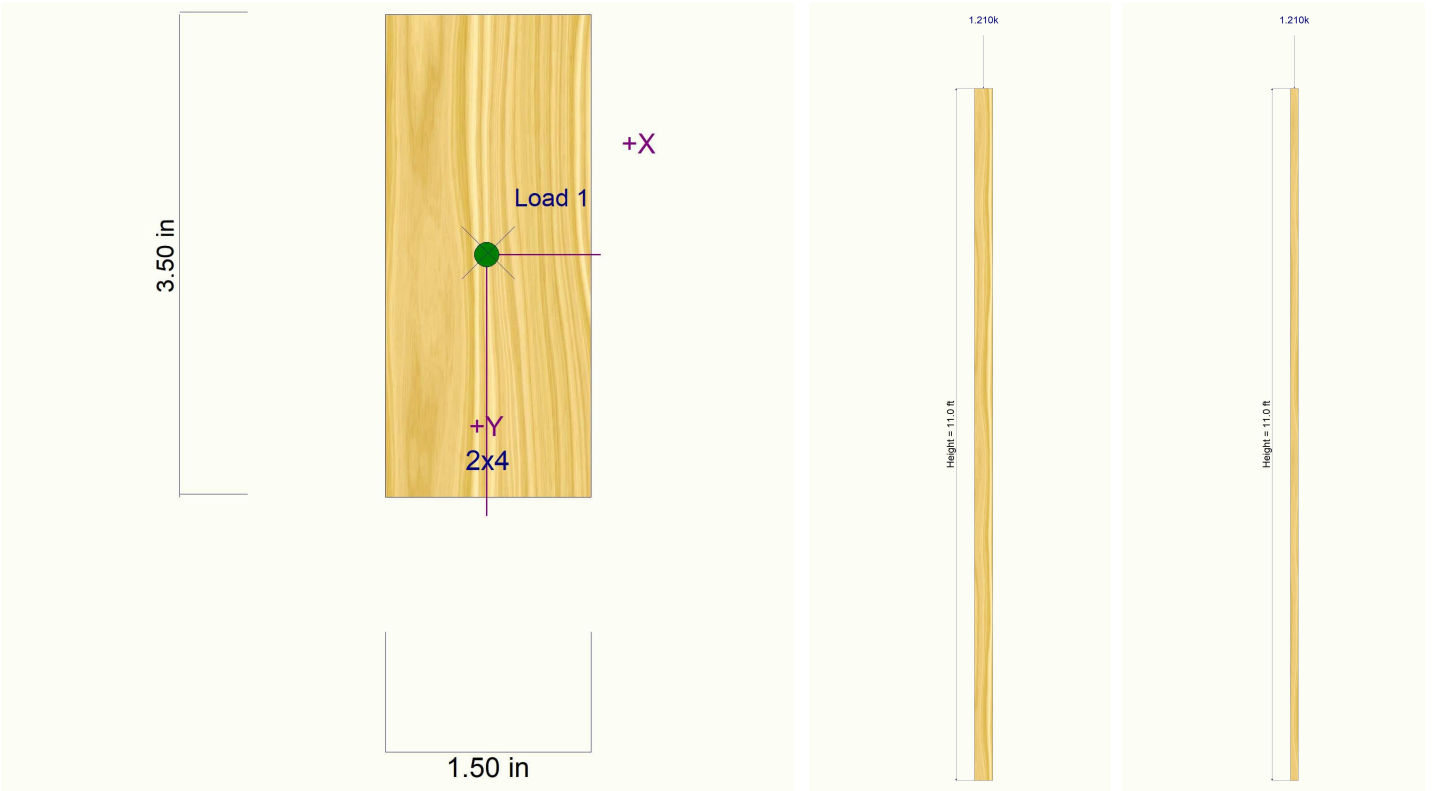
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DESCRIPTION: 2x4 stud 11ft - 1.22 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2-2x4 stud 11ft - 2.44 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method		Allowable Stress Design		Wood Section Name		2-2x4	
End Fixities		Top & Bottom Pinned		Wood Grading/Manuf.		Graded Lumber	
Overall Column Height		11 ft		Wood Member Type		Sawn	
(Used for non-slender calculations)							
Wood Species		Hem-Fir		Exact Width		3.0 in	
Wood Grade		Stud		Exact Depth		3.50 in	
Fb +		675.0 psi	Fv	150.0 psi	Area	10.50 in^2	Allow Stress Modification Factors
Fb -		675.0 psi	Ft	400.0 psi	Ix	10.719 in^4	Cf or Cv for Bending 1.10
Fc - Prll		800.0 psi	Density	26.840 pcf	Iy	7.875 in^4	Cf or Cv for Compression 1.050
Fc - Perp		405.0 psi					Cf or Cv for Tension 1.10
							Cm : Wet Use Factor 1.0
							Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .		x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
		Basic	1,200.0	1,200.0	1,200.0 ksi		Kf : Built-up columns 1.0
		Minimum	440.0	440.0			Use Cr : Repetitive ? No
Column Buckling Condition:							
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0							
Fully braced against buckling ABOUT Y-Y Axis							

Applied Loads

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

Column self weight included : 21.528 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 2.420 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = **0.9961 : 1**
 Load Combination D Only
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 2.442 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 233.427 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 11.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 240.0 psi

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.309	0.9961	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.181	0.5730	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						2.442				
+0.60D						1.465				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

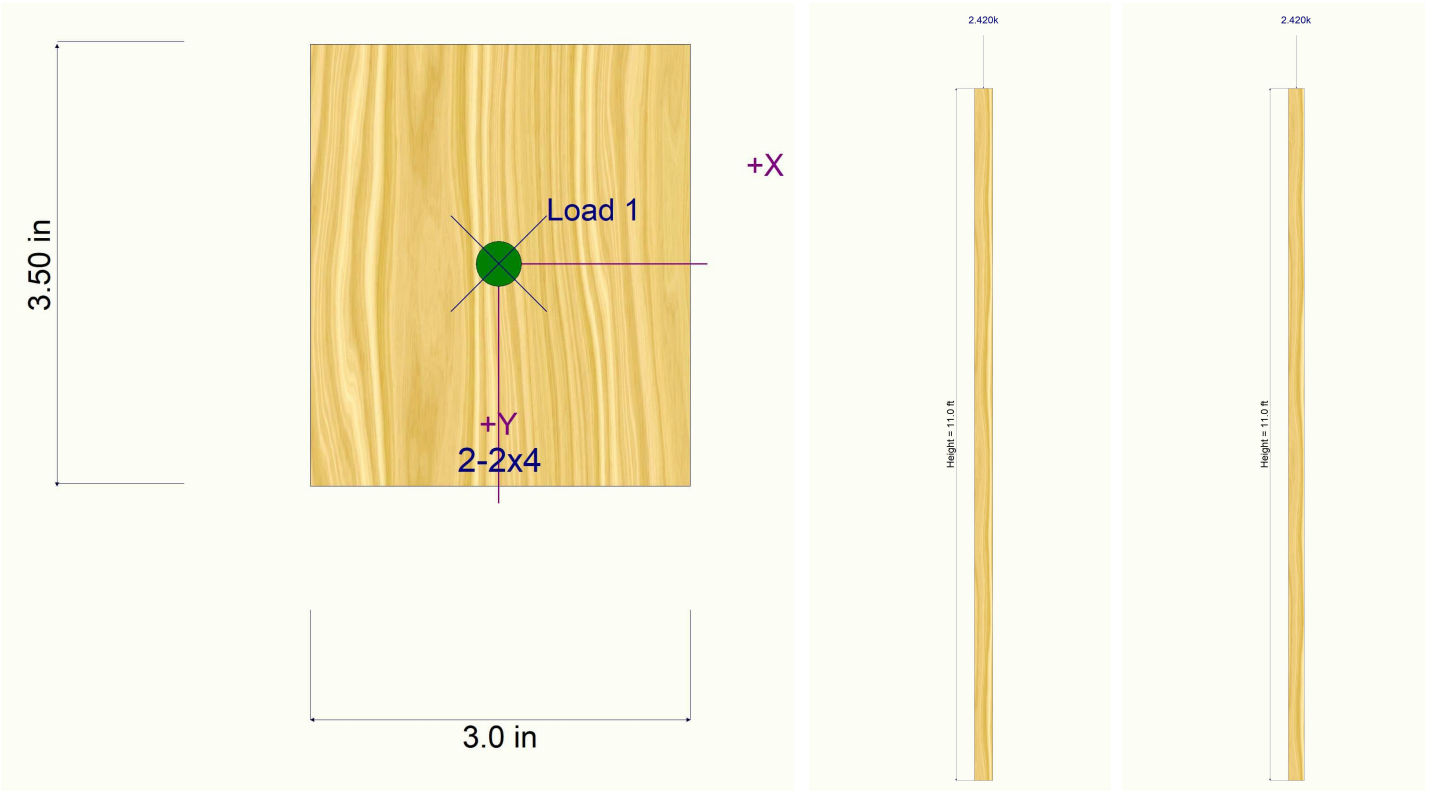
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DESCRIPTION: 2-2x4 stud 11ft - 2.44 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 3-2x4 stud 11ft - 3.67 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method		Allowable Stress Design		Wood Section Name		3-2x4	
End Fixities		Top & Bottom Pinned		Wood Grading/Manuf.		Graded Lumber	
Overall Column Height		11 ft		Wood Member Type		Sawn	
(Used for non-slender calculations)							
Wood Species		Hem-Fir		Exact Width		4.50 in	
Wood Grade		Stud		Exact Depth		3.50 in	
Fb +		675.0 psi	Fv	150.0 psi	Area	15.750 in^2	Allow Stress Modification Factors
Fb -		675.0 psi	Ft	400.0 psi	Ix	16.078 in^4	Cf or Cv for Bending 1.10
Fc - Prll		800.0 psi	Density	26.840 pcf	Iy	26.578 in^4	Cf or Cv for Compression 1.050
Fc - Perp		405.0 psi					Cf or Cv for Tension 1.10
E : Modulus of Elasticity . . .		x-x Bending	y-y Bending	Axial			Cm : Wet Use Factor 1.0
		Basic	1,200.0	1,200.0	1,200.0 ksi		Ct : Temperature Fact 1.0
		Minimum	440.0	440.0			Cfu : Flat Use Factor 1.0
							Kf : Built-up columns 1.0
							Use Cr : Repetitive ? No
Column Buckling Condition:							
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0							
Fully braced against buckling ABOUT Y-Y Axis							

Applied Loads

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

Column self weight included : 32.292 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 3.640 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.9989 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	3.672 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	233.427 psi

Maximum SERVICE Lateral Load Reactions . .	
Top along Y-Y	0.0 k
Bottom along Y-Y	0.0 k
Top along X-X	0.0 k
Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .	
Along Y-Y	0.0 in at 0.0 ft above base
for load combination : n/a	
Along X-X	0.0 in at 0.0 ft above base
for load combination : n/a	

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	11.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	240.0 psi

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.309	0.9989	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.181	0.5745	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Axial Reaction @ Base	My - End Moments @ Base	My - End Moments @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top
D Only						3.672				
+0.60D						2.203				

Wood Column

Project File: Florence Family Addition.ec6

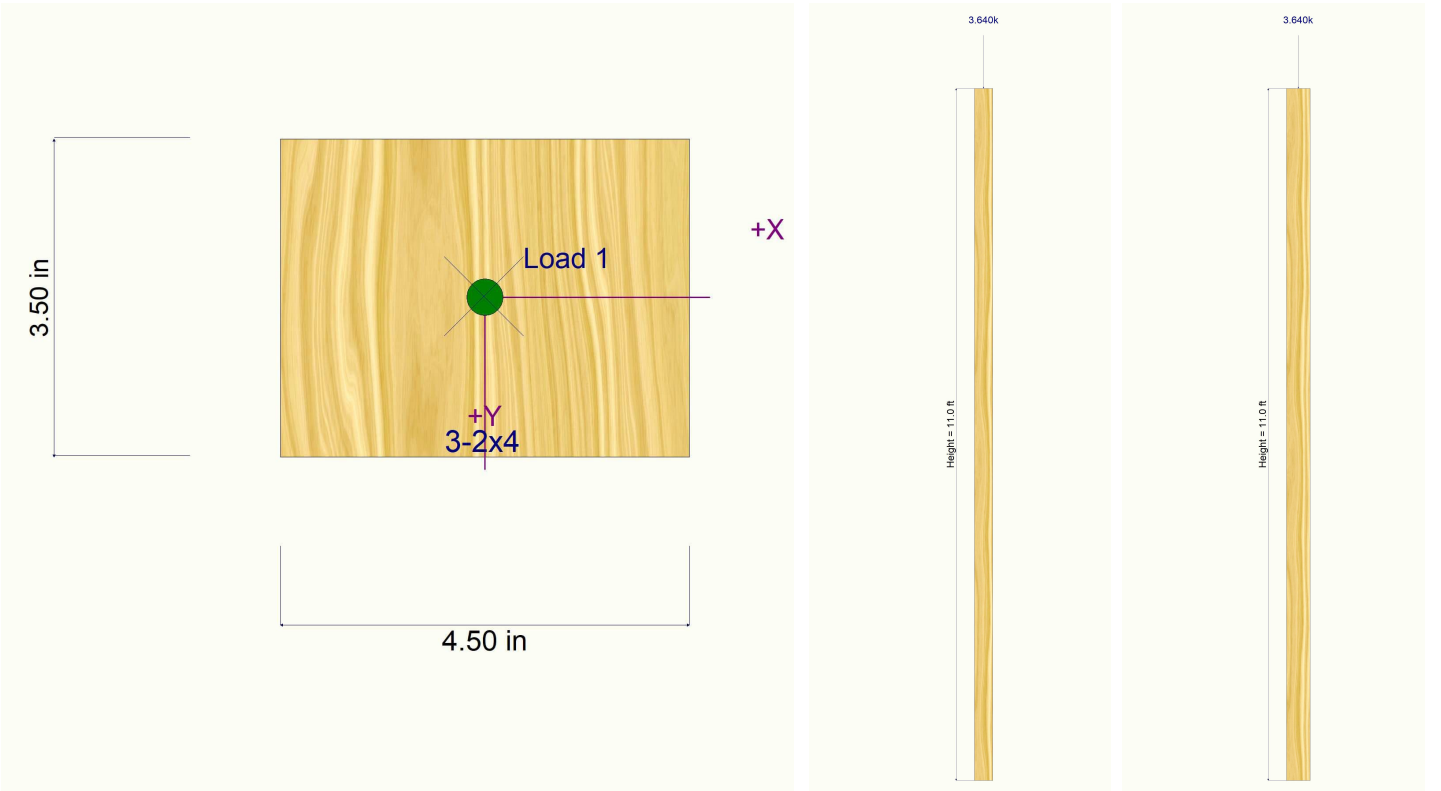
LIC# : KW-06012482, Build:20.24.03.04FACET(c) ENERCALC INC 1983-2023

DESCRIPTION: 3-2x4 stud 11ft - 3.67 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 4-2x4 stud 11ft - 4.89 kips

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	4-2x4	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	11 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	6.0 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	3.50 in	Cf or Cv for Bending 1.10
Fb +	675.0 psi	Fv	150.0 psi	Area	21.0 in^2	Cf or Cv for Compression 1.050
Fb -	675.0 psi	Ft	400.0 psi	Ix	21.438 in^4	Cf or Cv for Tension 1.10
Fc - Prll	800.0 psi	Density	26.840 pcf	Iy	63.0 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,200.0	1,200.0	1,200.0 ksi		Kf : Built-up columns 1.0
	Minimum	440.0	440.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 43.056 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 4.850 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.9982 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	4.893 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	233.427 psi

Maximum SERVICE Lateral Load Reactions . .			
Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .			
Along Y-Y	0.0 in	at	0.0 ft above base
for load combination : n/a			
Along X-X	0.0 in	at	0.0 ft above base
for load combination : n/a			

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	11.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	240.0 psi

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.309	0.9982	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.181	0.5741	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						4.893				
+0.60D						2.936				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

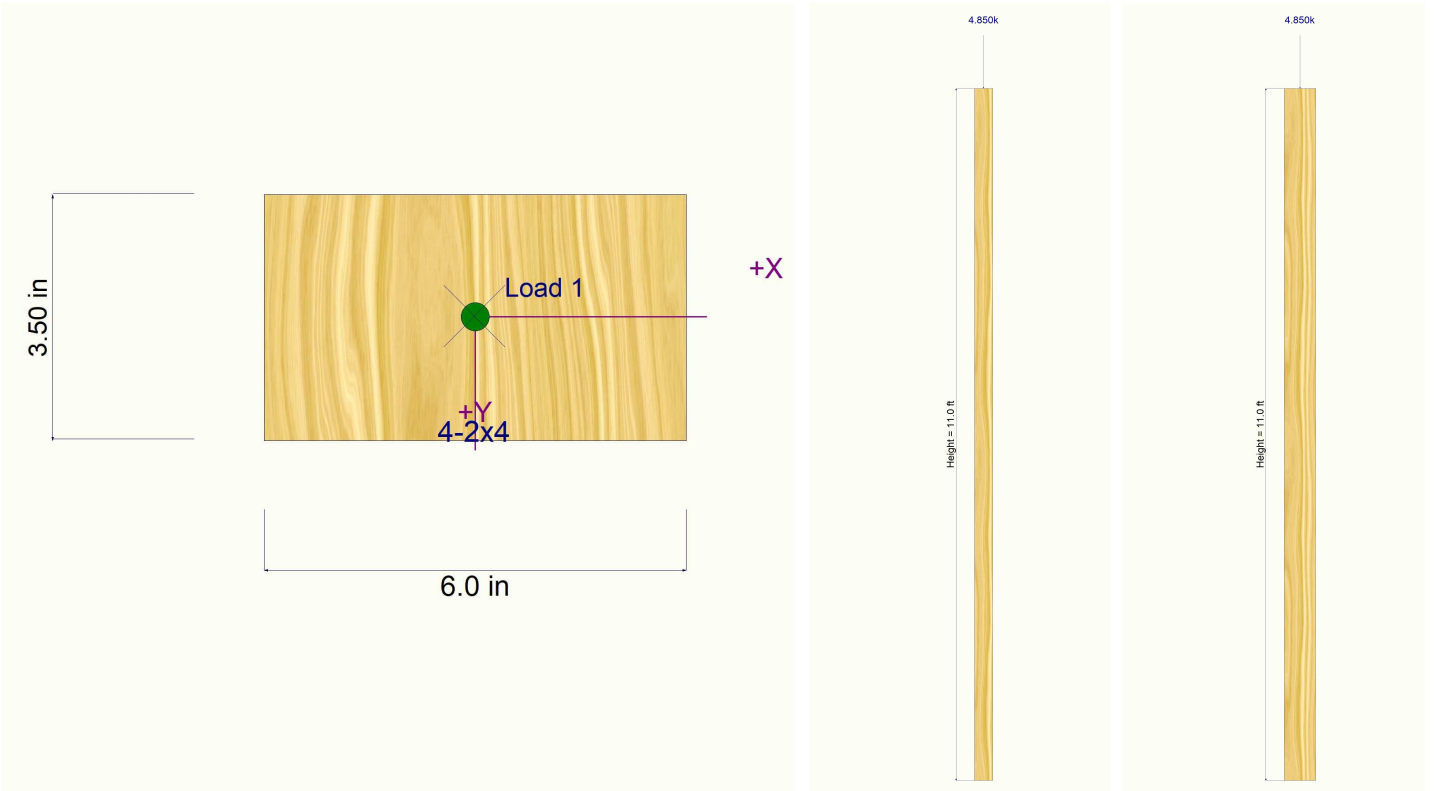
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DESCRIPTION: 4-2x4 stud 11ft - 4.89 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x6 stud 11ft - 3.81 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	11 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	1.50 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	5.50 in	
Fb +	675 psi	Fv	150 psi	Area	8.250 in^2	Cf or Cv for Bending 1.0
Fb -	675 psi	Ft	400 psi	Ix	20.797 in^4	Cf or Cv for Compression 1.0
Fc - Prll	800 psi	Density	26.84 pcf	Iy	1.547 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1200	1200	1200 ksi		Kf : Built-up columns 1.0
	Minimum	440	440			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 16.915 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 3.790 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = **0.9984 : 1**
 Load Combination D Only
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 3.807 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 462.193 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 11.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 240.0 psi

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.642	0.9984	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.427	0.5066	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						3.807				
+0.60D						2.284				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

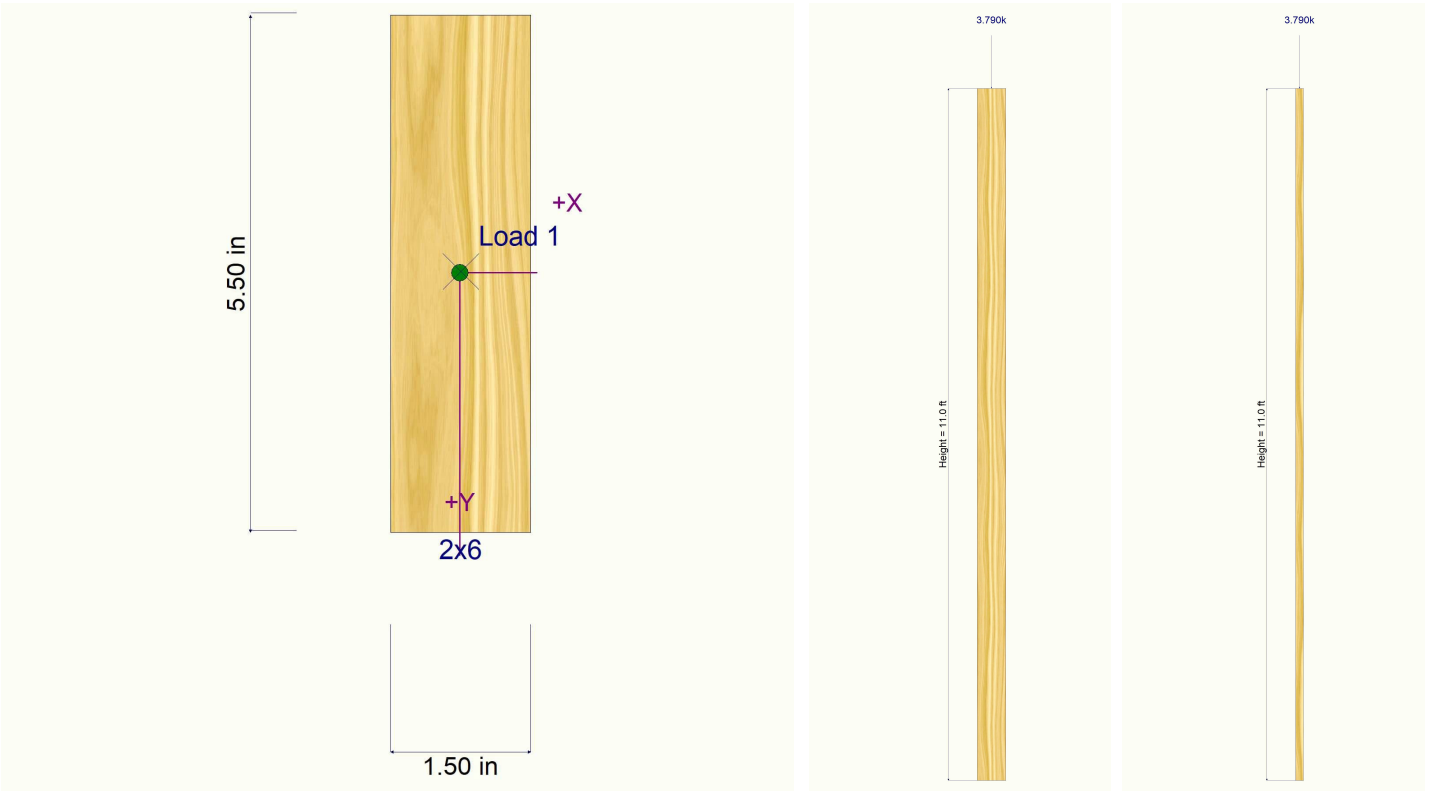
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DESCRIPTION: 2x6 stud 11ft - 3.81 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: 2-2x6 stud 11ft - 7.62 kips

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2-2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	11 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	3.0 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	675 psi	Fv	150 psi	Area	16.50 in^2	Cf or Cv for Compression 1.0
Fb -	675 psi	Ft	400 psi	Ix	41.594 in^4	Cf or Cv for Tension 1.0
Fc - Prll	800 psi	Density	26.84 pcf	Iy	12.375 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1200	1200	1200 ksi		Kf : Built-up columns 1.0
	Minimum	440	440			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 33.830 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 7.590 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.9997 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	7.624 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	462.193 psi

Maximum SERVICE Lateral Load Reactions . .	
Top along Y-Y	0.0 k
Bottom along Y-Y	0.0 k
Top along X-X	0.0 k
Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .	
Along Y-Y	0.0 in at 0.0 ft above base
for load combination : n/a	
Along X-X	0.0 in at 0.0 ft above base
for load combination : n/a	

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	11.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	240.0 psi

Other Factors used to calculate allowable stresses . . .

Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.642	0.9997	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.427	0.5073	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						7.624				
+0.60D						4.574				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

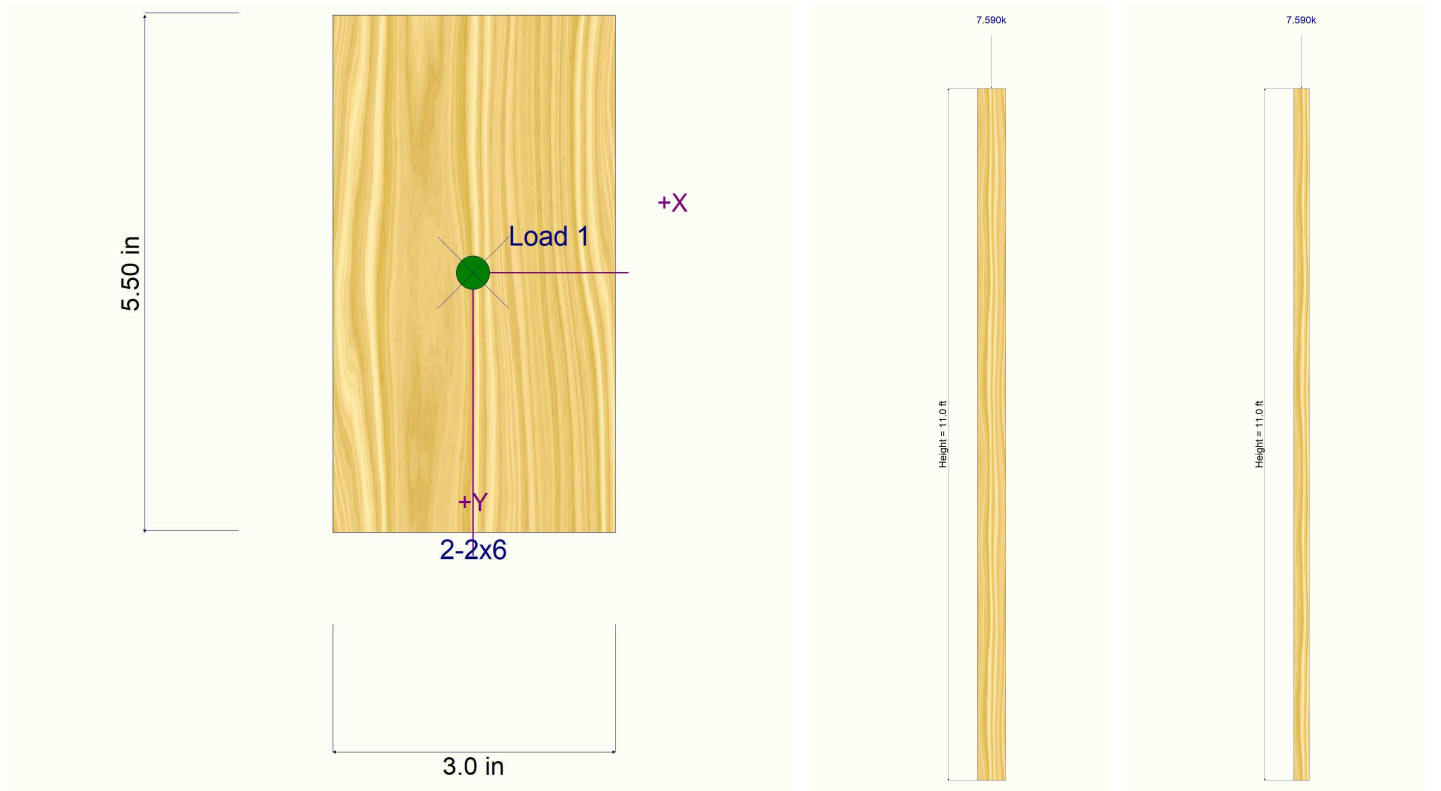
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DESCRIPTION: 2-2x6 stud 11ft - 7.62 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: 3-2x6 stud 11ft - 11.37 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	3-2x6		
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber		
Overall Column Height	11 ft			Wood Member Type	Sawn		
(Used for non-slender calculations)							
Wood Species	Hem-Fir			Exact Width	4.50 in	Allow Stress Modification Factors	
Wood Grade	Stud			Exact Depth	5.50 in	Cf or Cv for Bending	1.0
Fb +	675 psi	Fv	150 psi	Area	24.750 in^2	Cf or Cv for Compression	1.0
Fb -	675 psi	Ft	400 psi	Ix	62.391 in^4	Cf or Cv for Tension	1.0
Fc - Prll	800 psi	Density	26.84 pcf	Iy	41.766 in^4	Cm : Wet Use Factor	1.0
Fc - Perp	405 psi					Ct : Temperature Fact	1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor	1.0
	Basic	1200	1200	1200 ksi		Kf : Built-up columns	1.0
	Minimum	440	440			Use Cr : Repetitive ?	No
Column Buckling Condition:							
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0							
Fully braced against buckling ABOUT Y-Y Axis							

Applied Loads

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

Column self weight included : 50.744 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 11.320 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = **0.9940 : 1**
 Load Combination D Only
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 11.371 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 462.193 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 11.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 240.0 psi

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.642	0.9940	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.427	0.5044	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						11.371				
+0.60D						6.822				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 3-2x6 stud 11ft - 11.37 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 4-2x6 stud 11ft - 15.25 kips

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	4-2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	11 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Hem-Fir			Exact Width	6.0 in	Allow Stress Modification Factors
Wood Grade	Stud			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	675 psi	Fv	150 psi	Area	33.0 in^2	Cf or Cv for Compression 1.0
Fb -	675 psi	Ft	400 psi	Ix	83.188 in^4	Cf or Cv for Tension 1.0
Fc - Prll	800 psi	Density	26.84 pcf	Iy	99.0 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	405 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1200	1200	1200 ksi		Kf : Built-up columns 1.0
	Minimum	440	440			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 67.659 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 15.180 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.9997 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	15.248 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	462.193 psi

Maximum SERVICE Lateral Load Reactions . .			
Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .			
Along Y-Y	0.0 in	at	0.0 ft above base
for load combination : n/a			
Along X-X	0.0 in	at	0.0 ft above base
for load combination : n/a			

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	11.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	240.0 psi

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.642	0.9997	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.427	0.5073	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						15.248				
+0.60D						9.149				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

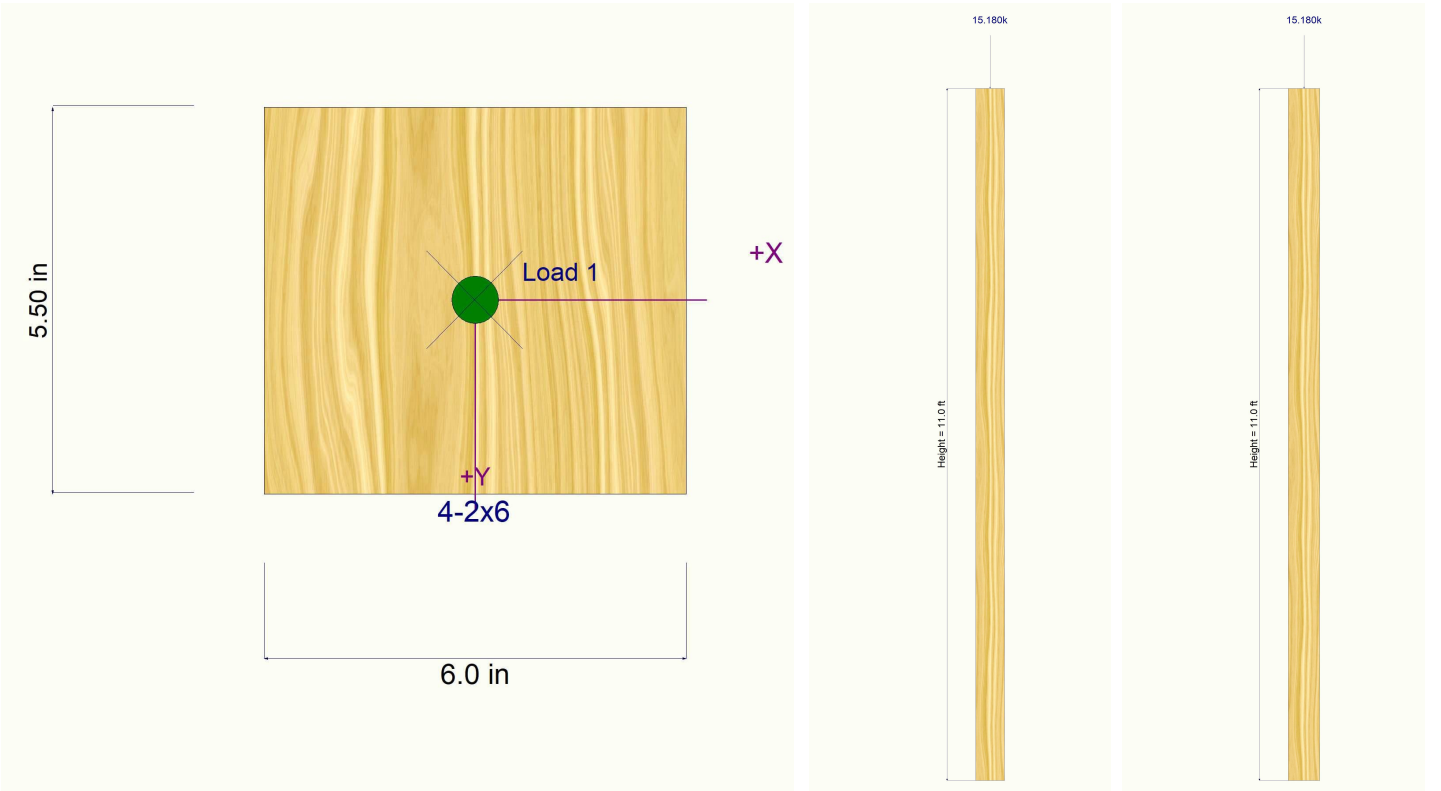
(c) ENERCALC INC 1983-2023

DESCRIPTION: 4-2x6 stud 11ft - 15.25 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 4x6 Post 11ft - 9.05 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	4x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	11 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Douglas Fir-Larch			Exact Width	3.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	Cf or Cv for Bending 1.30
Fb +	750 psi	Fv	170 psi	Area	19.250 in^2	Cf or Cv for Compression 1.10
Fb -	750 psi	Ft	475 psi	Ix	48.526 in^4	Cf or Cv for Tension 1.30
Fc - Prll	700 psi	Density	31.21 pcf	Iy	19.651 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	625 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1300	1300	1300 ksi		Kf : Built-up columns 1.0
	Minimum	470	470			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 45.894 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 9.0 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio = **0.9978 : 1**
 Load Combination D Only
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 9.046 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 470.954 psi

Maximum SERVICE Lateral Load Reactions . .
 Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
 Top along X-X 0.0 k Bottom along X-X 0.0 k

Maximum SERVICE Load Lateral Deflections . . .
 Along Y-Y 0.0 in at 0.0 ft above base
 for load combination : n/a
 Along X-X 0.0 in at 0.0 ft above base
 for load combination : n/a

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 11.0 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 272.0 psi

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.680	0.9978	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.464	0.4932	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						9.046				
+0.60D						5.428				

DESCRIPTION: 4x6 Post 11ft - 9.05 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 4x6 Post 13ft - 7.38 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	4x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	13 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Douglas Fir-Larch			Exact Width	3.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	Cf or Cv for Bending 1.30
Fb +	750.0 psi	Fv	170.0 psi	Area	19.250 in^2	Cf or Cv for Compression 1.10
Fb -	750.0 psi	Ft	475.0 psi	Ix	48.526 in^4	Cf or Cv for Tension 1.30
Fc - Prll	700.0 psi	Density	31.210 pcf	Iy	19.651 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	625.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,300.0	1,300.0	1,300.0 ksi		Kf : Built-up columns 1.0
	Minimum	470.0	470.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 13 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 54.238 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 13.0 ft, D = 7.330 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.9978 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	7.384 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	384.435 psi

Maximum SERVICE Lateral Load Reactions . .			
Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .			
Along Y-Y	0.0 in at	0.0 ft above base	
for load combination : n/a			
Along X-X	0.0 in at	0.0 ft above base	
for load combination : n/a			

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	13.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Other Factors used to calculate allowable stresses . . .
Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.555	0.9978	PASS	0.0 ft	0.0	PASS	13.0 ft
+0.60D	1.600	0.352	0.5313	PASS	0.0 ft	0.0	PASS	13.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						7.384				
+0.60D						4.431				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 4x6 Post 13ft - 7.38 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 6x6 Post 11ft - 13.57 kips**Code References**

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	6x6		
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber		
Overall Column Height	11 ft			Wood Member Type	Sawn		
(Used for non-slender calculations)				Exact Width	5.50 in	Allow Stress Modification Factors	
Wood Species	Douglas Fir-Larch			Exact Depth	5.50 in	Cf or Cv for Bending	1.0
Wood Grade	No.2			Area	30.250 in^2	Cf or Cv for Compression	1.0
Fb +	750.0 psi	Fv	170.0 psi	Ix	76.255 in^4	Cf or Cv for Tension	1.0
Fb -	750.0 psi	Ft	475.0 psi	Iy	76.255 in^4	Cm : Wet Use Factor	1.0
Fc - Prll	700.0 psi	Density	31.210 pcf			Ct : Temperature Fact	1.0
Fc - Perp	625.0 psi					Cfu : Flat Use Factor	1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Kf : Built-up columns	1.0
	Basic	1,300.0	1,300.0	1,300.0 ksi		Use Cr : Repetitive ?	No
	Minimum	470.0	470.0	Column Buckling Condition:			
				ABOUT X-X Axis: Lux = 11 ft, Kx = 1.0			
				Fully braced against buckling ABOUT Y-Y Axis			

Applied Loads

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

Column self weight included : 72.119 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 13.50 k

DESIGN SUMMARY**Bending & Shear Check Results****PASS** Max. Axial+Bending Stress Ratio = **1.0 : 1**

Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	13.572 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	448.679 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y	0.0 in	at	0.0 ft	above base
for load combination : n/a				
Along X-X	0.0 in	at	0.0 ft	above base
for load combination : n/a				

Other Factors used to calculate allowable stresses . . .Bending Compression Tension**PASS** Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination	+0.60D
Location of max.above base	11.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.712	1.0	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D	1.600	0.499	0.4814	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only						13.572				
+0.60D						8.143				

Wood Column

LIC# : KW-06012482, Build:20.24.03.04

Project File: Florence Family Addition.ec6

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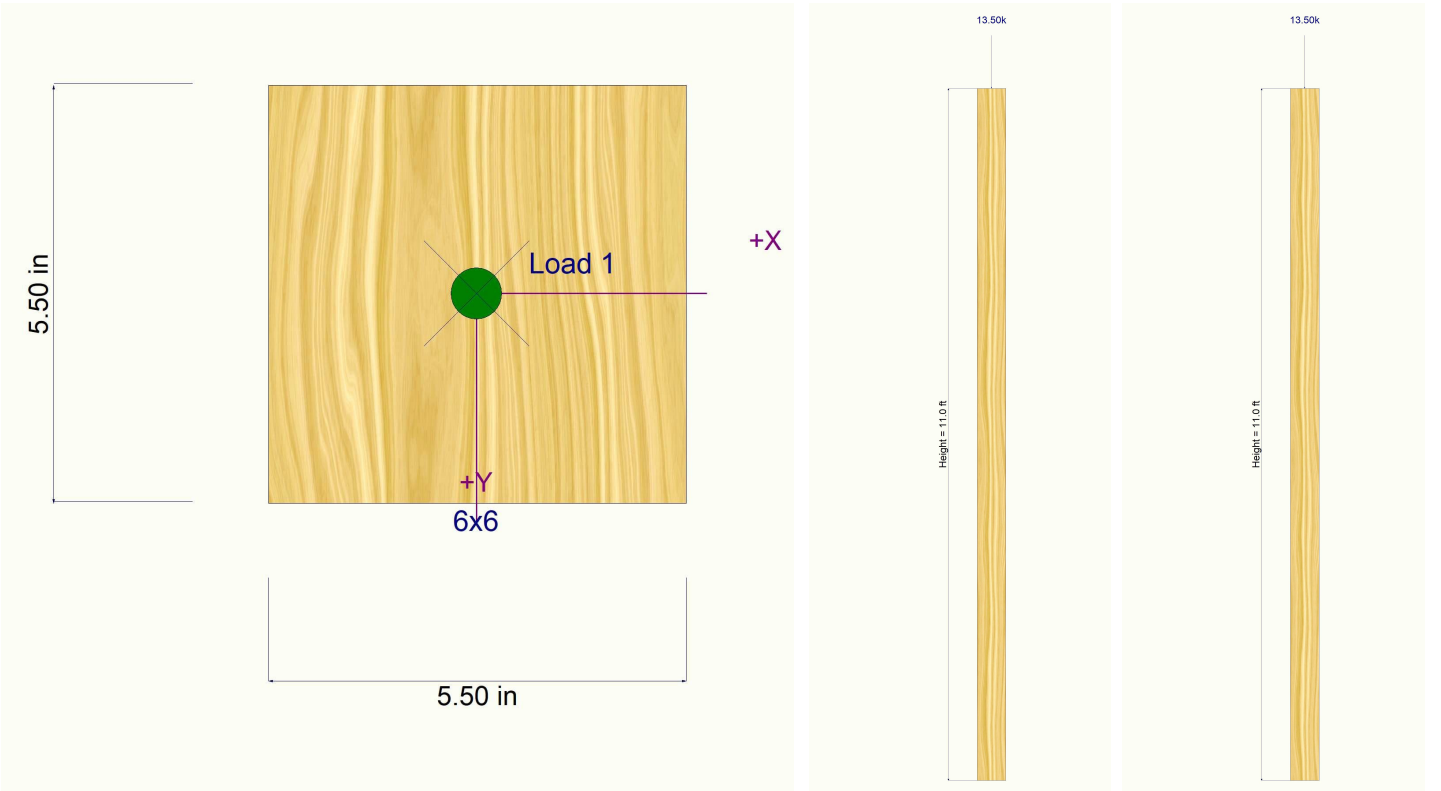
FACET

DESCRIPTION: 6x6 Post 11ft - 13.57 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: 6x6 Post 13ft - 11.235 kips

Code References

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	6x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	13 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Douglas Fir-Larch			Exact Width	5.50 in	Allow Stress Modification Factors
Wood Grade	No.2			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	750.0 psi	Fv	170.0 psi	Area	30.250 in^2	Cf or Cv for Compression 1.0
Fb -	750.0 psi	Ft	475.0 psi	Ix	76.255 in^4	Cf or Cv for Tension 1.0
Fc - Prll	700.0 psi	Density	31.210 pcf	Iy	76.255 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	625.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,300.0	1,300.0	1,300.0 ksi		Kf : Built-up columns 1.0
	Minimum	470.0	470.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 13 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 85.231 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 13.0 ft, D = 11.150 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.9971 : 1
Load Combination	D Only
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	11.235 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	372.477 psi

Maximum SERVICE Lateral Load Reactions . .	
Top along Y-Y	0.0 k
Bottom along Y-Y	0.0 k
Top along X-X	0.0 k
Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .	
Along Y-Y	0.0 in at 0.0 ft above base
for load combination : n/a	
Along X-X	0.0 in at 0.0 ft above base
for load combination : n/a	

PASS Maximum Shear Stress Ratio =	0.0 : 1
Load Combination	+0.60D
Location of max.above base	13.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Other Factors used to calculate allowable stresses . . .
 Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.591	0.9971	PASS	0.0 ft	0.0	PASS	13.0 ft
+0.60D	1.600	0.382	0.5213	PASS	0.0 ft	0.0	PASS	13.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only						11.235				
+0.60D						6.741				

Wood Column

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

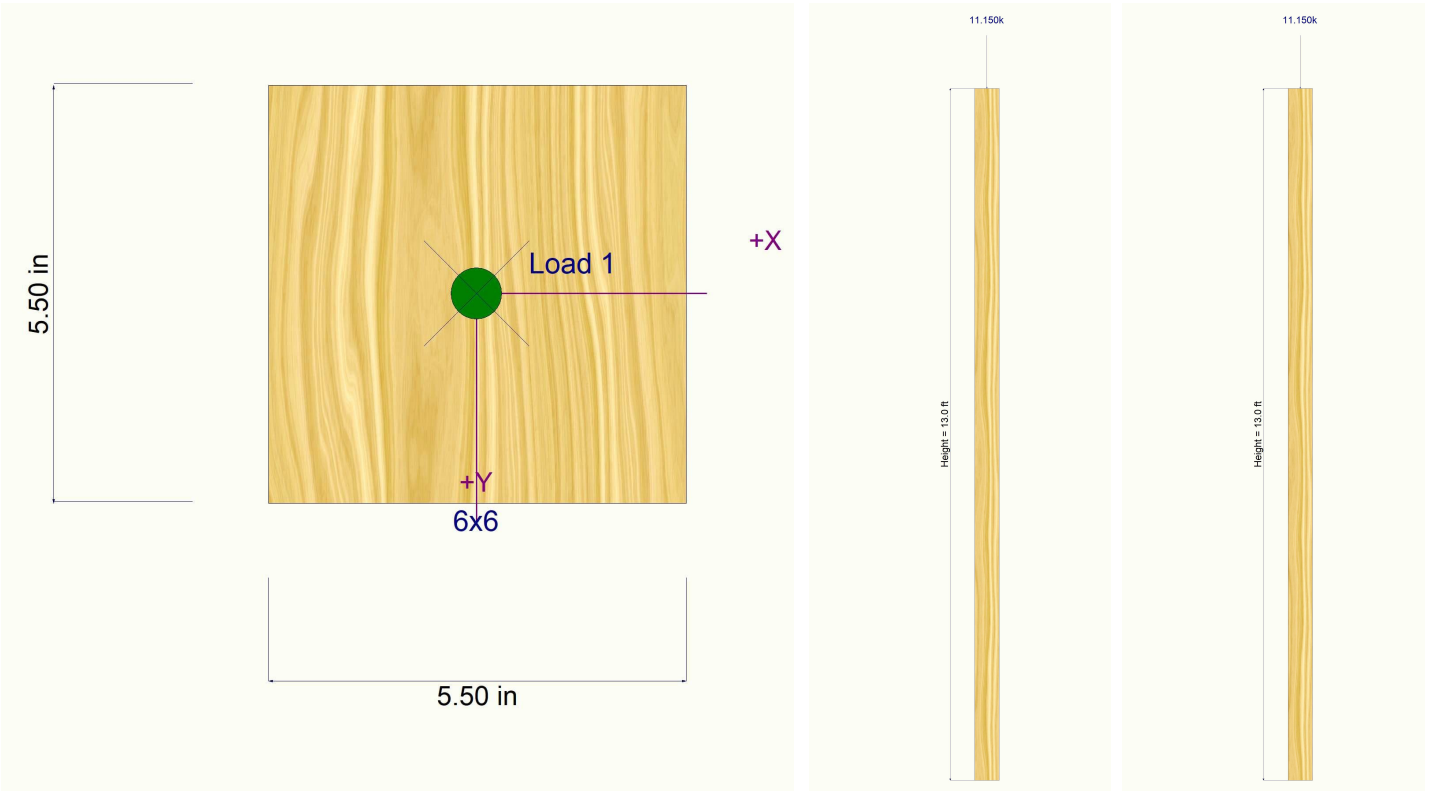
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DESCRIPTION: 6x6 Post 13ft - 11.235 kips

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000ft

Sketches



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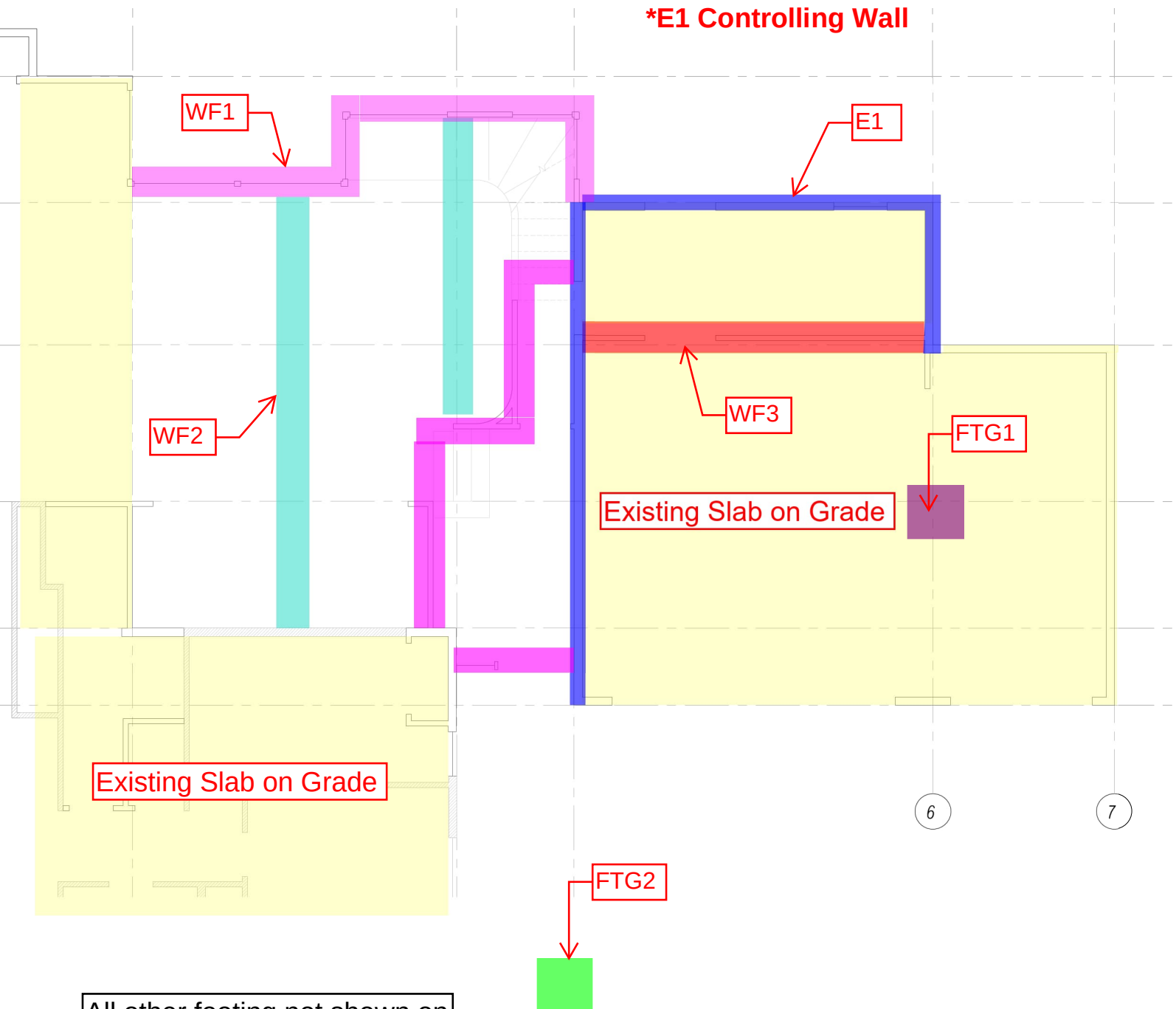
STRUCTURAL CALCULATIONS

FOUNDATION DESIGN

FLORENCE ADDITION
MERCER ISLAND, WA

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Florence Addition
scale: 1/8" = 1'-0"
Foundation Key Plan



All other footing not shown on this key plan, are out of scope and to remain as is

 FACET	Date: 6/12/2024
	Made By: NKP
Project: Florence Family Addition Description: Foundation Load Tracking	

Foundation Load Tracking

WF1: New Footing

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	TOTAL	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Roof	15.0	0.0	25.0	10.0	6.0	10.0	340	190	0	150
Low Roof	15.0	0.0	25.0	10.0	5.0	10.0	300	175	0	125
Crawl Space	15.0	40.0	0.0	10.0	5.0	4.0	315	115	200	0
Total:							955	480	200	275

WF2: Crawl Space

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	Total Load	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Main floor	15.0	40.0	40.0	10.0	10.0	10.0	1050	250	400	400
Total:							1050	250	400	400

WF3: New Footing at Garage

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	TOTAL	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Roof	15.0	0.0	25.0	10.0	2.0	10.0	180	130	0	50
Low Roof	15.0	40.0	0.0	10.0	2.0	10.0	210	130	80	0
Total:							390	260	80	50

E1: Existing

Level	Dead Load	Live Load	Snow Load	Wall Weight	Trib. Width	Wall Ht.	TOTAL	Total Dead Load	Total Live Load	Total Snow Load
	psf	psf	psf	psf	ft	ft	plf	plf	plf	plf
Roof	15.0	0.0	25.0	10.0	8.0	10.0	420	220	0	200
Upper Floor	15.0	40.0	0.0	10.0	13.0	10.0	815	295	520	0
Total:							1235	515	520	200

Wall Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: WF1: New Footing (Controlling) / E1 Controlling

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

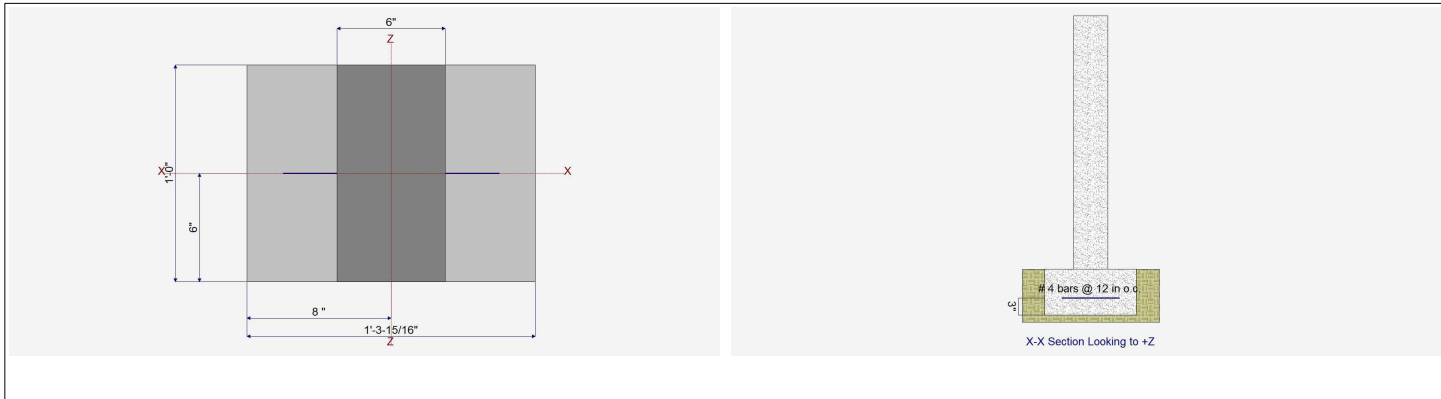
General Information

Material Properties			Soil Design Values		
fc : Concrete 28 day strength	=	2.50 ksi	Allowable Soil Bearing	=	1.50 ksf
fy : Rebar Yield	=	60.0 ksi	Increase Bearing By Footing Weight	=	No
Ec : Concrete Elastic Modulus	=	3,122.0 ksi	Soil Passive Resistance (for Sliding)	=	150.0 pcf
Concrete Density	=	145.0 pcf	Soil/Concrete Friction Coeff.	=	0.30
φ Values Flexure	=	0.90	Increases based on footing Depth		
Shear	=	0.750	Reference Depth below Surface	=	ft
Analysis Settings			Allow. Pressure Increase per foot of depth	=	ksf
Min Steel % Bending Reinf.	=		when base footing is below	=	ft
Min Allow % Temp Reinf.	=	0.00180	Increases based on footing Width		
Min. Overturning Safety Factor	=	1.0 : 1	Allow. Pressure Increase per foot of width	=	ksf
Min. Sliding Safety Factor	=	1.0 : 1	when footing is wider than	=	ft
AutoCalc Footing Weight as DL :		Yes	Adjusted Allowable Bearing Pressure	=	1.50 ksf

Dimensions

Footing Width	=	1.330 ft	Footing Thickness	=	8.0 in	Bars along X-X Axis	
Wall Thickness	=	6.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	0 in	at Bottom of footing =	=	3.0 in	Reinforcing Bar Size	= # 4

Reinforcing



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	0.5150		0.520	0.20		k
OB : Overburden	=						ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=		in above top of footing				

Wall Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: WF1: New Footing (Controlling) / E1 Controlling**DESIGN SUMMARY****Design OK**

Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	No Uplift
Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5933	Soil Bearing	0.8899 ksf	+D+0.750L+0.750S
PASS	0.02573	Z Flexure (+X)	0.1103 k-ft	+1.20D+1.60L+0.50S
PASS	0.008745	Z Flexure (-X)	0.03750 k-ft	+0.90D
PASS	n/a	1-way Shear (+X)	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	n/a

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
, D Only	1.50 ksf	0.0 in	0.4839 ksf	0.4839 ksf	0.323
, +D+L	1.50 ksf	0.0 in	0.8749 ksf	0.8749 ksf	0.583
, +D+S	1.50 ksf	0.0 in	0.6343 ksf	0.6343 ksf	0.423
, +D+0.750L	1.50 ksf	0.0 in	0.7771 ksf	0.7771 ksf	0.518
, +D+0.750L+0.750S	1.50 ksf	0.0 in	0.8899 ksf	0.8899 ksf	0.593
, +0.60D	1.50 ksf	0.0 in	0.2903 ksf	0.2903 ksf	0.194

Units : k-ft

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D	0.05834	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.40D	0.05834	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60L	0.1039	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60L	0.1039	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60L+0.50S	0.1103	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60L+0.50S	0.1103	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L	0.06684	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L	0.06684	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D	0.05	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D	0.05	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+1.60S	0.08756	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+1.60S	0.08756	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60S	0.07072	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+1.60S	0.07072	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+0.50S	0.07331	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+0.50S	0.07331	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+0.70S	0.0759	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +1.20D+0.50L+0.70S	0.0759	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +0.90D	0.0375	-X	Bottom	0.1728	Min Temp %	0.2	4.288	OK
, +0.90D	0.0375	+X	Bottom	0.1728	Min Temp %	0.2	4.288	OK

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60L	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60L+0.50S	0 psi	0 psi	0 psi	75 psi	0	OK

Wall Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: WF1: New Footing (Controlling) / E1 Controlling

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.20D+0.50L	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+1.60S	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+1.60S	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+0.50S	0 psi	0 psi	0 psi	75 psi	0	OK
+1.20D+0.50L+0.70S	0 psi	0 psi	0 psi	75 psi	0	OK
+0.90D	0 psi	0 psi	0 psi	75 psi	0	OK

Minimum footing dimensions:
16" wide, 8" deep

General Footing

Project File: Florence Family Addition.ec6

LIC#: KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: FTG1 - Footing at Garage Slab

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f _c : Concrete 28 day strength	=	2.50 ksi
f _y : Rebar Yield	=	60.0 ksi
E _c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	Yes
Soil Passive Resistance (for Sliding)	=	150.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

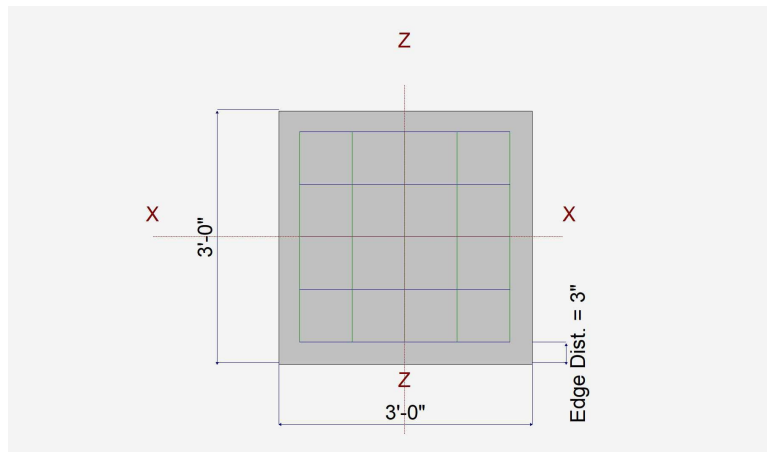
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



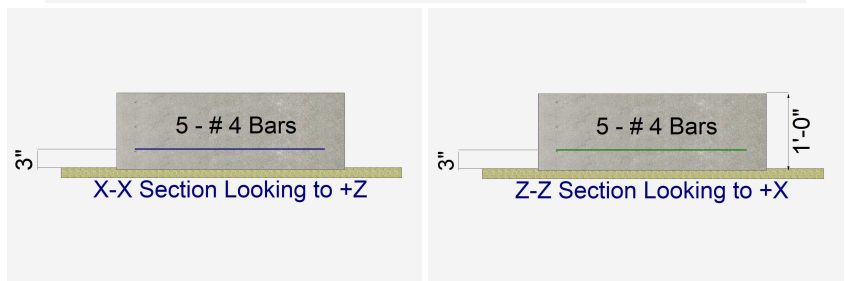
Reinforcing

Bars parallel to X-X Axis	=	5.0
Number of Bars	=	# 4
Reinforcing Bar Size	=	# 4

Bars parallel to Z-Z Axis	=	5.0
Number of Bars	=	# 4
Reinforcing Bar Size	=	# 4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

	D	L _r	L	S	W	E	H
P : Column Load	=	6.339		4.809	3.839		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: FTG1 - Footing at Garage Slab

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9544	Soil Bearing	1.570 ksf	1.645 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1667	Z Flexure (+X)	2.153 k-ft/ft	12.912 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.1667	Z Flexure (-X)	2.153 k-ft/ft	12.912 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.1667	X Flexure (+Z)	2.153 k-ft/ft	12.912 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.1667	X Flexure (-Z)	2.153 k-ft/ft	12.912 k-ft/ft	+1.20D+1.60L+0.50S
PASS	0.3042	1-way Shear (+X)	13.288 psi	43.679 psi	+1.20D+1.60L+0.50S
PASS	0.3042	1-way Shear (-X)	13.288 psi	43.679 psi	+1.20D+1.60L+0.50S
PASS	0.3042	1-way Shear (+Z)	13.288 psi	43.679 psi	+1.20D+1.60L+0.50S
PASS	0.3042	1-way Shear (-Z)	13.288 psi	43.679 psi	+1.20D+1.60L+0.50S
PASS	0.3322	2-way Punching	49.828 psi	150.0 psi	+1.20D+1.60L+0.50S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.645	n/a	0.0			0.8493	0.8493	n/a	n/a	0.516
X-X, +D+L	1.645	n/a	0.0			1.384	1.384	n/a	n/a	0.841
X-X, +D+S	1.645	n/a	0.0			1.276	1.276	n/a	n/a	0.776
X-X, +D+0.750L	1.645	n/a	0.0			1.250	1.250	n/a	n/a	0.760
X-X, +D+0.750L+0.750S	1.645	n/a	0.0			1.570	1.570	n/a	n/a	0.954
X-X, +0.60D	1.645	n/a	0.0			0.5096	0.5096	n/a	n/a	0.310
Z-Z, D Only	1.645	0.0	n/a			n/a	n/a	0.8493	0.8493	0.516
Z-Z, +D+L	1.645	0.0	n/a			n/a	n/a	1.384	1.384	0.841
Z-Z, +D+S	1.645	0.0	n/a			n/a	n/a	1.276	1.276	0.776
Z-Z, +D+0.750L	1.645	0.0	n/a			n/a	n/a	1.250	1.250	0.760
Z-Z, +D+0.750L+0.750S	1.645	0.0	n/a			n/a	n/a	1.570	1.570	0.954
Z-Z, +0.60D	1.645	0.0	n/a			n/a	n/a	0.5096	0.5096	0.310

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	1.109	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.40D	1.109	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+1.60L	1.913	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+1.60L	1.913	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+1.60L+0.50S	2.153	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+1.60L+0.50S	2.153	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L	1.251	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L	1.251	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D	0.9509	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D	0.9509	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+1.60S	2.019	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+1.60S	2.019	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+1.60S	1.719	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK

General Footing

Project File: Florence Family Addition.ecb

LIC# : KW-06012482, Build:20.24.03.04

FACET

(c) ENERCALC INC 1983-2023

DESCRIPTION: FTG1 - Footing at Garage Slab

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	1.719	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+0.50S	1.491	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+0.50S	1.491	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+0.70S	1.587	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +1.20D+0.50L+0.70S	1.587	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +0.90D	0.7131	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
X-X, +0.90D	0.7131	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.40D	1.109	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.40D	1.109	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60L	1.913	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60L	1.913	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60L+0.50S	2.153	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60L+0.50S	2.153	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L	1.251	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L	1.251	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D	0.9509	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D	0.9509	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+1.60S	2.019	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+1.60S	2.019	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60S	1.719	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+1.60S	1.719	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+0.50S	1.491	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+0.50S	1.491	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+0.70S	1.587	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +1.20D+0.50L+0.70S	1.587	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +0.90D	0.7131	-X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK
Z-Z, +0.90D	0.7131	+X	Bottom	0.2592	ACI 7.6.1.1	0.3333	12.912	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	6.85 psi	6.85 psi	6.85 psi	43.68 psi	0.16	OK
+1.20D+1.60L	11.81 psi	11.81 psi	11.81 psi	43.68 psi	0.27	OK
+1.20D+1.60L+0.50S	13.29 psi	13.29 psi	13.29 psi	43.68 psi	0.30	OK
+1.20D+0.50L	7.73 psi	7.73 psi	7.73 psi	43.68 psi	0.18	OK
+1.20D	5.87 psi	5.87 psi	5.87 psi	43.68 psi	0.13	OK
+1.20D+0.50L+1.60S	12.46 psi	12.46 psi	12.46 psi	43.68 psi	0.29	OK
+1.20D+1.60S	10.61 psi	10.61 psi	10.61 psi	43.68 psi	0.24	OK
+1.20D+0.50L+0.50S	9.21 psi	9.21 psi	9.21 psi	43.68 psi	0.21	OK
+1.20D+0.50L+0.70S	9.80 psi	9.80 psi	9.80 psi	43.68 psi	0.22	OK
+0.90D	4.40 psi	4.40 psi	4.40 psi	43.68 psi	0.10	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	6.85 psi	6.85 psi	6.85 psi	43.68 psi	0.16	OK
+1.20D+1.60L	11.81 psi	11.81 psi	11.81 psi	43.68 psi	0.27	OK
+1.20D+1.60L+0.50S	13.29 psi	13.29 psi	13.29 psi	43.68 psi	0.30	OK
+1.20D+0.50L	7.73 psi	7.73 psi	7.73 psi	43.68 psi	0.18	OK
+1.20D	5.87 psi	5.87 psi	5.87 psi	43.68 psi	0.13	OK
+1.20D+0.50L+1.60S	12.46 psi	12.46 psi	12.46 psi	43.68 psi	0.29	OK
+1.20D+1.60S	10.61 psi	10.61 psi	10.61 psi	43.68 psi	0.24	OK
+1.20D+0.50L+0.50S	9.21 psi	9.21 psi	9.21 psi	43.68 psi	0.21	OK
+1.20D+0.50L+0.70S	9.80 psi	9.80 psi	9.80 psi	43.68 psi	0.22	OK
+0.90D	4.40 psi	4.40 psi	4.40 psi	43.68 psi	0.10	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	25.68 psi	150.00psi	0.1712	OK
+1.20D+1.60L	44.27 psi	150.00psi	0.2952	OK
+1.20D+1.60L+0.50S	49.83 psi	150.00psi	0.3322	OK
+1.20D+0.50L	28.97 psi	150.00psi	0.1931	OK
+1.20D	22.01 psi	150.00psi	0.1467	OK
+1.20D+0.50L+1.60S	46.74 psi	150.00psi	0.3116	OK
+1.20D+1.60S	39.78 psi	150.00psi	0.2652	OK

All units k

General Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: FTG1 - Footing at Garage Slab

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+0.50L+0.50S	34.52 psi	150.00 psi	0.2301	OK
+1.20D+0.50L+0.70S	36.74 psi	150.00 psi	0.245	OK
+0.90D	16.51 psi	150.00 psi	0.1101	OK

General Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

FACET

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DESCRIPTION: FTG2

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Material Properties

f'_c : Concrete 28 day strength	=	2.50 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	Yes
Soil Passive Resistance (for Sliding)	=	150.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

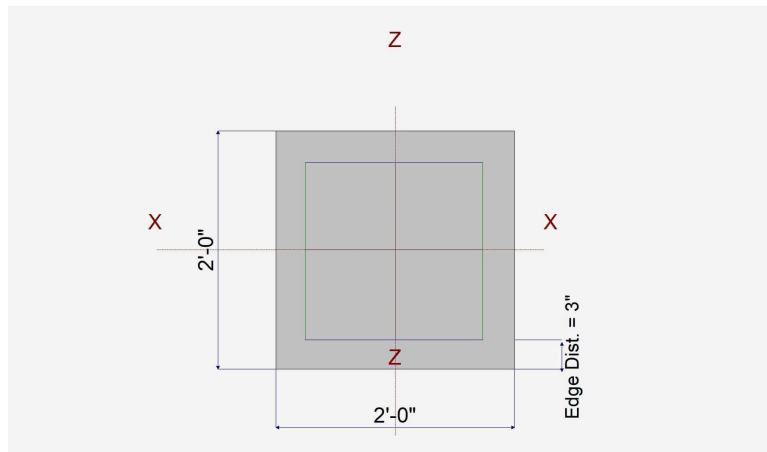
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
---	---	-----------

Dimensions

Width parallel to X-X Axis	=	2.0 ft
Length parallel to Z-Z Axis	=	2.0 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in



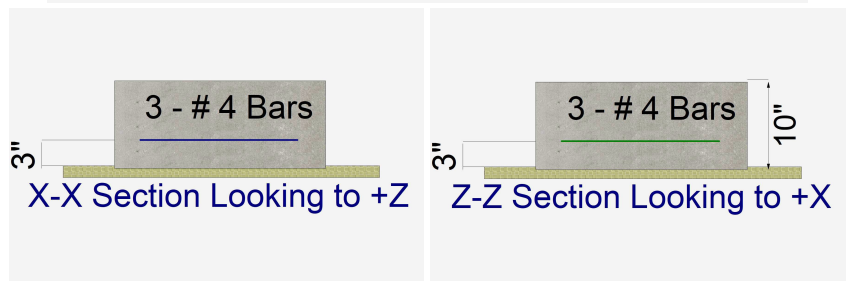
Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	3
Reinforcing Bar Size	=	# 4

Bars parallel to Z-Z Axis	=	
Number of Bars	=	3
Reinforcing Bar Size	=	# 4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation		n/a
# Bars required within zone		n/a
# Bars required on each side of zone		n/a



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	1.050		0.0	1.229		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: FTG2

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4261	Soil Bearing	0.6906 ksf	1.621 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.04494	Z Flexure (+X)	0.4033 k-ft/ft	8.974 k-ft/ft	+1.20D+1.60S
PASS	0.04494	Z Flexure (-X)	0.4033 k-ft/ft	8.974 k-ft/ft	+1.20D+1.60S
PASS	0.04494	X Flexure (+Z)	0.4033 k-ft/ft	8.974 k-ft/ft	+1.20D+1.60S
PASS	0.04494	X Flexure (-Z)	0.4033 k-ft/ft	8.974 k-ft/ft	+1.20D+1.60S
PASS	0.08795	1-way Shear (+X)	4.033 psi	45.857 psi	+1.20D+1.60S
PASS	0.08795	1-way Shear (-X)	4.033 psi	45.857 psi	+1.20D+1.60S
PASS	0.08795	1-way Shear (+Z)	4.033 psi	45.857 psi	+1.20D+1.60S
PASS	0.08795	1-way Shear (-Z)	4.033 psi	45.857 psi	+1.20D+1.60S
PASS	0.09987	2-way Punching	14.980 psi	150.0 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.621	n/a	0.0			0.3833	0.3833	n/a	n/a	0.237
X-X, +D+S	1.621	n/a	0.0			0.6906	0.6906	n/a	n/a	0.426
X-X, +D+0.750S	1.621	n/a	0.0			0.6138	0.6138	n/a	n/a	0.379
X-X, +0.60D	1.621	n/a	0.0			0.230	0.230	n/a	n/a	0.142
Z-Z, D Only	1.621	0.0	n/a			n/a	n/a	0.3833	0.3833	0.237
Z-Z, +D+S	1.621	0.0	n/a			n/a	n/a	0.6906	0.6906	0.426
Z-Z, +D+0.750S	1.621	0.0	n/a			n/a	n/a	0.6138	0.6138	0.379
Z-Z, +0.60D	1.621	0.0	n/a			n/a	n/a	0.230	0.230	0.142

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.1838	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.40D	0.1838	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D	0.1575	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D	0.1575	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+0.50S	0.2343	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+0.50S	0.2343	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+1.60S	0.4033	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+1.60S	0.4033	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+0.70S	0.2650	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +1.20D+0.70S	0.2650	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +0.90D	0.1181	+Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
X-X, +0.90D	0.1181	-Z	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.40D	0.1838	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.40D	0.1838	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D	0.1575	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D	0.1575	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D+0.50S	0.2343	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK

General Footing

Project File: Florence Family Addition.ec6

LIC# : KW-06012482, Build:20.24.03.04

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DESCRIPTION: FTG2**Footing Flexure**

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in ²	Gvrn. As in ²	Actual As in ²	Phi*Mn k-ft	Status
Z-Z, +1.20D+0.50S	0.2343	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D+1.60S	0.4033	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D+1.60S	0.4033	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D+0.70S	0.2650	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +1.20D+0.70S	0.2650	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +0.90D	0.1181	-X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK
Z-Z, +0.90D	0.1181	+X	Bottom	0.2160	ACI 7.6.1.1	0.30	8.974	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	1.84 psi	1.84 psi	1.84 psi	45.86 psi	0.04	OK
+1.20D	1.58 psi	1.58 psi	1.58 psi	45.86 psi	0.03	OK
+1.20D+0.50S	2.34 psi	2.34 psi	2.34 psi	45.86 psi	0.05	OK
+1.20D+1.60S	4.03 psi	4.03 psi	4.03 psi	45.86 psi	0.09	OK
+1.20D+0.70S	2.65 psi	2.65 psi	2.65 psi	45.86 psi	0.06	OK
+0.90D	1.18 psi	1.18 psi	1.18 psi	45.86 psi	0.03	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	1.84 psi	1.84 psi	1.84 psi	45.86 psi	0.04	OK
+1.20D	1.58 psi	1.58 psi	1.58 psi	45.86 psi	0.03	OK
+1.20D+0.50S	2.34 psi	2.34 psi	2.34 psi	45.86 psi	0.05	OK
+1.20D+1.60S	4.03 psi	4.03 psi	4.03 psi	45.86 psi	0.09	OK
+1.20D+0.70S	2.65 psi	2.65 psi	2.65 psi	45.86 psi	0.06	OK
+0.90D	1.18 psi	1.18 psi	1.18 psi	45.86 psi	0.03	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	6.83 psi	150.00 psi	0.0455	OK
+1.20D	5.85 psi	150.00 psi	0.039	OK
+1.20D+0.50S	8.70 psi	150.00 psi	0.05802	OK
+1.20D+1.60S	14.98 psi	150.00 psi	0.09987	OK
+1.20D+0.70S	9.84 psi	150.00 psi	0.06563	OK
+0.90D	4.39 psi	150.00 psi	0.02925	OK



STRUCTURAL CALCULATIONS

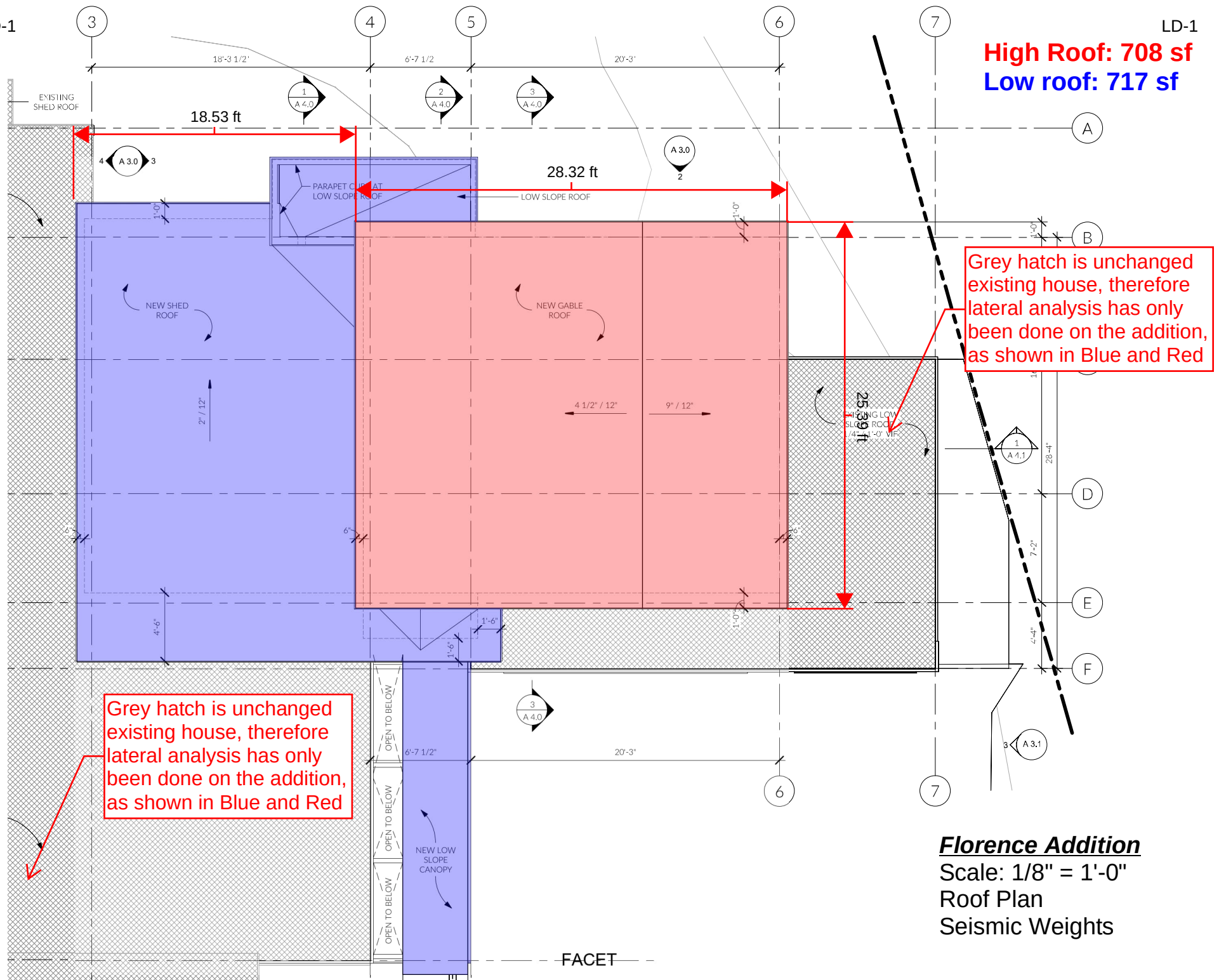
LATERAL DESIGN

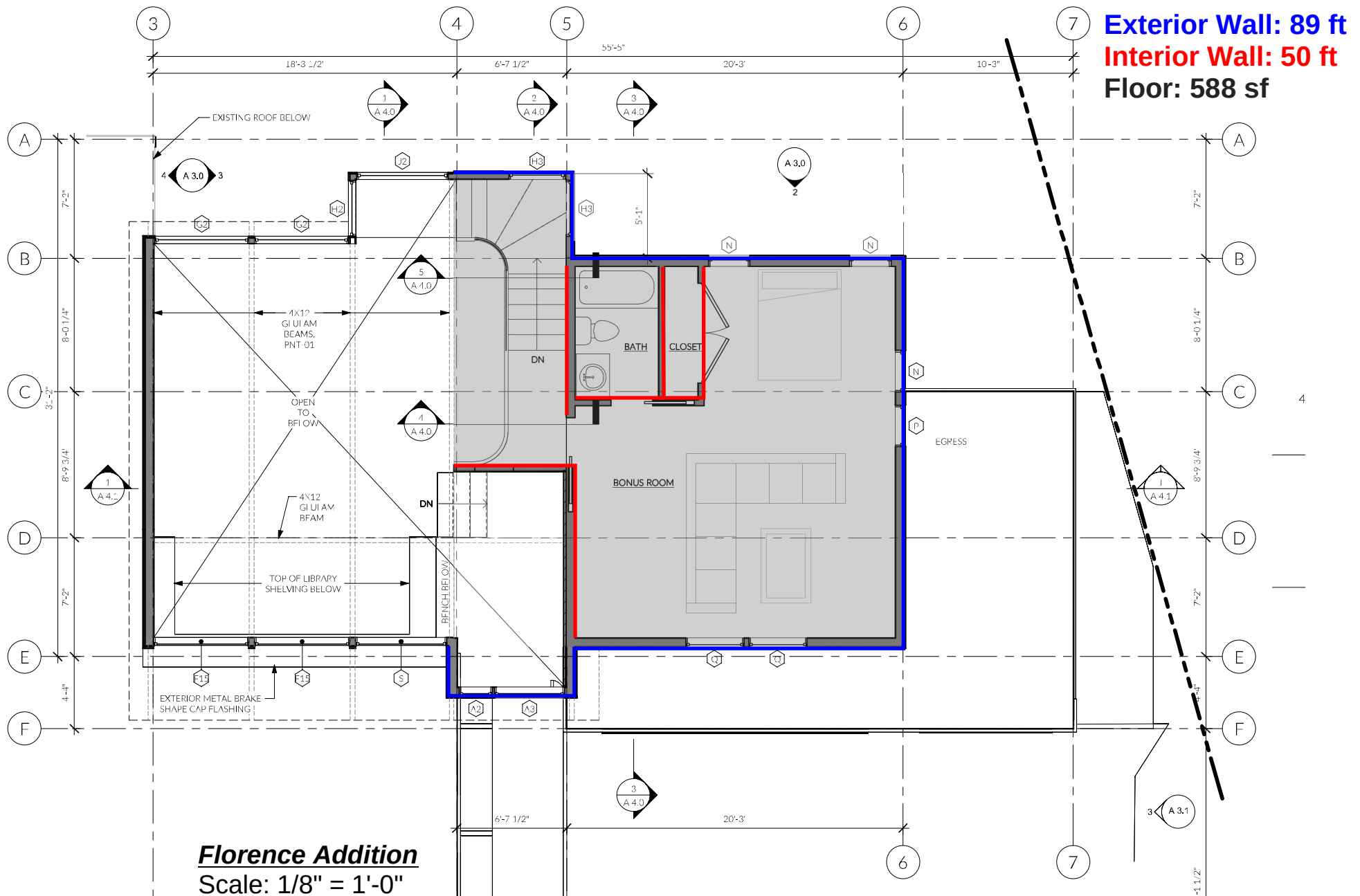
FLORENCE ADDITION
MERCER ISLAND, WA

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LD-1

LD-1





Florence Addition

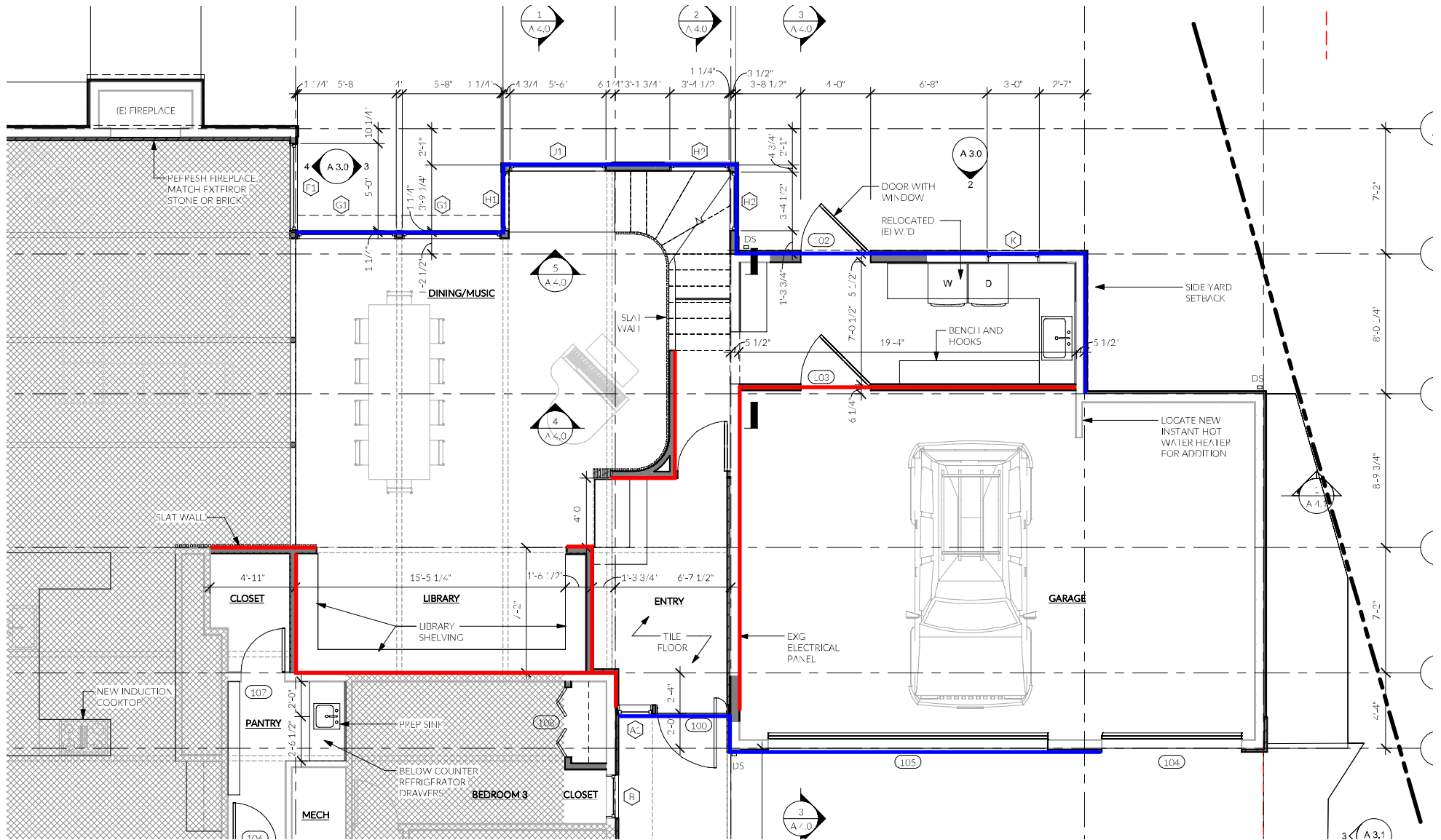
Scale: 1/8" = 1'-0"

Upper Floor

Seismic Weights

FACET

Florence Addition
Scale: 1/8" = 1'-0"
Floor Plan
Seismic Weights



FACET



Project: **Florence Residence**
Description: **Wind Base Shear**

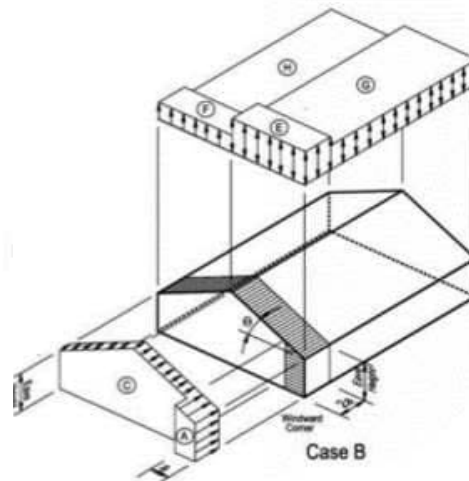
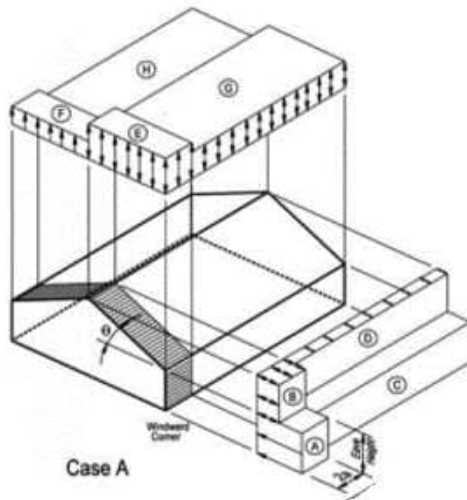
Assmptions:

Enclosed structure with simple diaphragm low-rised with flat, gable c Reference from ASCE 7-16

Site Data Residence

Risk Category	$I_w =$	II	Table 1.5-1
Basic Wind Speed	$V =$	100 mph	Figs 26.5-1 or 26.5-2
Exposure Category		B	Section 26.7
Topographic Factor	$K_{zt} =$	1.00	Section 26.8
Mean roof height	$h =$	20.00 ft	
Floor Depth	$J =$	11.88 in	
Adjustment Factor for Height & Exposure	$\lambda =$	1.00	Figure 28.5-1
Front/Back Dimension	$B =$	28.75	
Front/Back Roof Pitch:	4.5 :12	$\Theta_B = 20.56^\circ$	Hip
Side/Side Dimension	$L =$	24.50	
End Zone Width	$a_B =$	6.00	
Side/Side Roof Pitch:	4.5 :12	$\Theta_L = 20.56^\circ$	Hip
End Zone Width	$a_L =$	6.00	

Design wind pressure are determine from the following equation and Figure 28.5-1



ASCE 7-16 F28.5-1 for $V = 100$ mph

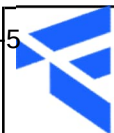
Roof Angle	Load Case	A	B	C	D
5	1	15.9	-8.2	10.5	-4.9
10	1	17.9	-7.4	11.9	-4.3
15	1	19.9	-6.6	13.3	-3.8
20	1	22.0	-5.8	14.6	-3.2
25	1	19.9	3.2	14.4	3.3
30	1	17.8	12.2	14.2	9.8
45	1	17.8	12.2	14.2	9.8
25	2	--	--	--	--
30	2	17.8	12.2	14.2	9.8
45	2	17.8	12.2	14.2	9.8

Design Wind Presures, p_s

$$p_s = \lambda K_{zt} p_{s30}$$

		HORIZONTAL LOAD (LRFD, psf)			
Direction	Roof Angle	End zone		Interior zone	
		Wall A	Roof B	Wall C	Roof D
F/B	20.56	19.90	3.20	14.40	3.30
S/S	20.56	19.90	3.20	14.40	3.30

HORIZONTAL WIND FORCES:



Project: Florence Residence

Description: Wind Base Shear

Front/Back Direction:

Location	Width	Height	Plane	End Zone	End Zone		Int Zone	Int Zone		LRFD Force	ASD Force	MIN Force	Force Used
	feet	feet		length	A	B		C	D	kips	kips	kips	kips
ROOF Top Roof to Eave Eave to Midwall	28.3	1.00	roof	6.00	19.90	3.20	22.3	14.40	3.30	0.09	0.06	0.14	
	28.3	4.00	wall	6.00	19.90	0.00	22.3	14.40	0.00	1.76	1.06	1.09	
									$\Sigma =$	1.85	1.11	1.22	1.22
2nd Flr Mid to Floor Low Roof to Plate Floor to Mid	28.3	4.00	wall	6.0	19.90	0.00	22.3	14.40	0.00	1.76	1.06	1.09	
	18.5	6.55	Parapet	6.0	19.90	0.00	12.5	14.40	0.00	1.96	1.18	1.16	
	28.3	6.55	wall	6.0	19.90	0.00	22.3	14.40	0.00	2.89	1.73	1.78	
									$\Sigma =$	6.61	3.97	4.03	4.03

Total Wind Base Shear (ASD, kips), $V_{Side} = 5.25$

Side/Side Direction:

Location	Width	Height	Plane	End Zone	End Zone		Int Zone	Int Zone		LRFD Force	ASD Force	MIN Force	Force Used
	feet	feet		length	A	B		C	D	kips	kips	kips	kips
ROOF Top Roof to Eave Eave to Midwall	25.5	1.00	roof	6.0	19.90	3.20	19.5	14.40	3.30	0.08	0.05	0.12	
	25.5	4.00	wall	6.0	19.90	0.00	19.5	14.40	0.00	1.60	0.96	0.98	
									$\Sigma =$	1.68	1.01	1.10	1.10
2nd Flr Mid to Floor Low Roof to Plate Floor to Mid	25.5	4.00	wall	6.0	19.90	0.00	19.5	14.40	0.00	1.60	0.96	0.98	
	0.0	0.00	Hip	0.0	19.90	3.20	0.0	14.40	3.30	0.00	0.00	0.00	
	25.5	6.55	wall	6.0	19.90	0.00	19.5	14.40	0.00	2.62	1.57	1.60	
									$\Sigma =$	4.22	2.53	2.58	2.58

Total Wind Base Shear (ASD, kips), $V_{Side} = 3.68$



FACET

Date: 6/5/2024

By: NKP

Project: Florence Residence

Description: Seismic Weights

DEAD LOAD WEIGHTS FOR SEISMIC CALCULATIONS:

Unit Roof Weight: 15 psf

Unit Floor Weight: 15 psf

Unit Exterior Wall Wt: 10 psf

Unit Interior Wall Wt: 7 psf

		AREA / LENGTH sf / ft	HEIGHT ft	UNIT WT. psf		Total Wt. (lbs)	Sub-Total (kips)
ROOF LEVEL:	Roof	708	1	15	=	10620	
	Ext. Wall Below	89	4	10	=	3560	
	Int. Wall Below	50	4	7	=	1400	
							15.6 Kips
2nd FLOOR LEVEL:	Floor	588	1	15	=	8820	
	Low Roof	717	1	15	=	10755	
	Ext. Wall Above	89	4	10	=	3560	
	Int. Wall Above	50	4	7	=	1400	
	Ext. Wall Below	92	5.5	10	=	5060	
	Int. Wall Below	91	5.5	7	=	3504	
							33.1 Kips
Ground Level:	Ext. Wall Above	92	5.5	10	=	5060	
	Int. Wall Above	91	5.5	7	=	3504	
							8.6 Kips
STRUCTURE WEIGHT FOR SEISMIC BASE SHEAR:							48.7 Kips
TOTAL WEIGHT OF STRUCTURE:							57.2 Kips



FACET

Date: 6/5/2024

By: NKP

Project: Florence Residence

Description: Seismic Weights

ASCE 7-16

Seismic Use Group = **II** From Table 1.5-1
 Site Classification = **D**
 Geotech Report Provided = **No**

Refer to attached sheet for Map specified variables

$S_S = 1.457$ $F_a = 1.200$ (Table 11.4-1)
 $S_1 = 0.505$ $F_v = 1.795$ (Table 11.4-1)
 $S_{DS} = 1.166 = 0.67 \cdot F_a \cdot S_S$ (11.4-1 & 11.4-3)
 $S_{D1} = 0.604 = 0.67 \cdot F_v \cdot S_1$ (11.4-2 & 11.4-4)
 Building Height, $h_n = 20.1$ ft
 Building Period Coefficients, $C_T = 0.020$ $\alpha = 0.750$ per Table 12.8-2
 Approx. Fundamental Period, $T = 0.190 = C_T \cdot (h_n)^{0.75}$ (12.8-7)
 Response Spectrum, $S_a = 1.1656$ (11.4-5 & 11.4-6)
 Response Modification Factor, $R = 6.5$
 Occupancy Importance Factor, $I = 1.0$ per Table 1.5-2
 Seismic Design Category = **D** -11.6
 Redundancy Factor, $\rho =$ Calculation Required
 Calculated Redundancy Factor, $\rho = 1.0$

Seismic Response Coefficient

$C_s = S_{DS}/R/I = 0.179$ (12.8-2)
 $C_{s, MAX} = S_{D1}/T(R/I) = 0.489$ (12.8-3)
 $C_{s, MIN} = 0.044 S_{DS} \cdot I = 0.051$ (12.8-5)

$C_s = 0.179$

Seismic Base Shear

Seismic Base Shear, $V = 0.179 W$ (12.8-1)
 $W = 48.679$ kips
 $V = 8.73$ kips
 $V_{final} = 0.7 \rho V = 6.11$ kips

Vertical Distribution of Seismic Forces

12.8.3

$k = 1$

Floor	Story Height H (ft)	Total Height h_x (ft)	Story Weight w_x (kips)	$w_x h_x^k$ (k-ft)	Story Force F_i (kips)	Story Shear V (kips)
Roof	8.00	19.00	15.6	296.0	2.74	2.74
Second	11.00	11.00	33.1	364.1	3.37	6.11
Base	0.00	0.00	8.6	0.0	0.00	6.11

Sum = 660.1



FACET

Project: **Florence Residence**
Description: **Seismic Weights**

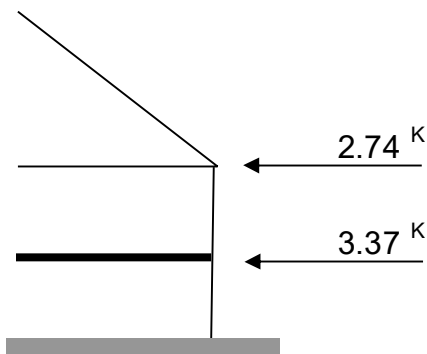
Date: 6/5/2024

By: NKP

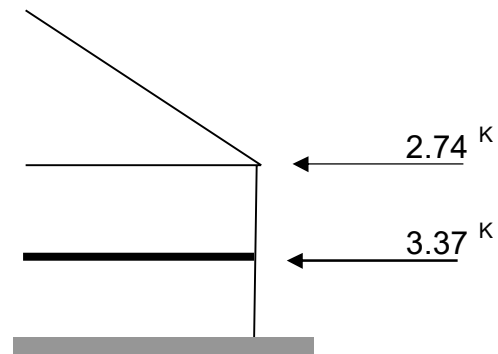
Level	Wind Front/Back (kips)	Wind Side (kips)	Seismic (kips)
Roof	1.22	1.10	2.74
Second	4.03	2.58	3.37
Total	5.25	3.68	6.11

Controlling:

Front/Back - Seismic
Side - Seismic



Front/Back Direction



Side/Side Direction

Lateral analysis has only been done on the house addition because all existing walls and elements of the original existing structure remain unchanged. No existing shearwalls are being altered outside the new renovation scope.



FACET

Date: 6/5/24
Designed By: NKP

Project: Florence Addition
Description: Shear Wall Sheathing

AWC SDPWS 2015 Table 4.3A (Seismic)

Panel Grade	Nominal Thickness	Minimum Penetration	Common or Galv. Box Nail Size	Nail Spacing at Panel Edges			
				6" o.c.	4" o.c.	3" o.c.	2" o.c.
Wood Structural Panels - Sheathing	5/16	1 1/4	6d	360	540	700	900
	3/8			440	640	820	1060
	7/16	1 3/8	8d	480	700	900	1170
	15/32			520	760	980	1280
	15/32	1 1/2	10d	620	920	1200	1540
	19/32			680	1020	1330	1740

Stud Species: HF Sheathing Thickness: 7/16
Specific Gravity: 0.43 Shear Wall Nailing: 8d
Design Method ASD, Ω $1-(0.5-SG)/\Omega = 0.47$
Factor: 2.00

AWC SDPWS 2015 Table 4.3A (Seismic) Adjusted for Grade and Design Method

Panel Grade	Nominal Thickness	Minimum Penetration	Common or Galv. Box Nail Size	Nail Spacing at Panel Edges			
				6" o.c.	4" o.c.	3" o.c.	2" o.c.
Wood Structural Panels - Sheathing	5/16	1 1/4	6d	167	251	326	419
	3/8			205	298	381	493
	7/16	1 3/8	8d	223	326	419	544
	15/32			242	353	456	595
	15/32	1 1/2	10d	288	428	558	716
	19/32			316	474	618	809

Notes:

- 1) Unit shear capacity from SDPWS 2021 Table 4.3A are adjusted for design method.
- 2) Allowable shear values in framing members other than Douglas fir-larch shall be calculated by multiplying the shear capacities for nails in DF by $1-(0.5-SG)$.
- 3) Values for 3/8 and 7/16 ply may be increased to the values allowed for 15/32, if framing is spaced maximum of 16" o.c. or panels are applied long way across the studs.
- 4) Shaded values require 3x framing or Dbl 2x at all abutting panel edges.

Shear Wall Sheathing Used in Design

Panel Grade	Nominal Thickness	Minimum Penetration	Common or Galv. Box Nail Size	Nail Spacing at Panel Edges			
				8d at 6" o.c.	8d at 4" o.c.	8d at 3" o.c.	8d at 2" o.c.
Panel Sheathing	7/16	1 3/8	8d	242	353	456	595

 FACET Project: Florence Addition Description: Shear Wall Plate Connections	Date: 6/5/24
	Designed By: NKP

Species = HF

Note: For SDS into narrow face of 1 1/4" LVL Rim use HF values for a DF plate

Base Plate = 2x Plate

Base Plate Thickness = 1 1/2 in

Sheathing Thickness = 3/4 in

Base plate nailing

$$Z' = Z C_D C_M C_t$$

Applicability of Adjustment Factor for Connections per NDS Table 11.3.1

Duration Factor, C_D = 1.60 Wind or SeismicWet Service Factor, C_M = 1.00 Moisture content < 19%Temperature Factor, C_t = 1.00 Temperatures < 150 °FTotal Adjustment Factor, Z' = 1.60**Top plate/Rim connection**

Hardware	Fasteners	Allowable Loads (lbs)						
		Each	24" o.c.	16" o.c.	12" o.c.	8" o.c.	12" o.c. ea. face	8" o.c. ea. Face
Simpson A35	(12) 8dx 1-1/2"	560	280	420	560	840	1120	1680
Simpson LTP4	(12) 8dx 1-1/2"	540	270	405	540	810	1080	1620

1) Values are based on Simpson C-C-2019 Catalog.

2) All capacities include adjustment for wind and seismic forces.

Base plate/Rim nailing - Single Shear Connection

Fasteners	Diameter (in)	Length (in)	Embed (in)	Adjustment	Table Values	1 1/2 -in plate and 3/4 -in Flr Sheathing (lbs)				
						Per Nail	6" o.c.	4" o.c.	3" o.c.	2" o.c.
16d Box Nails	0.135	3.5	1.25	1.48	89	132	264	396	527	791
16d Sinker	0.148	3.25	1.00	1.08	102	110	221	331	441	662
16d Commons	0.162	3.5	1.25	1.23	122	151	301	452	602	904

Fasteners	Diameter (in)	Length (in)	Embed (in)	Adjustment	Table Values	1 -in plate and 3/4 -in Flr Sheathing (lbs)				
						Per Nail	16" o.c.	8" o.c.	6" o.c.	4" o.c.
1/4"Øx4-1/2" SDS	0.25	4.5	2.25	1.44	190	274	205	410	547	821
1/4"Øx5" SDS	0.25	5	2.75	1.60	190	304	228	456	608	912
1/4"Øx6" SDS	0.25	6	3.75	1.60	190	304	228	456	608	912

1) Single shear values for 16d are based on NDS-2018 Table 12N.

2) Values have been reduced for penetration reduction per Table 12N footnote 3.

3) SDS values are based on values in Simpson C-F-2019TECHSUP catalog, page 79.

4) All values have been multiplied by adjustment factor indicated above.

Anchor Bolts - Single Shear Connection

Fasteners	Diameter (in)	Adjustment Factor	Table Values (lbs)	1 1/2 -in plate and 3/4 -in Flr Sheathing (lbs)					
				Per Bolt	48" o.c.	32" o.c.	24" o.c.	16" o.c.	8" o.c.
1/2"Ø Anchor Bolts	0.5	1.60	590	944	236	354	472	708	1416
5/8"Ø Anchor Bolts	0.625	1.60	860	1376	344	516	688	1032	2064
3/4"Ø Anchor Bolts	0.75	1.60	1200	1920	480	720	960	1440	2880
Simpson MASAP	---	---	1060	1060	265	398	530	795	1590

1) Single shear values for anchor bolts are based on NDS-2018 Table 12E.

2) Bolt bending yield strength, F_{yb} = 45,000 psi.3) Dowel bearing strength, F_c = 7,500 psi.4) Concrete compressive strength, f'_c = 2,500 psi.

5) All values have been multiplied by adjustment factor indicated above.

6) Standard installing for MASAP is assumed. Refer to Simpson catalog C-C-2019, page 29 for additional information.

	FACET	Date: 6/5/24
		Designed By: NKP
Project: Florence Addition Description: Holdown and Straps		

Floor to Floor Holdowns

Model	Post		Anchor			Allowable Load
	Min. Dim (IN)	Fasteners	Diameter	Centerline	Embedment	
MST37	3.00	(6) 1/4"Øx2 1/2 SDS	0.625	1.313	8	2,355
MST48	3.00	(10) 1/4"Øx2 1/2 SDS	0.625	1.313	8	3,640
MST60	3.00	(14) 1/4"Øx2 1/2 SDS	0.625	1.313	9	5,405
HDU11	5.50	(30) 1/4"Øx2 1/2 SDS	1.000	1.375	12	8,030

- 1) Refer to Simpson catalog C-C-2019, page 264 for additional information.
- 2) All loads have been adjusted for wind and seismic load duration ($C_D = 1.6$).
- 3) Holdowns straps to clear span floor diaphragm (16" max).

Shear Wall to Foundation Holdowns

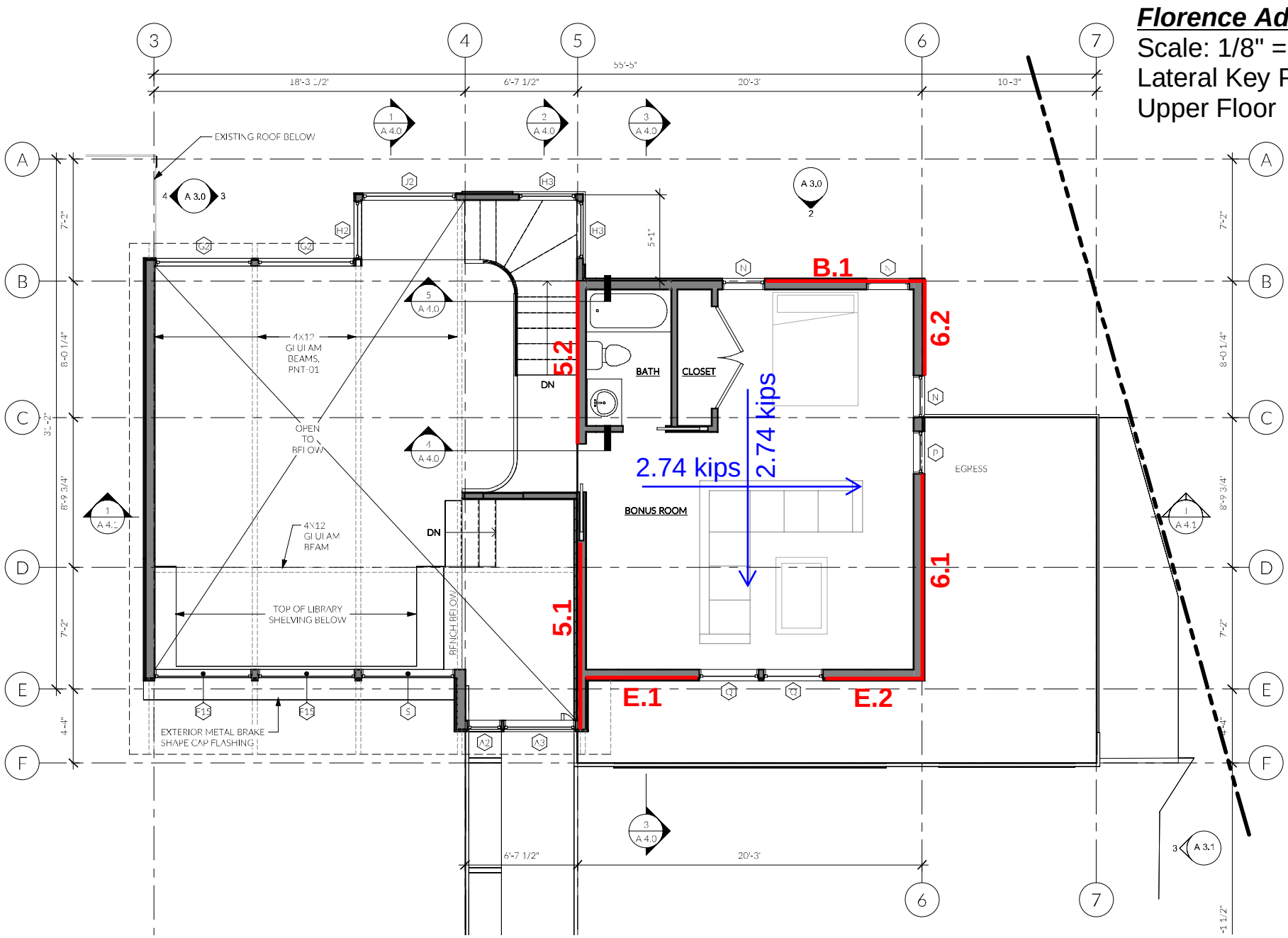
Model	Post		Anchor			Allowable Load
	Min. Dim	Fasteners	Diameter	Centerline	Embedment	
HDU2	3.00	(6) 1/4"Øx2 1/2 SDS	0.625	1.313	8	2,215
HDU4	3.00	(10) 1/4"Øx2 1/2 SDS	0.625	1.313	8	3,285
HDU5	3.00	(14) 1/4"Øx2 1/2 SDS	0.625	1.313	9	4,340
HDU8	3.00	(20) 1/4"Øx2 1/2 SDS	0.875	1.375	10	5,820
HDU11	5.50	(30) 1/4"Øx2 1/2 SDS	1.000	1.375	12	8,030

- 1) Refer to Simpson catalog C-C-2019, page 53 for additional information.
- 2) All loads have been adjusted for wind and seismic load duration ($C_D = 1.6$).
- 3) See attached calculations for anchor bolt embedment length.
- 4) Holdowns may be installed with up to 18" above the top of concrete with no load reduction.

Strap Around Openings

Model	Required Fasteners ea. side of opening	Minimum Length (in)	Allowable Load
CS16	(22) 10d	16	1,705
CMSTC16	(58) 16d	27	4,690
CMST14	(66) 16d	36	6,475

- 1) Refer to Simpson catalog C-C-2019, page 267 for additional information.
- 2) All loads have been adjusted for wind and seismic load duration ($C_D = 1.6$).
- 3) See attached calculations for anchor bolt embedment length.
- 4) Holdowns may be installed with up to 18" above the top of concrete with no load reduction.
- 5) Use half of the required nails in each member being connected.



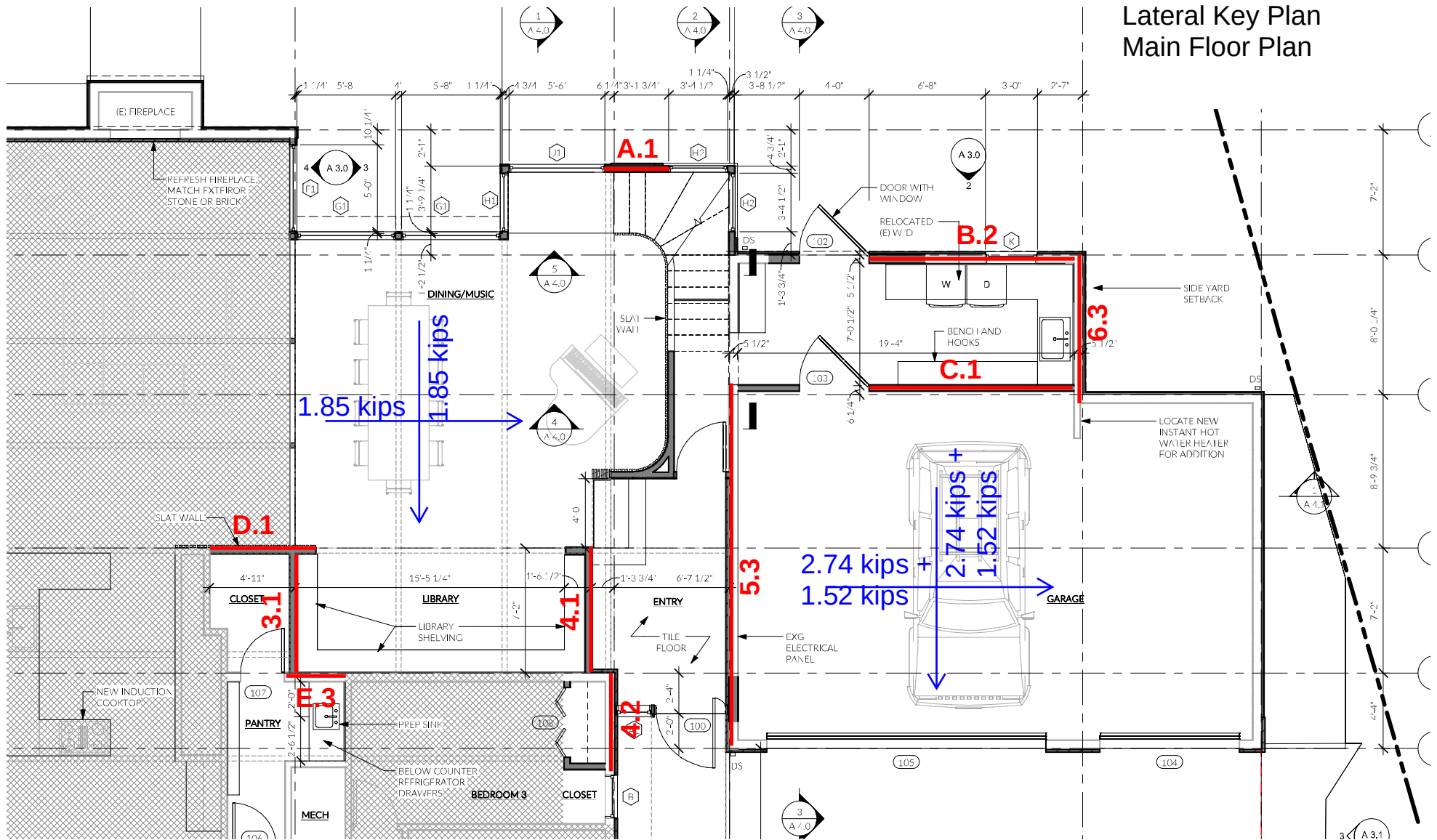
Florence Addition
Scale: 1/8" = 1'-0"
Lateral Key Plan
Upper Floor

FACET

Note: Analysis is only done at the addition, all existing walls to remain as is.

Florence Addition

Scale: 1/8" = 1'-0"

Lateral Key Plan
Main Floor Plan

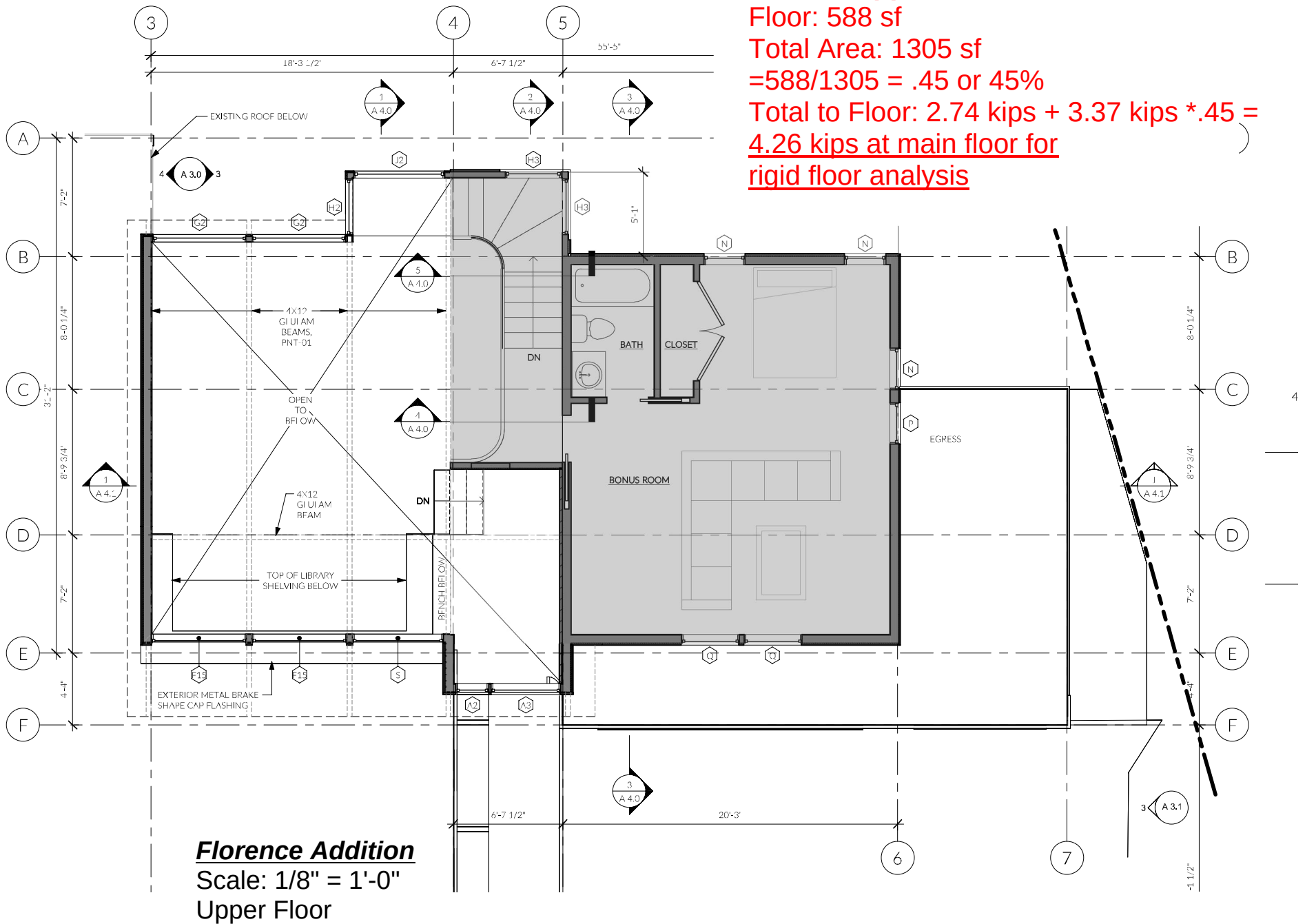
FACET

Note: Analysis is only done at the addition, all existing walls to remain as is.

Load to Upper Floor

Floor: 588 sf

Total Area: 1305 sf

 $= 588 / 1305 = .45$ or 45%**Total to Floor: 2.74 kips + 3.37 kips * .45 = 4.26 kips at main floor for rigid floor analysis**



Project:

Two Story Garage at Btm Floor

Description:

Rigid Diaphragm Distribution

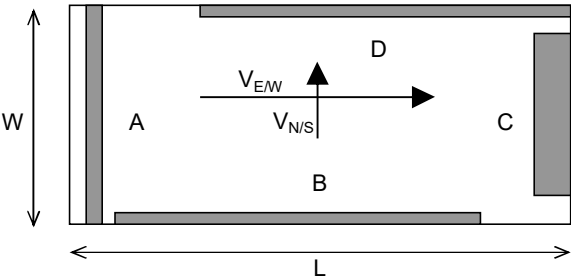
Date:

6/5/2024

Made By:

NKP

Assumptions:
*Design based on a solid, rectangular, rigid diaphragm



Diaphragm Width, W = 35.00 ft

Diaphragm Legth, L = 45.50 ft

Laterateral Force on Diaphragm (N/S) = 4.26 kips (Second Story plus a portion of main

Laterateral Force on Diaphragm (E/W) = 4.26 kips (Second Story plus a portion of main

Shear Wall Side A				Shear Wall Side B			
Length (ft)		Stiffness	D off Edge	Length (ft)		Stiffness	D off Edge
Shear Wall Side C				Shear Wall Side D			
Length (ft)		Stiffness	D off Edge	Length (ft)		Stiffness	D off Edge
5.3	21.00	1	19.00	B.2	9.75	1	5.00
6.3	10.25	1	0.00	C.1	11.75	1	12.00

Maximum Distributed Shear in Each Wall					
Based on Code Added 5% Eccentricity in Each Direction					
	Kips	Load Case		Kips	Load Case
0	0.00	1	5.3	2.11	3
0	0.00	1	6.3	3.88	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	B.2	2.53	3
0	0.00	1	C.1	1.93	4
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1

Case 1 - Ecc. in East Direction

Case 2 - Ecc. in West Direction

Case 3 - Ecc. in North Direction

Case 4 - Ecc. in South Direction



Project:

Low Roof

Description:

Rigid Diaphragm Distribution

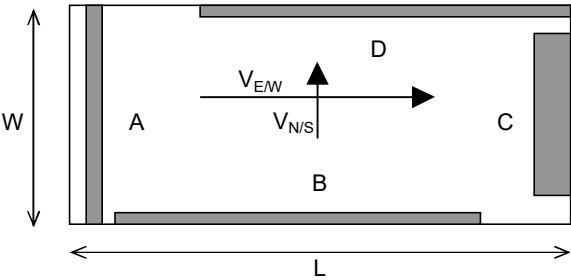
Date:

6/5/2024

Made By:

NKP

Assumptions:
*Design based on a solid, rectangular, rigid diaphragm



Diaphragm Width, W = 35.00 ft

Diaphragm Legth, L = 45.50 ft

Laterateral Force on Diaphragm (N/S) = 1.85 kips (Portion of Main Floor)

Laterateral Force on Diaphragm (E/W) = 1.85 kips (Portion of Main Floor)

Shear Wall Side A				Shear Wall Side B			
	Length (ft)	Stiffness	D off Edge		Length (ft)	Stiffness	D off Edge
3.1	7.0	1	0.00	D.1	6.00	1	11.50
4.1	7.0	1	17.00	E.3	3.50	1	4.00
4.2	5.5	1	18.00				
Shear Wall Side C				Shear Wall Side D			
	Length (ft)	Stiffness	D off Edge		Length (ft)	Stiffness	D off Edge
				A.1	3.75	1	0.00

Maximum Distributed Shear in Each Wall					
Based on Code Added 5% Eccentricity in Each Direction					
	Kips	Load Case		Kips	Load Case
3.1	1.26	2	0	0.00	1
4.1	0.46	1	0	0.00	1
4.2	0.33	1	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1
D.1	0.89	4	A.1	0.54	2
E.3	0.56	4	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1
0	0.00	1	0	0.00	1

Case 1 - Ecc. in East Direction

Case 2 - Ecc. in West Direction

Case 3 - Ecc. in North Direction

Case 4 - Ecc. in South Direction



FACET

Date: 6/5/24
Design By: NKP

Project: Florence Addition
Description: Front-Back Shear Walls

Sheathing Thickness: 7/16 in

Shearwall Nailing: 8d

Base Plate Nails: 16d Commons

Top Plate Hardware: Simpson LTP4

Anchor Bolts: 5/8"Ø Anchor Bolts

S_{DS}: 1.166 Seismic Controls

Values for sheathing shear are based on studs at 16"o.c. and 15/32 sheathing.

2nd story

Front-Back

Input

Story shear(kips) = 2.74

Story height (ft) = 10.00

Total Area (sf) = 708.00

Story	Wall	Wall D (ft)	Wall Height (ft)	Opening Width (ft)	Opening Height (ft)	Opening to Edge (ft)	Plate to Opening (ft)	Trib.Area (sf)	% Sharing	Story V (kips)	Sum V (kips)	Roof Trib (ft)	DL (psf)	Floor Trib (ft)	DL (psf)	Wall DL (psf)	Story DL (klf)	Sum DL (klf)
2nd	5.1	8.00	10.00	0.00	0.00	0.00	0.00	354.00	0.46	0.63	0.63	4.00	15.00	0.00	15.00	10.00	0.16	0.16
2nd	5.2	9.50	10.00	0.00	0.00	0.00	0.00	354.00	0.54	0.74	0.74	4.00	15.00	0.00	15.00	10.00	0.16	0.16
2nd	6.1	11.00	10.00	0.00	0.00	0.00	0.00	354.00	0.67	0.91	0.91	4.00	15.00	0.00	15.00	10.00	0.16	0.16
2nd	6.2	5.50	10.00	0.00	0.00	0.00	0.00	354.00	0.33	0.46	0.46	4.00	15.00	0.00	15.00	10.00	0.16	0.16
Sum		1.00						1062.00		2.74	2.74							

1st story

Front-Back

Input

Story shear(kips) = 3.37

Story height (ft) = 11.00

Total Area (sf) = 1305.00

Commutative = 6.11

Commutative Rigid = 8.05

Story	Wall	Wall D (ft)	Wall Height (ft)	Opening Width (ft)	Opening Height (ft)	Opening to Edge (ft)	Plate to Opening (ft)	Trib.Area (sf)	% Sharing	Story V (kips)	Sum V (kips)	Roof Trib (ft)	DL (psf)	Floor Trib (ft)	DL (psf)	Wall DL (psf)	Story DL (klf)	Sum DL (klf)
1st	3.1	7.00	11.00	0.00	0.00	0.00	0.00			1.26	1.26	3.00	15.00	0.00	15.00	10.00	0.16	0.16
1st	4.1	7.00	11.00	0.00	0.00	0.00	0.00			0.46	0.46	3.00	15.00	0.00	15.00	10.00	0.16	0.16
1st	4.2	5.50	11.00	0.00	0.00	0.00	0.00			0.33	0.33	2.00	15.00	0.00	15.00	10.00	0.14	0.14
1st	5.3	21.00	9.50	0.00	0.00	0.00	0.00			2.11	2.11	0.00	15.00	10.00	15.00	10.00	0.25	0.41
1st	6.3	10.25	9.50	0.00	0.00	0.00	0.00			3.88	3.88	0.00	15.00	10.00	15.00	10.00	0.25	0.41
Sum		50.75								8.05	8.05							

Rigid Diaphragm



FACET

Date: 6/5/2024
Design By: NKP

Project: Florence Addition
Description: Front-Back Shear Walls

Sheathing Thickness: 7/16 in
Shearwall Nailing: 8d
Base Plate Nails: 16d Commons
Top Plate Hardware: Simpson LTP4
Anchor Bolts: 5/8"Ø Anchor Bolts
SDS: 1.166 Seismic Controls

2nd story

Front-Back
Output

Story	Wall	Aspect Ratio ¹		Panel Shear Factor ²	Panel Shear (plf) ³	Panel Edge Nailing	Plate Shear (plf) ⁴	Base Connection	BTM Plate Connection	Top Plate LTP4	Sum OTM (k-ft) ⁵	RM (k-ft) ⁶	Resultant HD (kips) ⁷	Holdown	Force at Window (kips)	Window Strap
2nd	5.1	1.25	0.00	1.00	78	8d at 6" o.c.	78	Nail	16d at 6" o.c.	at 24" o.c.	6.26	5.12	0.54	NA	NA	NA
2nd	5.2	1.05	0.00	1.00	78	8d at 6" o.c.	78	Nail	16d at 6" o.c.	at 24" o.c.	7.44	7.22	0.48	NA	NA	NA
2nd	6.1	0.91	0.00	1.00	83	8d at 6" o.c.	83	Nail	16d at 6" o.c.	at 24" o.c.	9.13	9.68	0.47	NA	NA	NA
2nd	6.2	1.82	0.00	1.00	83	8d at 6" o.c.	83	Nail	16d at 6" o.c.	at 24" o.c.	4.57	2.42	0.70	NA	NA	NA

1st story

Front-Back
Output

Max HDU at new 8" wall

Story	Wall	Aspect Ratio ¹		Panel Shear Factor ²	Panel Shear (plf) ³	Panel Edge Nailing	Plate Shear (plf) ⁴	Base Connection	BTM Plate Connection	Top Plate LTP4	Sum OTM (k-ft) ⁵	RM (k-ft) ⁶	Resultant HD (kips) ⁷	Holdown	Force at Window (kips)	Window Strap
1st	3.1	1.57	0.00	1.00	181	8d at 6" o.c.	181	A. Bolt	x w/AB at 48" o.	at 24" o.c.	13.91	3.80	1.88	HDU2	NA	NA
1st	4.1	1.57	0.00	1.00	65	8d at 6" o.c.	65	A. Bolt	x w/AB at 48" o.	at 24" o.c.	5.01	3.80	0.52	NA	NA	NA
1st	4.2	2.00	0.00	1.00	60	8d at 6" o.c.	60	A. Bolt	x w/AB at 48" o.	at 24" o.c.	3.62	2.12	0.54	NA	NA	NA
1st	5.3	0.45	0.00	1.00	101	8d at 6" o.c.	101	A. Bolt	x w/AB at 48" o.	at 24" o.c.	27.53	89.30	-0.56	NA	NA	NA
1st	6.3	0.93	0.00	1.00	379	8d at 3" o.c.	379	A. Bolt	x w/AB at 32" o.	at 16" o.c.	41.46	21.28	3.30	HDU5	NA	NA



Date:6/5/24

Design By:NKP

Project:Florence Addition

Description:Side-Side Shear Walls

Sheathing Thickness:7/16

Shearwall Nailing:8d

Base Plate Nails:16d Commons

Top Plate Hardware:Simpson LTP4

Anchor Bolts:5/8"Ø Anchor Bolts

S_{DS}:1.166Seismic Controls

Values for sheathing shear are based on studs at 16"o.c. and 15/32 sheathing.

2nd story

Side-Side

Input

Story shear(kips) =2.74

Story height (ft) =10.00

Total Area (sf) =708.00

Story	Wall	Wall D (ft)	Wall Height (ft)	Opening Width (ft)	Opening Height (ft)	Opening to Edge (ft)	Plate to Opening (ft)	Trib.Area (sf)	% Sharing	Story V (kips)	Sum V (kips)	Roof		Floor		Wall DL (psf)	Story DL (klf)	Sum DL (klf)
												Trib (ft)	DL (psf)	Trib (ft)	DL (psf)			
2nd	B.1	11.25	10.00	3.00	3.00	3.00	1.00	354.00	1.00	1.37	1.37	2.00	15.00	0.00	15.00	10.00	0.13	0.13
2nd	E.1	7.25	10.00	0.00	0.00	0.00	0.00	354.00	0.56	0.76	0.76	2.00	15.00	0.00	15.00	10.00	0.13	0.13
2nd	E.2	5.75	10.00	0.00	0.00	0.00	0.00	354.00	0.44	0.61	0.61	2.00	15.00	0.00	15.00	10.00	0.13	0.13
	Sum	24.25								2.74	2.74							



FACET

Project: Florence Addition
Description: Side-Side Shear Walls

Date: 6/5/2024
Design By: NKP

Sheathing Thickness:

7/16 in

Shearwall Nailing:

8d

Base Plate Nails:

16d Commons

Top Plate Hardware:

Simpson LTP4

Anchor Bolts:

5/8"Ø Anchor Bolts

SDS:

1.166 Seismic Controls

2nd story

Side-Side
Output

Story	Wall	Aspect Ratio ¹		Panel Shear Factor ²	Panel Shear (plf) ³	Panel Edge	Plate Shear (plf) ⁴	Base Connection	BTM Plate	Top Plate	Sum OTM (k-ft) ⁵	RM (k-ft) ⁶	Resultant HD (kips) ⁷	Holdown	Force at Window (kips)	Window Strap
		Wall	Pier			Nailing			Connection	LTP4						
2nd	B.1	1.00	1.00	1.00	166	8d at 6" o.c.	122	Nail	16d at 6" o.c.	at 24" o.c.	13.70	8.23	0.94	NA	1.25	CS16
2nd	E.1	1.38	0.00	1.00	105	8d at 6" o.c.	105	Nail	16d at 6" o.c.	at 24" o.c.	7.64	3.42	0.91	NA	NA	NA
2nd	E.2	1.74	0.00	1.00	105	8d at 6" o.c.	105	Nail	16d at 6" o.c.	at 24" o.c.	6.06	2.15	0.98	NA	NA	NA



Date:6/5/24

Design By:NKP

Project:Florence Addition

Description:Side-Side Shear Walls

Sheathing Thickness:7/16

Shearwall Nailing:8d

Values for sheathing shear are based on studs at 16"o.c. and 15/32 sheathing.

Base Plate Nails:16d Commons

Top Plate Hardware:Simpson LTP4

Anchor Bolts:5/8"Ø Anchor Bolts

S_{DS}:1.166Seismic Controls

1st story

Side-Side
Input

Story shear(kips) = 3.37

Story height (ft) = 11.00

Total Area (sf) = 1305.00

Commutative = 6.11

Commutative Rigid = 6.45

Story	Wall	Wall D (ft)	Wall Height (ft)	Opening Width (ft)	Opening Height (ft)	Opening to Edge (ft)	Plate to Opening (ft)	Trib.Area (sf)	% Sharing	Story V (kips)	Sum V (kips)	Roof		Floor		Wall DL (psf)	Story DL (klf)	Sum DL (klf)
												Trib (ft)	DL (psf)	Trib (ft)	DL (psf)			
1st	A.1	3.75	11.00	0.00	0.00	0.00	0.00			0.54	0.54	0.00	12.00	1.00	15.00	10.00	0.13	0.13
1st	B.2	9.75	9.75	3.00	3.00	2.50	1.00			2.53	2.53	0.00	12.00	1.33	15.00	10.00	0.12	0.25
1st	C.1	11.75	9.75	0.00	0.00	0.00	0.00			1.93	1.93	0.00	12.00	1.33	15.00	10.00	0.12	0.12
1st	D.1	6.00	11.00	0.00	0.00	0.00	0.00	Rigid Diaphragm		0.89	0.89	0.00	12.00	1.00	15.00	10.00	0.13	0.13
1st	E.3	3.75	11.00	0.00	0.00	0.00	0.00			0.56	0.56	0.00	12.00	1.00	15.00	10.00	0.13	0.13
	Sum	35.00								6.45	6.45							



FACET

Date: 6/5/2024
Design By: NKP

Project: Florence Addition
Description: Side-Side Shear Walls

Sheathing Thickness: 7/16 in
Shearwall Nailing: 8d
Base Plate Nails: 16d Commons
Top Plate Hardware: Simpson LTP4
Anchor Bolts: 5/8"Ø Anchor Bolts
SDS: 1.166 Seismic Controls

1st story

Side-Side
Output

Max HDU at existing
thickened slab

Story	Wall	Aspect Ratio ¹		Panel Shear Factor ²	Panel Shear (plf) ³	Panel Edge Nailing	Plate Shear (plf) ⁴	Base Connection	BTM Plate Connection	Top Plate LTP4	Sum OTM (k-ft) ⁵	RM (k-ft) ⁶	Resultant HD (kips) ⁷	Holdown	Force at Window (kips)	Window Strap
1st	A.1	2.93	0.00	1.13	163	8d at 6" o.c.	144	A. Bolt	2x w/AB at 48" o.c.	at 24" o.c.	5.95	0.88	1.71	HDU2	NA	NA
1st	B.2	1.20	1.20	1.00	375	8d at 3" o.c.	260	A. Bolt	2x w/AB at 48" o.c.	at 24" o.c.	38.41	11.76	3.60	HDU5	2.35	CMSTC16
1st	C.1	0.83	0.00	1.00	164	8d at 6" o.c.	164	A. Bolt	2x w/AB at 48" o.c.	at 24" o.c.	18.79	8.11	1.36	HDU2	NA	NA
1st	D.1	1.83	0.00	1.00	148	8d at 6" o.c.	148	A. Bolt	2x w/AB at 48" o.c.	at 24" o.c.	9.75	2.25	1.59	HDU2	NA	NA
1st	E.3	2.93	0.00	1.13	170	8d at 6" o.c.	150	A. Bolt	2x w/AB at 48" o.c.	at 24" o.c.	6.18	0.88	1.78	HDU2	NA	NA

1) NDS 2018 (SDPWS 2015) Section 4.3.4 & Table 4.3.4. Maximum of wall ratio or pier ratio used.

2) NDS 2018 (SDPWS 2015) Section 4.3.4. If (h/b) > 2:1 the shear capacity shall be multiplied by the Aspect Ratio Factor (WSP = 1.25 - 0.125h/b).

3) Panel Shear = (V / L_{wall} - L_{opening}) * Panel Shear Factor

4) Plate Shear = V / L_{wall}

5) OTM = (V * h_w) + OTM_{above}, see diagram on SWCED

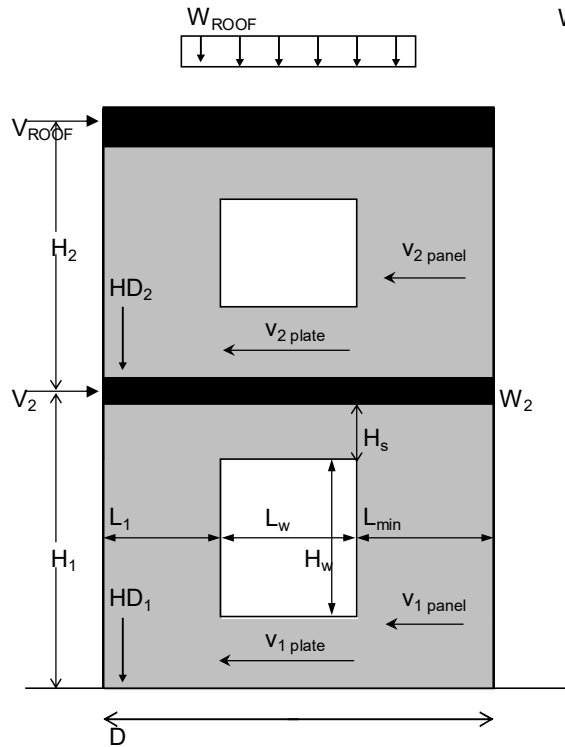
6) RM = (ω_{DL} * L_w²) / 2, see diagram on SWCED

7) Resultant = (OTM - 0.6RM) / L_w, see diagram on SWCED. RM is multiplied by a factor of 0.6 per ASCE 7-16 Section 2.4.5. If seismic controls, a factor of (0.6-0.7(.2)S_{DS}) is applied to the RM per ASCE 7-16 Section 12.4.2.2

8) Force at Windows = (Panel Shear * L_{min} * (H_w/2 + H_s)) / H_s, see diagram on SWCED

Shear Wall Calculation Equation Diagram (SWCED)

Shear Wall with Window based on Shear Transfer



Where:

V_i = Story Shear

W_i = Story Dead Load

HD_i = Story Holddown

M_{OTi} = Story Over Turning Moment

M_{Ri} = Story Resisting Moment

$$M_{OT\ ROOF} = V_{ROOF} \times H_2$$

$$M_{OT1} = [(V_2 + V_{ROOF}) \times H_1] + M_{OT\ RC}$$

$$M_{R\ ROOF} = 0.6 \times W_{ROOF} \times D^2/2$$

$$M_{R1} = 0.6 \times (W_2 + W_{ROOF}) \times D^2/2$$

$$HD_2 = (M_{OT\ ROOF} - M_{R\ ROOF}) / (D - 6")$$

$$HD_1 = (M_{OT1} - M_{R1}) / (D - 6")$$

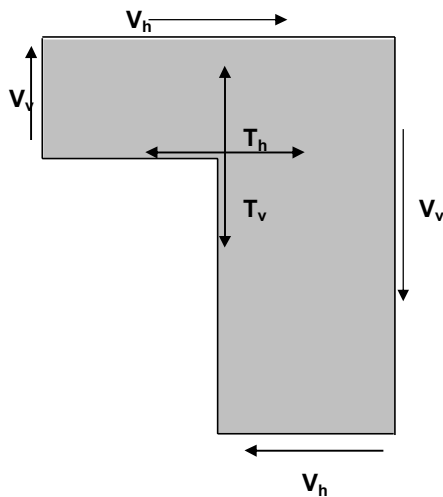
$$V_{2\ panel} = V_{ROOF} / (L_1 + L_{min})$$

$$V_{1\ panel} = (V_{ROOF} + V_2) / (L_1 + L_{min})$$

$$V_{2\ plate} = V_{ROOF} / D$$

$$V_{1\ plate} = (V_{ROOF} + V_2) / D$$

Force Transfer Around Window Calculation



$$V_h = V_{i\ panel} \times L_{min}$$

$$V_v = HD_i$$

$$T_h = V_h (H_w / 2 + H_s) / H_s$$

T_v = Is resisted by the continuous stud adjacent to the window.
No calculation is required.



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1. Project information

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

Project description:
 Location:
 Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-19
 Units: Imperial units

Anchor Information:

Anchor type: Bonded anchor
 Material: F1554 Grade 36
 Diameter (inch): 0.625
 Effective Embedment depth, h_{ef} (inch): 12.000
 Code report: ICC-ES ESR-4057
 Anchor category: -
 Anchor ductility: Yes
 h_{min} (inch): 13.38
 c_{ac} (inch): 31.29
 C_{min} (inch): 1.75
 S_{min} (inch): 3.00

Base Material

Concrete: Normal-weight
 Concrete thickness, h (inch): 18.00
 State: Cracked
 Compressive strength, f'_c (psi): 2500
 $\Psi_{c,v}$: 1.0
 Reinforcement condition: Supplementary reinforcement not present
 Supplemental edge reinforcement: Not applicable
 Reinforcement provided at corners: No
 Ignore concrete breakout in tension: No
 Ignore concrete breakout in shear: No
 Hole condition: Dry concrete
 Inspection: Continuous
 Temperature range, Short/Long: 150/110°F
 Reduced installation torque (for AT-3G): Not applicable
 Ignore 6do requirement: Not applicable
 Build-up grout pad: No

Recommended Anchor

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



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

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Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination: not set

Seismic design: Yes

Anchors subjected to sustained tension: Yes

Ductility section for tension: 17.10.5.2 not applicable

Ductility section for shear: 17.10.6.2 not applicable

Ω_0 factor: not set

Apply entire shear load at front row: Yes

Anchors only resisting wind and/or seismic loads: No

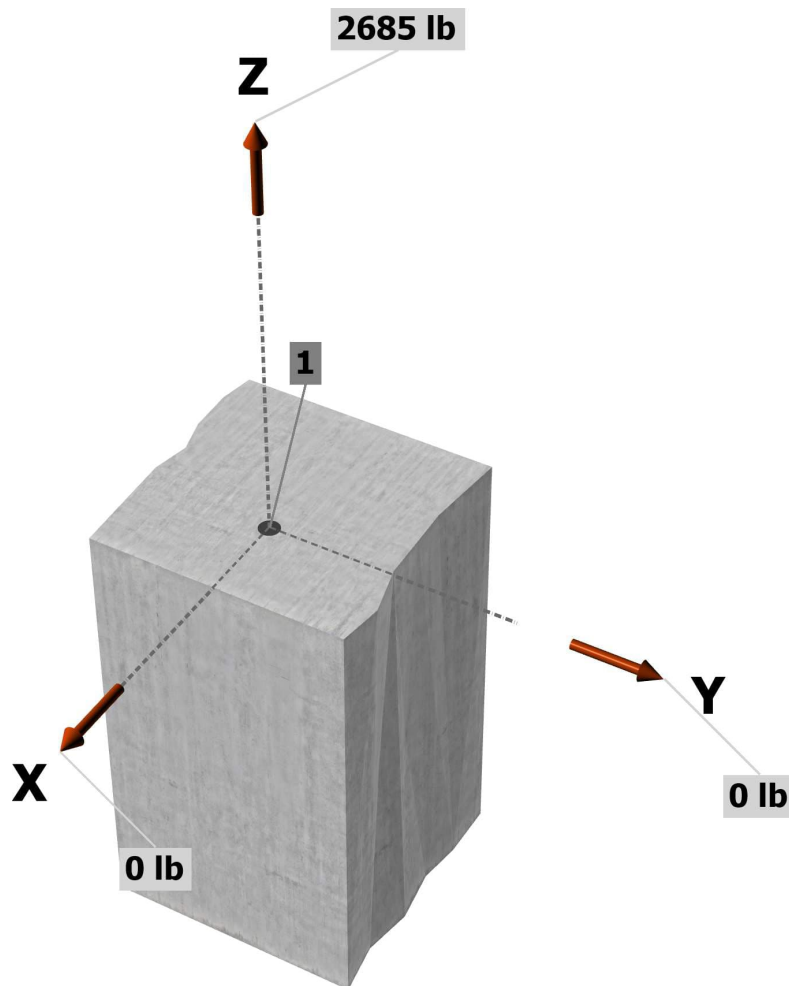
Strength level loads:

N_{ua} [lb]: 2685

V_{uax} [lb]: 0

V_{uay} [lb]: 0

<Figure 1>



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

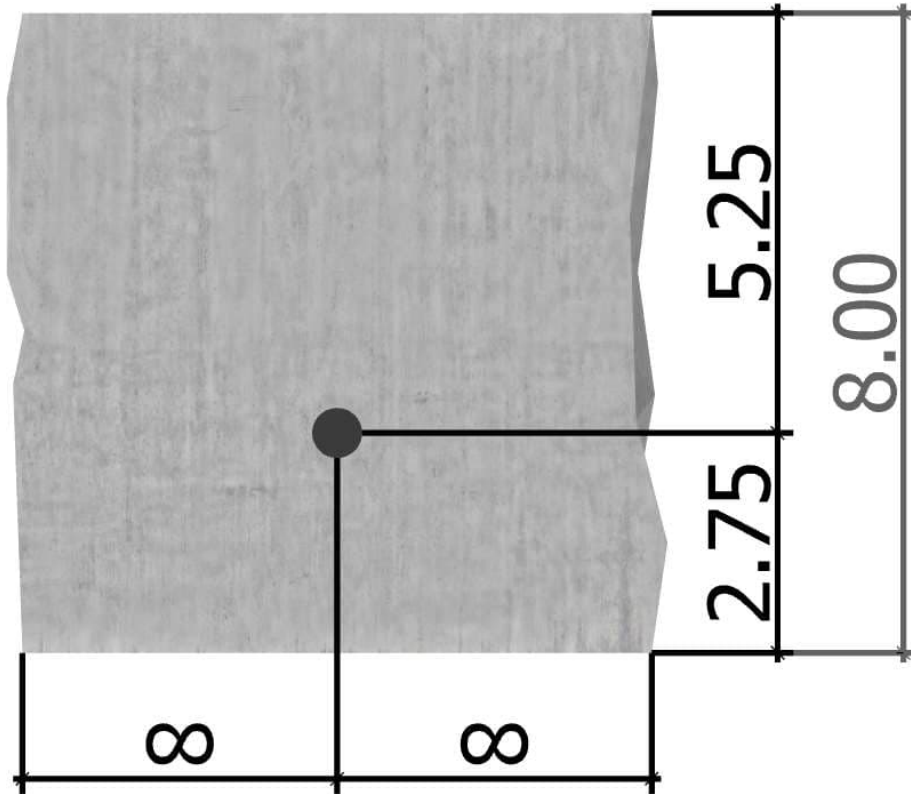
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<Figure 2>



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3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	2685.0	0.0	0.0	0.0
Sum	2685.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00

Maximum concrete compression stress (psi): 0

Resultant tension force (lb): 2685

Resultant compression force (lb): 0

Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00

Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.6.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
13110	0.75	9833

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.6.2)

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \text{ (Eq. 17.6.2.2.1)}$$

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	12.000	35334

$$0.75\phi N_{cb} = 0.75\phi (A_{Nc} / A_{Nco}) \psi'_{ed,N} \psi'_{c,N} \psi'_{cp,N} N_b \text{ (Sec. 17.5.1.2 & Eq. 17.6.2.1a)}$$

A_{Nc} (in ²)	A_{Nco} (in ²)	$c_{a,min}$ (in)	$\psi'_{ed,N}$	$\psi'_{c,N}$	$\psi'_{cp,N}$	N_b (lb)	ϕ	$0.75\phi N_{cb}$ (lb)
288.00	1296.00	2.75	0.746	1.00	1.000	35334	0.65	2855

6. Adhesive Strength of Anchor in Tension (Sec. 17.6.5)

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

$\tau_{k,cr}$ (psi)	$f_{short-term}$	K_{sat}	$\alpha_{N,seis}$	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1356	1.00	1.00	1.00	2500	0.24	1356

$$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef} \text{ (Eq. 17.6.5.2.1)}$$

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1356	0.63	12.000	31950

$$0.75\phi N_a = 0.75\phi (A_{Na} / A_{Na0}) \psi'_{ed,Na} \psi'_{cp,Na} N_{ba} \text{ (Sec. 17.5.1.2 & Eq. 17.6.5.1a)}$$

A_{Na} (in ²)	A_{Na0} (in ²)	c_{Na} (in)	$c_{a,min}$ (in)	$\psi'_{ed,Na}$	$\psi'_{cp,Na}$	N_{ba0} (lb)	ϕ	$0.75\phi N_a$ (lb)
140.19	307.10	8.76	2.75	0.794	1.000	31950	0.65	5647

$$\phi N_{sust} = 0.55\phi N_{ba} \text{ (Eq. 17.5.2.2)}$$

ϕ	N_{ba} (lb)	ϕN_{sust} (lb)
0.65	31950	11422

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

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11. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	2685	9833	0.27	Pass
Concrete breakout	2685	2855	0.94	Pass (Governs)
Adhesive	2685	5647	0.48	Pass
Adhesive (sustained)	2685	11422	0.24	Pass

SET-3G w/ 5/8"Ø F1554 Gr. 36 with hef = 12.000 inch meets the selected design criteria.

12. Warnings

- Per designer input, the tensile component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor tensile force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.5.2 for tension need not be satisfied – designer to verify.
- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.6.2 for shear need not be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.



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1. Project information

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

Project description:
 Location:
 Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-19
 Units: Imperial units

Anchor Information:

Anchor type: Bonded anchor
 Material: F1554 Grade 36
 Diameter (inch): 0.875
 Effective Embedment depth, h_{ef} (inch): 15.000
 Code report: ICC-ES ESR-4057
 Anchor category: -
 Anchor ductility: Yes
 h_{min} (inch): 17.00
 c_{ac} (inch): 39.41
 C_{min} (inch): 1.75
 S_{min} (inch): 3.00

Base Material

Concrete: Normal-weight
 Concrete thickness, h (inch): 18.00
 State: Cracked
 Compressive strength, f'_c (psi): 2500
 $\Psi_{c,v}$: 1.0
 Reinforcement condition: Supplementary reinforcement not present
 Supplemental edge reinforcement: Not applicable
 Reinforcement provided at corners: No
 Ignore concrete breakout in tension: No
 Ignore concrete breakout in shear: No
 Hole condition: Dry concrete
 Inspection: Continuous
 Temperature range, Short/Long: 150/110°F
 Reduced installation torque (for AT-3G): Not applicable
 Ignore 6do requirement: Not applicable
 Build-up grout pad: No

Recommended Anchor

Anchor Name: SET-3G™ - SET-3G w/ 7/8"Ø F1554 Gr. 36
 Code Report: ICC-ES ESR-4057



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

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Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination: not set

Seismic design: Yes

Anchors subjected to sustained tension: Yes

Ductility section for tension: 17.10.5.2 not applicable

Ductility section for shear: 17.10.6.2 not applicable

Ω_0 factor: not set

Apply entire shear load at front row: Yes

Anchors only resisting wind and/or seismic loads: No

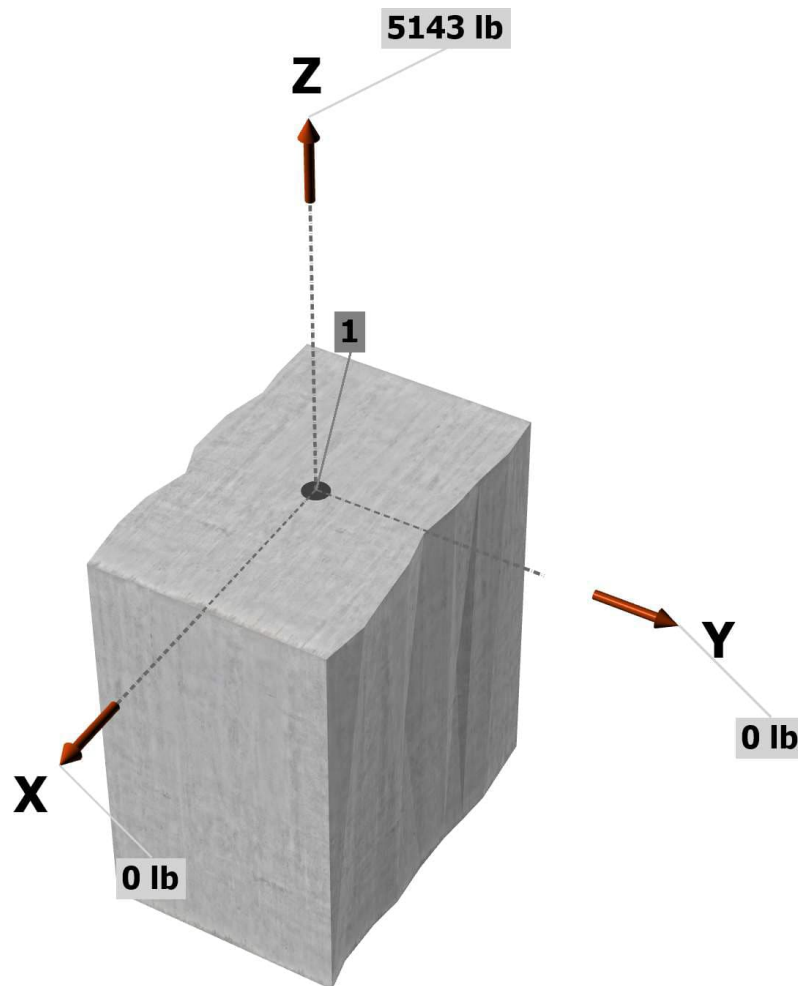
Strength level loads:

N_{ua} [lb]: 5143

V_{uax} [lb]: 0

V_{uay} [lb]: 0

<Figure 1>



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

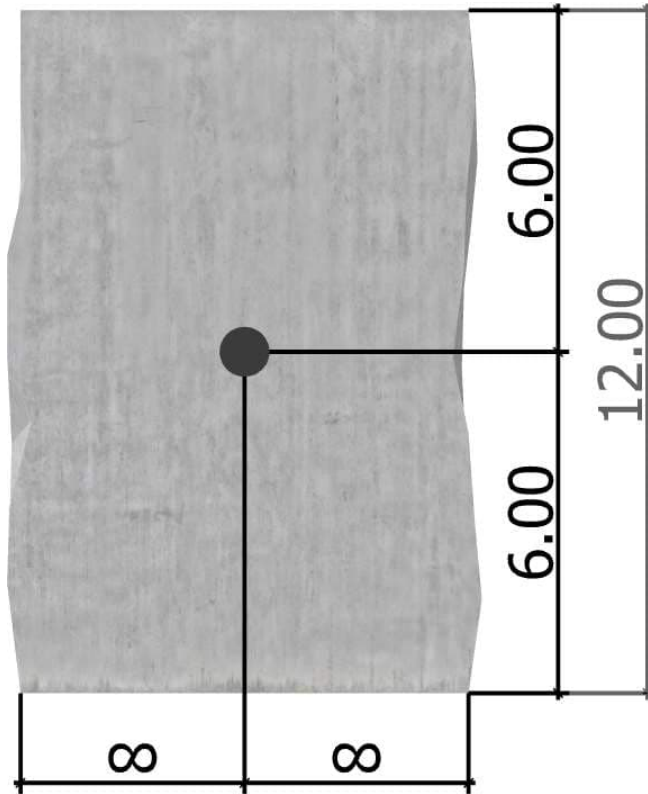
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<Figure 2>



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

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3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	5143.0	0.0	0.0	0.0
Sum	5143.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00

Maximum concrete compression stress (psi): 0

Resultant tension force (lb): 5143

Resultant compression force (lb): 0

Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00

Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.6.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
26795	0.75	20096

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.6.2)

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \text{ (Eq. 17.6.2.2.1)}$$

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	15.000	49381

$$0.75\phi N_{cb} = 0.75\phi (A_{Nc} / A_{Nco}) \psi'_{ed,N} \psi'_{c,N} \psi'_{cp,N} N_b \text{ (Sec. 17.5.1.2 \& Eq. 17.6.2.1a)}$$

A_{Nc} (in ²)	A_{Nco} (in ²)	$c_{a,min}$ (in)	$\psi'_{ed,N}$	$\psi'_{c,N}$	$\psi'_{cp,N}$	N_b (lb)	ϕ	$0.75\phi N_{cb}$ (lb)
540.00	2025.00	6.00	0.780	1.00	1.000	49381	0.65	5007

6. Adhesive Strength of Anchor in Tension (Sec. 17.6.5)

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

$\tau_{k,cr}$ (psi)	$f_{short-term}$	K_{sat}	$\alpha_{N,seis}$	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1265	1.00	1.00	1.00	2500	0.24	1265

$$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef} \text{ (Eq. 17.6.5.2.1)}$$

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1265	0.88	15.000	52160

$$0.75\phi N_a = 0.75\phi (A_{Na} / A_{Na0}) \psi'_{ed,Na} \psi'_{cp,Na} N_{ba} \text{ (Sec. 17.5.1.2 \& Eq. 17.6.5.1a)}$$

A_{Na} (in ²)	A_{Na0} (in ²)	c_{Na} (in)	$c_{a,min}$ (in)	$\psi'_{ed,Na}$	$\psi'_{cp,Na}$	N_{a0} (lb)	ϕ	$0.75\phi N_a$ (lb)
280.82	547.63	11.70	6.00	0.854	1.000	52160	0.65	11133

$$\phi N_{sust} = 0.55\phi N_{ba} \text{ (Eq. 17.5.2.2)}$$

ϕ	N_{ba} (lb)	ϕN_{sust} (lb)
0.65	52160	18647

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

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Anchor Designer™
Software
 Version 3.2.2309.2

Company:		Date:	2/17/2023
Engineer:		Page:	5/5
Project:			
Address:			
Phone:			
E-mail:			

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	5143	20096	0.26	Pass
Concrete breakout	5143	5007	1.03	Fail (Governs)
Adhesive	5143	11133	0.46	Pass
Adhesive (sustained)	5143	18647	0.28	Pass

FAIL! Selected anchor type and embedment do not meet the selected design criteria.

Within 5%, okay

12. Warnings

- Per designer input, the tensile component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor tensile force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.5.2 for tension need not be satisfied – designer to verify.
- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.6.2 for shear need not be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.

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