

STRUCTURAL CALCULATIONS

San Bernardino County Fire Department		
Fire Station 227		
180 W. 38th Street		
San Bernardino, CA 92405		

Prepared for:

STK Architecture, Inc. 42095 Zevo Dr., Suite A15, Temecula, CA 92590-3780

Prepared by:

ISE Structural Engineers, Inc. 27369 Via Industria Temecula, CA 92590



March 7, 2025 ISE Project # 24-8400.32

REVIEWED FOR CODE COMPLIANCE

applicable code requirements of the jurisdiction. Issuance of a permit is recommended ubject to approval by other departments and any noted conditions. This stamping of these stans shall not be held to permit or be an approval of any violation of applicable codes and standards to releve the owner, design professional of record or contractor of compliance with the applicable codes and standards. Plan review of documents does not authorize construction to proceed in violation of any federal, state or local regulations.

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DATE: 5/30/2025



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Project: Fire Station 227 Project Manager Sandy Fong Engineer: Valeria Gallardo

General

Governing Building Code(s):

Building Risk Category:

Construction Fire Resistance Type:

2022 California Building Code, ASCE 7-16

Type V-B

(CBC Table 1604.5)

(CBC Chapter 6)

Building Description:

One-story Fire Station

Building System:

Roof Shape Roof Framing System Roof Diaphragm S Wall Framing S

ragm System	
aming System	
Build Method	

Main Structure	Secondary Structure
Monoslope	N/A
Wood Truss	N/A
Wood Sheathed	N/A
Wood Stud	N/A
Site Built	N/A

Foundation System:

Slab on Grade Footings/Grade Beams Curbs/Stemwalls **Deep Foundation Members**

Conventional Rebar	N/A
Conventional Rebar	N/A
Concrete	N/A
N/A	N/A

Earth Retaining Systems

Cant. Masonry N/A



Design Live Loads						(CBC Table 1607.1)
Roofs: Uniform load: Reducible?	20 Yes	psf				(CBC 1607.13.2.1)
Deflection Criteria						(CBC, Table 1604.3)
	L	E, S, W			+L	
Roof:	L/ 360	L/ 360			240	
		L/ 360				
Floor:	L/ 600	1 / 260			240	
Exterior Walls:	1 / 040	L/ 360				
Interior Walls:	L/ 240	Ì				
Load Combinations						(CBC, Section 1605)
Strength Design or Load ar	nd Resistance	e Factor Design (LRF	D)			(CBC, Section 1605.2)
Alternate ASD Load Combi	inations				(CBC, Section 1605.3.2)
Seismic Design Crite	eria				(ASCE	7-16, Chapter 11 & 12)
Site Factors:						
Spectral acceleration	on for short p	eriod buildings (S _s):		2.505	g	
Spectral acceleration	on for 1-sec p	period buildings (S ₁):		1.002	g	
Soil Site Class:				D		
Seismic Importance	e Factor: (I _E)			1.50		
Effective Seismic V	Veight:	Dead				(ASCE 12.7.2)
						,
Narrative of Design to resis			valle and v	rood she	athod fle	exible diaphragms. The
		assumed flexible per <i>i</i>				exible diapriragilis. The
	,			,		
Lateral Resisting System P	arameters:			(ASC	CE Table	e 12.2-1, Table 12.12-1)
Description			R	Ωο	Cd	Allowable Drift, Δa
Light Framed Wood	d Sheathed S	Shear Walls	6.5	3.0	4.0	0.025h
Redundancy Facto	r, ρ: 1.00	With exceptions per	ASCE 12.3	3.4		
Seismic Analysis Procedure	o: Equivale	ent Lateral Force Pro	codura Sc	ection 12	8	(ASCE Table 12.6-1)



Structural Irregularities:

Horizontal Structural Irregularities:

		Туре	Description	Location
		Type 1a	Torsional Irregularity	
		Type 1b	Extreme Torsional Irregularity	
ļ	Х	Type 2	Reentrant Corner Irregularity	
		Туре 3	Diaphragm Discontinuity Irregularity	
		Type 4	Out-of-Plane Offset Irregularity	
Į		Type 5	Nonparallel System Irregularity	

Vertical Structural Irregularities:

(ASCE Table 12.3-2)

(ASCE Table 12.3-1

Ту	/pe	Description	Location
Ту	pe 1a	Stiffness-Soft Story Irregularity	
Ту	pe 1b	Stiffness-Extreme Soft Story Irregularity	
Ту	/pe 2	Weight (Mass) Irregularity	
Ту	/pe 3	Vertical Geometry Irregularity	
Ту	/pe 4	In-Plane Discontinuity VLFR Element	
Ту	pe 5a	Discontinuity in Lateral - Weak Story	
Ту	pe 5b	Discont. in Lat Extreme Weak Story	

Wind Design Criteria

(ASCE 7-16, Chapter 26)

Basic Wind Speed:	125	mph (3s Gı	ust)		(A	SCE 26.5)
Special Wind Region	Yes	Sou	ırce: .	ASCE 7 Hazard Tool		
Surface Roughness Category:	С				(AS	CE 26.7.2)
Exposure Category:	С				(AS	CE 26.7.3)
Enclosure Classification	Enclose	ed			(AS	CE 26.12)

Design procedure for Main Wind Force Resisting System (MWFRS):

Directional Procedure, Ch. 27

Design procedure for Component & Cladding Wind Loads (C&C):

Component & Cladding, Ch. 30



Geotechnical Design Criteria & Foundation Type

Geotechnical Report:

Prepared by: Inland Foundation Engineering, Inc.

Report Number: \$168-193

Date: September 6, 2024

Expansive Soil: Non-expansive

Static Settlement: <1"

Liquefaction Settlemnt: Not significant

Seismic Hazards: None

Corrosive Soil: Not corrosive

Foundation Type: Conventional slab on grade with Shallow grade beam footings





PROJECT DEAD LOAD ANALYSIS

ROOF TYPES

	_		_		
R1	Main Sloped Roof:				
	Lightweight Tile/Membrane:	5.0	psf		
	15/32" Sheathing:	2.5	psf		
	Roof Framing (Trusses at 24" o.c.):	3.0	psf		
	Insulation (Batt):	0.5	psf		
	(1) Layer 5/8" Drywall at Ceiling:	2.5	psf		
	Mech/Elec/Plumbing:	1.5	psf		
	Ceiling Framing:	0.0	psf		
	Total Dead Load =	15.0	psf		

WALL TYPES

	_			
W1	2x4 Wood Stud Exterior Wall			
	7/8" Plaster/Stucco	8.0	ps	
	15/32" Sheathing:	1.5	ps	
	Wall Framing (2x4 at 16" o.c.):	1.5	ps	
	Insulation (Batt):	0.5	ps	
	(1) Layer 5/8" Drywall:	3.0	ps	
	Mech/Elec/Plumbing:	0.5	ps	
	Total Dead Load =	15.0	ps	

$\overline{}$			_
/2	2x4 Wood Stud Interior Wall		
	15/32" Sheathing:	1.5	psf
	Wall Framing (2x4 at 16" o.c.):	1.5	psf
	Insulation (Batt):	0.5	psf
	(1) Layer 5/8" Drywall each side:	6.0	psf
	Mech/Elec/Plumbing:	0.5	psf
	Total Dead Load =	10.0	psf



BUILDING GRAVITY DESIGN





ROOF			
Member Name	Results (Max UTIL %)	Current Solution	Comments
(B1) - HEADER	Passed (45% M)	1 piece(s) 2 x 6 DF No.2 (Plank)	
(B2) - HEADER	Passed (101% M)	1 piece(s) 2 x 6 DF No.2 (Plank)	
(B3) - HEADER	Passed (79% M)	1 piece(s) 4 x 6 DF No.2 (Plank)	
(B4) - HEADER	Passed (100% M)	1 piece(s) 6 x 6 DF No.1	
(B5) - HEADER	Passed (101% M)	1 piece(s) 6 x 8 DF No.1	
(B6) - HEADER	Passed (69% V)	1 piece(s) 6 x 6 DF No.1	
(B7) - HEADER	Passed (45% M)	1 piece(s) 4 x 6 DF No.2 (Plank)	
(B8) - HEADER	Passed (71% M)	1 piece(s) 2 x 6 DF No.2 (Plank)	
(B9) - FLUSH BEAM	Passed (27% M)	1 piece(s) 6 x 6 DF No.1	
(B10) - FLUSH BEAM	Passed (25% R)	1 piece(s) 2 x 8 DF No.2	
(B12) - HEADER	Passed (45% M)	1 piece(s) 6 x 6 DF No.1	
(B13) - HEADER	Passed (57% M)	1 piece(s) 4 x 6 DF No.2	
(B16) - HEADER	Passed (88% M)	1 piece(s) 4 x 6 DF No.2 (Plank)	
(B17) - HEADER	Passed (42% M)	1 piece(s) 4 x 6 DF No.2 (Plank)	
(B18) - HEADER	Passed (89% M)	1 piece(s) 4 x 6 DF No.2 (Plank)	
(B20) - HEADER	Passed (39% M)	1 piece(s) 6 x 6 DF No.1	
(B22) - DROP BEAM	Passed (60% M)	1 piece(s) 6 x 8 DF No.1	
(B23) - HEADER	Passed (67% ΔT)	1 piece(s) 6 x 6 DF No.1	
(B24) - HEADER	Passed (70% M)	1 piece(s) 6 x 6 DF No.1 (Plank)	7
(B26) HEADER	Passed (99% ΔT)	1 piece(s) 2 x 4 DF No.2 (Plank)	
(B27) HEADER	Passed (35% M)	1 piece(s) 4 x 4 DF No.2 (Plank)	
(B28) HEADER	Passed (96% B/C)	1 piece(s) 6 x 14 DF No.1	
RJ1 - ELECTRICAL ROOM	Passed (19% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
RJ2 - ENTRY	Passed (70% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
rj3 - apparatus	Passed (13% M)	1 piece(s) 2 x 6 DF No.2 @ 24" OC	
rj4 - apparatus	Passed (26% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
rj5 - apparatus	Passed (17% M)	1 piece(s) 2 x 8 DF No.2 @ 24" OC	
RJ10 - LOCKER ROOM	Passed (34% M)	1 piece(s) 2 x 6 DF No.2 @ 24" OC	
CJ1 - High/Clerestory, Roof Framing Plan - B/W Grids B&C - Kitchen Ceiling Joists	Passed (38% ΔT)	1 piece(s) 2 x 8 DF No.2 @ 16" OC	

1 piece(s) 2 x 8 DF No.2 @ 16" OC

2 piece(s) 2 x 8 DF No.2 @ 16" OC

1 piece(s) 2 x 6 DF No.2 @ 16" OC

1 piece(s) 2 x 10 DF No.2 @ 24" OC

2 piece(s) 2 x 8 DF No.2 @ 16" OC

1 piece(s) 2 x 6 DF No.2 @ 16" OC

1 piece(s) 2 x 6 DF No.2 @ 16" OC

1 piece(s) 2 x 6 DF No.2 @ 16" OC

1 piece(s) 6 x 6 DF No.1

ForteWEB Software Operator	Job Notes
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com	

Passed (34% B/C)

Passed (72% ΔT_{lat})

Passed (52% f_c)

Passed (40% M)

Passed (78% M)

Passed (42% f_e)

Passed (97% ΔT_{lat})

Passed (25% B/C)

Passed (97% ΔT_{lat})

Wall: 2x8 Stud Tall Wall: 2x6 Stud

Roof: Joist

Interior Wall: 2x6 Stud

(B30) - FLUSH BEAM

Tall Wall: 2x8 Stud

Gravity Exterior Wall: 2x6 Stud

Wind Exterior Wall: 2x6 Stud

Day Room Exterior 2x6 Wall

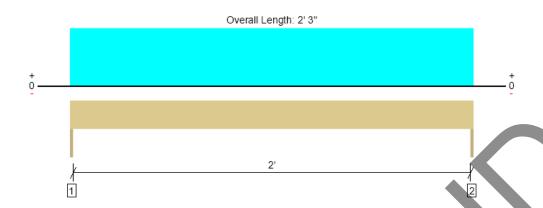


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ROOF, (B1) - HEADER

1 piece(s) 2 x 6 DF No.2 (Plank)



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)	233 @ 0	5156 (1.50")	Passed (5%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	181 @ 3"	1238	Passed (15%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	131 @ 1' 1 1/2"	289	Passed (45%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.023 @ 1' 1 1/2"	0.075	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.048 @ 1' 1 1/2"	0.112	Passed (L/560)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	28 @ 2' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	13 @ 7"	1584	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	16 @ mid-span	1148	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.000 @ mid-span	0.112	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.32	1.00	Passed (32%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 2' 3" System: Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	120	113	233	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	120	113	233	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections									
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing			
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 3"	N/A	2.1		
1 - Uniform (PSF)	0 to 2' 3"	5'	15.0	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 2' 3"	2'	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	1'	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

ForteWEB Software Operator	Job Notes
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B1 - HEADER ALONG GL-B CLERESTORY

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



ForteWEB Software Operator	Job Notes
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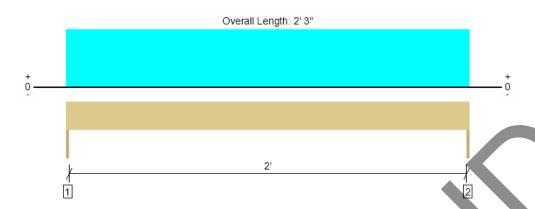


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ROOF, (B2) - HEADER

1 piece(s) 2 x 6 DF No.2 (Plank)



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)	521 @ 0	5156 (1.50")	Passed (10%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	405 @ 3"	1238	Passed (33%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	293 @ 1' 1 1/2"	289	Passed (101%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.057 @ 1' 1 1/2"	0.075	Passed (L/473)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.108 @ 1' 1 1/2"	0.112	Passed (L/250)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	28 @ 2' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	13 @ 7"	1584	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	16 @ mid-span	1148	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.000 @ mid-span	0.112	Passed (L/999+)	-	1.0 D + 0.6 W
Bi-Axial Bending	0.70	1.00	Passed (70%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 2' 3" System : Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	246	276	521	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	246	276	521	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections						
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 3"	N/A	2.1		
1 - Uniform (PSF)	0 to 2' 3"	12' 3"	15.0	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 2' 3"	2' 2"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	1'	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B2 - HEADER ALONG 4.5 CLERESTORY

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



ForteWEB Software Operator	Job Notes
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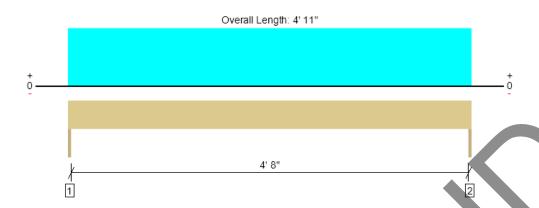
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ROOF, (B3) - HEADER

1 piece(s) 4 x 6 DF No.2 (Plank)



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)	922 @ 0	5156 (1.50")	Passed (18%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	765 @ 5"	2888	Passed (27%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1133 @ 2' 5 1/2"	1437	Passed (79%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.079 @ 2' 5 1/2"	0.164	Passed (L/743)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.157 @ 2' 5 1/2"	0.246	Passed (L/376)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	212 @ 4' 11"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	162 @ 7"	3696	Passed (4%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	260 @ mid-span	2731	Passed (10%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.010 @ mid-span	0.246	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.61	1.00	Passed (61%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length : 4' 11" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	454	467	922	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	454	467	922	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections						
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 11"	N/A	4.9		
1 - Uniform (PSF)	0 to 4' 11"	9' 6"	15.0	20.0	R1 - ROOF ELEC AREA
2 - Uniform (PSF)	0 to 4' 11"	2' 6"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3' 7"	40.1	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

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• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B3 - HEADER AT ELECTRICAL ROOM

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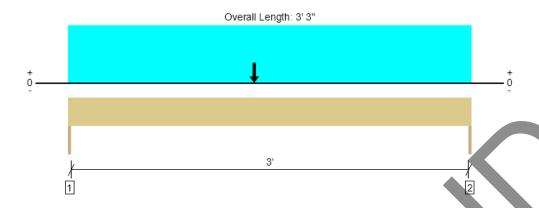
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ROOF, (B4) - HEADER

1 piece(s) 6 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)	2847 @ 0	5156 (1.50")	Passed (55%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2427 @ 7"	4285	Passed (57%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	3461 @ 1' 6"	3466	Passed (100%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.024 @ 1' 7 3/8"	0.108	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.046 @ 1' 7 7/16"	0.162	Passed (L/846)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	144 @ 3' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	92 @ 7"	5485	Passed (2%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	117 @ mid-span	4437	Passed (3%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.001 @ mid-span	0.162	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.70	1.00	Passed (70%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length : 3' 3" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	Bearing Length Loads to Sup				to Support	s (lbs)	
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	1374	1473	2847	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	1272	1336	2608	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connection	nnections								
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing			
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				

			Dead	Roof Live	
Vertical Loads	Location	Tributary Width	(0.90)	(1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	7.7		
1 - Uniform (PSF)	0 to 3' 3"	7' 5"	15.2	20.0	R1 - ROOF Electrical Area
2 - Uniform (PSF)	0 to 3' 3"	10' 4"	15.0	-	EXT WALL ABV
3 - Point (lb)	1' 6"	N/A	1335	1780	TRUSS POINT LOAD
4 - Uniform (PSF)	0 to 3' 3"	8' 5"	15.2	20.0	2x8 Roof Rafters Apparatus

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			Wind	
Pagedrap Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3' 7"	41.1	

- ASCE/SET 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.
 IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

B4 - HEADER ALONG GL-A

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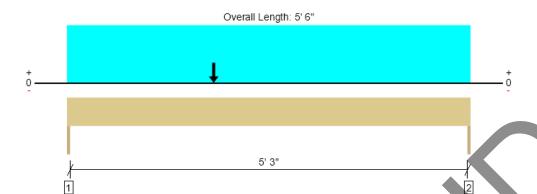
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ROOF, (B5) - HEADER 1 piece(s) 6 x 8 DF No.1



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)	3970 @ 0	5156 (1.50")	Passed (77%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	3428 @ 9"	5844	Passed (59%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	6495 @ 2'	6422	Passed (101%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.052 @ 2' 7 7/8"	0.183	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.102 @ 2' 8"	0.275	Passed (L/644)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	235 @ 5' 6"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	185 @ 7"	7480	Passed (2%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	324 @ mid-span	6050	Passed (5%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.007 @ mid-span	0.275	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.73	1.00	Passed (73%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length : 5' 6" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- A 0.4% decrease in the moment capacity has been added to account for lateral stability.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	1967	2004	3970	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	1603	1518	3121	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connection	ons					
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	

			Dead	Roof Live	
Vertical Loads	Location	Tributary Width	(0.90)	(1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	10.4		
1 - Uniform (PSF)	0 to 5' 6"	7' 5"	15.2	20.0	R1 - ROOF Electrical Area
2 - Uniform (PSF)	0 to 5' 6"	10' 4"	15.0	-	EXT WALL ABV
3 - Point (lb)	2'	N/A	1335	1780	TRUSS POINT LOAD
4 - Uniform (PSF)	0 to 5' 6"	8' 5"	15.2	20.0	2x8 Roof Rafters Apparatus

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			Wind	
Page 19 PL378	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3' 7"	39.8	

- ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.
 IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

B5 - HEADER ALONG GL-A

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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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ROOF, (B6) - HEADER 1 piece(s) 6 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)	3479 @ 0	5156 (1.50")	Passed (67%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2971 @ 7"	4285	Passed (69%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1829 @ 9 3/8"	3466	Passed (53%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.012 @ 1' 5 9/16"	0.108	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.027 @ 1' 6"	0.162	Passed (L/999+)	/	1.0 D + 1.0 Lr (All Spans)

Member Length : 3' 3" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	1772	1707	3479	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	873	511	1384	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

			Dead	Roof Live	
Vertical Loads	Location	Tributary Width	(0.90)	(1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	7.7		
1 - Uniform (PSF)	0 to 3' 3"	5'	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 3' 3"	18' 10"	15.0	-	EXT WALL ABV
3 - Point (lb)	6 1/2"	N/A	1335	1780	TRUSS POINT LOAD
4 - Point (lb)	1' 6"	N/A	120	113	Linked from: (B1) - HEADER, Support 1

Member Notes

B6 - HEADER ALONG GL-B

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ROOF, (B7) - HEADER

1 piece(s) 4 x 6 DF No.2 (Plank)

Overall Length: 5' 1" 4' 10" 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)	465 @ 0	5156 (1.50")	Passed (9%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	303 @ 5"	2079	Passed (15%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	461 @ 2' 6 1/2"	1035	Passed (45%)	0.90	1.0 D (All Spans)
Vert Live Load Defl. (in)	0.019 @ 2' 6 1/2"	0.169	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.087 @ 2' 6 1/2"	0.254	Passed (L/698)	4	1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	219 @ 5' 1"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	168 @ 7"	3696	Passed (5%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	278 @ mid-span	2731	Passed (10%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.012 @ mid-span	0.254	Passed (L/999+)		1.0 D + 0.6 W
Bi-Axial Bending	0.38	1.00	Passed (38%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 5' 1" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	363	102	465	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	363	102	465	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections							
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing	
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3		
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3		

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 1"	N/A	4.9		
1 - Uniform (PSF)	0 to 5' 1"	2'	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 5' 1"	7' 2"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3' 7"	40.0	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B7 - HEADER ALONG GL-C

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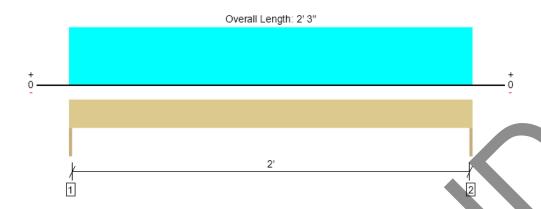


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ROOF, (B8) - HEADER

1 piece(s) 2 x 6 DF No.2 (Plank)



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)	367 @ 0	5156 (1.50")	Passed (7%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	286 @ 3"	1238	Passed (23%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	207 @ 1' 1 1/2"	289	Passed (71%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.022 @ 1' 1 1/2"	0.075	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.076 @ 1' 1 1/2"	0.112	Passed (L/355)	4	1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	70 @ 2' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	34 @ 7"	1584	Passed (2%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	39 @ mid-span	1148	Passed (3%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.001 @ mid-span	0.112	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.54	1.00	Passed (54%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 2' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	262	105	367	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	262	105	367	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections							
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing	
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2		
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2		

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 3"	N/A	2.1		
1 - Uniform (PSF)	0 to 2' 3"	4' 8"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 2' 3"	10' 8"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	2' 6"	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B8 - HEADER ALONG GL-D

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



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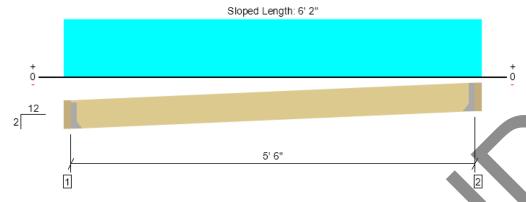


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ROOF, (B9) - FLUSH BEAM 1 piece(s) 6 x 6 DF No.1



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)	677 @ 3 1/2"	5156 (1.50")	Passed (13%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	566 @ 8 15/16"	4285	Passed (13%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	931 @ 3' 1/2"	3466	Passed (27%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.016 @ 3' 1/2"	0.186	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.043 @ 3' 1/2"	0.279	Passed (L/999+)	4	1.0 D + 1.0 Lr (All Spans)

Member Length: 5' 7 13/16" System: Roof Member Type: Flush Beam Building Use: Commercial

Building Code : IBC 2021 Design Methodology : ASD Member Pitch : 2/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	В	Bearing Length		Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 5 1/2" DF beam	3.50"	Hanger ¹	1.50"	467	279	746	See note ¹
2 - Hanger on 5 1/2" DF beam	3.50"	Hanger ¹	1.50"	467	279	746	See note 1

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

 $[\]bullet \text{Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions. } \\$

Connector: Simpson Strong-Tie								
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories		
1 - Face Mount Hanger	HUC66X SLU9	2.50"	N/A	8-10dx1.5	4-10d			
2 - Face Mount Hanger	HUC66X SLD9	2.50"	N/A	8-10dx1.5	4-10d			

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	3 1/2" to 5' 9 1/2"	N/A	7.7		
1 - Uniform (PSF)	0 to 6' 1"	4' 7"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 6' 1"	5'	15.0	-	EXT WALL ABV

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

Member	Notes
Meniper	14016

B9 - FLUSH BEAM - ALONG GL-E

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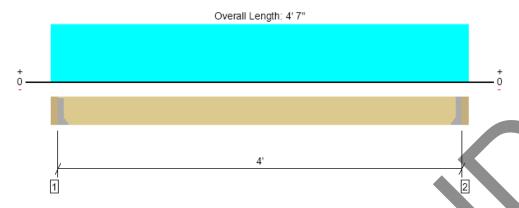
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ROOF, (B10) - FLUSH BEAM 1 piece(s) 2 x 8 DF No.2



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)	358 @ 3 1/2"	1406 (1.50")	Passed (25%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	250 @ 10 3/4"	1631	Passed (15%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	358 @ 2' 3 1/2"	1478	Passed (24%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.008 @ 2' 3 1/2"	0.133	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.014 @ 2' 3 1/2"	0.200	Passed (L/999+)	4-7	1.0 D + 1.0 Lr (All Spans)

Member Length: 4'
System: Roof
Member Type: Fluc

Member Type : Flush Beam Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on NDS.

	Bearing Length			Loads	s to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 7 1/4" LVL beam	3.50"	Hanger ¹	1.50"	180	229	409	See note ¹
2 - Hanger on 7 1/4" LVL beam	3.50"	Hanger ¹	1.50"	180	229	409	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	End Bearing Points	

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

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	3 1/2" to 4' 3 1/2"	N/A	2.8		
1 - Uniform (PSF)	0 to 4' 7" (Front)	5'	15.2	20.0	R1 - ROOF

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

Member Notes

B10 - FLUSH BEAM AT APPARATUS ROOF

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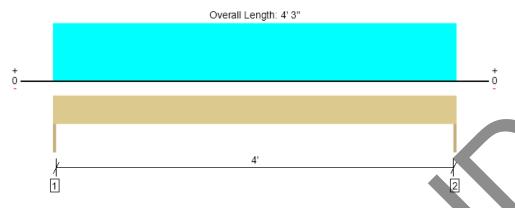
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ROOF, (B12) - HEADER 1 piece(s) 6 x 6 DF No.1



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)	1484 @ 0	5156 (1.50")	Passed (29%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1076 @ 7"	4285	Passed (25%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1576 @ 2' 1 1/2"	3466	Passed (45%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.022 @ 2' 1 1/2"	0.142	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.042 @ 2' 1 1/2"	0.213	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	106 @ 4' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	77 @ 7"	5485	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	112 @ mid-span	4437	Passed (3%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.002 @ mid-span	0.213	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.33	1.00	Passed (33%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 4' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	704	779	1484	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	704	779	1484	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connection	ons							
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing		
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2			
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2			

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	7.7		
1 - Uniform (PSF)	0 to 4' 3"	18' 4"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 4' 3"	3'	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	2'	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B12 - HEADER ALONG GRID 1

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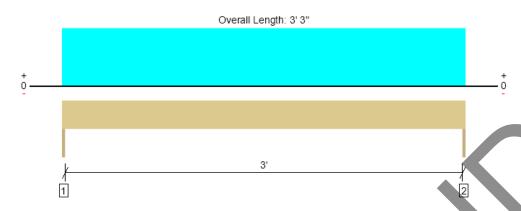
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ROOF, (B13) - HEADER

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)	1503 @ 0	3281 (1.50")	Passed (46%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	963 @ 7"	2888	Passed (33%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1221 @ 1' 7 1/2"	2142	Passed (57%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.016 @ 1' 7 1/2"	0.108	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.030 @ 1' 7 1/2"	0.162	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)

Member Length: 3' 3" System: Wall Member Type: Header Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- A 0.4% decrease in the moment capacity has been added to account for lateral stability.
- Applicable calculations are based on NDS.

	Bearing Length		Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	723	780	1503	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	723	780	1503	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9		
1 - Uniform (PSF)	0 to 3' 3"	24'	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 3' 3"	7' 6"	10.0	-	INT WALL ABV

Member Notes

B13 - HEADER ALONG GL-5.2

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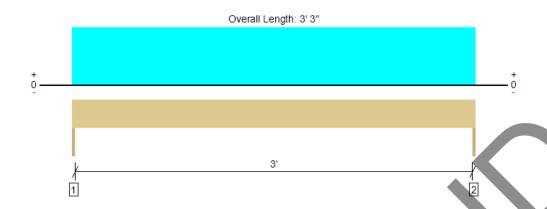
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ROOF, (B16) - HEADER

1 piece(s) 4 x 6 DF No.2 (Plank)



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)	1550 @ 0	5156 (1.50")	Passed (30%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1152 @ 5"	2888	Passed (40%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1259 @ 1' 7 1/2"	1437	Passed (88%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.038 @ 1' 7 1/2"	0.108	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.076 @ 1' 7 1/2"	0.162	Passed (L/512)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	144 @ 3' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	92 @ 7"	3696	Passed (2%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	117 @ mid-span	2738	Passed (4%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.002 @ mid-span	0.162	Passed (L/999+)	į	1.0 D + 0.6 W
Bi-Axial Bending	0.63	1.00	Passed (63%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 3' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	770	780	1550	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	770	780	1550	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connection	ons						
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing	
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2		
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2		

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	4.9		
1 - Uniform (PSF)	0 to 3' 3"	24'	15.0	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 3' 3"	7' 3"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3' 7"	41.1	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B16 - HEADER ALONG GL-5

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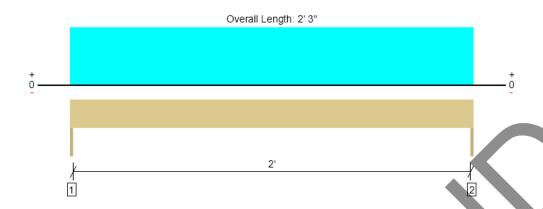
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ROOF, (B17) - HEADER

1 piece(s) 4 x 6 DF No.2 (Plank)



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)	1078 @ 0	5156 (1.50")	Passed (21%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	679 @ 5"	2888	Passed (24%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	607 @ 1' 1 1/2"	1437	Passed (42%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.009 @ 1' 1 1/2"	0.075	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.018 @ 1' 1 1/2"	0.112	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	70 @ 2' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	34 @ 7"	3696	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	39 @ mid-span	2743	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.000 @ mid-span	0.112	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.30	1.00	Passed (30%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 2' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	538	540	1078	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	538	540	1078	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections								
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing		
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2			
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2			

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 3"	N/A	4.9		
1 - Uniform (PSF)	0 to 2' 3"	24'	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 2' 3"	7' 3"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	2' 6"	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

ForteWEB Software Operator	Job Notes
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B17 - HEADER ALONG GL-5

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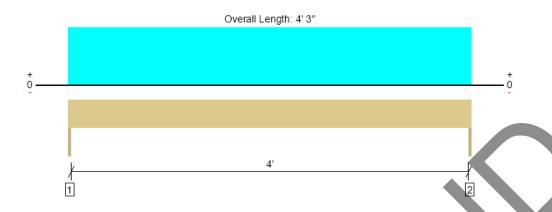
ForteWEB Software Operator	Job Notes
valeria Gallardo ISE Engineers (619) 600-8807 valeria@iseengineers.com	





ROOF, (B18) - HEADER

1 piece(s) 4 x 6 DF No.2 (Plank)



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)	1197 @ 0	5156 (1.50")	Passed (23%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	962 @ 5"	2888	Passed (33%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1272 @ 2' 1 1/2"	1437	Passed (89%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.068 @ 2' 1 1/2"	0.142	Passed (L/749)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.132 @ 2' 1 1/2"	0.213	Passed (L/388)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	106 @ 4' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	77 @ 7"	3696	Passed (2%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	112 @ mid-span	2734	Passed (4%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.003 @ mid-span	0.213	Passed (L/999+)	-	1.0 D + 0.6 W
Bi-Axial Bending	0.63	1.00	Passed (63%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 4' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.

	Bearing Length				to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	577	620	1197	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	577	620	1197	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connection	ons					
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	4.9		
1 - Uniform (PSF)	0 to 4' 3"	14' 7"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 4' 3"	3'	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	2'	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B18 - HEADER ALONG GL-6

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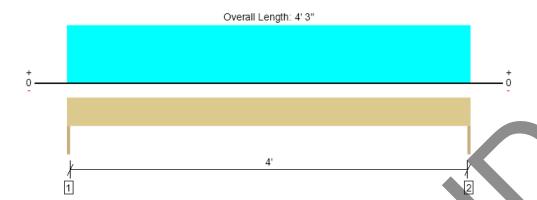


ForteWEB Software Operator	Job Notes	
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ROOF, (B20) - HEADER 1 piece(s) 6 x 6 DF No.1



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)	1283 @ 0	5156 (1.50")	Passed (25%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	931 @ 7"	4285	Passed (22%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1363 @ 2' 1 1/2"	3466	Passed (39%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.018 @ 2' 1 1/2"	0.142	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.036 @ 2' 1 1/2"	0.213	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	26 @ 4' 3"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	19 @ 7"	5485	Passed (0%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	28 @ mid-span	4437	Passed (1%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.001 @ mid-span	0.213	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.27	1.00	Passed (27%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 4' 3" System: Wall Member Type : Header Building Use: Commercial Building Code : IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	663	620	1283	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	663	620	1283	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Lateral Connections									
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing			
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	2				

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 3"	N/A	7.7		
1 - Uniform (PSF)	0 to 4' 3"	14' 7"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 4' 3"	5' 6"	15.0	-	EXT WALL ABV

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	6"	41.5	

ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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Member Notes

B20 - HEADER ALONG GL-6

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



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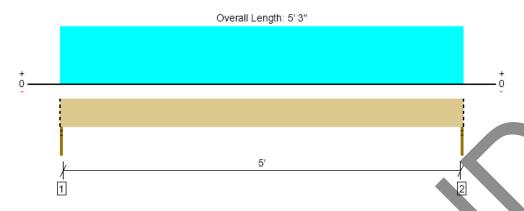


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ROOF, (B22) - DROP BEAM 1 piece(s) 6 x 8 DF No.1

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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)	2960 @ 0	5156 (1.50")	Passed (57%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2114 @ 9"	5844	Passed (36%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	3885 @ 2' 7 1/2"	6445	Passed (60%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.031 @ 2' 7 1/2"	0.175	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.062 @ 2' 7 1/2"	0.262	Passed (L/999+)	4-7	1.0 D + 1.0 Lr (All Spans)

Member Length : 5' 3" System : Roof Member Type : Drop Beam Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

Member Pitch: 0/12

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

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Stud wall - DF	1.50"	1.50"	1.50"	1490	1470	2960	Blocking
2 - Stud wall - DF	1.50"	1.50"	1.50"	1490	1470	2960	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 3" o/c	
Bottom Edge (Lu)	5' 3" o/c	

[•]Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	10.4		
1 - Uniform (PSF)	0 to 5' 3" (Front)	28'	15.2	20.0	ROOF
2 - Uniform (PSF)	0 to 5' 3" (Front)	8' 9"	15.0	-	WALL

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

Member Notes

B22 - DROP BEAM ALONG GL-4.5

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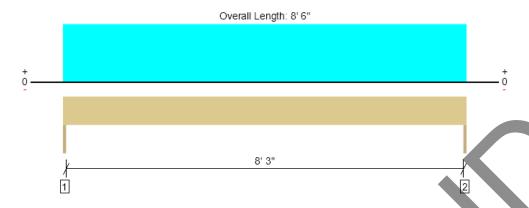




FORTEWEB®

ROOF, (B23) - HEADER 1 piece(s) 6 x 6 DF No.1

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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)	925 @ 0	5156 (1.50")	Passed (18%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	798 @ 7"	4285	Passed (19%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1966 @ 4' 3"	3466	Passed (57%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.116 @ 4' 3"	0.283	Passed (L/883)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.210 @ 4' 3"	0.313	Passed (L/487)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	392 @ 8' 6"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	338 @ 7"	5485	Passed (6%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	833 @ mid-span	4437	Passed (19%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.062 @ mid-span	0.425	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.52	1.00	Passed (52%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 8' 6" System: Wall Member Type: Header Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (5/16").
- Lateral deflection criteria: Wind (L/240)
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	В	earing Leng	th	Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	415	510	925	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	415	510	925	None

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

[•]Maximum allowable bracing intervals based on applied load.

Lateral Connect	tions					
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	10d (0.128" x 3") (End)	4	
Right	2X	Douglas Fir-Larch	Nails	10d (0.128" x 3") (End)	4	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 8' 6"	N/A	7.7		
1 - Uniform (PSF)	0 to 8' 6"	6'	15.0	20.0	ROOF
2 - Uniform (PSF)	0 to 8' 6"	5' 6"	-	-	

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	4'	38.4	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

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• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

Page 41 of 378 Member Notes

B23 - HEADER ALONG GL-7.5

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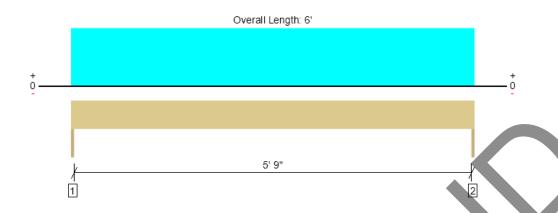
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ROOF, (B24) - HEADER

1 piece(s) 6 x 6 DF No.1 (Plank)



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)	1832 @ 0	5156 (1.50")	Passed (36%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1476 @ 7"	4285	Passed (34%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	2748 @ 3'	3899	Passed (70%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.072 @ 3'	0.200	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.146 @ 3'	0.300	Passed (L/493)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	283 @ 6'	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	228 @ 7"	5485	Passed (4%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	424 @ mid-span	4437	Passed (10%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.016 @ mid-span	0.600	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.62	1.00	Passed (62%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length : 6' System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/120)
- Member has been designed in flat (plank) orientation.
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	В	Bearing Length			to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	932	900	1832	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	932	900	1832	None

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

[•]Maximum allowable bracing intervals based on applied load

Lateral Connecti	ons					
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	

			Dead	Roof Live	
Vertical Loads	Location	Tributary Width	(0.90)	(1.25)	Comments
0 - Self Weight (PLF)	0 to 6'	N/A	7.7		
1 - Uniform (PSF)	0 to 6'	15'	15.2	20.0	ROOF
2 - Uniform (PSF)	0 to 6'	5'	15.0	-	WALL

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	4'	39.3	

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• ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

Page 1804 1804 3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

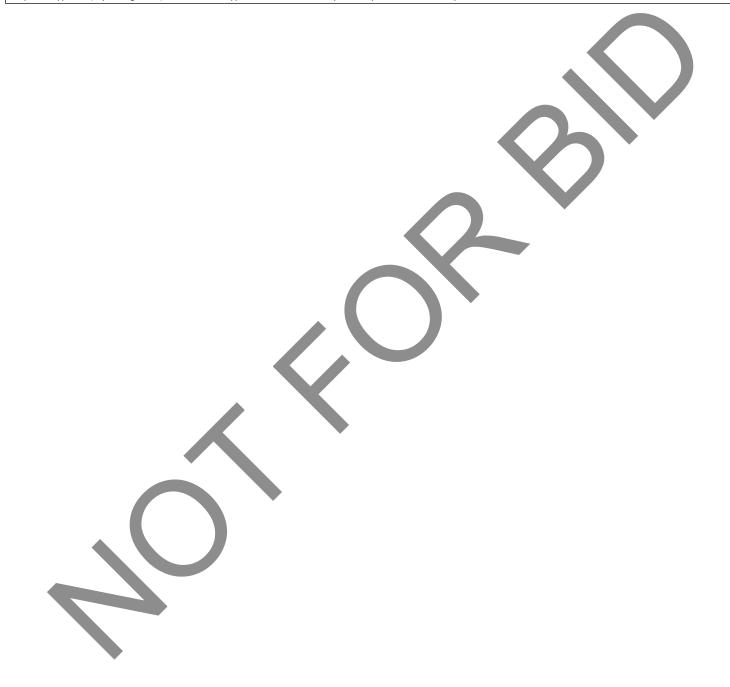
Member Notes

B24 - HEADER ALONG GL-6

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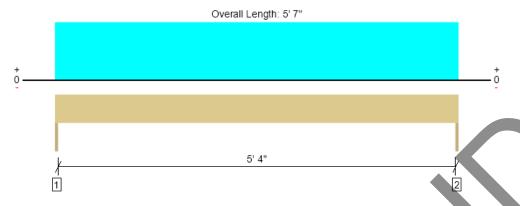


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ROOF, NU (B25) - HEADER 1 piece(s) 6 x 6 DF No.2



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)	1354 @ 0	5156 (1.50")	Passed (26%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1071 @ 7"	4285	Passed (25%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1891 @ 2' 9 1/2"	2166	Passed (87%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.051 @ 2' 9 1/2"	0.186	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.107 @ 2' 9 1/2"	0.279	Passed (L/626)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	265 @ 5' 7"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	209 @ 7"	5485	Passed (4%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	369 @ mid-span	2773	Passed (13%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.015 @ mid-span	0.558	Passed (L/999+)	ļ	1.0 D + 0.6 W
Bi-Axial Bending	0.70	1.00	Passed (70%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 5' 7" System: Wall Member Type: Header Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/120)
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	Bearing Length			Loads	to Support	s (lbs)	
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	712	642	1354	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	712	642	1354	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

[•]Maximum allowable bracing intervals based on applied load.

Lateral Connections						
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing
Left	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	
Right	2X	Douglas Fir-Larch	Nails	8d (0.113" x 2 1/2") (Toe)	3	

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 7"	N/A	7.7		
1 - Uniform (PSF)	0 to 5' 7"	11' 6"	15.0	20.0	ROOF
2 - Uniform (PSF)	0 to 5' 7"	5'	15.0	-	WALL

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	4'	39.5	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

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• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B25 - HEADER ALONG GL-6

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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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ROOF, (B26) HEADER

1 piece(s) 2 x 4 DF No.2 (Plank)

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)	165 @ 0	3281 (1.50")	Passed (5%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	139 @ 3"	788	Passed (18%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	134 @ 1' 7 1/2"	203	Passed (66%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.106 @ 1' 7 1/2"	0.108	Passed (L/367)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.162 @ 1' 7 1/2"	0.162	Passed (L/241)	/	1.0 D + 1.0 Lr (All Spans)

Member Length : 3' 3" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

	Bearing Length			Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	56	108	165	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	56	108	165	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)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 3' 3"	N/A	1.3		
1 - Uniform (PSF)	0 to 3' 3"	3' 4"	10.0	20.0	CEILING

Member Notes

B26 - HEADER ALONG GL-A.8

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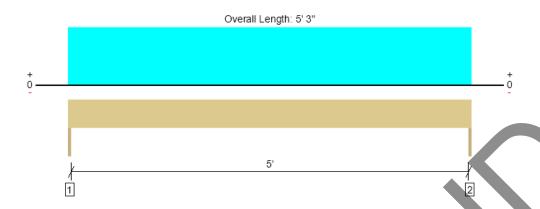
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ROOF, (B27) HEADER

1 piece(s) 4 x 4 DF No.2 (Plank)



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)	271 @ 0	3281 (1.50")	Passed (8%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	228 @ 5"	1838	Passed (12%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	355 @ 2' 7 1/2"	1005	Passed (35%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.057 @ 2' 7 1/2"	0.175	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.088 @ 2' 7 1/2"	0.262	Passed (L/715)	4-7	1.0 D + 1.0 Lr (All Spans)

Member Length : 5' 3" System : Wall Member Type : Header Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- · Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	В	Bearing Length			s to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	96	175	271	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	96	175	271	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 3" o/c	
Bottom Edge (Lu)	5' 3" o/c	

[•]Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 5' 3"	N/A	3.1		
1 - Uniform (PSF)	0 to 5' 3"	3' 4"	10.0	20.0	CEILING

Member Notes

B27 - HEADER ALONG GL-A.9

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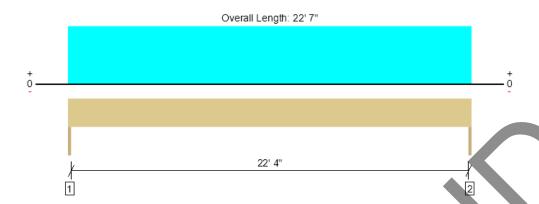
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ROOF, (B28) HEADER

1 piece(s) 6 x 14 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)	3073 @ 0	5156 (1.50")	Passed (60%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2733 @ 1' 3"	10519	Passed (26%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	17349 @ 11' 3 1/2"	23188	Passed (75%)	1.25	1.0 D + 1.0 Lr (All Spans)
Vert Live Load Defl. (in)	0.303 @ 11' 3 1/2"	0.753	Passed (L/895)		1.0 D + 1.0 Lr (All Spans)
Vert Total Load Defl. (in)	0.883 @ 11' 3 1/2"	1.129	Passed (L/307)		1.0 D + 1.0 Lr (All Spans)
Lat Member Reaction (lbs)	700 @ 22' 7"	N/A	Passed (N/A)	1.60	1.0 D + 0.6 W
Lat Shear (lbs)	664 @ 7"	13464	Passed (5%)	1.60	1.0 D + 0.6 W
Lat Moment (Ft-lbs)	3952 @ mid-span	8948	Passed (44%)	1.60	1.0 D + 0.6 W
Lat Deflection (in)	0.848 @ mid-span	1.129	Passed (L/320)	į	1.0 D + 0.6 W
Bi-Axial Bending	0.96	1.00	Passed (96%)	1.60	1.0 D + 0.45 W + 0.75 L + 0.75 Lr

Member Length: 22' 7" System: Wall Member Type: Header Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Lateral deflection criteria: Wind (L/240)
- \bullet Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Trimmer - DF	1.50"	1.50"	1.50"	2019	1054	3073	None
2 - Trimmer - DF	1.50"	1.50"	1.50"	2019	1054	3073	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	22' 7" o/c	
Bottom Edge (Lu)	22' 7" o/c	

[•]Maximum allowable bracing intervals based on applied load.

Lateral Connections								
Supports	Stud Size	Stud Material	Connector	Type/Model	Quantity	Nailing		
Left	2X	Douglas Fir-Larch	Nails	10d (0.128" x 3") (End)	7			
Right	2X	Douglas Fir-Larch	Nails	10d (0.128" x 3") (End)	7			

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 22' 7"	N/A	18.8		
1 - Uniform (PSF)	0 to 22' 7"	4' 8"	15.0	20.0	ROOF
2 - Uniform (PSF)	0 to 22' 7"	6'	15.0	-	WALL

			Wind	
Lateral Load	Location	Tributary Width	(1.60)	Comments
1 - Uniform (PSF)	Full Length	3'	34.4	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

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• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

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B28 HEADER ALONG GL-D

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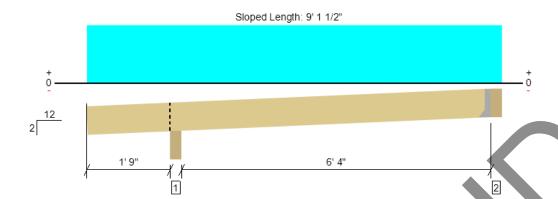


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ROOF, RJ1 - ELECTRICAL ROOM 1 piece(s) 2 x 8 DF No.2 @ 24" OC



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)	216 @ 8' 6 1/2"	1406 (1.50")	Passed (15%)		1.0 D + 1.0 Lr (Alt Spans)
Shear (lbs)	194 @ 2' 9 5/8"	1631	Passed (12%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	331 @ 5' 5 11/16"	1700	Passed (19%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Live Load Defl. (in)	0.020 @ 5' 3 13/16"	0.222	Passed (L/999+)		1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.033 @ 5' 4 3/16"	0.333	Passed (L/999+)	4-7	1.0 D + 1.0 Lr (Alt Spans)

Member Length: 8' 9 1/8" System: Roof Member Type: Joist Building Use: Commercial

Building Code : IBC 2021 Design Methodology : ASD Member Pitch : 2/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Beveled Plate - DF	5.50"	5.50"	1.50"	169	222	391	Blocking
2 - Hanger on 7 1/4" DF Ledger	5.50"	Hanger ¹	1.50"	104	144	248	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)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

[•]Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie									
Support		Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories		
2 - Face Mount Hanger		LRU26Z	1.94"	N/A	4-10dx1.5	5-10d			

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 9'	24"	15.0	20.0	R1 - ROOF

Member Notes

RJ1 - ROOF JOISTS - ELECTRICAL ROOM

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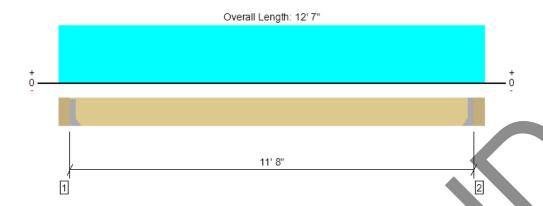
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ROOF, RJ2 - ENTRY

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)	408 @ 5 1/2"	1406 (1.50")	Passed (29%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	366 @ 1' 3/4"	1631	Passed (22%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1191 @ 6' 3 1/2"	1700	Passed (70%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.219 @ 6' 3 1/2"	0.389	Passed (L/640)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.383 @ 6' 3 1/2"	0.583	Passed (L/366)	/	1.0 D + 1.0 Lr (All Spans)

Member Length : 11' 8" System : Roof Member Type : Joist Building Use : Commercial Building Code : IBC 2021 Design Methodology : ASD

Member Pitch: 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- ullet A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	Bearing Length			Load	s to Suppo		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 7 1/4" DF beam	5.50"	Hanger ¹	1.50"	189	252	440	See note ¹
2 - Hanger on 7 1/4" DF Ledger	5.50"	Hanger ¹	1.50"	189	252	440	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

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

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

Vertical Load	Ţ	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)		0 to 12' 7"	24"	15.0	20.0	R1 - ROOF

Member Notes

RJ2 - ROOF JOISTS - ENTRY

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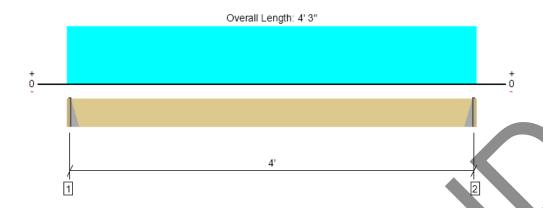
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ROOF, RJ3 - APPARATUS

1 piece(s) 2 x 6 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)	140 @ 1 1/2"	1406 (1.50")	Passed (10%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	108 @ 7"	1238	Passed (9%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	140 @ 2' 1 1/2"	1060	Passed (13%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.007 @ 2' 1 1/2"	0.133	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.012 @ 2' 1 1/2"	0.200	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)

Member Length: 4'
System: Roof
Member Type: Joist
Building Use: Commercial
Building Code: IBC 2021
Design Methodology: ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- ullet A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	Bearing Length			Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 5 1/2" DF Ledger	1.50"	Hanger ¹	1.50"	64	85	149	See note ¹
2 - Hanger on 5 1/2" DF Ledger	1.50"	Hanger ¹	1.50"	64	85	149	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 4' 3"	24"	15.0	20.0	R1 - ROOF

Member Notes

RJ3 - ROOF JOISTS - APPARATUS

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ROOF, RJ4 - APPARATUS

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

Sloped Length: 7' 10 5/16"

12

4'

4'

3' 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)	484 @ 4' 4 1/4"	5227 (5.50")	Passed (9%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	187 @ 3' 6 3/8"	1631	Passed (11%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	-406 @ 4' 4 1/4"	1534	Passed (26%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.036 @ 7' 9"	0.230	Passed (2L/999+)		1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.060 @ 7' 9"	0.344	Passed (2L/999+)	/	1.0 D + 1.0 Lr (Alt Spans)

Member Length: 7' 10" System: Roof Member Type: Joist Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD Member Pitch: 2/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- \bullet A 9.8% decrease in the moment capacity has been added to account for lateral stability.
- Applicable calculations are based on NDS.

	В	earing Leng	Length Loads to Supports (lbs)				
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 7 1/4" DF beam	1.50"	Hanger ¹	1.50"	27	62/-7	89	See note ¹
2 - Beveled Plate - DF	5.50"	5.50"	1.50"	209	275	484	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

[•]Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie								
Support		Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger		LRU26Z	1.94"	N/A	4-10dx1.5	5-10d		

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 7' 9"	24"	15.0	20.0	R1 - ROOF

Member Notes

RJ4 - ROOF JOISTS - APPARATUS

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ROOF, RJ5 - APPARATUS

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)	392 @ 2' 10 1/8"	6797 (7.25")	Passed (6%)	1	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	133 @ 1' 11 1/4"	1631	Passed (8%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	-275 @ 2' 10 1/8"	1626	Passed (17%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.015 @ 5' 7 3/4"	0.200	Passed (2L/999+)		1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.025 @ 5' 7 3/4"	0.280	Passed (2L/999+)	/	1.0 D + 1.0 Lr (Alt Spans)

Member Length: 5' 6 1/4" System: Roof Member Type: Joist Building Use: Commercial

Building Code: IBC 2021
Design Methodology: ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- \bullet Overhang deflection criteria: LL (0.2") and TL (2L/240).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- \bullet A 4.3% decrease in the moment capacity has been added to account for lateral stability.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Loads	to Supports		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 7 1/4" DF beam	1.50"	Hanger ¹	1.50"	1	30/-26	32/-24	See note ¹
2 - Stud wall - DF	7.25"	7.25"	1.50"	168	224	392	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	All Bearing Points	

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 5' 7 3/4"	24"	15.0	20.0	R1 - ROOF

Member Notes
RJ5 - ROOF JOISTS - APPARATUS

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ROOF, RJ10 - LOCKER ROOM

1 piece(s) 2 x 6 DF No.2 @ 24" OC

Sloped Length: 7' 4 3/16"

12

6' 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)	226 @ 6' 9 1/2"	1406 (1.50")	Passed (16%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	194 @ 6' 4 1/16"	1238	Passed (16%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	362 @ 3' 7"	1060	Passed (34%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.047 @ 3' 7"	0.217	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.083 @ 3' 7"	0.325	Passed (L/941)	/	1.0 D + 1.0 Lr (All Spans)

Member Length: 6' 11 9/16" System: Roof

System: Roor
Member Type: Joist
Building Use: Commercial
Building Code: IBC 2021
Design Methodology: ASD
Member Pitch: 2/12

- Deflection criteria: LL (L/360) and TL (L/240).
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	Bearing Length			Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Beveled Plate - DF	5.50"	5.50"	1.50"	109	143	252	Blocking
2 - Hanger on 5 1/2" DF Ledger	5.50"	Hanger ¹	1.50"	111	147	258	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments	
Top Edge (Lu)	Continuous		
Bottom Edge (Lu)	All Bearing Points		

[•]Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Stro	ng-1	Гіе						
Support			Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	7		LRU26Z	1.94"	N/A	4-10dx1.5	5-10d	

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

Vertical Load	L	ocation (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	7	0 to 7' 3"	24"	15.0	20.0	R1 - ROOF

Member Notes

RJ10 - CERILING JOISTS - LOCKER ROOM

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ROOF, CJ1 - High/Clerestory, Roof Framing Plan - B/W Grids B&C - Kitchen Ceiling Joists

1 piece(s) 2 x 8 DF No.2 @ 16" OC

Overall Length: 14' 5"

14'

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)	163 @ 3 1/2"	1406 (1.50")	Passed (12%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	149 @ 10 3/4"	1631	Passed (9%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	572 @ 7' 3 1/2"	1700	Passed (34%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.151 @ 7' 3 1/2"	0.467	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.265 @ 7' 3 1/2"	0.700	Passed (L/635)		1.0 D + 1.0 Lr (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A		N/A

Member Length: 14'
System: Floor
Member Type: Joist
Building Use: Commercial
Building Code: IBC 2021
Design Methodology: ASD

PASSED

- Deflection criteria: LL (L/360) and TL (L/240).
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

	В	earing Leng	th	Loads	to Support	s (lbs)	
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 7 1/4" LVL beam	3.50"	Hanger ¹	1.50"	73	97	170	See note ¹
2 - Hanger on 7 1/4" DF Ledger	1.50"	Hanger ¹	1.50"	71	95	166	See note 1

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	End Bearing Points	

Connector: Simpson Strong-Tie								
Support		Model		Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger		LU28		1.50"	N/A	8-10dx1.5	6-10dx1.5	
2 - Face Mount Hanger		LU28		1.50"	N/A	8-10dx1.5	6-10dx1.5	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 14' 5"	16"	7.5	10.0	Ceiling Assembly, excluding self- weight

Member Notes

CJ1 - High/Clerestory, Roof Framing Plan - B/W Grids B&C - Kitchen Ceiling Joists

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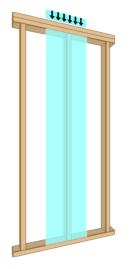
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ROOF, Wall: 2x8 Stud

1 piece(s) 2 x 8 DF No.2 @ 16" OC

Wall Height: 13' 3" Member Height: 12' 10 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	21	50	Passed (43%)		
Compression (lbs)	1403	9544	Passed (15%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	1403	8496	Passed (17%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	192			1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	174	2088	Passed (8%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	617 @ mid-span	2145	Passed (29%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.18 @ mid-span	0.86	Passed (L/841)		1.0 D + 0.6 W
Bending/Compression	0.34	1	Passed (34%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- A 15% increase in the moment capacity has been added to account for repetitive member usage

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch

Max Unbraced Length 1'

Member Type : Stud
Building Code: IBC 2021
Design Methodology : ASD

Lateral Connections							
Supports	Connector	Type/Model	Quantity	Connector Nailing			
Тор	Nails	8d (0.113" x 2 1/2") (Toe)	2	N/A			
Base	Nails	8d (0.113" x 2 1/2") (Toe)	2	N/A			

[•] Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Wasting Hands	Spacing	Dead (0.90)	Roof Live (1.25)	
Vertical Loads	Spacing	(0.90)	(1.25)	Comments
1 - Point (PLF)	16.00"	333.0	445.0	(1/3) Roof Truss Point Load / 16" x12"
2 - Point (PLF)	16.00"	118.5	156.0	Linked from: Roof: Joist, Support 1

			Wind	
Lateral Load	Location	Spacing	(1.60)	Comments
1 - Uniform (PSF)	Full Length	16.00"	37.2	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

Member Notes

Exterior 2x8 Wall Between Apparatus and Electrical Room

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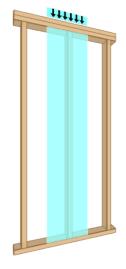
[•] IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.



ROOF, Tall Wall: 2x6 Stud

2 piece(s) 2 x 8 DF No.2 @ 16" OC

Wall Height: 26' Member Height: 25' 7 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	42	50	Passed (85%)		
Compression (lbs)	1186	5576	Passed (21%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	1186	15293	Passed (8%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	347			1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	330	4176	Passed (8%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	2220 @ mid-span	4339	Passed (51%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	1.23 @ mid-span	1.71	Passed (L/250)		1.0 D + 0.6 W
Bending/Compression	0.58	1	Passed (58%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.125 has been applied to base plate bearing capacity.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.

System: Wall Member Type : Stud

• A 15% increase in the moment capacity has been added to account for repetitive member usage

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch

Inbraced Length		Comments		
				Design Methodology . ASD
	2X	Douglas	Fir-Larch	Building Code : IBC 2021 Design Methodology : ASD
				Puilding Codo : IPC 2021

Max Unbraced Length	Comments
1'	
•	

Lateral Connection	ons			
Supports	Connector	Type/Model	Quantity	Connector Nailing
Тор	Nails	8d (0.113" x 2 1/2") (Toe)	4	N/A
Base	Nails	8d (0.113" x 2 1/2") (Toe)	4	N/A

[•] Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

Vertical Loads	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Point (PLF)	16.00"	333.8	445.0	Roof truss
2 - Point (PLF)	16.00"	48.0	63.0	Roof Trib 3'-2"

			Wind	
Lateral Load	Location	Spacing	(1.60)	Comments
1 - Uniform (PSF)	Full Length	16.00"	33.8	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

Member Notes

Exterior stud wall along grid B full height

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[•] IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

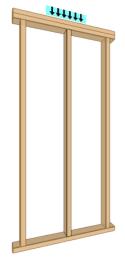




ROOF, Interior Wall: 2x6 Stud

1 piece(s) 2 x 6 DF No.2 @ 16" OC

Wall Height: 19' Member Height: 18' 7 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	41	50	Passed (81%)		
Compression (lbs)	1186	2301	Passed (52%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	1186	6445	Passed (18%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	0				N/A
Lateral Shear (lbs)	0	N/A	Passed (N/A)		N/A
Lateral Moment (ft-lbs)	0 @ mid-span	N/A	Passed (N/A)		N/A
Total Deflection (in)	0.10 @ mid-span	1.24	Passed (L/2134)		1.0 D + 1.0 Lr
Bending/Compression	0.46	1	Passed (46%)	1.25	1.0 D + 1.0 Lr

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- A 15% increase in the moment capacity has been added to account for repetitive member usage

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch

Max Unbraced Length	Comments	
1'		

System : Wall
Member Type : Stud
Building Code: IBC 2021
Design Methodology : ASD

Vertical Loads	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Point (PLF)	16.00"	333.8	445.0	
2 - Point (PLF)	16.00"	48.0	63.0	Roof Trib 3'-2"

Member Notes

Interior stud wall along grid B braced by Day room

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



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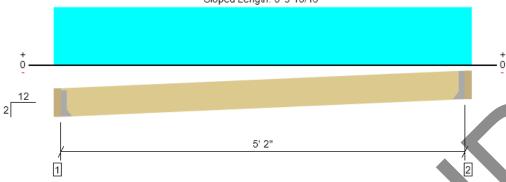
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ROOF, (B30) - FLUSH BEAM 1 piece(s) 6 x 6 DF No.1

Sloped Length: 5' 9 15/16"



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)	1078 @ 3 1/2"	5156 (1.50")	Passed (21%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	889 @ 8 15/16"	4285	Passed (21%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1392 @ 2' 10 1/2"	3466	Passed (40%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.025 @ 2' 10 1/2"	0.175	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.056 @ 2' 10 1/2"	0.262	Passed (L/999+)	4-7	1.0 D + 1.0 Lr (All Spans)

Member Length: 5' 3 3/4" System: Roof Member Type: Flush Beam Building Use: Commercial

Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD Member Pitch: 2/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on NDS.
- This product has a square cross section. The analysis engine has checked both edge and plank orientations to allow for either installation.

	В	earing Leng	th	Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 5 1/2" DF beam	3.50"	Hanger ¹	1.50"	655	541	1197	See note ¹
2 - Hanger on 5 1/2" DF beam	3.50"	Hanger ¹	1.50"	655	541	1197	See note 1

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

 $[\]bullet \text{Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions. } \\$

Connector: Simpson Strong-Tie								
Support		Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger		HUC66X SLU9	2.50"	N/A	12-10dx1.5	6-10d		
2 - Face Mount Hanger		HUC66X SLD9	2.50"	N/A	12-10dx1.5	6-10d		

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	3 1/2" to 5' 5 1/2"	N/A	7.7		
1 - Uniform (PSF)	0 to 5' 9"	9' 5"	15.2	20.0	R1 - ROOF
2 - Uniform (PSF)	0 to 5' 9"	5'	15.0	-	EXT WALL ABV

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

Member	Notes

B30 - FLUSH BEAM - ALONG A.5 Electrical Room

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ROOF, Roof: Joist

1 piece(s) 2 x 10 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)	528 @ 3 1/2"	1406 (1.50")	Passed (38%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	475 @ 1' 5/8"	2081	Passed (23%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	1980 @ 7' 9 1/2"	2537	Passed (78%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.296 @ 7' 9 1/2"	0.760	Passed (L/617)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.521 @ 7' 9 1/2"	1.014	Passed (L/350)	/	1.0 D + 1.0 Lr (All Spans)

Member Length: 15' 4" System: Roof Member Type: Joist Building Use: Commercial Building Code: IBC 2021 Design Methodology: ASD Member Pitch: 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- ullet A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

	Bearing Length			Loads to Supports (lbs)			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Hanger on 9 1/4" DF Ledger	3.50"	Hanger ¹	1.50"	237	312	549	See note ¹
2 - Hanger on 9 1/4" DF Ledger	3.50"	Hanger ¹	1.50"	237	312	549	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	End Bearing Points	

[•]Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie									
Support		Mode		Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger		LRU28	<u>z</u>	1.94"	N/A	6-10dx1.5	5-10d		
2 - Face Mount Hanger	7	LRU28	Z	1.94"	N/A	6-10dx1.5	5-10d		

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 15' 7"	24"	15.0	20.0	Roof

Member Notes

Electrical Room Roof Joists

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System: Wall Member Type: Stud Building Code: IBC 2021

Design Methodology: ASD

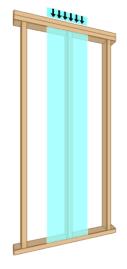
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ROOF, Tall Wall: 2x8 Stud

2 piece(s) 2 x 8 DF No.2 @ 16" OC

Wall Height: 29' Member Height: 28' 7 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	47	50	Passed (95%)		
Compression (lbs)	223	4500	Passed (5%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	223	15293	Passed (1%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	381			1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	365	4176	Passed (9%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	2725 @ mid-span	4339	Passed (63%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	1.85 @ mid-span	1.91	Passed (L/186)		1.0 D + 0.6 W
Bending/Compression	0.64	1	Passed (64%)	1.60	1.0 D + 0.6 W

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.125 has been applied to base plate bearing capacity.
- The column stability factor (Kf = 0.6) applied to this design assumes nailed built-up columns per NDS section 15.3.3. For Weyerhaeuser ELP products refer to the U.S. Wall Guide for multiple-member connection requirements.
- A 15% increase in the moment capacity has been added to account for repetitive member usage

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch

			1
Max Unbraced Length	Cor	nments	5
1'			

Lateral Connection	ns			7	
Supports	Connector	Type/Model	Quantity		Connector Nailing
Тор	Nails	8d (0.113" x 2 1/2") (Toe)	4		N/A
Base	Nails	8d (0.113" x 2 1/2") (Toe)	4		N/A

[•] Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

		Dead	Roof Live	
Vertical Load	Spacing	(0.90)	(1.25)	Comments
1 - Point (PLF)	16.00"	72.0	95.0	4'-9" Roof Trib

Lateral Load	Location	Spacing	Wind (1.60)	Comments
1 - Uniform (PSF)	Full Length	16.00"	33.3	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.
• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

Member	Notes

Exterior 2x8 Wall Along Grid 2/7

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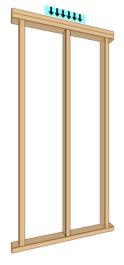


System: Wall
Member Type: Stud
Building Code: IBC 2021
Design Methodology: ASD

ROOF, Gravity Exterior Wall: 2x6 Stud

1 piece(s) 2 x 6 DF No.2 @ 16" OC

Wall Height: 17' 2" Member Height: 16' 9 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	37	50	Passed (73%)		
Compression (lbs)	1186	2805	Passed (42%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	1186	6445	Passed (18%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	0				N/A
Lateral Shear (lbs)	0	N/A	Passed (N/A)		N/A
Lateral Moment (ft-lbs)	0 @ mid-span	N/A	Passed (N/A)		N/A
Total Deflection (in)	0.09 @ mid-span	1.12	Passed (L/2367)		1.0 D + 1.0 Lr
Bending/Compression	0.34	1	Passed (34%)	1.25	1.0 D + 1.0 Lr

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch

Max Unbraced Length	Comments
1'	

	•			
		Dead	Roof Live	
Vertical Loads	Spacing	(0.90)	(1.25)	Comments
1 - Point (PLF)	16.00"	333.8	445.0	
2 - Point (PLF)	16.00"	48.0	63.0	Roof Trib 3'-2"

Member Notes

Exterior stud wall along grid A

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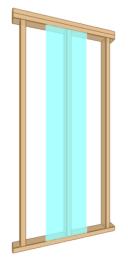
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ROOF, Wind Exterior Wall: 2x6 Stud

1 piece(s) 2 x 6 DF No.2 @ 16" OC

Wall Height: 17' 2" Member Height: 16' 9 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	37	50	Passed (73%)		
Compression (lbs)	0	2835	Passed (0%)	1.60	1.0 D + 0.6 W
Plate Bearing (lbs)	0	6445	Passed (0%)		1.0 D + 0.6 W
Lateral Reaction (lbs)	241			1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	228	1584	Passed (14%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	1013 @ mid-span	1342	Passed (75%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	1.08 @ mid-span	1.12	Passed (L/186)		1.0 D + 0.6 W
Bending/Compression	0.75	1	Passed (75%)	1.60	1.0 D + 0.6 W

- · Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- A 15% increase in the moment capacity has been added to account for repetitive member up

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch
	-	

Max Unbraced Length	Comments
1'	

System : Wall
Member Type : Stud
Building Code: IBC 2021
Design Methodology : ASD

Lateral Connections					
Supports	Connector	Type/Model	Quantity	Connector Nailing	
Тор	Nails	8d (0.113" x 2 1/2") (Toe)	3	N/A	
Base	Nails	8d (0.113" x 2 1/2") (Toe)	3	N/A	

[•] Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

An error occurred while attempting to execute the subreport.

			Wind	
Lateral Load	Location	Spacing	(1.60)	Comments
1 - Uniform (PSF)	Full Length	16.00"	35.9	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Height (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.
• IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

Member Notes

Exterior stud wall along grid A

Weyerhaeuser Notes

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ForteWEB Software Operator	Job Notes	
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com		

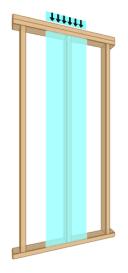


System: Wall
Member Type: Stud
Building Code: IBC 2021
Design Methodology: ASD

ROOF, Day Room Exterior 2x6 Wall

1 piece(s) 2 x 6 DF No.2 @ 16" OC

Wall Height: 9' 1" Member Height: 8' 8 1/2" O. C. Spacing: 16.00"



Drawing is Conceptual

Supports Top

Base

Lateral Connections

Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	19	50	Passed (38%)		
Compression (lbs)	677	8650	Passed (8%)	1.25	1.0 D + 1.0 Lr
Plate Bearing (lbs)	677	6445	Passed (11%)		1.0 D + 1.0 Lr
Lateral Reaction (lbs)	136			1.60	1.0 D + 0.6 W
Lateral Shear (lbs)	122	1584	Passed (8%)	1.60	1.0 D + 0.6 W
Lateral Moment (ft-lbs)	297 @ mid-span	1342	Passed (22%)	1.60	1.0 D + 0.6 W
Total Deflection (in)	0.09 @ mid-span	0.58	Passed (L/1149)		1.0 D + 0.6 W
Bending/Compression	0.25	1	Passed (25%)	1.60	1.0 D + 0.6 W

N/A

- Lateral deflection criteria: Wind (L/180)
- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.
- A bearing area factor of 1.25 has been applied to base plate bearing capacity.
- · A 15% increase in the moment capacity has been added to account for repetitive member usage.

Supports	Туре	Material
Тор	Dbl 2X	Douglas Fir-Larch
Base	2X	Douglas Fir-Larch
	•	

Max Unbraced Length Comments
1'

1			
nector	Type/Model	Quantity	Connector Nailing
ails	8d (0.113" x 2 1/2") (Toe)	2	N/A

[•] Nailed connection at the top of the member is assumed to be nailed through the bottom 2x plate prior to placement of the top 2x of the double top plate assembly.

8d (0.113" x 2 1/2") (Toe)

Vertical Load	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Point (PLF)	16.00"	218.0	290.0	Roof Trib 14'-6"

			Wind	
Lateral Load	Location	Spacing	(1.60)	Comments
1 - Uniform (PSF)	Full Length	16.00"	39.2	

[•] ASCE/SEI 7 Sec. 30.4: Exposure Category (C), Mean Roof Neight (26'), Topographic Factor (1.0), Wind Directionality Factor (0.85), Basic Wind Speed (125), Risk Category(IV), Wind Zone (4), GCpi (+/- 0.18), Effective Wind Area determined using full member span and trib. width.

Nails

Member Notes

Exterior stud wall along grid A

Weyerhaeuser Notes

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ForteWEB Software Operator	Job Notes	
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com		



[•] IBC Table 1604.3, footnote f: Deflection checks are performed using 42% of this lateral wind load.

Project Title: Engineer: Project ID: Project Descr:

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B11 - HEADER ALONG GL-2&7

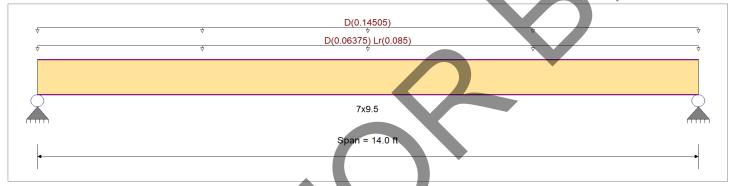
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb+	2,900.0 psi	E : Modulus of Elas	ticity
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx	2,000.0 ksi
	Fc - Prll	2,635.0 psi	Eminbend - xx	1,036.83 ksi
Wood Species : RedBuilt	Fc - Perp	750.0 psi		
Wood Grade : RedLam LVL Beam/Joist	Fv	285.0 psi		
11000 01000 1 11000001	Ft	1,660.0 psi	Density	42.010 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional b	ouckling			·



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 4.250 ft, (ROOF) Uniform Load : D = 0.0150 ksf, Tributary Width = 9.670 ft, (EXT WALL ABV)

				Design OK
0.244: 1	Maximum S	Shear Stress Ratio	=	0.125 : 1
7x9.5	Section	used for this span		7x9.5
637.19psi		fv: Actual	=	32.09 psi
2,610.00psi		Fv: Allowable	=	256.50 psi
D Only	Load C	ombination		D Only
7.000ft	Locatio	n of maximum on span	=	13.234 ft
Span # 1	Span #	where maximum occurs	=	Span # 1
0.074 in Ratio =	2273 >=360	Span: 1 : Lr Only		
0 in Ratio =	0 < 360	n/a		
0.272 in Ratio =	617 >= 240	Span: 1 : +D+Lr		
0 in Ratio =	0<240	n/a		
	7x9.5 637.19psi 2,610.00psi D Only 7.000ft Span # 1 0.074 in Ratio = 0 in Ratio = 0.272 in Ratio =	7x9.5 Section 637.19psi 2,610.00psi D Only Load C 7.000ft Location Span # 1 Span # 0.074 in Ratio = 0 <360 0 in Ratio = 0 <360 0.272 in Ratio = 617 >= 240	7x9.5 Section used for this span 637.19psi fv: Actual 2,610.00psi Fv: Allowable D Only Load Combination 7.000ft Location of maximum on span Span # 1 Span # where maximum occurs 0.074 in Ratio = 2273 >=360 Span: 1 : Lr Only 0 in Ratio = 0<360 n/a 0.272 in Ratio = 617 >=240 Span: 1 : +D+Lr	7x9.5 Section used for this span 637.19psi fv: Actual = 2,610.00psi Fv: Allowable = D Only Load Combination 7.000ft Location of maximum on span = Span # 1 Span # where maximum occurs = 0.074 in Ratio = 2273 >= 360 Span: 1 : Lr Only 0 in Ratio = 0 < 360 n/a 0.272 in Ratio = 617 >= 240 Span: 1 : +D+Lr

Maximum Forces & Stresses for Load Combinations

maximam i or	000 C C	000			001111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0110									
Load Combination		Max Stre	ess Ratio)S							Mom	ent Values	S	S	Shear Val	ues
Segment Length	Span #	М	V	c_d	$C_{F/V}$	Сi	Cr	c_{m}	C t	CL	М	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.244	0.125	0.90	1.000	1.00	1.00	1.00	1.00	1.00	5.59	637.19	2610.00	1.42	32.09	256.50
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.241	0.124	1.25	1.000	1.00	1.00	1.00	1.00	1.00	7.67	874.53	3625.00	1.95	44.04	356.25
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.225	0.115	1.25	1.000	1.00	1.00	1.00	1.00	1.00	7.15	815.20	3625.00	1.82	41.05	356.25
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.082	0.042	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.35	382.31	4640.00	0.85	19.25	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl Loca	ation in Span	Load Combination	Max. "+" Defl Locat	ion in Span
+D+l r	1	0.2722	7.051		0.0000	0.000

Project Title: Engineer: Project ID: Project Descr:

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B11 - HEADER ALONG GL-2&7

ertical Reactions		Support notation : Far left is #1	Values in KIPS
Load Combination	Support 1 S	Support 2	
Overall MAXimum	2.192	2.192	
Overall MINimum	0.595	0.595	
D Only	1.597	1.597	
+D+Lr	2.192	2.192	
+D+0.750Lr	2.044	2.044	
+0.60D	0.958	0.958	
Lr Only	0.595	0.595	



Project Title: Engineer: Project ID: Project Descr:

Project File: 7067.ec6 **Wood Column**

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: B11 - HEADER OOP WIND CHECK

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

General Information

Analysis Method End Fixities		Stress Desigr	1	Wood Section Nar Wood Grading/Ma			
Overall Column Height		14 ft	Wood Member Ty	pe Parallam F	PSL		
,	on-slender calcula	tions)		Exact Width	7.0 in All	ow Stress Modification Factor	ors
Wood Species	RedBuilt	December / Indian		Exact Depth	9.50 in	Cf or Cv for Bending	1.0
Wood Grade	RedLam LVL			Area	66.50 in^2	Cf or Cv for Compression	1.0
Fb +	2,900.0 psi		285.0 psi	IX	500.14 in^4	Cf or Cv for Tension	1.0
Fb -	2,900.0 psi		1,660.0 psi	IV	271.542 in^4	Cm : Wet Use Factor	1.0
Fc - Prll	2,635.0 psi	Density	42.010 pcf	•		Ct : Temperature Fact	1.0
Fc - Perp	750.0 psi				`	Cfu : Flat Use Factor	1.0
E : Modulus of E	lasticity	x-x Bending	y-y Bending	Axial		Kf : Built-up columns	1.0
	Basic	2,000.0	2,000.0	2,000.0 ksi		Use Cr : Repetitive ?	No
	Minimum	1,036.83	1,036.83	Column Buckling Condition	on:	•	

ABOUT X-X Axis: Lux = 14 ft, Kx = 1.0ABOUT Y-Y Axis: Luy = 14 ft, Ky = 1.0

Applied Loads

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

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Column self weight included: 271.606 lbs * Dead Load Factor

BENDING LOADS . . .

ROOF: Lat. Uniform Load creating Mx-x, D = 0.0640, LR = 0.0850 k/ft EXT WALL ABV: Lat. Uniform Load creating Mx-x, D = 0.150 k/ft WIND: Lat. Uniform Load creating My-y, W = 0.2160 k/ft

DESIGN SUMMARY

Bending & Shear Check Results	
PASS Max. Axial+Bending Stress Ratio =	0.2495:1
Load Combination +D+0.750L	
Governing NDS Forumla Comp + Mxx + Myy, ND	S Eq. 3.9-
Location of max.above base	6.953 ft
At maximum location values are .	
Applied Axial	0.2716 k
Applied Mx	6.805 k-ft
Applied My	2.381 k-ft
Fc : Allowable	1,408.93 psi

PASS Maximum Shear Stress Ratio =	0.1325 : 1
Load Combination	+D+Lr
Location of max.above base	0.0 ft
Applied Design Shear	70.816 psi
Allowable Shear	356.250 psi

Maximum SERVICE Lateral Load Reactions . .

Bottom along Y-Y 2.093 k Top along Y-Y 2.093 k Top along X-X 1.512 k Bottom along X-X 1.512 k

Maximum SERVICE Load Lateral Deflections . . .

0.2612 in at Along Y-Y 7.047 ft above base

for load combination: +D+Lr

Along X-X 0.3475 in at 7.047 ft above base

for load combination: W Only

Other Factors used to calculate allowable stresses . . .

<u>Bending</u> Compression **Tension**

Load Combination Results

	_	_	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
Load Combination	C_D	CP	Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.555	0.2309	PASS	6.953 ft	0.1317	PASS	14.0 ft
+D+Lr´	1.250	0.419	0.2331	PASS	7.047 ft	0.1325	PASS	0.0 ft
+D+0.750Lr	1.250	0.419	0.2165	PASS	6.953 ft	0.1231	PASS	0.0 ft
+D+0.60W	1.600	0.334	0.2370	PASS	7.047 ft	0.07410	PASS	14.0 ft
+D+0.750Lr+0.450W	1.600	0.334	0.2495	PASS	6.953 ft	0.09617	PASS	0.0 ft
+D+0.450W	1.600	0.334	0.2105	PASS	7.047 ft	0.07410	PASS	14.0 ft
+0.60D+0.60W	1.600	0.334	0.1845	PASS	7.047 ft	0.04488	PASS	14.0 ft
+0.60D	1.600	0.334	0.07843	PASS	7.047 ft	0.04446	PASS	14.0 ft

Wood Column Project File: 7067.ec6

LIC# : KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: B11 - HEADER OOP WIND CHECK

(c) ENERCALC, LLC 1982-2024

Maximum Reactions

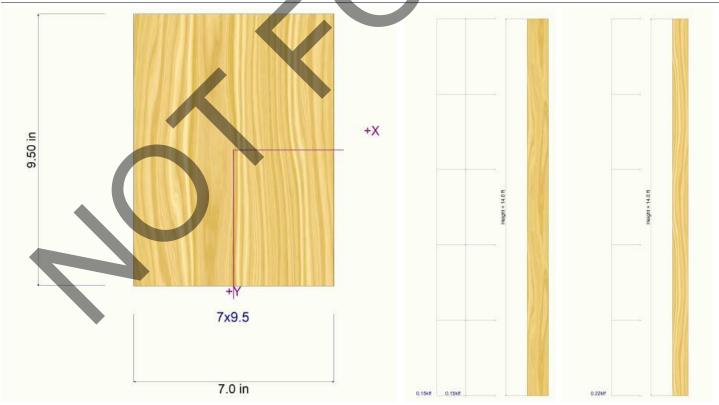
Note: Only non-zero reactions are listed.

	X-X Axis Re	eaction k	Y-Y Axis	Reaction	Axial Reaction	My - End Moments k-ft Mx - End Moments
Load Combination	@ Base	@ Top	@ Base	@ Top	@ Base	@ Base @ Top @ Base @ Top
D Only			1.498	1.498	0.272	
+D+Lr			2.093	2.093	0.272	
+D+0.750Lr			1.944	1.944	0.272	
+D+0.60W	0.907	0.907	1.498	1.498	0.272	
+D+0.750Lr+0.450W	0.680	0.680	1.944	1.944	0.272	
+D+0.450W	0.680	0.680	1.498	1.498	0.272	
+0.60D+0.60W	0.907	0.907	0.899	0.899	0.163	
+0.60D			0.899	0.899	0.163	
Lr Only			0.595	0.595		
W Only	1.512	1.512				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance	
D Only	0.0000 in	0.000ft	0.187 in	7.047 ft	
+D+Lr	0.0000 in	0.000ft	0.261 in	7.047 ft	
+D+0.750Lr	0.0000 in	0.000ft	0.243 in	7.047 ft	
+D+0.60W	0.2085 in	7.047ft	0.187 in	7.047 ft	
+D+0.750Lr+0.450W	0.1564 in	7.047ft	0.243 in	7.047 ft	
+D+0.450W	0.1564 in	7.047ft	0.187 in	7.047 ft	
+0.60D+0.60W	0.2085 in	7.047ft	0.112 in	7.047 ft	
+0.60D	0.0000 in	0.000ft	0.112 in	7.047 ft	
Lr Only	0.0000 in	0.000ft	0.074 in	7.047 ft	
W Only	0.3475 in	7.047ft	0.000 in	0.000 ft	

Sketches



Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: B14 - FLUSH BEAM ALONG GL-5.2

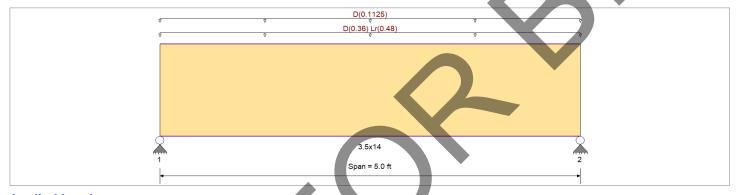
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb+	2,900.0 psi	E : Modulus of Elas	ticity
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx	2,000.0 ksi
	Fc - Prll	2,635.0 psi	Eminbend - xx	1,036. 83 ksi
Wood Species : RedBuilt	Fc - Perp	750.0 psi		
Wood Grade : RedLam LVL Beam/Joist	Fv	285.0 psi		
	Ft	1,660.0 psi	Density	42.010 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckl	ing			



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 24.0 ft, (ROOF) Uniform Load: D = 0.0150 ksf, Tributary Width = 7.50 ft, (INT WALL ABV)

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio	0.089: 1	Maximum S	hear Stress Ratio	=	0.112 : 1
Section used for this span	3.5x14	Section	used for this span		3.5x14
fb: Actual =	317.10psi		fv: Actual	=	39.97 psi
F'b =	3,549.79psi		F'v	=	356.25 psi
Load Combination	+D+Lr	Load C	ombination		+D+Lr
Location of maximum on span =	2.500ft	Locatio	n 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	0.004 in Ratio =	14145 >= 360	Span: 1 : Lr Only		
Max Upward Transient Deflection	0 in Ratio =	0 <360	n/a		
Max Downward Total Deflection	0.009 in Ratio =	7023 >= 240	Span: 1 : +D+Lr		
Max Upward Total Deflection	0 in Ratio =	<mark>0</mark> <240	n/a		

Maximum Forces & Stresses for Load Combinations

maximum i o							u										
Load Combination		Max S	tress Ra	tios								Moment	Values		Sh	near Valu	Jes
Segment Length	Span #	М	V	CD	СМ	C _t (CLx	C_F	Cfu	c i	C _r	М	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.062	0.078	0.90	1.00	1.00	1.00	0.979	1.00	1.00	1.00	1.52	159.7	2,555.9	0.66	20.1	256.5
+D+Lr					1.00	1.00	1.00	0.979	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.089	0.112	1.25	1.00	1.00	1.00	0.979	1.00	1.00	1.00	3.02	317.1	3,549.8	1.31	40.0	356.3
+D+0.750Lr					1.00	1.00	1.00	0.979	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.078	0.098	1.25	1.00	1.00	1.00	0.979	1.00	1.00	1.00	2.65	277.7	3,549.8	1.14	35.0	356.3
+0.60D					1.00	1.00	1.00	0.979	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.021	0.026	1.60	1.00	1.00	1.00	0.979	1.00	1.00	1.00	0.91	95.8	4,543.7	0.39	12.1	456.0

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: B14 - FLUSH BEAM ALONG GL-5.2

rtical Reactions		port notation : Far left is #1	Values in KIPS	
oad Combination	Support 1 Support 2			
Max Upward from all Load Conditions	2.417 2.417			
Max Upward from Load Combinations	2.417 2.417 1.217 1.217			
Max Upward from Load Cases D Only	1.217 1.217 1.217 1.217			
+D+Lr	2.417 2.417			
+D+0.750Lr	2.117 2.117			
+0.60D	0.730 0.730			
_r Only	1.200 1.200			
3.1				
5/1				
23				
15				
" //				
			. \\	
				//
0.8				- //
				~ \ \
	_			1
BER>>				
0.46 0.93	1.41 1.88 2.35	2.83 3.30	3.78 4.25	4,73
	Distanc	a (ft)		
	■ D Only ■ +D+L ■ +			
	■ 00/1y ■ 101ti ■ 1	VT0./ 300 T0.00V		

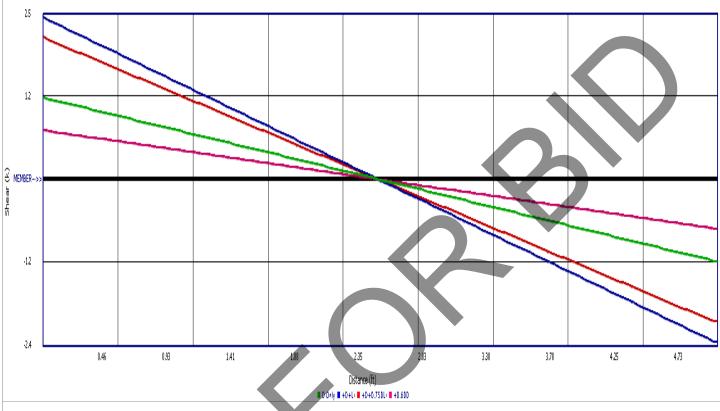
Wood Beam Project File: 7067.ec6

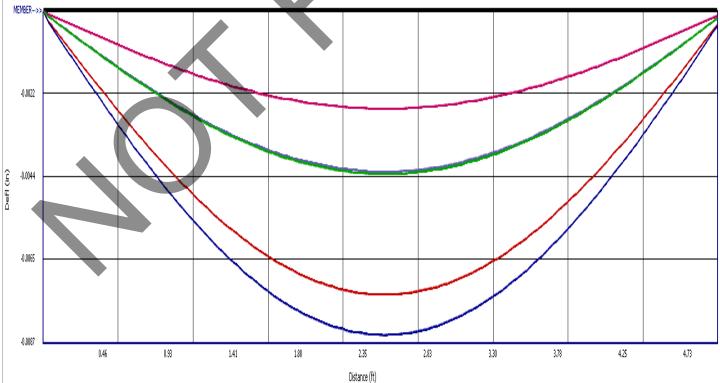
LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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DESCRIPTION: B14 - FLUSH BEAM ALONG GL-5.2





■ D Only ■ +D+L+■ +D+B.758L+■ +B.68D ■ L+Only

Wood Column

Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B14

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

General Information

Analysis Method	Allowable	Stress Design	1	Wood Section Na	ame 4x6		
End Fixities	Top & Bot	tom Pinned		Wood Grading/M	lanuf. Graded Lu	mber	
Overall Column I	Height		13 ft	Wood Member T	ype Sawn		
(Used for no	on-slender calcula	tions)		Exact Width	3 50 in All	ow Stress Modification Fact	ors
Wood Species	Douglas Fir-L	arch.		Exact Depth	5.50 in	Cf or Cv for Bending	1.30
Wood Grade	No.2			Area	19.250 in^2	Cf or Cv for Compression	1.10
Fb +	900.0 psi	Fv	180.0 psi	Ix	48.526 in^4	Cf or Cv for Tension	1.30
Fb -	900.0 psi	Ft	575.0 psi		19.651 in^4	Cm : Wet Use Factor	1.0
Fc - Prll	1,350.0 psi	Density	31.210 pcf	•,	10.001 111 4	Ct : Temperature Fact	1.0
Fc - Perp	625.0 psi				`	Cfu : Flat Use Factor	1.0
E : Modulus of E	lasticity	x-x Bending	y-y Bending	Axial		Kf : Built-up columns	1.0
	Basic	1,600.0	1,600.0	1,600.0 ksi		Use Cr : Repetitive ?	No
	Minimum	580.0	580.0	Column Buckling Condit	tion:	,	

ABOUT X-X Axis: Lux = 13 ft, Kx = 1.0 ABOUT Y-Y Axis: Luy = 13 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 54.238 lbs * Dead Load Factor

AXIAL LOADS . . .

B14 REACTIONS: Axial Load at 13.0 ft, Xecc = 0.5830 in, D = 1.220, Lr = 1.20 k

DESIGN SUMMARY

Bending & Shear Check Results						
PASS Max. Axial+Bending Stress Ratio	= 0.5510 : 1	Maximum SERVI	CE Lateral Loa	ad Reactions		
Load Combination	+D+Lr	Top along Y-Y	0.0 k		along Y-Y	0.0 k
Governing NDS Forumla	Comp Only, fc/Fc'	Top along X-X	0.009044 k	Bottom	along X-X	0.009044 k
Location of max.above base	0.0 ft	Maximum SERVI	CF Load Later	al Deflections	2	
At maximum location values are.						haaa
Applied Axial	2.474 k	Along Y-Y	0.0 in	at 0.	0 ft above	base
Applied Mx	0.0 k-ft	for load comb	oination : n/a			
	***************************************	Along X-X	-0.07066 in	at 7.59	1 ft above	base
Applied My	0.0 k-ft	J	bination : +D+L	r		
Fc : Allowable	233.280 psi			-		
		Other Factors us	ed to calculate		resses	
PASS Maximum Shear Stress Ratio =	0.003132 : 1			<u>Bending</u>	<u>Compress</u>	<u>sion</u> <u>Tension</u>
Load Combination	+D+Lr					
Location of max.above base	13.0 ft					
Applied Design Shear	1.057 psi					
Allowable Shear	225.0 psi					

Load Combination Results

			Maximum Axial -	+ Bending	Stress Ratios	<u>Maximu</u>	m Shear R	atios
Load Combination	CD	C_P	Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.172	0.2873	PASS	0.0 ft	0.002193	PASS	13.0 ft
+D+Lr [´]	1.250	0.126	0.5510	PASS	0.0 ft	0.003132	PASS	13.0 ft
+D+0.750Lr	1.250	0.126	0.4842	PASS	0.0 ft	0.002744	PASS	13.0 ft
+0.60D	1.600	0.099	0.1691	PASS	0.0 ft	0.000740	PASS	13.0 ft
Maximum Reactions						Note: Only non-z	ero reactio	ns are listed.

	X-X Axis R	eaction I	k	Y-Y Axis I	Reaction	Axial Reaction	My - End Mo	oments k-ft	Mx - End	Moments
Load Combination	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only	-0.005	0.005				1.274				
+D+Lr	-0.009	0.009				2.474				
+D+0.750Lr	-0.008	0.008				2.174				

Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B14

Maximum Reactions

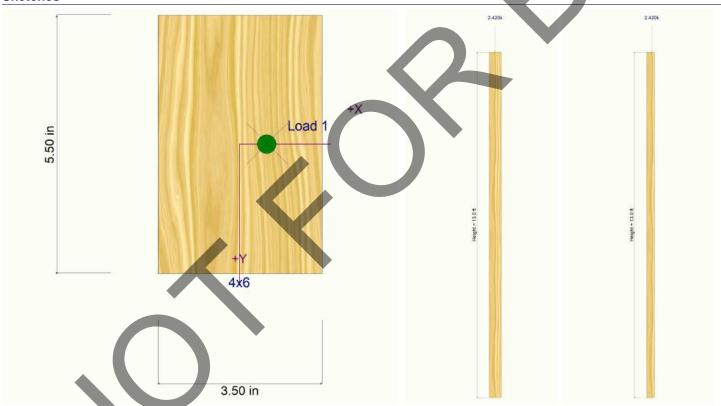
Note: Only non-zero reactions are listed.

	X-X Axis R	eaction k	Y-Y Axis Reaction	Axial Reaction	My - End M	oments k-ft Mx - End Moments
Load Combination	@ Base	@ Top	@ Base @ Top	@ Base	@ Base	@ Top
+0.60D	-0.003	0.003		0.765		
Lr Only	-0.004	0.004		1.200		

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection Dista	nce	Max. Y-Y Deflection	Distance	
D Only	-0.0356 in 7	.591ft	0.000 in	0.000 ft	
+D+Lr	-0.0707 in 7	.591ft	0.000 in	0.000ft	
+D+0.750Lr	-0.0619 in 7	.591ft	0.000 in	0.000 ft	
+0.60D	-0.0214 in 7	.591ft	0.000 in	0.000 ft	
Lr Only	-0.0350 in 7	.591ft	0.000 in	0.000 ft	

Sketches



Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B15 - FLUSH BEAM ALONG GL-5

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb+	2,900.0 psi	E : Modulus of Elas	ticity
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx	2,000.0 ksi
	Fc - Prll	2,635.0 psi	Eminbend - xx	1,036.83 ksi
Wood Species : RedBuilt	Fc - Perp	750.0 psi		
Wood Grade : RedLam LVL Beam/Joist	Fv	285.0 psi		
	Ft	1,660.0 psi	Density	42.010 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional bu	ıckling			

D(0.36) Lr(0.48)

5.25x22

Span = 27.670 ft

Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 24.0 ft, (ROOF)

DESIGN SUMMARY				Design OK
Maximum Bending Stress Ratio =	0.699 : 1	Maximum Shear Stress Ratio	=	0.383 : 1
Section used for this span	5.25x22	Section used for this span		5.25x22
fb: Actual	2,369.28psi	fv: Actual	=	136.36 psi
Fb: Allowable	3,389.13psi	Fv: Allowable	=	356.25 psi
Load Combination	+D+Lr	Load Combination		+D+Lr
Location of maximum on span =	13.835ft	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	0.683 in Ratio =	485 >= 360 Span: 1 : Lr Only		
Max Upward Transient Deflection	0 in Ratio =	<mark>0</mark> <360 n/a		
Max Downward Total Deflection	1.244 in Ratio =	266 >= 240 Span: 1: +D+Lr		
Max Upward Total Deflection	0 in Ratio =	<mark>0</mark> <240 n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination Max Stress Ratios						Moment Values				Shear Values						
Segment Length	Span #	M	V	c_d	$C_{F/V}$	Сį	c_r	c_m	C t	C _L	М	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 27.670 ft	1	0.438	0.240	0.90	0.935	1.00	1.00	1.00	1.00	1.00	37.68	1,067.62	2440.17	4.73	61.44	256.50
+D+Lr					0.935	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 27.670 ft	1	0.699	0.383	1.25	0.935	1.00	1.00	1.00	1.00	1.00	83.62	2,369.28	3389.13	10.50	136.36	356.25
+D+0.750Lr					0.935	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 27.670 ft	1	0.603	0.330	1.25	0.935	1.00	1.00	1.00	1.00	1.00	72.13	2,043.86	3389.13	9.06	117.63	356.25
+0.60D					0.935	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 27.670 ft	1	0.148	0.081	1.60	0.935	1.00	1.00	1.00	1.00	1.00	22.61	640.57	4338.09	2.84	36.87	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl Loc	ation in Span	Load Combination	Max. "+" Defl Locati	on in Span
+D+Lr	1	1.2440	13.936		0.0000	0.000

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B15 - FLUSH BEAM ALONG GL-5

Vertical Reactions	Support notation : Far left is #	1 Values in KIPS
Load Combination	Support 1 Support 2	
Overall MAXimum	12.088 12.088	
Overall MINimum	6.641 6.641	
D Only	5.447 5.447	
+D+Lr	12.088 12.088	
+D+0.750Lr	10.427 10.427	
+0.60D	3.268 3.268	
Lr Only	6.641 6.641	



Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B15

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

General Information

Analysis Method		Stress Design		Wood Section Nam	
End Fixities	Top & Bott	om Pinned		Wood Grading/Mar	nuf. Graded Lumber
Overall Column	Height		14.33 ft	Wood Member Typ	pe Sawn
(Used for no	n-slender calculati	ons)		Exact Width	5.50 in Allow Stress Modification Factors
Wood Species	Douglas Fir-La	ırch		Exact Depth	7.50 in Cf or Cv for Bending 1.0
Wood Grade	No.1			•	
Fb +	1,200.0 psi	Fv	170.0 psi	Area	11.200 III 2
Fb -	1.200.0 psi	Ft	825.0 psi	lx	190.009 111 4
Fc - Prll	1,000.0 psi	Density	31.210 pcf	IV	103.984 in 4 Cm : Wet Use Factor 1.0
Fc - Perp	′ '	Donoity	01.210 por		Ct : Temperature Fact 1.0
•	625.0 psi	.			Cfu: Flat Use Factor 1.0
E : Modulus of E	lasticity	x-x Bending	y-y Bending	Axial	Kf : Built-up columns 1.0
	Basic	1,600.0	1,600.0	1,600.0 ksi	Use Cr : Repetitive ? No
	Minimum	580.0	580.0	Column Buckling Condition	n:

ABOUT X-X Axis: Lux = 14.33 ft, Kx = 1.0 ABOUT Y-Y Axis: Luy = 14.33 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 128.115 lbs * Dead Load Factor

AXIAL LOADS . . .

B15 REACTIONS: Axial Load at 14.330 ft, Xecc = 0.920 in, D = 5.490, Lr = 6.640 k

DESIGN SUMMARY

Bending & Shear Check Results						
PASS Max. Axial+Bending Stress Ratio =	0.9565 : 1	Maximum SERVIO	CE Lateral Load	d Reactions		
Load Combination	+D+Lr	Top along Y-Y	0.0 k		along Y-Y	0.0 k
Governing NDS Forumla Comp + Myy, NDS	Eq. 3.9-3	Top along X-X	0.06490 k	Bottom	along X-X	0.06490 k
Location of max.above base	14.234 ft	Maximum SERVIO	CE Load Latera	al Deflections	.	
At maximum location values are.		Along Y-Y	0.0 in		oft above	hasa
Applied Axial	12.258 k	for load comb		at 0.0	on above	base
Applied Mx	0.0 k-ft					
Applied My	-0.9237 k-ft	Along X-X	-0.1283 in		7 ft above	base
Fc : Allowable	439.935 psi	for load comb	ination: +D+Lr			
	·	Other Factors use	ed to calculate	allowable st	resses	
PASS Maximum Shear Stress Ratio =	0.01111 : 1			<u>Bending</u>	<u>Compressi</u>	ion <u>Tension</u>
Load Combination	+D+Lr					
Location of max.above base	14.330 ft					
Applied Design Shear	3.540 psi					
Allowable Shear	212.50 psi					

Load Combination Results

	_		Maximum Axial	+ Bending	Stress Ratios	<u>Maximu</u>	Maximum Shear Rati			
Load Combination	C_D	C_P	Stress Ratio	Status	Location	Stress Ratio	Status	Location		
D Only	0.900	0.462	0.3273	PASS	0.0 ft	0.006981	PASS	14.330 ft		
+D+Lr	1.250	0.352	0.9565	PASS	14.234 ft	0.01111	PASS	14.330 ft		
+D+0.750Lr	1.250	0.352	0.6975	PASS	14.234 ft	0.009586	PASS	14.330 ft		
+0.60D	1.600	0.283	0.1808	PASS	0.0 ft	0.002356	PASS	14.330 ft		

Maximum Reactions Note: Only non-zero reactions are listed.

	X-X Axis Reac	tion k	Y-Y Axis Rea	action	Axial Reaction	My - End Mo	oments k-ft	Mx - End I	Moments
Load Combination	@ Base @ ⁻	Гор	@ Base @	? Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only	-0.029 0	.029			5.618				
+D+Lr	-0.065 C	.065			12.258				
+D+0.750Lr	-0.056 C	.056			10.598				

Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B15

Maximum Reactions

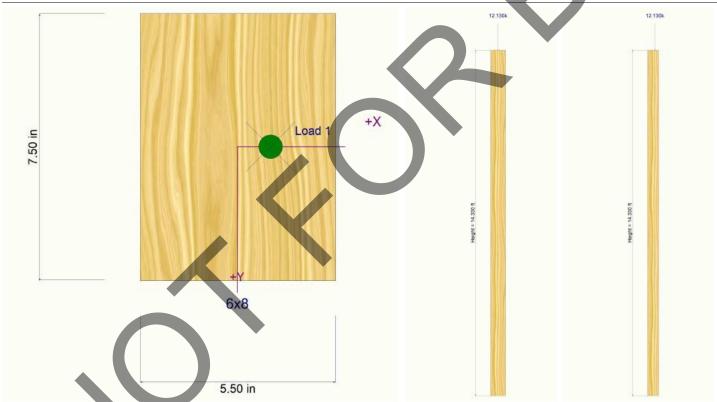
Note: Only non-zero reactions are listed.

	X-X Axis R	eaction k	Y-Y Axis Reaction	Axial Reaction	My - End M	oments k-ft	Mx - End	Moments
Load Combination	@ Base	@ Top	@ Base @ Top	@ Base	@ Base	@ Top	@ Base	@ Top
+0.60D	-0.018	0.018		3.371				
Lr Only	-0.036	0.036		6.640				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection Dis	ance	Max. Y-Y Deflection	Distance	4 7	
D Only	-0.0581 in	8.367ft	0.000 in	0.000 ft		
+D+Lr	-0.1283 in	8.367ft	0.000 in	0.000ft		
+D+0.750Lr	-0.1108 in	8.367ft	0.000 in	0.000 ft		
+0.60D	-0.0349 in	8.367ft	0.000 in	0.000 ft		
Lr Only	-0.0703 in	8.367ft	0.000 in	0.000 ft		

Sketches



Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B19-HEADER ALONG GL-6

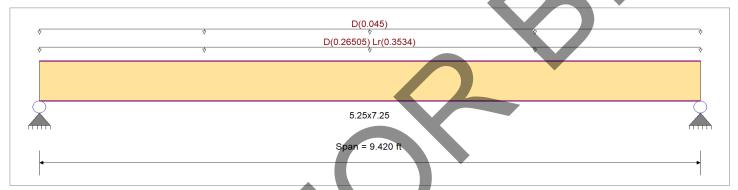
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb+	2,900.0 psi	E : Modulus of Elasticity		
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx	2,000.0 ksi	
	Fc - Prll	2,635.0 psi	Eminbend - xx	1,036.83 ksi	
Wood Species : RedBuilt	Fc - Perp	750.0 psi			
Wood Grade : RedLam LVL Beam/Joist	Fv	285.0 psi			
	Ft	1,660.0 psi	Density	42.010 pcf	
Beam Bracing : Beam is Fully Braced against lateral-torsional buc	kling				



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 17.670 ft, (ROOF)
Uniform Load: D = 0.0150 ksf, Tributary Width = 3.0 ft, (EXT WALL ABV)

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio	0.539. 1	Maximum She	ear Stress Ratio	=	0.308 : 1
Section used for this span	5.25x7.25	Section u	ised for this span		5.25x7.25
fb: Actual	1,952.21 psi		fv: Actual	=	109.67 psi
Fb: Allowable =	3,625.00psi		Fv: Allowable	=	356.25 psi
Load Combination	+D+Lr	Load Cor	mbination		+D+Lr
Location of maximum on span =	4.710ft	Location	of maximum on span	=	8.836 ft
Span # where maximum occurs = Maximum Deflection	Span # 1	Span # w	here maximum occurs	=	Span # 1
Max Downward Transient Deflection	0.189 in Ratio =	598 >= 360	Span: 1 : Lr Only		
Max Upward Transient Deflection	0 in Ratio =	0 <360	n/a		
Max Downward Total Deflection	0.361 in Ratio =	0.0	Span: 1 : +D+Lr		
Max Upward Total Deflection	0 in Ratio =	0<240	n/a		

Maximum Forces & Stresses for Load Combinations

	000 0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	JO 101 1		001111	minati	0110									
Load Combination		Max Stre	ess Ratio)S							Mor	nent Value:	S		Shear Val	ues
Segment Length	Span #	М	V	c_d	$C_{F/V}$	Сi	Cr	c_m	C t	CL	М	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 9.420 f	1 1	0.356	0.204	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.56	929.44	2610.00	1.32	52.21	256.50
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 9.420 f	t 1	0.539	0.308	1.25	1.000	1.00	1.00	1.00	1.00	1.00	7.48	1,952.21	3625.00	2.78	109.67	356.25
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 9.420 f	t 1	0.468	0.268	1.25	1.000	1.00	1.00	1.00	1.00	1.00	6.50	1,696.52	3625.00	2.42	95.31	356.25
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 9.420 f	t 1	0.120	0.069	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.14	557.67	4640.00	0.79	31.33	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl Loc	ation in Span	Load Combination	Max. "+" Defl Locati	on in Span
+D+Lr	1	0.3605	4.744		0.0000	0.000

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B19 - HEADER ALONG GL-6

/ertical Reactions		Support notation : Far left is #1	Values in KIPS
Load Combination	Support 1 Su	pport 2	
Overall MAXimum	3.177	3.177	
Overall MINimum	1.665	1.665	
D Only	1.513	1.513	
+D+Lr	3.177	3.177	
+D+0.750Lr	2.761	2.761	
+0.60D	0.908	0.908	
Lr Only	1.665	1.665	



Project File: 7067.ec6 **Wood Column**

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: B19 - HEADER OOP WIND CHECK

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

General Information

Analysis Method End Fixities	Top & Bot	Stress Desigr tom Pinned		Wood Section Nar Wood Grading/Ma	nuf. RedBuilt		
Overall Column H	J		9.42 ft	Wood Member Typ	pe RedLam		
,	n-slender calcula	tions)		Exact Width	5 250 in All	ow Stress Modification Fac	tors
Wood Species	RedBuilt			Exact Depth	7.250 in	Cf or Cv for Bending	1.071
Wood Grade	RedLam LVL	Beam/Joist		Area	38.063 in^2	Cf or Cv for Compression	1.0
Fb +	2,900.0 psi	Fv	285.0 psi	Ix	166.722 in^4	Cf or Cv for Tension	1.0
Fb -	2,900.0 psi	Ft	1,660.0 psi		87.425 in^4	Cm : Wet Use Factor	1.0
Fc - Prll	2,635.0 psi	Density	42.010 pcf	•	07.420 111 4	Ct : Temperature Fact	1.0
Fc - Perp	750.0 psi				`	Cfu: Flat Use Factor	1.0
E : Modulus of El	lasticity	x-x Bending	y-y Bending	Axial		Kf : Built-up columns	1.0
	Basic	2,000.0	2,000.0	2,000.0 ksi		Use Cr : Repetitive ?	No
	Minimum	1,036.83	1,036.83	Column Buckling Condition	on:	× F	-

ABOUT X-X Axis: Lux = 9.42 ft, Kx = 1.0

ABOUT Y-Y Axis: Luy = 9.42 ft, Ky = 1.0

Applied Loads

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

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Column self weight included: 104.603 lbs * Dead Load Factor

BENDING LOADS . . .

ROOF: Lat. Uniform Load creating Mx-x, D = 0.2650, LR = 0.3540 k/ft EXT WALL ABV: Lat. Uniform Load creating Mx-x, D = 0.0450 k/ft WIND: Lat. Uniform Load creating My-y, W = 0.1080 k/ft

DESIGN SUMMARY

Bending & Shear Check Results	
PASS Max. Axial+Bending Stress Ratio =	0.5004:1
Load Combination	+D+Lr
Governing NDS Forumla Comp + Mxx, NDS	Eq. 3.9-3
Location of max.above base	4.678 ft
At maximum location values are .	
Applied Axial	0.1046 k
Applied Mx	7.365 k-ft
Applied My	0.0 k-ft
Fc : Allowable	1,667.42 psi
PASS Maximum Chaga Strong Botio	0.2460 - 1

FC . Allowable	1,007.42 psi
PASS Maximum Shear Stress Ratio =	0.3460 : 1
Load Combination	+D+Lr
Location of max above base	0.0 ft
Applied Design Shear	184.873 psi
Allowable Shear	356.250 psi

Maximum SERVICE Lateral Load Reactions . .

Bottom along Y-Y 3.127 k Top along Y-Y 3.127 k Top along X-X 0.5087 k Bottom along X-X 0.5087 k

Maximum SERVICE Load Lateral Deflections . . .

0.3566 in at Along Y-Y 4.742 ft above base

for load combination: +D+Lr

Along X-X 0.1106 in at 4.742 ft above base

for load combination: W Only

Other Factors used to calculate allowable stresses . . .

<u>Bending</u> Compression **Tension**

Load Combination Results

	_	_	Maximum Axial	+ Bending	Stress Ratios	Maximum Shear Ratios			
Load Combination	CD	CP	Stress Ratio	Status	Location	Stress Ratio	Status	Location	
D Only	0.900	0.653	0.3234	PASS	4.678 ft	0.2243	PASS	0.0 ft	
+D+Lr [´]	1.250	0.506	0.5004	PASS	4.678 ft	0.3460	PASS	0.0 ft	
+D+0.750Lr	1.250	0.506	0.4337	PASS	4.678 ft	0.2999	PASS	0.0 ft	
+D+0.60W	1.600	0.408	0.2354	PASS	4.742 ft	0.1262	PASS	0.0 ft	
+D+0.750Lr+0.450W	1.600	0.408	0.3794	PASS	4.678 ft	0.2343	PASS	0.0 ft	
+D+0.450W	1.600	0.408	0.2224	PASS	4.678 ft	0.1262	PASS	0.0 ft	
+0.60D+0.60W	1.600	0.408	0.1621	PASS	4.678 ft	0.07571	PASS	0.0 ft	
+0.60D	1.600	0.408	0.1099	PASS	4.678 ft	0.07571	PASS	0.0 ft	

Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: B19 - HEADER OOP WIND CHECK

Note: Only non-zero reactions are listed.

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Maximum Reactions

	X-X Axis Re	eaction k	Y-Y Axis	Reaction	Axial Reaction	My - End Moments k-ft Mx - End Moments
Load Combination	@ Base	@ Top	@ Base	@ Top	@ Base	@ Base @ Top @ Base @ Top
D Only			1.460	1.460	0.105	
+D+Lr			3.127	3.127	0.105	
+D+0.750Lr			2.711	2.711	0.105	
+D+0.60W	0.305	0.305	1.460	1.460	0.105	
+D+0.750Lr+0.450W	0.229	0.229	2.711	2.711	0.105	
+D+0.450W	0.229	0.229	1.460	1.460	0.105	
+0.60D+0.60W	0.305	0.305	0.876	0.876	0.063	
+0.60D			0.876	0.876	0.063	
Lr Only			1.667	1.667		
W Only	0.509	0.509				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance	
D Only	0.0000 in	0.000ft	0.166 in	4.742ft	
+D+Lr	0.0000 in	0.000ft	0.357 in	4.742ft	
+D+0.750Lr	0.0000 in	0.000ft	0.309 in	4.742 ft	
+D+0.60W	0.0664 in	4.742ft	0.166 in	4.742ft	
+D+0.750Lr+0.450W	0.0498 in	4.742ft	0.309 in	4.742 ft	
+D+0.450W	0.0498 in	4.742ft	0.166 in	4.742 ft	
+0.60D+0.60W	0.0664 in	4.742ft	0.100 in	4.742 ft	
+0.60D	0.0000 in	0.000ft	0.100 in	4.742 ft	
Lr Only	0.0000 in	0.000ft	0.190 in	4.742 ft	
W Only	0.1106 in	4.742ft	0.000 in	0.000 ft	

Sketches



Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: B21 - DROP BEAM ALONG GL-4.5

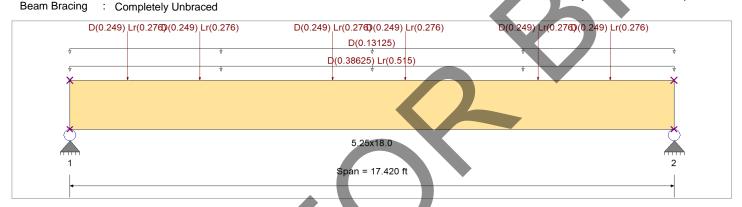
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb+	2,900.0 psi	E : Modulus of Elasticity	
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx 2,000	0.0 ksi
	Fc - Prll	2,635.0 psi	Eminbend - xx 1,036.	83 ksi
Wood Species : RedBuilt	Fc - Perp	750.0 psi		
Wood Grade : RedLam LVL Beam/Joist	Fv	285.0 psi		
. Rodean Eve Boarn, color	Ft	1,660.0 psi	Density 42.0	10 pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 25.750 ft, (ROOF)

Uniform Load: D = 0.0150 ksf, Tributary Width = 8.750 ft, (EXT WALL ABV)

Point Load : D = 0.2490, Lr = 0.2760 k @ 1.670 ft, (B2 REACTION) Point Load : D = 0.2490, Lr = 0.2760 k @ 3.750 ft, (B2 REACTION) Point Load : D = 0.2490, Lr = 0.2760 k @ 7.580 ft, (B2 REACTION) Point Load : D = 0.2490, Lr = 0.2760 k @ 9.670 ft, (B2 REACTION) Point Load : D = 0.2490, Lr = 0.2760 k @ 13.50 ft, (B2 REACTION)

Point Load: D = 0.2490, Lr = 0.2760 k @ 15.580 ft, (B2 REACTION)

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio =	0.631: 1	Maximum S	Shear Stress Ratio	=	0.413 : 1
Section used for this span	5.25x18.0	Section	used for this span		5.25x18.0
fb: Actual =	1,996.59psi		fv: Actual	=	147.20 psi
F'b =	3,164.28psi		F'v	=	356.25 psi
Load Combination	+D+Lr	Load C	ombination		+D+Lr
Location of maximum on span =	8.710ft	Locatio	n 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	0.250 in Ratio =	837 >= 360	Span: 1 : Lr Only		
Max Upward Transient Deflection	0 in Ratio =	0<360	n/a		
Max Downward Total Deflection	0.508 in Ratio =	411 >= 240	Span: 1 : +D+Lr		
Max Upward Total Deflection	0 in Ratio =	0<240	n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max S	tress Ra	itios								Momer	it Values		SI	near Valu	ies
Segment Length	Span #	М	V	CD	CM	c_t	CLx	C_{F}	Cfu	c i	C _r	М	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 17.420	ft 1	0.427	0.291	0.90	1.00	1.00	0.95	0.956	1.00	1.00	1.00	23.98	1,014.9	2,379.4	4.70	74.7	256.5
+D+Lr					1.00	1.00	0.95	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 17.420	ft 1	0.631	0.413	1.25	1.00	1.00	0.91	0.956	1.00	1.00	1.00	47.17	1,996.6	3,164.3	9.27	147.2	356.3

Wood Beam Project File: 7067.ec6

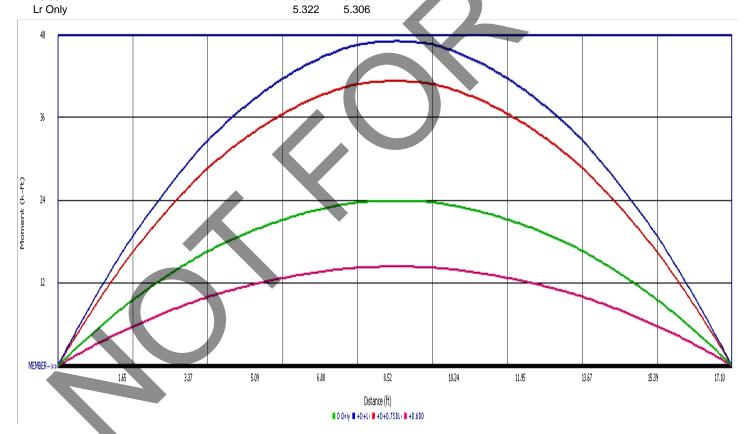
LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: B21 - DROP BEAM ALONG GL-4.5

Maximum Forces & Stresses for Load Combinations

Load Combination		Max S	tress Ra	tios								Momer	t Values		Sł	near Valu	Jes
Segment Length	Span #	М	V	CD	CM	Ct	CLx	C_F	Cfu	c i	C _r	М	fb	F'b	V	fv	F'v
+D+0.750Lr					1.00	1.00	0.91	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 17.420 ft	t 1	0.553	0.362	1.25	1.00	1.00	0.91	0.956	1.00	1.00	1.00	41.37	1,751.2	3,164.3	8.13	129.1	356.3
+0.60D					1.00	1.00	0.91	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 17.420 ft	t 1	0.162	0.098	1.60	1.00	1.00	0.85	0.956	1.00	1.00	1.00	14.39	608.9	3,766.6	2.82	44.8	456.0
Vertical Reaction	ns							Suppo	ort nota	ation :	Far left	is #1		Values in	KIPS		

Vertical Reactions		Suppor	t notation : Far left is #1	Values in Kl	PS
Load Combination	Support 1 S	Support 2			
Max Upward from all Load Conditions	10.824	10.793			
Max Upward from Load Combinations	10.824	10.793			
Max Upward from Load Cases	5.502	5.487			
D Only	5.502	5.487			
+D+Lr	10.824	10.793			
+D+0.750Lr	9.493	9.466			
+0.60D	3.301	3.292			



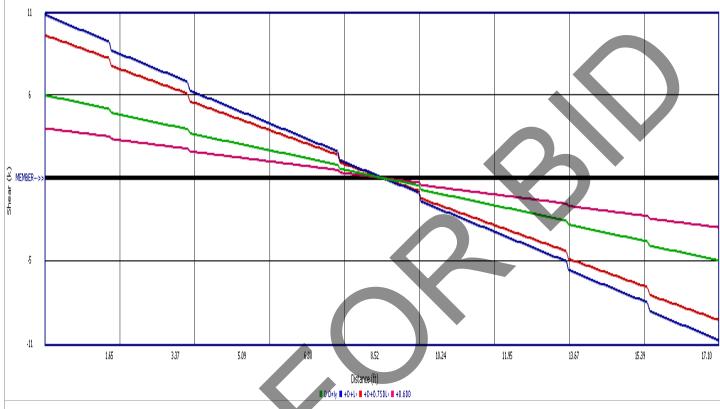
Wood Beam Project File: 7067.ec6

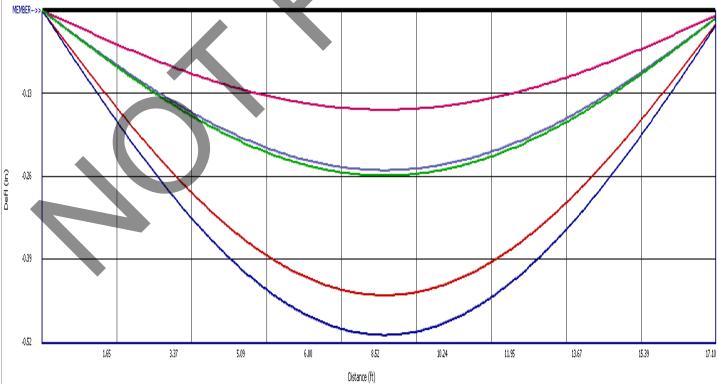
LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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■ D Only ■ +D+L+■ +D+B.758L+■ +B.68D ■ L+Only

Wood Column

Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: COLUMN SUPPORTING B21

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used: ASCE 7-16

General Information

/	Analysis Method	Allowable	Stress Design		Woo	od Section Name	6x6		
ı	End Fixities	Top & Bott	tom Pinned		Woo	od Grading/Manuf	. Graded Lur	mber	
(Overall Column F	0		11.58 ft	Woo	od Member Type	Sawn		
	,	n-slender calculat	,		Exa	ct Width	5.50 in Allo	w Stress Modification Factor	ors
	Wood Species	Douglas Fir-La	arch		Exa	ct Depth	5.50 in	Cf or Cv for Bending	1.0
	Wood Grade	No.1	_			Area	30.250 in^2	Cf or Cv for Compression	1.0
ı	Fb +	1,200.0 psi	Fv	170.0 psi		lx	76.255 in^4	Cf or Cv for Tension	1.0
-	-b -	1,200.0 psi	Ft	825.0 psi		ly	76.255 in^4	Cm : Wet Use Factor	1.0
-	Fc - Prll	1,000.0 psi	Density	31.210 pcf		.,	70.200 111 4	Ct : Temperature Fact	1.0
I	Fc - Perp	625.0 psi						Cfu: Flat Use Factor	1.0
ı	E : Modulus of El	asticity	x-x Bending	y-y Bending	Axial			Kf : Built-up columns	1.0 NDS 15.3.2
		Basic	1.600.0	1.600.0	1,600.0 ksi			Use Cr : Repetitive ?	No
		Minimum	580.0	580.0	•	e condition for de	flection (bucklin	a) along columns :	INU

stace condition for deflection (buckling) along columns.

X-X (width) axis: Unbraced Length for buckling ABOUT Y-Y Axis = 11
Y-Y (depth) axis: Unbraced Length for buckling ABOUT X-X Axis = 11

Applied Loads

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

Column self weight included : 75.922 lbs * Dead Load Factor

AXIAL LOADS . . .

B21 REACTIONS: Axial Load at 11.580 ft, Xecc = 0.920 in, D = 5.475, Lr = 5.322 k

-0.063

0.063

DESIGN SUMMARY

Bending & Shear Check Results						
PASS Max. Axial+Bending Stress Ratio =	0.7901 : 1	Maximum SERVIO	CE Lateral Loa	d Reactions		
Load Combination	+D+Lr	Top along Y-Y	0.0 k	Bottom	along Y-Y	0.0 k
Governing NDS Forumla Comp + Myy, NDS	S Eq. 3.9-3	Top along X-X	0.07148 k	Bottom	along X-X	0.07148 k
Location of max.above base	11.502 ft	Maximum SERVIO	CE Load Latera	al Deflections	· · · ·	
At maximum location values are .		Along Y-Y	0.0 in	at 0.0	oft above	base
Applied Axial	10.873 k	for load comb	ination : n/a			
Applied Mx	0.0 k-ft		-0.1017 in	ot 6.76	1 ft above	haaa
Applied My	-0.8222 k-ft	Along X-X			i it above	base
Fc : Allowable	623.04 psi		ination : +D+Lr			
		Other Factors use	ed to calculate	allowable st	resses	
PASS Maximum Shear Stress Ratio =	0.01668 : 1			<u>Bending</u>	Compress	ion <u>Tension</u>
Load Combination	+D+Lr					
Location of max.above base	11.580 ft					
Applied Design Shear	3.545 psi					
Allowable Shear	212.50 psi					

Load Combination Results

+D+0.750Lr

	_	_	Maximum Axial	+ Bending	Stress Ratios	<u>Maximu</u>	m Shear R	<u>Ratios</u>	
Load Combination	CD	C_P	Stress Ratio	Status	Location	Stress Ratio	Status	Location	
D Only	0.900	0.623	0.3284	PASS	11.502 ft	0.01175	PASS	11.580 ft	
+D+Lr [´]	1.250	0.498	0.7901	PASS	11.502 ft	0.01668	PASS	11.580 ft	
+D+0.750Lr	1.250	0.498	0.6164	PASS	11.502 ft	0.01463	PASS	11.580 ft	
+0.60D	1.600	0.410	0.1679	PASS	0.0 ft	0.003965	PASS	11.580 ft	
Maximum Reactions						Note: Only non-ze	ero reactio	ns are listed.	

	X-X Axis R	eaction k	Y-Y Axis Reaction	Axial Reaction	My - End M	oments k-ft	Mx - End	Moments
Load Combination	@ Base	@ Top	@ Base @ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only	-0.036	0.036		5.551				
+D+Lr	-0.071	0.071		10.873				

9.542

Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: COLUMN SUPPORTING B21

Maximum Reactions

Note: Only non-zero reactions are listed.

	X-X Axis R	eaction k	Y-Y Axis Reaction	Axial Reaction	My - End M	oments k-ft Mx - End Momen
Load Combination	@ Base	@ Top	@ Base @ Top	@ Base	@ Base	@ Top
+0.60D	-0.022	0.022		3.331		
Lr Only	-0.035	0.035		5.322		

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection Di	stance	Max. Y-Y Deflection	Distance	
D Only	-0.0516 in	6.761ft	0.000 in	0.000 ft	
+D+Lr	-0.1017 in	6.761ft	0.000 in	0.000 ft	
+D+0.750Lr	-0.0892 in	6.761ft	0.000 in	0.000 ft	
+0.60D	-0.0310 in	6.761ft	0.000 in	0.000 ft	
Lr Only	-0.0501 in	6.761ft	0.000 in	0.000 ft	

Sketches



Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B29 - HIGH/CLERESTORY ROOF FRAMING PLAN - B/W GRID 5&6 - DR BM

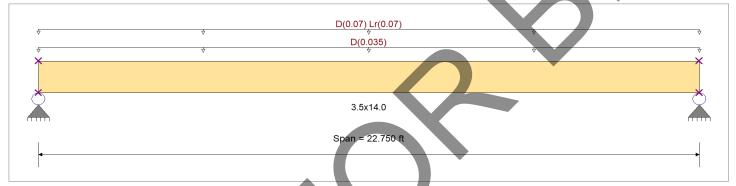
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set: IBC 2018

Material Properties

Fb+	2,900.0 psi	E : Modulus of Elas	ticity	
Fb -	2,900.0 psi	Ebend- xx	2,000.0 ksi	
Fc - Prll	2,635.0 psi	Eminbend - xx	1,036.83 ksi	
Fc - Perp	750.0 psi			
Fv	285.0 psi			
Ft	1,660.0 psi	Density	42.010 pcf	
	Fb - Fc - Prll Fc - Perp Fv	Fb - 2,900.0 psi Fc - Prll 2,635.0 psi Fc - Perp 750.0 psi Fv 285.0 psi	Fb - 2,900.0 psi Ebend- xx Fc - Prll 2,635.0 psi Eminbend - xx Fc - Perp 750.0 psi Fv 285.0 psi	Fb - 2,900.0 psi Ebend- xx 2,000.0 ksi Fc - Prll 2,635.0 psi Eminbend - xx 1,036.83 ksi Fc - Perp 750.0 psi Fv 285.0 psi



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load: D = 0.010 ksf, Tributary Width = 3.50 ft, (INTERIOR CRIPPLE WALL (W2)) Uniform Load: D = 0.010, Lr = 0.010 ksf, Tributary Width = 7.0 ft, (CEILING ASSEMBLY)

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio	0.631: 1	Maximum S	hear Stress Ratio	=	0.166 : 1
Section used for this span	3.5x14.0	Section	used for this span		3.5x14.0
fb: Actual	1,285.35psi		fv: Actual	=	59.18 psi
Fb: Allowable =	2,036.70psi		Fv: Allowable	=	356.25 psi
Load Combination	+D+Lr	Load C	ombination		+D+Lr
Location of maximum on span =	11.375ft	Location	n 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	0.265 in Ratio =	1029 >=360	Span: 1 : Lr Only		
Max Upward Transient Deflection	0 in Ratio =	0 < 360	n/a		
Max Downward Total Deflection	0.717 in Ratio =	380>=240	Span: 1 : +D+Lr		
Max Upward Total Deflection	0 in Ratio =	0 < 240	n/a		

Mayimum Forcoc	R Straceae for	Load Combinations
Maxilliulli Fulces	0 311 C33C3 101 1	Luau Guilibilialiulis

Load Combination		Max Stre	ess Ratio)S							Mor	nent Values	3		hear Val	ues
Segment Length	Span #	М	V	c_d	$C_{F/V}$	Сį	Cr	c_m	C t	CL	М	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = $22.750 f$	t 1	0.425	0.145	0.90	1.000	1.00	1.00	1.00	1.00	0.73	7.72	810.03	1908.00	1.22	37.30	256.50
+D+Lr					1.000	1.00	1.00	1.00	1.00	0.73			0.00	0.00	0.00	0.00
Length = $22.750 f$	t 1	0.631	0.166	1.25	1.000	1.00	1.00	1.00	1.00	0.56	12.25	1,285.35	2036.70	1.93	59.18	356.25
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	0.56			0.00	0.00	0.00	0.00
Length = $22.750 f$	t 1	0.573	0.151	1.25	1.000	1.00	1.00	1.00	1.00	0.56	11.11	1,166.52	2036.70	1.75	53.71	356.25
+1.224D					1.000	1.00	1.00	1.00	1.00	0.56			0.00	0.00	0.00	0.00
Length = 22.750 f	t 1	0.476	0.100	1.60	1.000	1.00	1.00	1.00	1.00	0.45	9.45	991.48	2082.50	1.49	45.65	456.00
+1.168D					1.000	1.00	1.00	1.00	1.00	0.45			0.00	0.00	0.00	0.00
Length = 22.750 f	t 1	0.454	0.096	1.60	1.000	1.00	1.00	1.00	1.00	0.45	9.01	946.12	2082.50	1.42	43.56	456.00
+0.60D					1.000	1.00	1.00	1.00	1.00	0.45			0.00	0.00	0.00	0.00
Length = 22.750 f	t 1	0.233	0.049	1.60	1.000	1.00	1.00	1.00	1.00	0.45	4.63	486.02	2082.50	0.73	22.38	456.00

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: B29 - HIGH/CLERESTORY ROOF FRAMING PLAN - B/W GRID 5&6 - DR BM

Maximum Forces & Stresses for Load Combinations

Load Combination	N	Max Stre	ess Ratio)S							Mome	ent Values	S	S	hear Val	ues
Segment Length	Span #	М	V	c_d	$C_{\text{F/V}}$	Сi	c_r	c_m	c t	c _L	М	fb	F'b	V	fv	F'v
+0.3760D					1.000	1.00	1.00	1.00	1.00	0.45			0.00	0.00	0.00	0.00
Length = 22.750 f	ft 1	0.146	0.031	1.60	1.000	1.00	1.00	1.00	1.00	0.45	2.90	304.57	2082.50	0.46	14.02	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl Loc	ation in Span	Load Combination	Max. "+" Defl Locati	on in Span
+D+Lr	1	0.7169	11.458		0.0000	0.000
Vertical Reactions			Suppor	rt notation : Far left is #1	Values in KIPS	

Load Combination	Support 1 Su	pport 2	
Overall MAXimum	2.153	2.153	
Overall MINimum	0.796	0.796	
D Only	1.357	1.357	
+D+Lr	2.153	2.153	
+D+0.750Lr	1.954	1.954	
+0.60D	0.814	0.814	
Lr Only	0.796	0.796	

Wood Column

Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B29

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

General Information

Analysis Method	Allowable	Stress Design	1	Wood Section Nam	e 4x4
End Fixities	Top & Bott	tom Pinned		Wood Grading/Man	uf. Graded Lumber
Overall Column I	Height		9.08 ft	Wood Member Type	e Sawn
,	n-slender calculat	,		Exact Width	3.50 in Allow Stress Modification Factors
Wood Species	Douglas Fir-La	arch		Exact Depth	3.50 in Cf or Cv for Bending 1.50
Wood Grade	No.2	_		Area	12.250 in^2 Cf or Cv for Compressio 1.150
Fb+	900.0 psi	Fv	180.0 psi	lx	12.505 in 4 Cf or Cv for Tension 1.50
Fb -	900.0 psi	Ft	575.0 psi	IV	12.505 in 4 Cm : Wet Use Factor 1.0
Fc - Prll	1,350.0 psi	Density	31.210 pcf	,	Ct : Temperature Fact 1.0
Fc - Perp	625.0 psi				Cfu : Flat Use Factor 1.0
E : Modulus of E	lasticity	x-x Bending	y-y Bending	Axial	Kf : Built-up columns 1.0
	Basic	1,600.0	1,600.0	1,600.0 ksi	Use Cr : Repetitive ? No
	Minimum	580.0	580.0	Column Buckling Condition):

ABOUT X-X Axis: Lux = 9.08 ft, Kx = 1.0 ABOUT Y-Y Axis: Luy = <math>9.08 ft, Ky = 1.0 ABOUT Y-Y Axis

Applied Loads

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

Column self weight included : 24.108 lbs * Dead Load Factor

AXIAL LOADS . . .

B29 REACTIONS: Axial Load at 9.080 ft, Xecc = 0.920 in, D = 1.357, Lr = 0.7960 k

DESIGN SUMMARY

Bending & Shear Check Results						
PASS Max. Axial+Bending Stress Ratio =	0.4028 : 1	Maximum SERVI	CE Lateral Loa	d Reactions.		
Load Combination	+D+Lr	Top along Y-Y	0.0 k	Bottom a	long Y-Y	0.0 k
Governing NDS Forumla Comp + Myy, NI	DS Eq. 3.9-3	Top along X-X	0.01818 k	Bottom a	long X-X	0.01818 k
Location of max.above base	9.019 ft	Maximum SERVI	CE Load Later	al Deflections		
At maximum location values are . Applied Axial	2.177 k	Along Y-Y	0.0 in	at 0.0	ft above	base
Applied Mx	0.0 k-ft	for load comb				
Applied My Fc : Allowable	-0.1640 k-ft 462.924 psi	Along X-X for load comb	-0.07605 in oination : +D+Lr		ft above	base
T C . Allowable	402.024 psi	Other Factors us	ed to calculate	allowable str	esses	
PASS Maximum Shear Stress Ratio = Load Combination	0.009893 : 1 +D+Lr			<u>Bending</u>	Compressi	ion <u>Tension</u>
Location of max.above base	9.080 ft					
Applied Design Shear	3.339 psi					
Allowable Shear	225.0 psi					

Load Combination Results

	_	_	Maximum Axial	<u>+ Bending</u>	Stress Ratios	<u>Maximur</u>	<u>m Shear R</u>	<u>tatios</u>
Load Combination	C_D	СР	Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.322	0.2509	PASS	0.0 ft	0.008660	PASS	9.080 ft
+D+Lr	1.250	0.239	0.4028	PASS	9.019 ft	0.009893	PASS	9.080 ft
+D+0.750Lr	1.250	0.239	0.3488	PASS	0.0 ft	0.008979	PASS	9.080 ft
+0.60D	1.600	0.189	0.1439	PASS	0.0 ft	0.002923	PASS	9.080 ft

Maximum Reactions Note: Only non-zero reactions are listed.

	X-X Axis R	leaction k	Y-Y Axis	Reaction	Axial Reaction	My - End M	oments k-ft	Mx - End	Moments
Load Combination	@ Base	@ Top	@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only	-0.011	0.011			1.381				
+D+Lr	-0.018	0.018			2.177				
+D+0.750Lr	-0.016	0.016			1.978				

Wood Column Project File: 7067.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2024

DESCRIPTION: COLUMN SUPPORTING B29

Maximum Reactions

Note: Only non-zero reactions are listed.

	X-X Axis Rea	action k	Y-Y Axis Reaction	Axial Reaction	My - End Mo	oments k-ft Mx - End Moments
Load Combination	@ Base @	2 Top	@ Base @ Top	@ Base	@ Base	@ Top
+0.60D	-0.007	0.007		0.829		
Lr Only	-0.007	0.007		0.796		

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection [Distance	Max. Y-Y Deflection	Distance	
D Only	-0.0479 in	5.302ft	0.000 in	0.000 ft	
+D+Lr	-0.0761 in	5.302ft	0.000 in	0.000ft	
+D+0.750Lr	-0.0690 in	5.302ft	0.000 in	0.000 ft	
+0.60D	-0.0288 in	5.302ft	0.000 in	0.000 ft	
Lr Only	-0.0281 in	5.302ft	0.000 in	0.000 ft	

Sketches



General Footing

Project File: 7067.ec6 (c) ENERCALC INC 1983-2021

LIC#: KW-06014215, Build:20.21.10.12

Innovative Structural Engineering, Inc. (IS

DESCRIPTION: PAD FOOTING - COLUMN SUPPORTING B15

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used: ASCE 7-16

General Information

Material Properties f'c: Concrete 28 day strength fy: Rebar Yield Ec: Concrete Elastic Modulus Concrete Density φ Values Flexure	= = = =	6 3,12 14 0	.50 ksi 0.0 ksi 2.0 ksi 5.0 pcf	Soil Design Values Allowable Soil Bearing Soil Density Increase Bearing By Footing Weight Soil Passive Resistance (for Sliding) Soil/Concrete Friction Coeff.	1.70 ksf 110.0 pcf No 280.0 pcf 0.30
Shear Analysis Settings Min Steel % Bending Reinf. Min Allow % Temp Reinf. Min. Overturning Safety Factor Min. Sliding Safety Factor	=	= = = = =	0.00090 1.0 : 1 1.0 : 1	Increases based on footing Depth Footing base depth below soil surface Allow press. increase per foot of depth when footing base is below Increases based on footing plan dimension	1.0 ft ksf ft
Add Ftg Wt for Soil Pressure Use ftg wt for stability, moments & sho Add Pedestal Wt for Soil Pressure Use Pedestal wt for stability, mom & s		: : :	Yes Yes No No	Allowable pressure increase per foot of depth = when max. length or width is greater than =	ksf ft

3.0 ft 3.0 ft

> in in

Dimensions

Width parallel to X-X Axis

Length parallel to Z-Z Axis

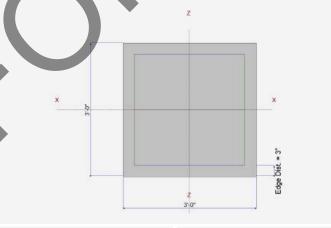
Pedestal dimensions px : parallel to X-X Axis = in	Footing Thickness	=	12 111
px : parallel to X-X Axis = in	Pedestal dimensions		
	px : parallel to X-X Axis	=	in

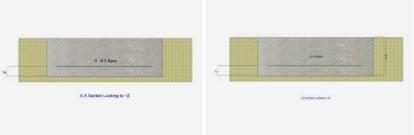
pz : parallel to Z-Z Axis Rebar Centerline to Edge of Concrete. at Bottom of footing 3.0 in

Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		3
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars			3
Reinforcing Bar Size	=	#	5
Bandwidth Distribution (Check (ACI 15.4.4	1.2)	
Direction Requiring Close	er Separation		
			n/a
			, a

Bars required within zone n/a # Bars required on each side of zone n/a





Applied Loads

		D	Lr	L	S	w	E	Н
P : Column Load	=	5.618	6.640					k
OB : Overburden	= _							ksf
M-xx M-zz	=							k-ft
M-zz	= _							k-ft
V-x	=							k
V-z	=							k

General Footing

Project File: 7067.ec6 (c) ENERCALC INC 1983-2021

	4215, Build:20.21.10 FION: PAD F		G - COL		novative Struc			nc. (IS			C INC 1983-2021
DESIGN SU	IMMARY									Design	OK
	Min. Ratio	Item			Applie	ed		Capacity	Gover	ning Load Com	
PASS	0.8865	Soil Bea	aring		1.507 I	ksf		1.70 ksf	+D+Lr	about Z-Z axis	
PASS	n/a	Overtur	ning - X-X		0.0 I	k-ft		0.0 k-ft	No Ov	erturning	
PASS	n/a	Overtur	ning - Z-Z		0.0 1	k-ft		0.0 k-ft	No Ov	erturning	
PASS	n/a	Sliding -	- X-X		0.0 1	k		0.0 k	No Sli	ding	
PASS	n/a	Sliding -	- Z-Z		0.0 1	k		0.0 k	No Sli	ding	
PASS	n/a	Uplift			0.0 1	k		0.0 k	No Up	lift	
PASS	0.1802	Z Flexu	re (+X)		2.171 l	k-ft/ft		12.046 k-ft	/ft +1.20[D+1,60Lr	
PASS	0.1802	Z Flexu	re (-X)		2.171 l	k-ft/ft		12.046 k-ft	/ft +1.20[D+1.60Lr	
PASS	0.1802	X Flexu			2.171 l	k-ft/ft		12.046 k-ft	/ft +1.20[D+1.60Lr	
PASS	0.1802	X Flexu	re (-Z)		2.171 l	k-ft/ft		12.046 k-ft	/ft +1.20[D+1.60Lr	
PASS	0.1787	1-way S	Shear (+X)		13.399	psi		75.0 psi	+1.20[0+1.60Lr	
PASS	0.1787	1-way S	Shear (-X)		13.399	psi		75.0 psi	+1.20[D+1.60Lr	
PASS	0.1787	1-way S	Shear (+Z)		ا 13.399	psi		75.0 psi	+1.20	D+1.60Lr	
PASS	0.1787	1-way S	Shear (-Z)		13.399	psi		75.0 psi	+1.20[D+1.60Lr	
PASS	0.3350	2-way P	unching		50.248	psi		150.0 psi	+1.20[D+1.60Lr	
Detailed Re	sults										
Soil Bearing											
Rotation Axi	s & ombination	Gros	s Allowak		ecc Zec (in)		Actu Bottom, -Z	al Soil Bearing S Top, +Z	Stress @ Lo Left, -X	cation Right, +X	Actual / Allov Ratio
X-X, D Only			1.70			0.0	0.7692		n/a	n/a	0.453
X-X, D Olly X-X, +D+Lr			1.70			0.0	1.507		n/a	n/a	0.433
X-X, +D+0.7	50Lr		1.70			0.0	1.323	1.323	n/a	n/a	0.778
X-X, +0.60D			1.70			0.0	0.4615	0.4615	n/a	n/a	0.272
Z-Z, D Only			1.70			n/a	n/a		0.7692	0.7692	0.453
Z-Z, +D+Lr Z-Z, +D+0.75	501 r		1.70 1.70			n/a n/a	n/a n/a		1.507 1.323	1.507 1.323	0.887 0.778
Z-Z, +0.60D	JOLI		1.70			n/a	n/a		0.4615	0.4615	0.272
Overturning S	tability										
Rotation Axis	s & ombination			Overti	urning Mon	ment		Resisting Mom	ent Sta	bility Ratio	Status
	NO Overturning			Overt	arrining into	iioiit		Tresisting mone	one ora	bility Italio	Otatas
Sliding Stabili	ty									A	ll units k
Force Applic											
	mbination			Sli	ding Force	е		Resisting Fore	ce Sta	bility Ratio	Status
Footing Has											
Footing Flexus			Mari	Side	Tanaian	Λ.	. Dowled	Cum Ao	Actual Ac	Phi*Mn	
Flexure Axis	& Load Combin	ation	Mu k-ft	Side	Tension Surface		s Req'd in^2	Gvrn. As in^2	Actual As in^2	k-ft	Status
X-X, +1.40D			0.9832	+Z	Bottom).1296	AsMin	0.310	12.046	ок
X-X, +1.40D	0.501		0.9832	-Z	Bottom).1296	AsMin	0.310	12.046	OK
X-X, +1.20D- X-X, +1.20D-			1.258 1.258	+Z -Z	Bottom Bottom).1296).1296	AsMin AsMin	0.310 0.310	12.046 12.046	OK OK
X-X, +1.20D- X-X, +1.20D			0.8427	-Z +Z	Bottom).1296).1296	Asiviin AsMin	0.310	12.046	OK OK
X-X, +1.20D			0.8427	-Z	Bottom).1296	AsMin	0.310	12.046	OK OK
X-X, +1.20D-			2.171	+Z	Bottom	C).1296	AsMin	0.310	12.046	OK
X-X, +1.20D-	+1.60Lr		2.171	-Z	Bottom).1296	AsMin	0.310	12.046	OK
X-X, +0.90D X-X, +0.90D			0.6320 0.6320	+Z -Z	Bottom Bottom).1296).1296	AsMin AsMin	0.310 0.310	12.046 12.046	OK OK
Z-Z, +1.40D			0.6320	-Z -X	Bottom).1296).1296	ASMIN AsMin	0.310	12.046 12.046	OK OK
Z-Z, +1.40D			0.9832	+X	Bottom).1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D+	+0.50Lr		1.258	-X	Bottom).1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D+			1.258	+X	Bottom	C).1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D			0.8427	-X	Bottom).1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D Z-Z, +1.20D+	⊾1 60l r		0.8427 2.171	+X -X	Bottom Bottom).1296).1296	AsMin AsMin	0.310 0.310	12.046 12.046	OK OK
۷-۲. + ۱.۷UD	FI.UULI		2.111	-^	וווטווטם	C	7.1230	MOINIIII	0.310	12.046	UK

General Footing

LIC# : KW-06014215, Build:20.21.10.12

Innovative Structural Engineering, Inc. (IS

Project File: 7067.ec6
(c) ENERCALC INC 1983-2021

DESCRIPTION: PAD FOOTING - COLUMN SUPPORTING B15

Footing Flexure

Flexure Axis & Load Combination	ո <mark>Mu</mark> k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. A in^2	As Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+1.60Lr	2.171	+X	Bottom	0.1296	AsMin	0.310	12.046	ок
Z-Z, +0.90D Z-Z. +0.90D	0.6320 0.6320	-X +X	Bottom Bottom	0.1296 0.1296	AsMin AsMin	0.310 0.310	12.046 12.046	OK OK
One Way Shear	0.0320	ΤΛ.	Bottom	0.1290	ASIVIIII	0.510	12.040	OK .
Load Combination	Vu @ -X	Vu @ +	X Vu @	-Z Vu (@ +Z	Vu:Max Phi	/n Vu / Phi*Vn	Status

Load Combination	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn Vu	∖ Phi*Vn	Status
+1.40D	6.07 ps	i 6.07 ps	i 6.07 psi	6.07 psi	6.07 psi	75.00 psi	0.08	ОК
+1.20D+0.50Lr	7.76 ps	i 7.76 ps	i 7.76 psi	7.76 psi	7.76 psi	75.00 psi	0.10	OK
+1.20D	5.20 ps	i 5.20 ps	i 5.20 psi	5.20 psi	5.20 psi	75.00 psi	0.07	OK
+1.20D+1.60Lr	13.40 ps	i 13.40 ps	i 13.40 psi	13.40 psi	13.40 psi	75.00 psi	0.18	OK
+0.90D	3.90 ps	i 3.90 ps	i 3.90 psi	3.90 psi	3.90 psi	75.00 psi	0.05	OK
Two-Way "Punching" Shear							All units	k

Load Combination	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	22.76 psi	150.00psi	0.1517	OK
+1.20D+0.50Lr	29.11 psi	150.00psi	0.1941	OK
+1.20D	19.51 psi	150.00 psi	0.13	OK
+1.20D+1.60Lr	50.25 psi	150.00 psi	0.335	OK
+0 90D	14 63 nsi	150 00nsi	0.09754	OK

General Footing

Project File: 7067.ec6
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LIC#: KW-06014215, Build:20.21.10.12

Innovative Structural Engineering, Inc. (IS

DESCRIPTION: PAD FOOTING - COLUMN SUPPORTING B21

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used: ASCE 7-16

General Information

Material Properties f'c: Concrete 28 day strength fy: Rebar Yield Ec: Concrete Elastic Modulus Concrete Density φ Values Flexure Shear	= = = = =	6 3,12 14 0	.50 ksi 0.0 ksi 2.0 ksi 5.0 pcf .90	Soil Design Values Allowable Soil Bearing Soil Density Increase Bearing By Footing Weight Soil Passive Resistance (for Sliding) Soil/Concrete Friction Coeff.	1.70 ksf 110.0 pcf No 280.0 pcf 0.30
Analysis Settings Min Steel % Bending Reinf. Min Allow % Temp Reinf. Min. Overturning Safety Factor Min. Sliding Safety Factor	-	= = = =	0.00090 1.0 : 1 1.0 : 1	Increases based on footing Depth Footing base depth below soil surface Allow press. increase per foot of depth when footing base is below Increases based on footing plan dimension	1.0 ft ksf ft
Add Ftg Wt for Soil Pressure Use ftg wt for stability, moments & sh Add Pedestal Wt for Soil Pressure Use Pedestal wt for stability, mom & s		: : :	Yes Yes No No	Allowable pressure increase per foot of depth = when max. length or width is greater than =	ksf ft

3.0 ft

3.0 ft

12.0 in

3.0 in

Dimensions

Width parallel to X-X Axis

Length parallel to Z-Z Axis

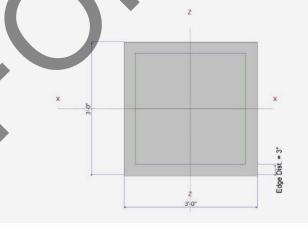
at Bottom of footing

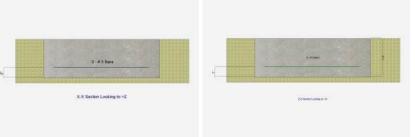
Footing Thickness

Pedestal dimensions		
px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in
Rebar Centerline to Edge of C	Concrete	

Reinforcing

Bars parallel to X-X Axis Number of Bars 3.0 Reinforcing Bar Size 5 Bars parallel to Z-Z Axis Number of Bars Reinforcing Bar Size 3.0 5 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	Н
P : Column Load	=	5.551	5.322					k
OB : Overburden	=							ksf
M-xx M-zz	=							k-ft
M-zz	= _							k-ft
V-x	=							k
V-z	=							k

General Footing

Project File: 7067.ec6 (c) ENERCALC INC 1983-2021

LIC#: KW-06014215, Build:20.21.10.12

Innovative Structural Engineering, Inc. (IS

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7959	Soil Bearing	1.353 ksf	1.70 ksf	+D+Lr 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	0.1575	Z Flexure (+X)	1.897 k-ft/ft	12.046 k-ft/ft	+1.20D+1.60Lr
PASS	0.1575	Z Flexure (-X)	1.897 k-ft/ft	12.046 k-ft/ft	+1.20D+1.60Lr
PASS	0.1575	X Flexure (+Z)	1.897 k-ft/ft	12.046 k-ft/ft	+1.20D+1.60Lr
PASS	0.1575	X Flexure (-Z)	1.897 k-ft/ft	12.046 k-ft/ft	+1.20D+1.60Lr
PASS	0.1561	1-way Shear (+X)	11.710 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.1561	1-way Shear (-X)	11.710 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.1561	1-way Shear (+Z)	11.710 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.1561	1-way Shear (-Z)	11.710 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.2928	2-way Punching	43.913 psi	150.0 psi	+1.20D+1.60Lr
ailed Re	sults				

D	e	taı	led	ΙR	les	ul	ts
---	---	-----	-----	----	-----	----	----

Rotation Axis &		Xecc Zecc Actual Soil Bearing Stress @ Location						Actual / Allov
Load Combination	Gross Allowable	(ir	1)	Bottom, -Z	Top, +Z	Left, -X	Right, +X	Ratio
X-X, D Only	1.70	n/a	0.0	0.7618	0.7618	n/a	n/a	0.448
X-X, +D+Lr	1.70	n/a	0.0	1.353	1.353	n/a	n/a	0.796
X-X, +D+0.750Lr	1.70	n/a	0.0	1.205	1.205	n/a	n/a	0.709
X-X, +0.60D	1.70	n/a	0.0	0.4571	0.4571	n/a	n/a	0.269
Z-Z, D Only	1.70	0.0	n/a	n/a	n/a	0.7618	0.7618	0.448
Z-Z, +D+Lr	1.70	0.0	n/a	n/a	n/a	1.353	1.353	0.796
Z-Z, +D+0.750Lr	1.70	0.0	n/a	n/a	n/a	1.205	1.205	0.709
Z-Z, +0.60D	1.70	0.0	n/a	n/a	n/a	0.4571	0.4571	0.269

	Overturni	ing	Stal	bil	lity
--	------------------	-----	------	-----	------

Rotation Axis & Load Combination	Overturning Moment	Resisting Moment	Stability Ratio	Status	
Footing Has NO Overturning					
Cliding Stability				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	0.9714	+Z	Bottom	0.1296	AsMin	0.310	12.046	ОК
X-X, +1.40D	0.9714	-Z	Bottom	0.1296	AsMin	0.310	12.046	OK
X-X, +1.20D+0.50Lr	1.165	+Z	Bottom	0.1296	AsMin	0.310	12.046	OK
X-X, +1.20D+0.50Lr	1.165	-Z	Bottom	0.1296	AsMin	0.310	12.046	ok
X-X, +1.20D	0.8327	+Z	Bottom	0.1296	AsMin	0.310	12.046	ok
X-X, +1.20D	0.8327	-Z	Bottom	0.1296	AsMin	0.310	12.046	ok
X-X, +1.20D+1.60Lr	1.897	+Z	Bottom	0.1296	AsMin	0.310	12.046	OK
X-X, +1.20D+1.60Lr	1.897	-Z	Bottom	0.1296	AsMin	0.310	12.046	OK
X-X, +0.90D	0.6245	+Z	Bottom	0.1296	AsMin	0.310	12.046	OK
X-X, +0.90D	0.6245	-Z	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.40D	0.9714	-X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.40D	0.9714	+X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D+0.50Lr	1.165	-X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D+0.50Lr	1.165	+X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D	0.8327	-X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D	0.8327	+X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +1.20D+1.60Lr	1.897	-X	Bottom	0.1296	AsMin	0.310	12.046	OK

General Footing

LIC# : KW-06014215, Build:20.21.10.12

Innovative Structural Engineering, Inc. (IS

Project File: 7067.ec6
(c) ENERCALC INC 1983-2021

DESCRIPTION: PAD FOOTING - COLUMN SUPPORTING B21

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+1.60Lr	1.897	+X	Bottom	0.1296	AsMin	0.310	12.046	ОК
Z-Z, +0.90D	0.6245	-X	Bottom	0.1296	AsMin	0.310	12.046	OK
Z-Z, +0.90D One Way Shear	0.6245	+X	Bottom	0.1296	AsMin	0.310	12.046	ОК

Load Combination	Vu @ -X	Vu @ +X	Vu @ -Z	. Vu	ı @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	6.00 ps	i 6.00	psi 6	3.00 psi	6.00 psi	6.00 psi	75.00	psi 0.08	OK
+1.20D+0.50Lr	7.19 ps	i 7.19	psi 7	'.19 psi	7.19 psi	7.19 psi	75.00	psi 0.10	OK
+1.20D	5.14 ps	i 5.14	psi 5	.14 psi	5.14 psi	5.14 psi	75.00	psi 0.07	OK
+1.20D+1.60Lr	11.71 ps	i 11.71	psi 11	.71 psi	11.71 psi	11.71 psi	75.00	psi 0.16	OK
+0.90D	3.86 ps	i 3.86	psi 3	8.86 psi	3.86 psi	3.86 psi	75.00	psi 0.05	OK
Two-Way "Punching" Shear								All units	k

Load Combination	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	22.49 psi	150.00psi	0.1499	OK
+1.20D+0.50Lr	26.97 psi	150.00psi	0.1798	OK
+1.20D	19.27 psi	150.00 psi	0.1285	OK
+1.20D+1.60Lr	43.91 psi	150.00 psi	0.2928	OK
+0.90D	14.46 psi	150.00psi	0.09637	OK

Wood Beam Project File: 7067.ec6

LIC#: KW-06014215, Build:20.21.10.12 Innovative Structural Engineering, Inc. (IS (c) ENERCALC INC 1983-2021

DESCRIPTION: 2x8 RAFTER TAIL

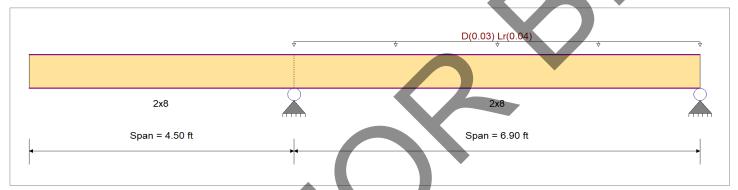
CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method: Allowable Stress Design	Fb +	900 psi	E : Modulus of Elastic	city
Load Combination : ASCE 7-16	Fb -	900 psi	Ebend- xx	1600 ksi
	Fc - Prll	1350 psi	Eminbend - xx	580 ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No.2	Fv	180 psi		
	Ft	575 psi	Density	31.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsiona	l buckling			·



Applied Loads

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

Load for Span Number 2

Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 2.0 ft

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio =	0.235: 1	Maximum S	hear Stress Ratio	=	0.123 : 1
Section used for this span	2x8	Section	used for this span		2x8
fb: Actual	380.42psi		fv: Actual	=	27.73 psi
Fb: Allowable	1,620.00psi		Fv: Allowable	=	225.00 psi
Load Combination	+D+Lr	Load Co	ombination		+D+Lr
Location of maximum on span =	3.469ft	Location	n of maximum on span	=	6.322 ft
Span # where maximum occurs =	Span # 2	Span #	where maximum occurs	=	Span # 2
Maximum Deflection	•				
Max Downward Transient Deflection	0.027 in Ratio =	3065 >= 360	Span: 2 : Lr Only		
Max Upward Transient Deflection	-0.056 in Ratio =	1932>=360	Span: 1 : Lr Only		
Max Downward Total Deflection	0.047 in Ratio =	1751 >=180	Span: 2 : +D+Lr		
Max Upward Total Deflection	-0.098 in Ratio =	1104>=180	Span: 1: +D+Lr		

Maximum Forces & Stresses for Load Combinations

				001111	midel	0110									
	Max Stre	ess Ratio	S							Mome	ent Values	3	S	hear Val	ues
Span #	M	V	c_d	$C_{\text{F/V}}$	c_i	c_r	c_{m}	C t	C _L	М	fb	F'b	V	fv	F'v
												0.00	0.00	0.00	0.00
2		0.073	0.90	1.200	1.00	1.00	1.00	1.00	1.00			1166.40	0.09	11.88	162.00
2	0.140	0.073	0.90	1.200	1.00	1.00	1.00	1.00	1.00	0.18	163.04	1166.40	0.09	11.88	162.00
				1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
2		0.123	1.25	1.200	1.00	1.00	1.00	1.00	1.00			1620.00	0.20	27.73	225.00
2	0.235	0.123	1.25	1.200	1.00	1.00	1.00	1.00	1.00	0.42	380.42	1620.00	0.20	27.73	225.00
				1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
2		0.106	1.25	1.200	1.00	1.00	1.00	1.00	1.00			1620.00	0.17	23.77	225.00
2	0.201	0.106	1.25	1.200	1.00	1.00	1.00	1.00	1.00	0.36	326.07	1620.00	0.17	23.77	225.00
				1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
2		0.025	1.60	1.200	1.00	1.00	1.00	1.00	1.00			2073.60	0.05	7.13	288.00
2	0.047	0.025	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.11	97.82	2073.60	0.05	7.13	288.00
	Span # 2 2 2 2 2 2 2 2 2	Max Stree Span # M 2 2 0.140 2 2 0.235 2 0.201 2	Max Stress Ration Max Stress Ration Mov 2 0.073 2 0.140 0.073 2 0.123 2 0.235 0.123 2 0.201 0.106 2 0.201 0.106 2 0.025	Max Stress Ratios M V C _d 2 0.073 0.90 2 0.140 0.073 0.90 2 0.123 1.25 2 0.235 0.123 1.25 2 0.201 0.106 1.25 2 0.201 0.106 1.25 2 0.025 1.60	Max Stress Ratios	Max Stress Ratios	Span # M V C _d C _{F/V} C _i C _r 2 0.140 0.073 0.90 1.200 1.00 1.00 2 0.140 0.073 0.90 1.200 1.00 1.00 2 0.123 1.25 1.200 1.00 1.00 2 0.235 0.123 1.25 1.200 1.00 1.00 2 0.106 1.25 1.200 1.00 1.00 2 0.201 0.106 1.25 1.200 1.00 1.00 2 0.201 0.106 1.25 1.200 1.00 1.00 2 0.201 0.106 1.25 1.200 1.00 1.00 1.200 1.00 1.00 1.00 1.00 1.00 2 0.025 1.60 1.200 1.00 1.00	Max Stress Ratios	Max Stress Ratios	Max Stress Ratios	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Max Stress Ratios	Max Stress Ratios	Max Stress Ratios	Max Stress Ratios

Wood Beam Project File: 7067.ec6

LIC# : KW-06014215, Build:20.21.10.12 Innovation DESCRIPTION: 2x8 RAFTER TAIL

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC INC 1983-2021

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl Loc	ation in Span	Load Combina	ation	Max. "+" Defl Location	on in Span
	1	0.0000	0.000	+D+Lr		-0.0978	0.000
+D+Lr	2	0.0473	3.469			0.0000	0.000
Vertical Reactions			Suppo	rt notation : Far I	eft is #1	Values in KIPS	
Load Combination		Support 1	Support 2 Su	pport 3			
Overall MAXimum			0.242	0.242			
Overall MINimum			0.138	0.138			
D Only			0.104	0.104			
+D+Lr			0.242	0.242			
+D+0.750Lr			0.207	0.207			
+0.60D			0.062	0.062			
Lr Only			0.138	0.138			



Page 104 of 378



RedSpec™ by RedBuilt™ v7.1.17

Project: Project

Location: SAN BERNARDINO Folder: FIRE STATION 227 Date: 12/17/24 12:31 PM

Designer: VG Comment:

40" Red-H™ @ 48" o.c.

This product meets or exceeds the set design controls for the application and loads listed

This truss design is feasible. The finished design shall be produced by RedBuilt Engineering. All open-web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specific loads. Do not use this analysis to verify the capacity of existing trusses.

DEFLECTIONS (in) % Design Allow. Design Pass/Fail 2.050 Span Live 66% 1.345 L / 360 L / 549 Span Total 77% 2.354 3.075 L / 314 L / 240 **PASS** SUPPORTS
Live Reaction (lb) (DOL%) Support 1 Support 2 2500 (125) 2493 (125) Dead Reaction (lb) 1875 1870 Total Reaction (lb) (DOL%) 4363 (125) 4375 (125) Bearing Top Chord Top Chord Support Wall Wall

Bearing Clip (Red-H) Z-Clip (Red-H) Z-Clip Approx. Clip Height 5.75" 5.75" 8" Approx. Clip Width Assumed Bearing Width 5.5" 5.5"

SPANS AND LOADS

Dimensions represent horizontal clear span.

Member Slope: 2/12 í



APPLICATION LOADS

Live Partition Member Type Units DOL Dead Tributary Type Roof(125%) Uniform psf 20 15 48" Roof Joist

NOTES

- Building code and design methodology: 2021 IBC ASD (US)
 No repetitive member increase applied in design.
 Beveled plate required at left support.
 Beveled plate required at right support.

- Truss design includes consideration for partial span application live load.
- Continuous lateral support required at top edge. Lateral support at bottom edge shall be per RedBuilt recommendations.
- Pricing Load (plf) = 140
- Pricing Index (plf)

W:\8400 - STK\8400.32 - SBC Fire Station 227\03 - Engineering\8400.32.red

12/17/2024 12:31:17 PM Project: FIRE STATION 226: APPARATUS Page 1 of 1

The products noted are intended for interior, untreated, non-corrosive applications with normal temperatures and dry conditions of use, and must be installed in accordance with local building code requirements and RedBuilt™ recommendations. The loads, spans, and spacing have been provided by others and must be approved for the specific application by the design professional for the project. Unless otherwise noted, this output has not been reviewed by a RedBuilt™ associate. PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

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Type: APPARATUS



RedSpec™ by RedBuilt™ v7.1.17

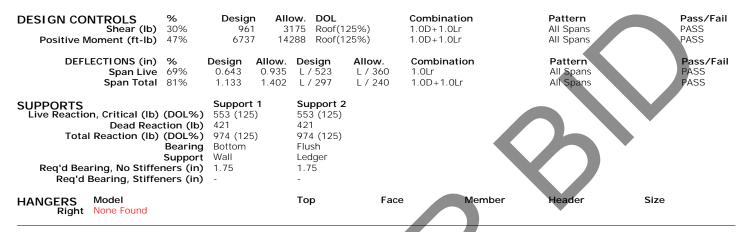
Project: Project

Location: SAN BERNARDINO Folder: FIRE STATION 227 Date: 12/17/24 12:31 PM

Designer: VG Comment:

14" Red-I90™ @ 24" o.c.

This product meets or exceeds the set design controls for the application and loads listed



SPANS AND LOADS

Dimensions represent horizontal design spans.

Member Slope: 2/12 í

Type: RJ6 - SLEEP QUAR



APPLICATION LOADS

Partition Tributary Member Type Units DOL Live Dead Type Roof(125%) Uniform psf 20 15 24" Roof Joist

NOTES

- Building code and design methodology: 2021 IBC ASD (US).
 Product Acceptance: ICC-ES ESR-2994 and LABC/LARC Supplement.
 Birdsmouth and beveled plate conditions require additional consideration.
 Continuous lateral support required at top edge. Lateral support at bottom edge shall be per RedBuilt recommendations.
- Sloped length multiplier = 1.014. Bevel cut add = 2.33".

W:\8400 - STK\8400.32 - SBC Fire Station 227\03 - Engineering\8400.32.red

12/17/2024 12:31:23 PM Project: FIRE STATION 226: RJ6 - SLEEP QUAR Page 1 of 1

The products noted are intended for interior, untreated, non-corrosive applications with normal temperatures and dry conditions of use, and must be installed in accordance with local building code requirements and RedBuilt™ recommendations. The loads, spans, and spacing have been provided by others and must be approved for the specific application by the design professional for the project. Unless otherwise noted, this output has not been reviewed by a RedBuilt™ associate. PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.



RedSpec™ by RedBuilt™ v7.1.17

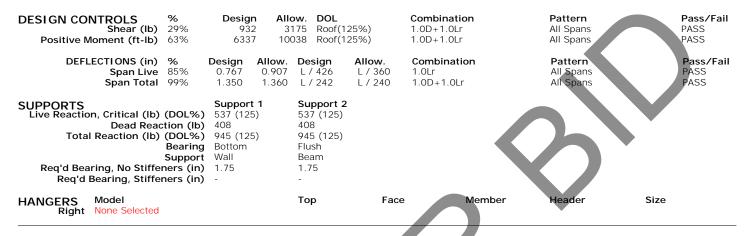
Project: Project

Location: SAN BERNARDINO Folder: FIRE STATION 227 Date: 12/17/24 12:30 PM

Designer: VG Comment:

14" Red-I65™ @ 24" o.c.

This product meets or exceeds the set design controls for the application and loads listed



SPANS AND LOADS

Dimensions represent horizontal design spans.

Member Slope: -2/12 î



APPLICATION LOADS

Live Partition Tributary Member Type Units DOL Dead Type Roof(125%) Uniform psf 20 15 24' Roof Joist

NOTES

- Building code and design methodology: 2021 IBC ASD (US).
 Product Acceptance: ICC-ES ESR-2994 and LABC/LARC Supplement.
 Birdsmouth and beveled plate conditions require additional consideration.
 Continuous lateral support required at top edge. Lateral support at bottom edge shall be per RedBuilt recommendations.
- Sloped length multiplier = 1.014. Bevel cut add = 2.33".

W:\8400 - STK\8400.32 - SBC Fire Station 227\03 - Engineering\8400.32.red

12/17/2024 12:30:18 PM Project: FIRE STATION 226: RJ8 - DAY ROOM Page 1 of 1

The products noted are intended for interior, untreated, non-corrosive applications with normal temperatures and dry conditions of use, and must be installed in accordance with local building code requirements and RedBuilt™ recommendations. The loads, spans, and spacing have been provided by others and must be approved for the specific application by the design professional for the project. Unless otherwise noted, this output has not been reviewed by a RedBuilt™ associate. PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

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Type: RJ8 - DAY ROOM



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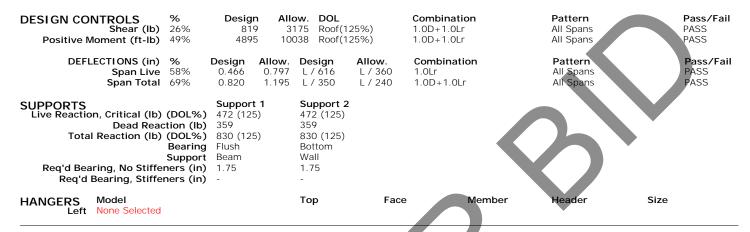
Project: Project

Location: SAN BERNARDINO Folder: FIRE STATION 227 Date: 12/17/24 12:30 PM

Designer: VG Comment:

14" Red-I65™ @ 24" o.c.

This product meets or exceeds the set design controls for the application and loads listed



SPANS AND LOADS

Dimensions represent horizontal design spans.

Member Slope: -2/12 î



APPLICATION LOADS

Partition Tributary Member Type Units DOL Live Dead Type Roof(125%) Uniform psf 20 15 24' Roof Joist

NOTES

- Building code and design methodology: 2021 IBC ASD (US).
 Product Acceptance: ICC-ES ESR-2994 and LABC/LARC Supplement.
 Birdsmouth and beveled plate conditions require additional consideration.
 Continuous lateral support required at top edge. Lateral support at bottom edge shall be per RedBuilt recommendations.
- Sloped length multiplier = 1.014. Bevel cut add = 2.33".

W:\8400 - STK\8400.32 - SBC Fire Station 227\03 - Engineering\8400.32.red

12/17/2024 12:30:21 PM Project: FIRE STATION 226: RJ9 - DAY ROOM Page 1 of 1

The products noted are intended for interior, untreated, non-corrosive applications with normal temperatures and dry conditions of use, and must be installed in accordance with local building code requirements and RedBuilt™ recommendations. The loads, spans, and spacing have been provided by others and must be approved for the specific application by the design professional for the project. Unless otherwise noted, this output has not been reviewed by a RedBuilt™ associate. PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

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Type: RJ9 - DAY ROOM



BUILDING LATERAL DESIGN





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	Sheet:	Seismic ELF Analysis
Date		
	Project ID:	
	Version:	2022 CBC / ASCE 7-16 supp3

SEISMIC DESIGN LOAD - EQUIVALENT LATERAL FORCE PROCEDURE

Structure: Fire Station 227	
Building Seismic Design Criteria	(ASCE - Chapter 11)
Risk Category of Building or Structure:	IV Table 1.5-1
Short-Period Spectral Response Acceleration, S_s :	2.506 Per ASCE 7 Hazard Tool
Long-Period Spectral Response Acceleration, S1:	1.002 Per ASCE 7 Hazard Tool
Average Height of Building Roof, h_n :	26.00 ft
Site-specific ground motion analysis provided?	Yes 11.4.8
Analytical procedure (Limit per Table 12.6-1)	ELF Equivalent Lateral Force 12.8
Structural irregularities per 12.3.2?	Yes 12.8.1.3 - Item 1
Exceed 5 story above base/grade including mezzanines?	12.8.1.3 - Item 2
Site Class	11.4.3 & 11.4.4
Soil Site Class:	Per Geotech Report
Site Coefficients & Spectral Response Acceleration Paramete	ters 11.4.4

Site Coefficients & Spectral Response Acceleration Parameters

Table

11.4-1 & 11.4-2

11.7.7

Site Coefficient, Fa:	1.00	N/A	1.20	
Site Coefficient, Fv:	Site Specific	1.70	1.70	
				-
$S_{MS} = F_a * S_s$:			2.51	Equation 11.4-1
$S_{M1} = F_{V}^{*}S_{1}:$			2.43	Equation 11.4-2
$S_{DS} = 2/3*S_{MS}$:			1.67	Equation 11.4-3
$S_{D1} = 2/3*S_{M1}$: $Ts = S_{D1} / S_{DS}$			1.62	Equation 11.4-4
$Ts = S_{D1} / S_{DS}$			0.97	11.4.6
Seismic Design Category	(SDC):		F	11.6 & Table 11.6-1 & 2

11.4.8

Exceptions

Site-specific

analysis per

Geotech Report

Seismic Equivalent Lateral Force Procedure

Impotance	Factor, I	e:
-----------	-----------	----

Response Modification Factor, R: Table 12.2-1 Overstrength Amplification factor, Ω_o :

Approximate Period Values: Table 12.8-2:

Approximate Fundamental Period, $Ta = C_t (h_n)^{x}$ Long Period Transition Period, T_{L}

		Section 12.8
	1.50	Table 1.5-2
	6.50	Light Framed Shear Walls
	2.5	Table 12.2-1
C_t	0.02	All other systems
X :	0.75	
	0.23	s Equation 12.8-7
	8	Figure 22 (14-17)

Calculation

Warnings/Notes



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	Sheet:	Seismic ELF Analysis
	Date:	
	Project ID:	
	Version:	2022 CBC / ASCE 7-16 supp3

Seismic Response Coefficient, Cs:

$$\begin{split} C_s &= S_{DS} \, / \, (R \, / \, I_e); \\ &\qquad \underline{Maximum \, C_s:} \\ C_s &= S_{D1} \, / \, T_a \, (R \, / \, I_e); \quad T \leq T_L \end{split}$$

 $C_s = S_{D1} / T_a (R / T_e). T \le T_L$ $C_s = S_{D1} T_L / T_a^2 (R / T_e) T > T_L$

Minimum C_s:

 $C_s = 0.044 S_{DS} I_e$: ≥ 0.01 $C_s = 0.5 S_1 / (R / I_e)$: for $S_1 \geq 0.6$

Seismic Base Shear, $V = C_s W$:

0.386	
	_

MAX 1.623 56.375

MIN

0.110
0.116

0.386 W

Equation 12.8-5

Equation 12.8-2

Equation 12.8-3

Equation 12.8-4

Equation 12.8-6

Equation 12.8-1

Building Structure - Horizontal Seismic Load Effect, Eh

Redundancy Factor, ρ : (Strength Level) 1.0 $E_h = \rho Qe$: (ASD Level) 0.7 $E_h = \rho Qe$:

1.00	
0.386	W
0.270	W

Section 12.3.4.2 Equation 12.4-3

Equation 12.4-3

Diaphragm Design Forces per 12.10.1

 $F_{px} = 0.2S_{DS}I_{e}W_{px} =$ $F_{px} = 0.4S_{DS}I_{e}W_{px} =$

F	_	W	*	ΣF.	/	Σω

0.501 W (Min) 1.002 W (Max)

Section 12.10

Equation 12.10-2

Equation 12.10-3

Equation 12.10-1



Sheet:	Wind Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

Chapter 27 - Wind Loads on Buildings: Main Wind Force Resisting System (Directional Procedure) Enclosed & Partially Enclosed Structures - Gable, Hip, Monoslope, & Mansard Roof

Structure: Fire Station 227

Building Data:

Type of Roof:

Horiz building dimension parallel to wind, L:

Horiz building dimension normal to wind, B:

h/L:

L/B:

Roof Pitch, O:

slope ratio: 2 :12 =

Monoslope 97.0 135.8 0.27 0.71 9.5 1,286

degrees

ft, above sea level

General Wind Load Requirements:

Ground Elevation, Zg:

Risk category:

V, Basic wind speed (3-s gust): mph

 $V_{asd} = V\sqrt{0.6}$: mph

Wind directionality factor, Kd

Exposure category:

Topographic factor, Kzt:

Ground elevation factor, Ke:

Gust-effect factor, Gf:

Enclosure classification:

Internal pressure coefficient, +/- GCpi

Velocity pressure exposure coefficient, Kz or Kh

Minimum design wind loading, ASD

IV	
125	
97	
0.85	•
C	
1.0	
0.95	
0.85	
Enclosed	
0.18	
0.92	

8.0

psf

(ASCE 7-16) Table 1.5-1

ASCE 7 Hazard Tool & Fig 26.5-1A, B, C, & D

Where exceptions 4 & 5 of Sec. 16.9.1.1 apply

Section 26.6 & Table 26.6-1

Section 26.7 Section 26.8 & Fig 26.8-1

Section 26.9

Section 26.11

Section 26.13 & Table 26.13-1

Table 26.10-1

Section 27.1.5

Section 26.10.2

Determine Velocity Pressure: $qz = 0.00256 \text{ Kz Kzt Kd Ke V}^2$, psf

				_				
1-Story Building Wind Analysis								
Level	Height (ft)	Kz or Kh	qz (psf)					
Ridge Height	26.00	0.95	30.77	=qh				
Mean Roof, h	22.17	0.92	29.77					
1st Level	18.33	0.88	28.67]				

Pressure on Building By Component (Roof Loads Normal to Roof Surface)										
Pressure	ori bullali	ig by Coi		CITE (TOOI			(psf)			
Surface	Level (ft)	Ср	qh or qz	q (psf)	External Pressure, q(GCp) (psf)	Internal Pressure, qh(+/-GCpi)	+(GCpi)	-(GCpi)		
Windward Roof - (-Cp)	26.00	0.00	qh	30.77	0.00	0.0	0.00	0.00		
Windward Roof - (+Cp)	26.00	0.00	qh	30.77	0.00	0.0	0.00	0.00		
Leeward Roof	26.00	-0.30	qh	30.77	-7.78	5.5	-2.24	-13.32		
Windward Wall	18.33	0.8	qz	28.67	19.49	5.5	25.03	13.96		
Leeward Wall	18.33	-0.50	qh	30.77	-13.08	5.5	-7.54	-18.61		



Sheet:	Wind Analysis					
Date:						
Project ID:						
Version:	2022 CBC / ASCE 7-16					

Wind Loading - Horizontal Components										
	+Internal -Internal				Min.					
Surface	Level (ft)	р	sf	Design (psf)	(psf)					
Windward Roof	26.00	0.00	0.00							
Leeward Roof	26.00	-0.37	-2.19	0.37	8					
Windward Wall	18.33	25.03	13.96							
Leeward Wall	18.33	-7.54	-18.61	32.57	16					

		Win	d Load No	rmal to M	onoslope Roof $q_h^{GC_B}$
Level	1.0W (Stren	gth)	0.6W (A	ASD)	g.GC. HILLIAM
1st Flr	360	plf	216	plf	The state of the s
					WIND A TABOCA



SHEAR WALL DESIGN GLOBAL PARAMETERS

Input Data:

Applicable Code References:

AWC NDS-18:ASD **2021 SDPWS** 2022 CBC

Seismic Design Properties

Overstrength Factor Ω_o

S.G. of Studs S.G. Adjustment Factor¹

Table 4.3A

1.670

Default Wood Framing Species: Strap & Holdown Manufacture:

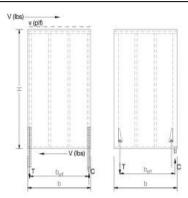
Douglas Fir-Larch SIMPSON STRONG TIE

				ASE	Unit She	ar Capacit	y Table - 2	021 SDPW	S Table 4.	3A				
Туре	Thickness (in.)	Grade	Nail Size ¹	E.N. O.C. Spacing (in.)	⁶ Framing Member Thk At Adjoining Panel Edges	Mominal Unit Shear Capacity (plf)	Wind Reduction Factor	Seismic Reduction Factor	S.G. Adjustment Factor	⁵ WSP Factor	² Fire Treated Factor	¹ Table 4.3A Footnote 10d nail Factor	Adjusted Seismic Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
6	3/8	CD	8d	6 in. o.c.	2x	730	2	2.8	1	1.0	1.0	-	261	365
4	3/8	CD	8d	4 in. o.c.	2x	1065	2	2.8	1	1.0	1.0	-	350	490
3	3/8	CD	8d	3 in. o.c.	3x	1370	2	2.8	1	1.0	1.0	-	489	685
2	3/8	CD	8d	2 in. o.c.	3x	1790	2	2.8	1	1.0	1.0	-	639	895
2A	3/8	S1	8d	2 in. o.c.	3x	2045	2	2.8	1	1.0	1.0	-	730	1023
2B	15/32	S1	10d	2 in. o.c.	3x	2435	2	2.8	1	1.0	1.0	-	870	1218

- 1. Nail Size Reduction Factor Applied for 10d Nails where Holdown is attached to the inside face of the end post
- 2. Based off of Manuf. Fire Retardant-Treated Wood ICC-ES report #
- 3. Stud Max Spacing 16" O.C. & Panels are applied with long dimension across studs
- 4. Nominal unit shear capacities have been increased to values shown for 15/32 inch (nominal) sheathing per NDS Table 4.3A
- 5. WSP Indicates Aspect Ratio Factor = 1.25-.125 h/b for wood structural panel shear walls
- 6. Type 4 values have been adjusted off a max nominal 980 plf capacity for SDC D,E or F to allow for 2x framing member at panel edges
- 7. Individual Shear Wall Panel Capacities may vary from this table depending on S.G. of wood used, WSP factor, or per foot note comment 10 of Table 4.3A



FULL HEIGHT SHEAR WALL SEGMENT



Terms & Definitions:

T = Tension Force Induced by Seismic or Wind Forces

= Compression Forced Induced by Seismic or Wind Forces

= effective width of overturning moment

= nominal width of shear wall

= Shear Force Induced by the ASD Design Seismic or Wind Load

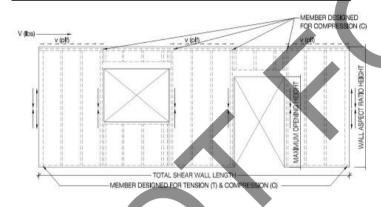
= unit shear force acting along length of shear wall

= Overturning Moment Induced by Seismic or Wind Forces

Resisting Moment Induced by Dead Load

Tension Force,
$$T = \frac{-M_{OT} + M_R}{b_{eff}}$$

PERFORATED SHEAR WALL



Terms & Definitions:

Shear Capacity Adjustment Factor

Sum of Perforated Shear Wall Segment Lengths $\sum b_i$

Maximum unit hsear forces induced by the designseismic or

= Total area sheathed with full-height sheathing

Total area of openings in the perforated shea wall

Total area of perforated shear wall

 ${\textstyle \sum} b_i$ Sum of perforated shear wall segment lengths

Max. unit shear force induced by the design load V_{max}

$$V_n = \nu_n C_o \sum B_i \tag{4.3-5}$$

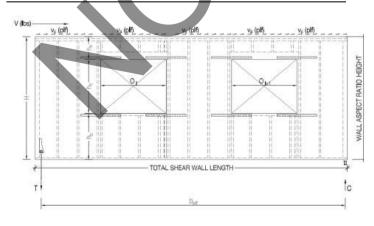
$$C_o = \frac{A_{wall}}{(3A_o + A_{fhs})} \le 1.0$$
 (4.3-6)

$$Tension\ Force, T = \frac{Vh}{C_{O\ \Sigma\ b_I}}$$
 (4.3-8)

Tension Force,
$$T = \frac{Vh}{Cont}$$
 (4.3-8)

$$v_{max} = \frac{V}{c_{O \sum b_I}} \tag{4.3-9}$$

FORCE TRANSFER SHEAR WALL



Terms & Definitions:

= Full Height of Shear Wall

= Wall Height Above Opening

= Clear Height of Opening

= Wall Height Below Opening

= Width of Wall Pier Segment

= Width of Opening

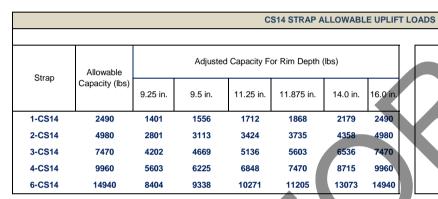
= effective width of overturning moment

$$Tension \ Force, T \ = \frac{-M_{OT} + M_R}{b_{eff}}$$



WOOD SITE BUILDING HARDWARE ALLOWABLE LOADS $f'_{c\;min} = 2{,}500\;psi$

	CS14 Reduced Capacity Comparison Table										
Floor Rim	Max	Min. Nail	1-CS Strap	1-CS Strap							
Depth	10d		Reduced Factor	Reduced Capacity (lbs)							
9.25	16	9	56%	1401							
9.5	16	10	63%	1556							
11.25	16	11	69%	1712							
11.875	16	12	75%	1868							
14	16	14	88%	2179							
16	16	16	100%	2490							



STANDARD TENSION STRAP ALLOWABLE LOADS									
Strap	Allowable Capacity (lbs)	Fasteners (in.)	End Length (in.)						
1-CS14	2490	(30) 0.131 x 2 1/2	16						
2-CS14	4980	(60) 0.131 x 2 1/2	16						
CMST14	6475	(66) 0.148 x 2 1/2	30						
CMST12	9215	(86) 0.148 x 2 1/2	39						
2-CMST14	12950	(132) 0.148 x 2 1/2	30						
2-CMST12	18430	(172) 0.148 x 2 1/2	39						

						HOLDO	WN TABL	E						
HD	Notes	Height, H (in")	Anchor Bolt	Anchor Bolt Capacity SDC C-F (lbs)	Minimum Embed (d _e)	Minimum End Post	Hold Capa DF/SP		F (in.)	2F (in.)	Minimum Square Pad Footing	Foundation Condition	(Ib	on Load os) ² SPF/HF
STHD14	1	-	-	3815	18	4x4	5285	5285	-	-	-	-	3815	3815
HTT4	-	12 3/8	SSTB20	4785	16 5/8	4x4	4455	3830	-	-	-	Slab on Grade	4455	3830
HTT4	-	12 3/8	SB5/8X24	5730	18	4x4	4455	3830	-	-	-	Concrete Stemwall	4455	3830
HDU5	-	13 3/8	SSTB24	5790	20 5/8	4x4	5645	4340	-	-	-	Slab on Grade	5645	4340
HDU5	-	13 3/8	SB5/8X24	5730	18	4x4	5645	4340	-	-	-	Concrete Stemwall	5645	4340
HDU8	-	16 5/8	SSTB28	8475	29 7/8	4x6	7870	6580	-	-	-	Slab on Grade	7870	6580
HDU8	1	16 5/8	SB7/8X24	7855	18	4x6	7870	6580	-	-	-	Concrete Stemwall	7855	6580
HDU11		22 1/4	SB1X30	13090	24	4x6	9535	8030	-	-	-	Slab on Grade	9535	8030
HDU11	-	22 1/4	PAB8	17080	11.50	4x6	9535	8030	17.5	35.0	36" square	Concrete Stemwall	9535	8030
HDU11	- `	22 1/4	SB1X30	13090	24	4x8	11175	9610	-	-	-	Slab on Grade	11175	9610
HDU11	•	22 1/4	PAB8	17080	11.50	4x8	11175	9610	17.5	35.0	36" square	Concrete Stemwall	11175	9610
HDU14	3	25 11/16	SB1X30	13090	24	4x8	14390	12375	-	-	-	Slab on Grade	13090	12375
HDU14	3	25 11/16	PAB8	17080	11.50	4x8	14390	12375	17.5	35.0	36" square	Concrete Stemwall	14390	12375
HDU14	3	25 11/16	SB1X30	13090	24	6x6	14445	12425	17.5	-	-	Slab on Grade	13090	12425
HDU14	3	25 11/16	PAB8	17080	11.50	6x6	14445	12425	17.5	35.0	36" square	Concrete Stemwall	14445	12425
HD12	-	20 5/16	PAB8	17080	11.50	4x8	15435	13120	17.5	35.0	36" square	Slab on Grade	15435	13120
HD12	-	20 5/16	PAB8	17080	11.50	6x6	15510	12690	17.5	35.0	oo oquale	Concrete Stemwall	15510	12690
HD19	-	24 1/2	PAB10	26690	15	6x6 DF#1	19070	16210	22.5	45.0	48" square	Slab on Grade	19070	16210
HD19	-	24 1/2	PAB10	26690	15	4x8 DF#1	19360	15270	22.5	45.0	.5 oquale	Concrete Stemwall	19360	15270

^{1.}Load is based on Cracked Concrete Corner Condition

^{2. 12&}quot; Minimum Concrete Footing Width

^{3.} Where SB1X30 or PAB8 is used with HDU14, 18" minimum width footing each way is required to achieve tabulated loads



PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3 Applicable Code Reference: **2021 SDPWS** Level: SW ID: W1 **Grid Reference** 1 Shear Wall Input Data: **General Data Inputs** Wood Species DF Redundancy Factor Wall Size Overstrength Factor Ω_o 2x6 2.5 # of Panel Sides 1 Discontinuous Lateral System? (Beam Below Strap) ft² A_0 128 Beam Depth ²Fire Treated Lumber Condition? ft² A_{fhs} 609 ²Reduction to Allowable Capacity 736.6667 ft² 1.0 A_{wall} $\sum b_{i}$ 528 in. 44'-0" 51 in. 4'-3" L_{min} S.G. 0.5 S.G. Adjustment Factor 1.00 Shear Wall Capacity Data: C。 0.74 1.0 OK A_o / A_{wall} 17% = A_{fhs} / A_{wall} 83% ASD Unit Shear Capacity Table - 2021 SDPWS Table 4.3A O.C. Spacing (in.) Adjusted Seismic Unit Shear Capacity (plf) Framing Member Thk At Adjoining Panel Edges Footnote 10d nail Factor Adjustment Factor Wind Reduction Factor Nominal Unit Shear Capacity (plf) eismic Reduction Factor Adjusted Wind Unit Shear Capacity (plf) Thickness (in.) Fire Treated WSP Factor Table 4.3A Nail Size¹ Factor Grade Ġ Z W 379 4 3/8 350 CD 8d 4 in. o.c. 2.8 1.00 1.0 No 1. See Global Parameter Sheet for Additional Notes.

Shear Wall Height:

73 8 H_{OTM} (in.) 120 = 120 H_{ASPECT} (in.) 10'-0"

Shear Panel Length Data Table

Full Height Segment Lengths		% Trib	h/b	Aspect Ratio	Aspect Ratio
ft	in.			Factor	Check
5	8	13%	1.76 :1	1.00	ок
5	9	13%	1.74 :1	1.00	ОК
5	8	13%	1.76 :1	1.00	ОК
5	8	13%	1.76 :1	1.00	ок
5	8	13%	1.76 :1	1.00	ок
5	8	13%	1.76 :1	1.00	ок
5	8	13%	1.76 :1	1.00	ок
4	3	10%	2.35 :1	0.96	ок
$\sum b_i =$	44.00 ft.	Weighted	d Average:	1.00	

Notes:

- 1. Apply All Dead Load From Levels Above
- 2. Input Additional Concentrated Dead Load As Occurs Per Plan in Overturning Design Section Below

Resisting Dead Load Data Table

Level	psf	L _{trib} (ft.)	Uniform plf	M _{resisting} (ft-kips)
Roof	15.00	13.2	198.00	537.25
Wall	15.00	10	150.00	407.01
			Total M _D :	944.26 ft-kips



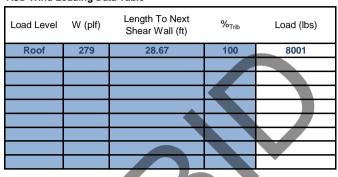
PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Seismic Loading Data Table

Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _{Trib}	Load (lbs)					
Roof	10637.48	1		100	10637					
	Line Loads(lbs)									
	0									
	0									

Total V_(E): 10637 lbs

ASD Wind Loading Data Table



Total V_(w): 8000.8 lbs

Shear Pan	Shear Panel Design: Apply 10d Nail Strength Reduction Factor Per Note 1 Above = Ye													
Load Type	V (lbs)	ρV (E) (lbs)	v _{max} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type			
Seimic:	10637.5	10637.48	325.8	350.0	4	8d	4 in. o.c.	3/8	E	0.9308	4			
Wind:	8.0008	-	245.0	363.4	6	8d	6 in. o.c.	3/8		0.6742	4			





PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Tens	ion Load	Combin	otioner							
Seism				_{os})D +.7E _h	= 0.366	D - 7οΩ _E				ASCE 2.4.5
Wind:		+ .7W =	n (10 1.1.0))5/2 ··· =n		D6W				ASCE 2.4.1
wina.	0.00	+ .7 VV =			= 0.6	D6VV				ASCE 2.4.1
Overturnii	ng Desig	n:								
Load Type	M_{OT}	M_{D}	M_{net}	HD	Strap		Net Uplift .7ρ	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	$C_o \sum b_i$ (ft.)	$C_o \sum b_i$ (ft.)		HD	Strap	HD	Strap
Seimic:	-106.37	345.79	239.41	32.7	32.7	output:	7332.1	7332.1	0.0	0.0
Wind:	-80.01	566.56	486.55	32.7	32.7	output:	14900.7	14900.7	0.0	0.0
							No Ne	t Uplift		·
									Apply Omega	
									Include Uplift I	F.A.? Yes
	ASD Uplift	^3 / \	30%	Orthorn			Total Net ASD	Tension Uplift	O1 0F Ter	nsion Uplift
Load Type	(lb		Ortho.	Orthogo Uplift	. ,	Point Load				
Loud Typo	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	Strap	HD	STRAP
Seimic:		0			0.0		2685.0	2685.0	0.0	0.0
Wind:		0			0.0		8940.4	8940.4	-	-
4. Ammlu 00	Orth c		Day 40	OF Cooties	40 F 0 4 /F=	a Hadista E. A.)				
		onai increa	ase Per AS	CE Section	12.5.3.1 (FO	r Uplift F.A.)				
2. (-) indica	-									
3. F.A. indic					7					
4. Uplift she	ould ASD	level but n	ot include	any dead lo	oad from ab	ove. Refer to "Up	lift 1.0ρE & 1.0W	(lbs) Section		
5. Orthogor	nal uplift s	hould be	the net up	ift from the	other direct	ion				

						F	oundation Type	Slab On Grade
Hold Down	Design:				Wood to Woo	d Connection	Post to Cor	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	-	4455 #N/A	0.0000 0.0000	OUTPUT HOLDOWN SUMMARY:	NONE REQUIRED	2x	NONE REQUIRED	2x



Project	ISE
Project #:	
Date:	11/15/2024
Designer:	-

WOOD SHEAR WALL DESIGN WITH FORCE TRANSFER AT DOOR OPENING PER THE DIEKMANN METHOD

SW2 ROOF FRAMING PLAN - ALONG GRID 2

Roof DL =	15.0	psf
Floor DL =	0.0	psf
Wall DL =	15.0	psf

S _{DS} =	1.67
C _d =	4.0
FRT	N

Z	Story	L	L ₁	Lo	L ₂	h	h _A	h_B
TIO		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
INFORMATION								
-OF								
WALL								
X	1	62.84	8.17	48.50	6.17	23.33	14.33	9.00

NOIL	Story	DL Trib. Width (ft)	Trib. P _{DL} (lb)	Max L/h Ratio	Aspect Ratio Factor	L _i (ft)
WALL INFORMATION						
L INF(
WAL	1	6.00	2,828	2.32	0.86	14.34

er.	PI		PZ	
	Lı	L _p	Lz	
	F _{SIA}	S1 55 For	-	1
V _{P1}	E SIA	F _{S1}	P VP2	rg t
P1			P2	

NALY	Story	WL (plf)	B _{trib} (ft)	F (lb)	(lb)	OM _w (lb-ft)	$v_{P1} = v_{P2}$ (plf)	v _{S1} (plf)	T = C (lb)	T _{net}	$F_{P1} = F_{P2}$ (lb)	F _{S1A} (lb)	F _{S1B} (lb)	i (in)	wi (in)
⋖		(Pii)	(11)	(ID)	(ID)	(10-11)	(Pii)	(Pii)	(ID)	(ID)	(ID)	(ID)	(ID)	(111)	(111)
N N				Ť											
>	1	279	41.00	11,442	11,442	266,933	798	327	4,248	2,551	5,717	9,036	6,824	0.899	0.899

ALY	Story	EL	A _{trib}	F	V	OM_w	$V_{P1} = V_{P2}$	v_{S1}	T = C	T _{net}	$F_{P1} = F_{P2}$	F _{S1A}	F _{S1B}	i	wi
AN		(plf)	(ft)	(lb)	(lb)	(lb-ft)	(plf)	(plf)	(lb)	(lb)	(lb)	(lb)	(lb)	(in)	(in)
N N															
\geq	1	19,149	1	19,149	19,149	446,742	1,335	547	7,109	6,074	9,568	15,124	11,421	2.883	2.883

	Story	Shear	р	Post	End Door Force Allowable		vable	End	End Post	Jamb	F.T.	D/C		
<u>U</u>		Wall	Side	Size	Post	Jamb	Transfer	Shear		Post	Strap/HD	Strap/HD	Strap	Check
SH		Туре	bl. S		Strap/HD	Strap/HD	Strap	Wind	Seismic	Capacity	Capacity	Capacity	Capacity	
_			D					(plf)	(in)	(lb)	(lb)	(lb)	(lb)	
۱A														
	1	2B	Υ	4x6	HDU11	HDU11	2-CMST12	2096.9	1497.8	12,030	11,175	11,175	18,430	OK



			FU	JLL HEIGH	IT WO	OD SHE	AR PANEL	DESIGN (I	NO OPENIN	GS) - SI	TE CON	NSTRU	CTION	J			
Annliaghla	Codo Pote	rongo		2021	SDPV		, , <u></u>							-	Level:		1
Applicable	Code Reit	erence.		2021	SUFV	73									SW ID:		W3
													•	Grid Re	ference		3
Shear Wall	Input Data	a:								G	eneral	Data II	nputs				
	Wood S		=	DF										cy Fact		=	1
	Wa # of Panel	all Size	=	2x6 1					Discon	tinuous L	ateral S		-	gth Fact		=	2.5
	# Of Farie	olues	_	'					Discon	illidod3 L	aterar	Эузсен	: (DCc		n Depth		
	A -1:	S.G.	=	0.5							² Eir	o Troot	od Lur	nhar Co	ndition?		No
5.0	6. Adjustmen	L _{total}	=	1.00 147 in.	12'-3"										Capacity		1.0
		L _{min}	=	147 in.	12'-3"												
					ASE	Unit SI	hear Capac	itv Table -	2021 SDPW	/S Table	4.3A						
				g				-						-	<u>.</u>		
	Thickness (in.)		-Φ	E.N. O.C. Spacing	_	Framing Member Thk At Adjoining	ges	Wind Beduction	Factor Factor Science Bodustion		Adjustment Factor	. tor	ated	¹ Table 4.3A Footnote 10d nai	Factor Adjusted Seismic	ear (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	ness	Grade	Nail Size ¹	S	(in.)	g Me	nel Edg #REF!	, Pa	Factor	Factor	djus	WSP Factor	Fire Treated	¹ Table 4.3A otnote 10d r	Factor sted Sei	Unit Shear Sapacity (pl	djusted Win Unit Shear Sapacity (plf
	hick	O	Z	0		amin k At	Panel Edges #REF!	7	T S		O	WSF	Fire	¹Tat	Jjuste	Unit Shear Capacity (plf)	\djusted Winc Unit Shear Capacity (pff)
	-			Ш		正 F		5		3	S)			ß.	AC		4 -
4	3/8	CD	80	d 4 in	. o.c.	2x	106	65	2	2.8	0.00	1.00	1.00	-	3	50	533
1. See Glob	al Parame	ter Shee	t for A	dditional N	lotes.												
Shear Wall H	leight:			ft. in.						Notes:	lv All D	ead I o	ad Fro	ım l eve	ls Above	2	
	H _{OTM} (in.)		=	12 9						• • •	•						Occurs Per
	H _{ASPECT} (in.)	=	12 9										Section			
Shear Pane		Data Tab	ole				Aspect			Resist	ing Dea	ad Loa	d Data	a Table			
Len	gth	% T	rib	h/b		t Ratio	Ratio			Leve	el	psf	L_{trib}	(ft.)	Jniform plf		sisting, M _D (ft-kips)
ft 12 ft.	in. 3 in.	100	10/.	1.04 :1		ctor .00	Check OK			Wal	1 1	15.00	1	0	150.00		11.25
1211.	3 111.	100	1/6	1.04 .1		.00	OK			VVal		13.00	'	U	0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
ΣL =	12.25 ft.	We	eighte	d Average:	1	.00								To	otal M _D :	11	.25 ft-kips
ASD Seism	nic Loading	g Data T	able						ASD Wind	Loading	Data 1	Гable					
Load	F _{xi} (psf)	A _{t1} (ft ²)	A _{t2} (ft ²)	%	PTrib	Load (lbs)		Load Leve	I W (pl	f)	Length	To Ne	ext	% _{Trib}	_	oad (lbs)
Description				7 (2 (11)								Shear		t)			
Roof	1541.91	1			1	00	1542		Roof	279		21	.67		100		6047
		Li	ne Lo	ads(lbs)													
				, , ,			0										
							0										

Total V_(E): 1542 lbs

Total $V_{(w)}$:

6047.3 lbs



Shear Panel	Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	er Note 1 Ab	pove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	1541.9	1541.91144	125.9	260.7	6	8d	6 in. o.c.	3/8	w	0.4828	4
Wind:	6047.3	-	493.7	532.5	4	8d	4 in. o.c.	3/8	"	0.9271	

ASD	lension	Load	Co	mbin	ations	S :
				_	_	

Seismic: $0.6D - .7E_v + .7E_h = (.6 - .14S_{DS})D + .7E_h$ = **0.366** D - .7pQ_E Wind: 0.6D + .7W = = **0.6** D - .6W

⁷ρQ_E

ASCE 2.4.5 ASCE 2.4.1

Overturning	Design:									
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE &	1.0W (lbs)
2000 .) po	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-19.66	4.12	-15.54	141.8	145.5	output:	-1315.4	-1281.5	-2377.6	-2316.3
Wind:	-77.10	6.75	-70.35	141.8	145.5	output:	-5955.6	-5802.1	-10878.8	-10598.4
									Apply Omega (Ω)	? No
									Include Uplift F.A.	? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift	1 1	Point Load 1.0D _I (+) (lbs)	Total Net ASD	Tension Uplift	1.0ρE Tensio	on Uplift
	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-1315.4	-1281.5	-2377.6	-2316.3
Wind:		0.0			0.0		-5955.6	-5802.1	-	-

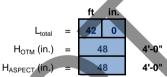
- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:				Wood to Woo	Fou	ındation Type: Post to Con	Slab On Grade
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU8 CMST14	7870 6475	0.7567 0.8961	OUTPUT HOLDOWN SUMMARY:	CMST14	2-2x6	HDU8	4x6



PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3 **2021 SDPWS** Applicable Code Reference: Level: SW ID: W4.5U **Grid Reference** 4.5 Shear Wall Input Data: **General Data Inputs** Wood Species DF Redundancy Factor Wall Size Overstrength Factor Ω_o 2x6 2.5 # of Panel Sides 1 Discontinuous Lateral System? (Beam Below Strap) ft^2 12 Beam Depth ft² ²Fire Treated Lumber Condition? A_{fhs} 156 ft² ²Reduction to Allowable Capacity 1.0 168 $\sum b_i$ 458 in. 38'-2" 30 in. 2'-6" L_{min} S.G. 0.5 S.G. Adjustment Factor 1.00 Shear Wall Capacity Data: C。 0.88 1.0 OK A_o / A_{wall} 7% = $\mathbf{A}_{\mathrm{fhs}}$ / $\mathbf{A}_{\mathrm{wall}}$ 93% ASD Unit Shear Capacity Table - 2021 SDPWS Table 4.3A O.C. Spacing (in.) Adjusted Seismic Unit Shear Capacity (plf) Framing Member Thk At Adjoining Panel Edges Footnote 10d nail Factor Wind Reduction Factor Adjustment Factor Nominal Unit Shear Capacity (pff) Adjusted Wind Unit Shear Capacity (plf) Seismic Reductio Factor Thickness (in.) Fire Treated Table 4.3A WSP Factor Nail Size Grade Type Ö Z W 895 2 3/8 2 in. o.c. CD 8d 2.8 1.00 639 1.0 No 1. See Global Parameter Sheet for Additional Notes.

Shear Wall Height:



Shear Panel Length Data Table

Full Height Lenç ft	-	% Trib	h/b	Aspect Ratio Factor	Aspect Ratio Check
23	5	61%	0.17 :1	1.00	ОК
4_	1	11%	0.98 :1	1.00	ок
4	1	11%	0.98 :1	1.00	ок
4	1	11%	0.98 :1	1.00	ОК
2	6	7%	1.60 :1	1.00	ок
$\sum b_i =$	38.17 ft.	Weighter	d Average:	1.00	

Notes:

- 1. Apply All Dead Load From Levels Above
- 2. Input Additional Concentrated Dead Load As Occurs Per Plan in Overturning Design Section Below

Resisting Dead Load Data Table

Level	psf	L _{trib} (ft.)	Uniform plf	M _{resisting} (ft-kips)
Roof	15.00	12	180.00	158.76
Wall	15.00	4	60.00	52.92
			Total M .	244 CO # Isino

Total M_D: 211.68 ft-kips



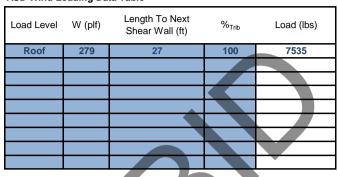
PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Seismic Loading Data Table

Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _{Trib}	Load (lbs)
Roof	18275.53	1		100	18276
		Line Lo	pads(lbs)		
					0
					0

Total V_(E): 18276 lbs

ASD Wind Loading Data Table



Total V_(w): 7534.7 lbs

Shear Pan	el Desig	n:				A	pply 10d Nail S	Strength Reduc	tion Factor	Per Note 1 A	Above = Yes
Load Type	V (lbs)	ρV (E) (lbs)	v _{max} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	18275.5	18275.53	547.2	639.3	2	8d	2 in. o.c.	3/8	F	0.8560	2
Wind:	7534.7	-	225.6	365.0	6	8d	6 in. o.c.	3/8	_	0.6181	2





5. Orthogonal uplift should be the net uplift from the other direction

PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

Seism	nic: 0.6D	7E _v +.7E	_h = (.614S _[os)D +.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.
Wind	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.
Overturni	ng Desig	n:								
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7ρΕ	& .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	$C_o \sum b_i$ (ft.)	C _o ∑b _i (ft.)		HD	Strap	HD	Strap
Seimic:	-73.10	77.52	4.42	33.4	33.4	output:	132.2	132.2	0.0	0.0
Wind:	-30.14	127.01	96.87	33.4	33.4	output:	2900.6	2900.6	0.0	0.0
							No Net	Uplift		
									Apply Omega	(Ω)? Yes
									Include Uplift F	A.? Yes
		3	30%				Tatal Aller ACD 3	Famaian Unlift	04.05.70	sion Uplift
Load Type	ASD Uplift	: F.A ³ . (-) s) ⁴	Ortho.	Orthogo Uplift		Point Load	Total Net ASD 1	rension opini	121.0E Ten	ISION OPINT
Load Type	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	Strap	HD	STRAP
Seimic:		0			0.0		48.4	48.4	0.0	0.0
Wind:		0			0.0		1740.4	1740.4	-	-
	•	onal Increa	ase Per AS	CE Section	12.5.3.1 (Fo	r Uplift F.A.)				
2. (-) indica	•									
3. F.A. indi	cates Fron	n Above								

						F	oundation Type	: Slab On Grade
Hold Down	Design:				Wood to Woo	d Connection	Post to Cor	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	-	4455 #N/A	0.0000 0.0000	OUTPUT HOLDOWN SUMMARY:	NONE REQUIRED	2x	NONE REQUIRED	2x



			FU	JLL HEIGI	HT WOO	D SHEAR	PANEL	DESIGN (NO OPENING	GS) - SIT	E CONST	ΓRU	CTION				
Applicable	Code Refe	erence:		2021	SDPWS	5							c		Level: SW ID: erence		1 W4.5L 4.5
Shear Wall	Innut Data	a·								G	eneral Da	ıta İr	nuite				
onear wan	•			DE	_								•	F4-			
	Wood S _i Wa	pecies all Size	=	DF 2x6										cy Facto		=	2.5
	# of Panel		=	1					Discont	inuous L	ateral Sys		_			=	
													4	Beam	Depth	=	
0.0	2. A dissaton and	S.G.	=	0.5							² Fire T	reat	ad Lum	ber Con	dition?		No
5.0	G. Adjustmen	L _{total}	=	1.00 592 in.	49'-4"									wable C		W	1.0
		L _{min}	=	116 in.	9'-8"									_ \			
							_										
				-			ar Capac	ity Table -	2021 SDPW			¥					
Туре	Thickness (in.)	Grade	Nail Size ¹		(in.)	Framing Member Thk At Adjoining Panel Edges	# # #		Factor Factor Seismic Reduction	Factor	S.G. Adjustment Factor	WSP Factor	¹ Fire Treated Factor	¹ Table 4.3A Footnote 10d nai	Adjusted Seismic	Capacity (plf)	Adjusted Wind Unit Shear Canacity (pf)
2	3/8	CD	80		n. o.c.	3x	179			2.8		1.00	1.00	-	63	39	895
1 See Glob	al Paramet	ter Shee	et for A	dditional N	lotes												
Shear Pan	H _{ASPECT} (in.)		= ble	14 4		<u> </u>					Overturni ng Dead	Ū	J		Below		
Len ft	gth in.	%1	Γrib	h/b	Aspect Fact	Ratio	Aspect Ratio Check			Leve	l ps	f	L_{trib}	(ft.) Ui	niform plf		sisting, M _i (ft-kips)
24 ft.	11 in.	51	%	0.58 :1	1.0	0	ОК			Wall	15.0	00	10	1	50.00		7.01
9 ft.	8 in.	20	_	1.48 :1	1.0		OK			Roof	15.0	00	14		10.00		9.81
14 ft.	9 in.	30	9%	0.97 :1	1.0	0	OK								0.00		0.00
															0.00		0.00
		7													0.00		0.00
			-												0.00		0.00
					1										0.00		0.00
		-			+										0.00		0.00
ΣL =	49.33 ft.	W	eighte	d Average	: 1.0	0									al M _D :	16.	82 ft-kip
ASD Seism	nic Loading	g Data 1	Гablе						ASD Wind I	oading	Data Tab	le					
Load Description	F _{xi} (psf)	A _{t1}	(ft ²)	A _{t2} (ft ²)	% _{T1}	rib Lo	oad (lbs)		Load Level	W (plf			To Ne: Wall (fi		% _{Trib}	L	oad (lbs)
Roof	29693.81	1	l		10	0	29694		Roof	279		3	88		100		10604
		L	ine Lo	ads(lbs)													
							0										
							0										

Total V_(E): 29694 lbs

10604.4 lbs

Total $V_{(w)}$:



Shear Pane	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	r Note 1 Ab	ove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	29693.8	29693.8069	601.9	639.3	2	8d	2 in. o.c.	3/8	E	0.9415	2
Wind:	10604.4	-	215.0	365.0	6	8d	6 in. o.c.	3/8	_	0.5889	

Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})E_h$
Wind:	0.6D + .7W =

ASD Tension Load Combinations:

D +.7E_h

= **0.366** D -.7ρQ_E

0.6 D - .6W

ASCE 2.4.5

ASCE 2.4.1

Overturning Design:

Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Lodd Typo	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-83.40	6.16	-77.24	110.8	114.5	output:	-8368.8	-8094.7	-12908.9	-12486.1
Wind:	-29.78	10.09	-19.69	110.8	114.5	output:	-2133.6	-2063.7	-5378.5	-5202.3
							,		Apply Omega ((Ω)? No
									Include Uplift F	.A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift	- 1	Point Load 1.0D _L (+) (lbs)	Total Net ASD	Tension Uplift	1.0ρE Ten	sion Uplift

Load Type		lift F.A°.(-) lbs) ⁴	Ortho.	Orthogo Uplift		Point Load 1.0D _L (+) (lbs)	Total Net ASD	rension opini	1.0pc Tel	ision opini
	100%	30%	?	100%	30%	1.05[(1)(100)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-8368.8	-8094.7	-12908.9	-12486.1
Wind:		0.0	No		0.0		-2133.6	-2063.7	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0ρΕ & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:					Fou	ındation Type:	Slab On Grade
					Wood to Woo	d Connection	Post to Cor	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU11 CMST12	11175 9215	0.7489 0.8784	OUTPUT HOLDOWN SUMMARY:	CMST12	2-2x6	HDU11	6x6



			FU	JLL HEIGH	IT WO	OD SHE	AR PANEL	DESIGN	(NO OPENIN	GS) - SI	TE CO	NSTRU	CTION	N			
Amuliaabla	Cada Dafa								(,			••.	•	Laval		4
Applicable	Code Refe	erence:		2021	SDPV	V5									Level: SW ID:		1 W5
													(Grid Re	ference	•	5
Shear Wall	Input Data	a:								G	enera	l Data lı	nputs				
	Wood S	pecies	=	DF						_			-	ncy Fac	tor p		1
		II Size	=	2x6								Over	streng	gth Fac	tor Ω_c		2.5
	# of Panel	Sides	=	1					Discon	tinuous L	_ateral	System	? (Bea		w Strap) m Depth		
		S.G.	=	0.5										Doa	прора	_	
S.G	6. Adjustment		=	1.00	441.46										ondition?		No
		L _{total} L _{min}	=	178 in. 178 in.	14'-10 14'-10						RE	duction	to Alic	owabie	Capacity	=	1.0
		-111111									4		1	1		>	
					ASE	Unit S	hear Capac	ity Table	- 2021 SDPV	/S Table	4.3A	V					
	<u>-</u>			in)	oer ng	" 0		LO ci	<u> </u>	ţ		7	ail	лic		P (
Φ	Thickness (in.)	<u>o</u>	ze ₁	Spac		1emt joinii	Panel Edges		luctic	2000	Adjustment Factor	WSP Factor	Fire Treated	¹ Table 4.3A otnote 10d r	or Seisr	Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	knes	Grade	Nail Size ¹	0	(jr.)	ng N Nt Ad	nel Edg #REF!		Factor Factor	Factor	Adju Fact	Ω. Έ	e Trea	ible a	Factor sted Sei	Unit Shear apacity (pl	sted nit St
	Thic		Z	E.N. O.C. Spacing		Framing Member Thk At Adjoining	Par		Wind Reduction Factor		S.G	8	ĪĒ	¹ Table 4.3A Footnote 10d nai	Factor Adjusted Seismic	S G	Adju Ur Cap
4	3/8	CD	80	d 4 in	. o.c.	2x	106	55	2	2.8	0.00	1.00	1.00	-	3	50	533
1. See Glob	al Paramet	er Shee	t for A	dditional N	lotes.					Notes:							
Shear Wall H	eight:			ft. in.							ly All [Dead Lo	ad Fro	om Leve	els Above	Э	
	H _{OTM} (in.)		=	10						2. Inpu	ıt Addi	tional C	oncen	trated D	ead Loa	ıd As (Occurs Per
	H _{ASPECT} (in.))	=	10						Plan in	Overt	urning D	esign	Section	Below		
OI D										D			1.5.4				
Shear Pane		Data Tak	oie				Aspect			Resist	ing De	ad Loa	a Data				
Len	gth	% T	rib	h/b	Asped	t Ratio	Ratio			Leve	el	psf	L_{trib}	(ft.)	Uniform plf		sisting, M _D (ft-kips)
ft	in.	400	20/	0.07.4		ctor	Check			\A/-1		45.00		10	•	1	
14 ft.	10 in.	100)%	0.67 :1	1.	.00	OK			Wal Roo		15.00 15.00	-	2	150.00 30.00		16.50 3.30
															0.00		0.00
					7										0.00		0.00
					· ·										0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
ΣL =	14.83 ft.	We	eighte	d Average:	1	.00								To	otal M _D :	19	.80 ft-kips
ASD Seism	ic Loading	r Data T	ablo						ASD Wind	Loading	Data	Tablo					
Load						[Ī		Length	To No	2×t			
Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	%	PTrib	Load (lbs)		Load Leve	l W (pl	f)	Shear			% _{Trib}	L	oad (lbs)
Roof	2991.12	1			1	00	2991		Roof	279			16		50		6418
											-						
		Li	ne Lo	ads(lbs)										$ \bot$			
							0										

Total V_(E): 2991 lbs

Total $V_{(w)}$:

6418.5 lbs



Shear Panel	Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	er Note 1 Ab	oove = Yes
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	2991.1	2991.11954	201.6	260.7	6	8d	6 in. o.c.	3/8	w	0.7734	4
Wind:	6418.5	-	432.7	532.5	4	8d	4 in. o.c.	3/8		0.8126	

1	ASD Tension L	oad Combinations:				
	Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	=	0.366 D7ρQ _E		ASCE 2.4.5
	Wind:	0.6D + .7W =	=	0.6 D6W		ASCE 2.4.1

Overturning	g Design:									
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
2000 .) p 0	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-29.91	7.25	-22.66	172.8	176.5	output:	-1574.0	-1540.6	-2968.2	-2905.2
Wind:	-64.18	11.88	-52.30	172.8	176.5	output:	-3633.2	-3556.0	-7430.9	-7273.1
									Apply Omega	(Ω)? No
									Include Uplift F	.A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift (_	Point Load 1.0D ₁ (+) (lbs)	Total Net ASD	Tension Uplift	1.0ρE Ten	sion Uplift
	100%	30%	Increase ?	100%	30%	1.0D[(+) (lb3)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-1574.0	-1540.6	-2968.2	-2905.2
Wind:		0.0			0.0		-3633.2	-3556.0	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:					For	undation Type:	Slab On Grade
					Wood to Woo	d Connection	Post to Con	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 2-CS14	3815 4980	0.9524 0.7141	OUTPUT HOLDOWN SUMMARY:	2-CS14	2-2x6	STHD14 ALT: HTT4	4x6



			FU	ILL HEIGH	IT WO	OD SHE	AR PANEL	DESIGN	I (NO OPENIN	GS) - SITE	CONSTRU	ICTION				
Annliaghla	Codo Defe			2021	SDPV				. (<i></i>				Level:		1
Applicable	Code Reit	erence.		2021	SDFV	VS								W ID:		W5.5
												(Grid Refe	rence		5.5
Shear Wall	Input Data	a:								Ge	neral Data	nputs				
	Wood S	pecies all Size	=	DF 2x6									cy Factor		=	1 2.5
	# of Panel		=	1					Discont	inuous La	teral Systen	_			-	7.5
		S.G.		0.5									Beam	Depth	=	
S.G	6. Adjustmen		=	0.5 1.00							² Fire Trea				=	No
		L _{total}	=	178 in. 178 in.	14'-10 14'-10						² Reduction	to Allo	wable Ca	pacity	=	1.0
		L _{min}	_	170 111.	14-10	,						1		7	•	
					ASE	O Unit S	hear Capac	ity Table	e - 2021 SDPW	'S Table 4	.3А					
	- i			cina)	ing	ς,		ion			P	nail	mic	_£	pr ∫€
Type	i) ssa	Grade	Nail Size ¹	Spa	(in.)	Merr djoir	nel Edge #RFF!		I Reduct Factor	Factor	Adjustment Factor SP Factor	re Treate Factor	able 4.3/ note 10d Factor	Seis	ity (p	d Wi Shea ity (p
ļ ²	Thickness (in.)	Ğ	Nail	E.N. O.C. Spacing	٥	Framing Member Thk At Adjoining	Panel Edges		Wind Reduction Factor	Fac	Factor WSP Factor	Fire Treated	¹ Table 4.3A Footnote 10d na Factor	Adjusted Seismic	Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
	É			Z W		Fra	Ф.		Nije Nije Nije Nije Nije Nije Nije Nije		5 ≥	<u>,</u>	F00	Adji	O	§ - O
3	3/8	CD	80	d 3 in	. o.c.	3x	137	70	2	2.8	0.00 1.00	1.00	-	48	89	685
1. See Glob	al Paramet	ter Shee	et for A	dditional N	lotes.			7								
Shear Wall H	eiaht:			ft. in.						Notes: 1. Apply	All Dead Lo	ad Fro	m Levels	Above	:	
	H _{OTM} (in.)		=	10							Additional C					ccurs Per
	H _{ASPECT} (in.))	=	10						Plan in C	overturning	Design	Section B	Below		
Shear Pane	el Length D	Data Tal	ble							Resistin	g Dead Loa	nd Data	Table			
Len				1.0			Aspect						Lln	iform	Res	sisting, M _D
ft	in.	% T	TID	h/b		ct Ratio	Ratio Check			Level	psf	L_{trib}	(11.)	plf	(ft-kips)
14 ft.	10 in.	100)%	0.67 :1	1	.00	OK			Wall	15.00	1		0.00		16.50
										Roof	15.00	2		0.00		3.30 0.00
														0.00		0.00
														0.00		0.00
														0.00		0.00
														0.00		0.00
													0	0.00		0.00
														0.00		0.00
ΣL =	14.83 ft.	W	eighte	d Average:	1	.00							Tota	al M _D :	19.	80 ft-kips
ASD Seism	ic Loading	g Data T	Table		ı	1	-	1	ASD Wind	Loading D			-	1		
Load Description	F _{xi} (psf)	A _{t1} ((ft ²)	A _{t2} (ft ²)	%	o _{Trib}	Load (lbs)		Load Level	W (plf)		To Ne Wall (f		∕ _{Trib}	Lo	oad (lbs)
Roof	2811.72	1			1	00	2812		Roof	279		59		50		8232
		Li	ine Lo	ads(lbs)				Ì								
							0									

Total V_(E): 2812 lbs

Total $V_{(w)}$:

8232.4 lbs



Shear Panel	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	er Note 1 Ab	pove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	2811.7	2811.72295	189.6	260.7	6	8d	6 in. o.c.	3/8	w	0.7271	3
Wind:	8232.4	-	555.0	685.0	3	8d	3 in. o.c.	3/8		0.8102	

ASD Tensio	n Load Co	mbinations	:				•	<i>~ A</i>		
Seismi	c: 0.6D	7E _v +.7E _h =	(.614S _{DS})D	+.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.5
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.1
Overturninç					a .					
Load Type	M _{OT} (ft-kips)	M _D (ft-kips)	M _{net} (ft-kips)	HD b _{eff} (in.)	Strap b _{eff} (in.)		HD	E & 6W (lbs) Strap	Uplift 1.0ρE & 1 HD	.0w (lbs) Strap
Seimic:	-28.12	7.25	-20.87	172.8	176.5	output:	-1449.4	-1418.6	-2790.2	-2730.9
Wind:	-82.32	11.88	-70.44	172.8	176.5	output:	-4893.3	-4789.3	-9531.0	-9328.5
									Apply Omega (Ω)?	No
İ									Include Uplift F.A.?	No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0ρE Tension	n Uplift

1.0D_L (+) (lbs)

HD

-1449.4

-4893.3

STRAP

-1418.6

-4789.3

HD

-2790.2

STRAP

-2730.9

1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)

No

2. (-) indicates uplift

Seimic:

Wind:

3. F.A. indicates From Above

100%

30%

0.0

0.0

4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0ρΕ & 1.0W (lbs) Section

100%

30%

0.0

0.0

5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	Design:				Wood to Woo		undation Type: Post to Cor	Slab On Grade
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU5 2-CS14	5645 4980	0.8668 0.9617	OUTPUT HOLDOWN SUMMARY:	2-CS14	2-2x6	HDU5	4x6



			FU	JLL HEIGH	HT WO	OD SHE	AR PANEL	DESIGN (NO OPENIN	IGS) - S	ITE C	ONSTRU	CTION	l			
Applicable	Code Refe	erence:		2021	SDP\					,					Level:		1
, фриссыс	oous non			2021	05.									,	SW ID:		W6
														Grid Refe	erence		6
Shear Wall	•										Gene	ral Data Ir					
	Wood S	pecies all Size	=	DF										cy Facto		=	1 2.5
	# of Panel		=	2x6 1					Discor	ntinuous	Later	al System	_	ith Facto m Below		=	2.5
	" or r arror	S.G.	=	0.5					Biocoi	itiiradad	Lator	ai Oyotom	. (200		Depth	=	
S.G	6. Adjustmen		=	1.00							2	Fire Treate	ed Lun	nber Con	dition?	-	No
		L_{total}	=	326 in.	27'-2	"					² F	Reduction	to Allo	wable Ca	apacity	=	1.0
		L _{min}	=	67 in.	5'-7"												
					ASI	D Unit S	hear Capac	ity Table -	2021 SDPV	VS Table	e 4.3 <i>A</i>	4					
	<u> </u>			i.	ס	oer ng	(0		E :	LION I	ij		77	iai	ji.		pı (
Φ	Thickness (in.)	<u>o</u>	Ze	orio ed S. C. O. N. H. D. C. O. N. H. D. C. O. N. H. D. C. O. D. C. D. C. O. D. C. D. C. O. D		Framing Member Thk At Adjoining	Panel Edges		Factor	Factor Factor	Adjustment	Factor WSP Factor	Fire Treated Factor	¹ Table 4.3A Footnote 10d nai	Adjusted Seismic	Capacity (pff)	Adjusted Wind Unit Shear Capacity (plf)
Туре	knes	Grade	Nail Size ¹		(in.)	ng N t Ad	nel Edg #RFF!		Factor	Factor	∫dju	-act	e Trea	able 4.3 note 100 Factor	usted Seisi	acity	sted iit St acity
	Pic		ž			'ami hk A	Pan				Ö	MS		Ta Jotno	djust	Сар	^dju Un Cap
3	3/8	CD	80		i 1. O.C.	<u>ш</u> ⊢ 3х	137		2	2.8	οί 0.0	0 100	1.00	L.		89	685
						3,	13		2	2.0	0.0	1.00	1.00			33	005
1. See Glob	al Paramet	ter Shee	et for A	idditional N	lotes.					Notes							
Shear Wall H	eight:			ft. in.								l Dead Loa	ad Fro	m Levels	Above		
	H _{OTM} (in.)		=	11						2. Inp	ut Ad	Iditional Co	oncent	rated De	ad Loa	d As C	Occurs Per
	H _{ASPECT} (in.))	=	11						Plan i	n Ove	erturning D	esign	Section E	Below		
Shear Pane	el Length D	Data Tak	ole					Ī		Resis	ting I	Dead Load	d Data	Table			
Len ft	gth in.	% T	rib	h/b		ct Ratio	Aspect Ratio Check			Lev	el	psf	L_{trib}	(ft.) Ur	niform plf		sisting, M _D (ft-kips)
10 ft.	11 in.	40	%	1.01 :1	_	actor .00	OK			Wa	ıll	15.00	1	1 10	65.00		2.57
10 ft.	8 in.	39	%	1.03 :1	1	.00	OK			Ro	of	15.00	1	0 1	50.00		2.34
5 ft.	7 in.	219	%	1.97 :1	1	.00	OK								0.00		0.00
											_				0.00		0.00
											_				0.00		0.00
															0.00		0.00
															0.00		0.00
											_				0.00		0.00
ΣL =	27.17 ft.	We	eighte	d Average	: 1	.00									al M _D :	4.9	91 ft-kips
ASD Seism	ic Loading	g Data T	able						ASD Wind	Loadin	g Dat	a Table					
Load	F _{xi} (psf)	A _{t1} ('ft ² \	A _{t2} (ft ²)	0	∕ _{Trib}	Load (lbs)		Load Leve	el W (p	olf)	Length			% _{Trib}		oad (lbs)
Description Roof	12795.49			A(2 (II)		100	12795			279		Shear \	Nall (f .25	t)	100	_	8442
ROOI	12795.49	-				100	12/93		Roof	213	9	30	.23		100		0442
		Li	ne Lo	ads(lbs)													
				(0										
							0										

Total V_(E): 12795 lbs

Total $V_{(w)}$:

8441.7 lbs



Shear Pane	l Design:					Арр	oly 10d Nail S	trength Reduct	tion Factor Per Note 1 Above = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load U.C. Gov. SW Type
Seimic:	12795.5	12795.4873	471.0	489.3	3	8d	3 in. o.c.	3/8	0.9626 E 3
Wind:	8441.7	-	310.7	365.0	6	8d	6 in. o.c.	3/8	0.8513

ASD Tension L	oad Combinations:		
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	= 0.366 D $7\rho Q_E$	ASCE 2.4.5
Wind:	0.6D + .7W =	= 0.6 D6W	ASCE 2.4.1

Overturning Design:

Load Type	${\rm M}_{\rm OT}$	M_{D}	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE &	1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-28.93	1.80	-27.13	61.8	65.5	output:	-5272.1	-4970.2	-8030.7	-7570.9
Wind:	-19.08	2.95	-16.14	61.8	65.5	output:	-3136.2	-2956.7	-6181.2	-5827.3
									Apply Omega (Ω)? No
									Include Uplift F.A	? No
Load Type		ft F.A ³ . (-)	30% Ortho.	Orthogoi Uplift (Point Load	Total Net ASD	Tension Uplift	1.0pE Tensi	on Uplift
Load Type	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	Ne		0.0		-5272.1	-4970.2	-8030.7	-7570.9
Wind:		0.0	No		0.0		-3136.2	-2956.7	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D)esign:				Wood to Woo		undation Type: Post to Cor	Slab On Grade
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU5 2-CS14	5645 4980	0.9339 0.9980	OUTPUT HOLDOWN SUMMARY:	2-CS14	2-2x6	HDU5	4x6



			FU	ILL HEIGI	HT WO	OD SHEA	R PANEL	DESIGN	N (NO OPENING	GS) - SITE	CONSTRU	ICTION			
Applicable	Code Refe	rence:		2021	SDPV								L	evel:	1
			,									G	S ^ı rid Refer	W ID:	W6.5 6.5
													iu iveiei	CIICC	0.3
Shear Wall	•				_					Gei	neral Data I	_			
	Wood Sp Wa	ecies Il Size	=	DF 2x6									y Factor h Factor		= 1 = 2.5
	# of Panel	Sides	=	1					Discont	inuous Lat	eral System	_			=
		0.0		0.5									Beam I	Depth	=
S.G	i. Adjustment	S.G. Factor	=	0.5 1.00							² Fire Treat	ed Lumb	er Cond	lition?	= No
		L_{total}	=	147 in.	12'-3"						² Reduction	to Allow	able Ca	pacity	= 1.0
		L_{min}	=	147 in.	12'-3"	1							_ `		
					ASE	Unit She	ear Capac	ity Tabl	e - 2021 SDPW	S Table 4	.3A				
	_			5	20	er			0	7			aj	.2	- 70 -
40	Thickness (in.)	Φ	Ze ₁		2	Framing Member Thk At Adjoining Panel Edges	,		Wind Reduction Factor Seismic Reduction		Factor WSP Factor	Fire Treated	Table 4.3A Footnote 10d nai Factor	Adjusted Seismic Unit Shear	Capacity (plf) Adjusted Wind Unit Shear Capacity (plf)
Туре	knes	Grade	Nail Size ¹	ر) <u>=</u>	ng M tt Ad	, #RFF!	į	Factor Factor ic Reduc	Factor	-actc	e Treat Factor	'Table 4.3A otnote 10d r Factor	usted Seisr Unit Shear	Sapacity (plf djusted Win Unit Shear Sapacity (plf
	Phic		ž		2	rami hk A Pan	++		Vind) ≥	į į ,	'Ta ootne F	djust	Cap Adjus Un Cap
	·			Ц	i	ш Н			> 0		_		ΙĹ	⋖	
6	3/8	CD	80	d 6 in	n. o.c.	2x	73	0	2 2	2.8 (0.00 1.00	1.00	-	261	365
1. See Glob	al Paramet	er Shee	t for A	dditional N	Notes.			7							
Shear Wall H	eight:			ft. in.						Notes: 1 Apply	All Dead Lo	ad From	ı I evels i	Above	
	H _{OTM} (in.)		=	11											As Occurs Per
	H _{ASPECT} (in.)		=	11							verturning [7.0 000010 1 01
			1												
Shear Pane	el Length D	ata Tal	ole				Aspect			Resistin	g Dead Loa	d Data	Table		
Len	gth in.	% T	rib	h/b		ct Ratio	Ratio Check			Level	psf	L _{trib} (1	T)	form olf	Resisting, M _D (ft-kips)
12 ft.	3 in.	100)%	0.90 :1		.00	OK			Wall	15.00	11	16	5.00	12.38
			À							Roof	15.00	2		0.00	2.25
														.00	0.00
														.00	0.00
		7				*								.00	0.00
													0.	.00	0.00
													0.	.00	0.00
														.00	0.00
	12.25 ft.	14/	.:	1 1	. 4	00								.00 I M _D :	0.00 14.63 ft-kips
ΣL =	12.25 π.	VV	eignted	d Average	: 1	.00							Tota	. н.р.	14.00 ft Kips
ASD Seism	ic Loading	Data T	able						ASD Wind I	_oading D	ata Table				
Load	F _{xi} (psf)	A _{t1} (ft ² \	A _{t2} (ft ²)	0/	o _{Trib} L	oad (lbs)		Load Level	W (plf)	Length	To Nex	. %	PTrib	Load (lbs)
Description				At2 (11)			.000 (100)		Load Level			Wall (ft)			
Roof	1389.68	1			1	00	1390		Roof	279	18	3.33	į	50	2558
		Li	ne Lo	ads(lbs)				ı							
							0								
							1200 Ib -						Total		

Total V_(E): 1390 lbs

Total $V_{(w)}$:

2557.6 lbs



Shear Pane	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	r Note 1 Ab	oove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	1389.7	1389.68061	113.4	260.7	6	8d	6 in. o.c.	3/8	w	0.4351	6
Wind:	2557.6	-	208.8	365.0	6	8d	6 in. o.c.	3/8	**	0.5720	

ASD Tensio	n Load Co	mbinations	:					< 4		
Seismi	c: 0.6D	7E _v +.7E _h =	(.614S _{DS})D) +.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.
Overturning	g Design:							·		
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE &	1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-15.29	5.36	-9.93	141.8	145.5	output:	-840.5	-818.9	-1848.7	-1801.1
Wind:	-28.13	8.78	-19.36	141.8	145.5	output:	-1638.5	-1596.3	-3969.5	-3867.2
									Apply Omega (Ω)	? No
ĺ									Include Uplift F.A.	? No
Load Type	-	ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load 1.0D _L (+) (lbs)		Tension Uplift	1.0pE Tensio	
	100%	30%	?	100%	30%	,	HD	STRAP	HD	STRAP

-840.5

-1638.5

-818.9

-1596.3

-1848.7

-1801.1

1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)

No

2. (-) indicates uplift

Seimic:

Wind:

- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section

0.0

0.0

5. Orthogonal uplift should be the net uplift from the other direction

0.0

0.0

Hold Down D	esign:				Wood to Woo	Found Connection	undation Type:	Slab On Grade
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 CS14	3815 2490	0.4295 0.6411	OUTPUT HOLDOWN SUMMARY:	CS14	2x6	STHD14 ALT: HTT4	4x6



Project	ISE
Project #:	
Date:	11/15/2024
Designer:	-

WOOD SHEAR WALL DESIGN WITH FORCE TRANSFER AT DOOR OPENING PER THE DIEKMANN METHOD

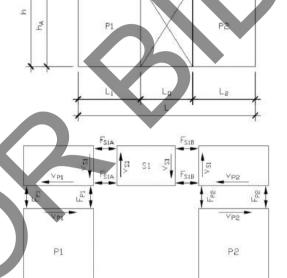
SW7 ROOF FRAMING PLAN - ALONG GRID 7

Roof DL =	15.0	psf
Floor DL =	0.0	psf
Wall DL =	15.0	psf

S _{DS} =	1.67
C _d =	4.0
FRT	N

Z	Story	L	L ₁	Lo	L ₂	h	h _A	h _B
TIO		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
INFORMATION								
-OF								
WALL								
X	1	62.84	8.17	48.50	6.17	23.33	14.33	9.00

INFORMATION	Story	DL Trib. Width (ft)	Trib. P _{DL}	Max L/h Ratio	Aspect Ratio Factor	L _i (ft)
ZMA-		,	,			
F						
WALL						
≥	1	6.00	2,828	2.32	0.86	14.34



ANALY	Story	WL (plf)	B _{trib} (ft)	F (lb)	V (lb)	OM _w (lb-ft)	$v_{P1} = v_{P2}$ (plf)	v _{S1} (plf)	T = C (lb)	T _{net} (lb)	$F_{P1} = F_{P2}$ (lb)	F _{S1A} (lb)	F _{S1B} (lb)	i (in)	wi (in)
				•											
\leq	1	279	41.00	11,442	11,442	266,933	798	327	4,248	2,551	5,717	9,036	6,824	0.899	0.899

ANALY	Story	EL (plf)	A _{trib} (ft)	F (lb)	V (lb)	OM _w (lb-ft)	$v_{P1} = v_{P2}$ (plf)	v _{S1} (plf)	T = C (lb)	T _{net} (lb)	$F_{P1} = F_{P2}$ (lb)	F _{S1A} (lb)	F _{S1B} (lb)	i (in)	wi (in)
N N															
\geq	1	19,149	1	19,149	19,149	446,742	1,335	547	7,109	6,074	9,568	15,124	11,421	2.883	2.883

	Story	Shear	р	Post	End	Door	Force	Allov	vable	End	End Post	Jamb	F.T.	D/C
<u>U</u>		Wall	Side	Size	Post	Jamb	Transfer	Sh	ear	Post	Strap/HD	Strap/HD	Strap	Check
SH		Туре	bl. S		Strap/HD	Strap/HD	Strap	Wind	Seismic	Capacity	Capacity	Capacity	Capacity	
_			D					(plf)	(in)	(lb)	(lb)	(lb)	(lb)	
۱A														
	1	2B	Υ	4x6	HDU11	HDU11	2-CMST12	2096.9	1497.8	12,030	11,175	11,175	18,430	OK



			PERF	ORATED	WOOD S	HEAR P	ANEL	DESIGN (SITE CO	ONST	RUCTION	I) PER	SEC	CTION	l 4.3.2	2.3			
Applicable	Code Refe	erence	: :	2021	SDPWS									Grid		evel: W ID: rence	١	1 W7.5 7.5
Shear Wall	Input Data	a:								General	Data Ir	puts	6					
	Wood Sp		=	DF										-	actor	ρ	=	1
±	vvaii § of Panel	Size	- 1	2x6 1				г)iscon	tinuous La	ateral S			_	actor		=	2.5
	, 0, , 0, , 0	A _o	-	36	ft ²			_					•	E	Beam [Depth	=	
		A _{fhs}	=	204	ft ² ft ²										r Cond ole Cap		= /	No 1.0
		A _{wall} Σb _i	=	240 138 in.							Keu	iuctio	II to A	llowat	DIE Ca	Dacity		1.0
		L_{min}	=	48 in.	4'-0"							4						
5.0	A divistment [S.G.	=	0.5							4							
S.G. /	Adjustment F	acior	=	1.00														
Shear Wall	Capacity																	
	Δ /	C _o A _{wall}	=	0.77 15%		1.0	OK							7				
		' A _{wall}		85%										•				
					ASD	Jnit She	ar Cap	acity Table - 2021	SDP	WS Table	4.3A							
				Did	ē	D	>	5	c	+				:	.	. <u>ല</u>	_	
_	(in.	a)	_a	paci	emb	hk At Adjoinin Panel Edges	Nominal Unit hear Capacit	ducti	lctio	Factor	Ļ	ctor	ated	3A	po F	eism ear	Capacity (plf)	ear (plf)
Туре	ness	Grade	Nail Size	S 0	(in)	t Adj el Ec	linal Cag	(plf) iic Redt Factor	Redi	Factor	Factor	WSP Factor	Fire Treated Factor	Table 4.3A	note 10c Factor	justed Seisi Unit Shear	acity	Únit Shear Capacity (plf)
	Thickness (in.)		Ž	E.N. O.C. Spacing	rami	Thk At Adjoining Panel Edges	Nominal Unit Shear Capacity	(pff) Seismic Reduction Factor	Wind Reduction	S. C.		MS	¹ Fire	Ta	Footnote 10d nail Factor	Adjusted Seismic Unit Shear	Capacity (plf) Adjusted Wind	Çağı Cı
6	3/8	CD	80		. о.с.	⊢ 2x	73			0.	.00	1.0	No	ı	щ	₹ 249		349
1. See Glob						2		2		.0	.00	1.0	NO			24.	,	343
Shear Wall	_	L _{total} (in.) (in.)	= =	ft in. 26 0 144	12'-0" 12'-0"					Notes: 1. Apply 2. Input A	Additio	nal C	oncen	trated	l Dead	Load A	As Occurs	s Per
Shear Pane		Data Ta	able		•					Resisting	Dead	l Loa	d Dat	a Tab	le			
Full Height Leng ft		% Tı	rib	h/b	Aspect Ratio Factor	Ra	pect atio ieck			Level	p:	sf	L _{trib}	(ft.)	Unifo	rm plf	M _{resi} (ft-ki	
7	6.	65%	%	1.60 :1	1.00	(OK			Roof	15.	.00		6	90.	.00	18.0	00
4	0	35%	%_	3.00 :1	0.88		OK			Wall	15.	.00	1	2	180	0.00	36.0	00
$\sum b_i =$	11.50 ft.	Weig	ghted	Average:	0.96										Tota	IM _D :	54.00 f	t-kips



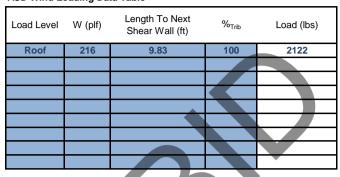
PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Seismic Loading Data Table

Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _{Trib}	Load (lbs)
Roof	978.84	1		100	979
		Line Lo	oads(lbs)		
					0
					0

Total V_(E): 979 lbs

ASD Wind Loading Data Table



Total V_(w): 2122.4 lbs

Shear Pan	el Desig	ın:				A	pply 10d Nail S	Strength Reduct	ion Factor	Per Note 1 A	Above = Yes
Load Type	V (lbs)	ρV (E) (lbs)	v _{max} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	978.8	978.8436	110.7	249.4	6	8d	6 in. o.c.	3/8	W	0.4437	6
Wind:	2122.4	-	239.9	349.1	6	8d	6 in. o.c.	3/8	- **	0.6872	В





5. Orthogonal uplift should be the net uplift from the other direction

PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

AOD T			-4!							
ASD Tens Seisn				os)D +.7E _h	= 0.366	D - 70O-				ASCE 2.4.5
			n= (.0 . 140[)S/D 1.7 Lh		· =				
Wind	: 0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.1
Overturni	ng Desig	ın:								
Load Type	M_{OT}	M_{D}	M_{net}	HD	Strap		Net Uplift .7ρΕ	& .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	$C_o \sum b_i$ (ft.)	C _o ∑b _i (ft.)		HD	Strap	HD	Strap
Seimic:	-11.75	19.77	8.03	8.8	8.8	output:	907.6	907.6	0.0	0.0
Wind:	-25.47	32.40	6.93	8.8	8.8	output:	783.5	783.5	0.0	0.0
							No Net	Uplift		· ·
									Apply Omega	(Ω)? Yes
									Include Uplift I	F.A.? Yes
										<u> </u>
Load Type	-	t F.A ³ . (-)	30% Ortho.	Orthog Uplift		Point Load 1.0D _L (+) (lbs)	Total Net ASD 1			nsion Uplift
	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	Strap	HD	STRAP
Seimic:		0			0.0		332.4	332.4	0.0	0.0
Wind:		0			0.0		470.1	470.1	-	-
		•								
1. Apply 30	% Orthog	onal Increa	se Per AS	CE Section	12.5.3.1 (Fo	r Uplift F.A.)				
2. (-) indica	tes uplift									
3. F.A. indi	cates Fror	n Above			7 4	, —				
4. Uplift sh	ould ASD	level but n	ot include	any dead lo	oad from ab	ove. Refer to "Upl	ift 1.0 _P E & 1.0W	(lbs) Section		

						F	oundation Type	Slab On Grade
Hold Down	Design:				Wood to Woo	d Connection	Post to Cor	nc. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	ï	4455 #N/A	0.0000 0.0000	OUTPUT HOLDOWN SUMMARY:	NONE REQUIRED	2x	NONE REQUIRED	2x



			FU	JLL HEIGH	IT WO	OD SHE	AR PANEL	DESIGN (NO OPENIN	GS) - SI	TE CO	NSTRU	CTION	1			
Annliaghla	Codo Pote	oronooi		2021	SDP									-	Level:		1
Applicable	Code Reit	erence.		2021	SUP	WS									SW ID:		WA.5
													(Grid Ref	erence		A.5
Shear Wall	Input Data	a:								G	enera	l Data Ir	nputs				
	Wood S		=	DF									-	cy Fact	or p		1
		all Size	=	2x6								Over	streng	gth Fact	or $\Omega_{\rm o}$	=	2.5
	# of Panel	l Sides	=	1					Discon	tinuous L	.ateral	System	? (Bea		v Strap) n Depth	=	
		S.G.	=	0.5										Deal	n Depui	-	
S.0	3. Adjustmen		=	1.00		_						re Treate					No
		L _{total} L _{min}	=	384 in. 78 in.	32'-0 6'-6"	•					-K6	eduction	to Allo	owable C	apacity	7	1.0
		-min														•	
					ASI	D Unit S	hear Capac	ity Table -	2021 SDPW	/S Table	4.3A	V					
	<u>-</u>			ina	0	oer ng	(0		<u>ئ</u> ن	<u></u>	ţ			Jail	nic		P (
Φ	Thickness (in.)	e	ze ₁	Spac		1emk Joinii	Panel Edges #REF!		or or	5	Adjustment Factor	WSP Factor	Fire Treated Factor	¹ Table 4.3A otnote 10d r	or Seisr	Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	knes	Grade	Nail Size ¹	C C	(<u>u</u>)	ing N	nel Edg #REF!	٥	Factor	Factor	Adju Fact	95 F.	e Trea	able ote	Factor sted Sei	Unit Shear Sapacity (pl	isted nit Sh nacity
	Thic		Z	Spacing Spacing		Framing Member Thk At Adjoining	Par		Wind Reduction Factor Coicmic Boduction		S.G	× ×	ᄩ	¹ Table 4.3A Footnote 10d nai	Factor Adjusted Seismic	Cap	Adju Ur Cap
6	3/8	CD	80		ı. o.c.	ш 2х	73			2.8	0.00	1.00	1.00			61	365
						2.	73		2	2.0	0.00	1.00	1.00	_	2	01	303
1. See Glob	ai Parame	ter Snee	et for A	aditional N	iotes.					Notes:							
Shear Wall H	leight:			ft. in.	_						ly All [Dead Lo	ad Fro	m Level	s Above)	
	H _{OTM} (in.)		=	10												d As C	Occurs Per
	H _{ASPECT} (in.)	=	10						Plan in	Overt	urning D	esign	Section	Below		
Shear Pane	el Lenath [Data Tab	ole							Resist	ina De	ead Loa	d Data	a Table			
Len							Aspect				J			1	Iniform	Re	sisting, M _D
ft	in.	% T	rib	h/b		ct Ratio	Ratio Check			Leve	el	psf	L _{trib}	(ft.)	plf		(ft-kips)
6 ft.	6 in.	209	%	1.54 :1		1.00	OK			Wal	I	15.00	1	0 1	150.00		3.17
25 ft.	6 in.	809	%	0.39 :1	1	1.00	OK			Roo	f	15.00	4.	.5	67.50		1.43
				·											0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
ΣL =	32.00 ft.	We	eighte	d Average	: 1	1.00								То	tal M _D :	4.	59 ft-kips
ASD Seism	nic Loading	g Data T	able						ASD Wind	Loading	Data	Table					
Load	F _{xi} (psf)	A _{t1} (ft ²)	A _{t2} (ft ²)	0	% _{Trib}	Load (lbs)		Load Leve	l W (pl	f)	Length	To Ne	ext	% _{Trib}	_	oad (lbs)
Description				A ₁₂ (It)								Shear '		ft)		_	
Roof	4671.77	1				100	4672		Roof	279		7.	75		100		2163
		Li	ne Lo	ads(lbs)													
				()			0										
							0										

Total V_(E): 4672 lbs

Total $V_{(w)}$:

2162.7 lbs



Shear Panel	Design:					Арр	ly 10d Nail S	trength Reduct	tion Factor Per Note 1 Above = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load U.C. Gov. SW Type
Seimic:	4671.8	4671.77195	146.0	260.7	6	8d	6 in. o.c.	3/8	0.5600 E 6
Wind:	2162.7	-	67.6	365.0	6	8d	6 in. o.c.	3/8	0.1852

ASCE 2.4.5 ASCE 2.4.1

ASD Tension L	oad Combinations:			
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	=	0.366 D7ρQ _E	
Wind:	0.6D + .7W =	=	0.6 D6W	

Overturning	g Design:									
Load Type	${\rm M}_{\rm OT}$	M_{D}	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
71 -	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-9.49	1.68	-7.81	72.8	76.5	output:	-1287.7	-1224.6	-2236.1	-2126.5
Wind:	-4.39	2.76	-1.64	72.8	76.5	output:	-269.9	-256.7	-1207.7	-1148.5
									Apply Omega (Ω)? No
									Include Uplift F.	A.? No
Load Type		ft F.A ³ . (-)	30% Ortho.	Orthogo Uplift	1 1	Point Load	Total Net ASD	Tension Uplift	1.0ρE Ten	sion Uplift
2000 1770	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	Ne		0.0		-1287.7	-1224.6	-2236.1	-2126.5
Wind:		0.0	No		0.0		-269.9	-256.7	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:					Fou	undation Type:	Slab On Grade
	_				Wood to Woo	d Connection	Post to Con	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 CS14	3815 2490	0.3375 0.4918	OUTPUT HOLDOWN SUMMARY:	CS14	2x6	STHD14 ALT: HTT4	4x6



			FU	ILL HEIGH	IT WOO	DD SHEA	R PANEL	DESIGN (NO	OPENING	GS) - SITE	CONSTRU	ICTION		
Applicable	Code Refe	erence:		2021	SDPW	ıs						Grid	Level: SW ID: Reference	1 WA A
Shear Wall	Innut Data	a·								Gen	eral Data I	nnute		
Sileai Wali	•			DE.	_					Gen		_		
	Wood S Wa	all Size	=	DF 2x6								lundancy F rstrength F		
	# of Panel	Sides	=	1					Discont	nuous Late		? (Beam B		
												В	eam Depth	=
0.0	A dissatman	S.G.	=	0.5							² Fire Treat	ed Lumber	Condition?	= No
5.0	3. Adjustmen	L _{total}	=	1.00 540 in.	45'-0"							to Allowab		= 1.0
		L _{min}	=	256 in.										110
														•
					ASD	Unit She	ar Capaci	ty Table - 20	21 SDPW	S Table 4.	3A			
	<u> </u>			ing)	oer ng		u	fion				mic nic	_ P _
0)	s (ii	Φ	Ze_	Spac		lemt joini dges	, .	uctiv	duc	it of	Factor WSP Factor	Fire Treated Factor Table 4.3A	od r	Unit Shear Sapacity (plf djusted Win Unit Shear
Туре	nes	Grade	Nail Size ¹	رن ن	(jr.)	M Bi	#REF!	Red	ractor ic Redi	Factor	acto	e Trea Factor able 4	Factor Factor sted Sei	acity acity a
'	Thickness (in.)	U	Z	E.N. O.C. Spacing		Framing Member Thk At Adjoining Panel Edges	#	Wind Reduction	ractor Seismic Reduction	П 4		Fire Treated Factor ¹ Table 4.3A	Footnote 10d nail Factor Adjusted Seismic	Capacity (plf) Adjusted Wind Unit Shear Capacity (plf)
	-			Ш		Ë = _		3	Sei	S			R A	0 4 0
3	3/8	CD	80	d 3 in	. o.c.	3x	137	0 2	2	.8 0	.00 1.00	1.00	- 4	89 685
1. See Glob	al Parame	ter Shee	et for A	dditional N	lotes.									
Shear Pane	H _{OTM} (in.) H _{ASPECT} (in.)		= ble	18 4		\langle				Plan in O	verturning I	Design Sect	tion Below	d As Occurs Per
Len	gth in.	%Т	Γrib	h/b	•	t Ratio	Aspect Ratio Check			Level	psf	L _{trib} (ft.)	Uniform plf	Resisting, M _D (ft-kips)
23 ft.	8 in.	53	3%	0.77 :1	1.	00	ок			Wall	15.00	18.33	274.95	62.57
21 ft.	4 in.	47	%	0.86 :1	1.	00	OK			Roof	15.00	41.5	622.50	141.65
				· ·									0.00	0.00
													0.00	0.00
						•							0.00	0.00
					1								0.00	0.00
													0.00	0.00
													0.00	0.00
													0.00	0.00
ΣL =	45.00 ft.	W	eighte	d Average:	1.	00							Total M _D :	204.22 ft-kips
ASD Seism	nic Loading	Data	Table					A	SD Wind I	_oading Da	ata Table			
Load Description	F _{xi} (psf)	A _{t1}	(ft ²)	A _{t2} (ft ²)	%	Trib L	oad (lbs)	L	oad Level	W (plf)		To Next Wall (ft)	% _{Trib}	Load (lbs)
Roof	21463.44	1			10	00	21463		Roof	279	37	7.75	100	10535
]							
		L	ine Lo	ads(lbs)										
							0							

Total V_(E): 21463 lbs

Total $V_{(w)}$:

10534.7 lbs



Shear Pane	Shear Panel Design: Apply 10d Nail Strength Reduction Factor Per Note 1 Above =													
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type			
Seimic:	21463.4	21463.4449	477.0	489.3	3	8d	3 in. o.c.	3/8	E	0.9748	3			
Wind:	10534.7	-	234.1	365.0	6	8d	6 in. o.c.	3/8	_	0.6414				

ASD Tensio	n Load Co	mbinations								
Seismi	c: 0.6D	7E _v +.7E _h =	(.614S _{DS})D	+.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.5
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.1
Overturning	g Design:									
Load Type	M _{OT}	M _D	M _{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE 8	1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-186.55	74.79	-111.76	250.8	254.5	output:	-5348.5	-5269.7	-12753.5	-12565.6
Wind:	-91.56	122.53	30.97	250.8	254.5	output:	1482.2	1460.3	0.0	0.0
									Apply Omega (Ω)? No
									Include Uplift F.A	? No
		ift F.A ³ . (-)	30% Ortho.	Orthogo		Point Load	Total Net ASD	Tension Uplift	1.0pE Tens	ion Uplift
Load Type	(II	bs) ⁴	Increase ¹	Uplift	(lbs) ⁵	1.0D _L (+) (lbs)				
	100%	30%	?	100%	30%		HD	STRAP	HD	STRAP

-5348.5

1482.2

-5269.7

1460.3

-12753.5

-12565.6

1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)

No

2. (-) indicates uplift

Seimic:

Wind:

- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section

0.0

0.0

5. Orthogonal uplift should be the net uplift from the other direction

0.0

0.0

Hold Down D	esign:				W I.e. W.		undation Type:	
					wood to woo	d Connection	Post to Col	nc. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU5 CMST14	5645 6475	0.9475 0.8139	OUTPUT HOLDOWN SUMMARY:	CMST14	2-2x6	HDU5	4x6

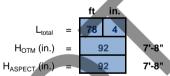


PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3 Applicable Code Reference: 2021 SDPWS Level: SW ID: WB.U **Grid Reference** В Shear Wall Input Data: **General Data Inputs** Wood Species DF Redundancy Factor Wall Size Overstrength Factor Ω_o 2x6 2.5 # of Panel Sides 1 Discontinuous Lateral System? (Beam Below Strap) ft² A_0 32 Beam Depth ²Fire Treated Lumber Condition? ft² A_{fhs} 569 ²Reduction to Allowable Capacity 600.5556 ft² 1.0 A_{wall} $\sum b_{i}$ 658 in. i4'-10" 69 in. 5'-9" L_{min} S.G. 0.5 S.G. Adjustment Factor 1.00 Shear Wall Capacity Data: C。 0.90 1.0 OK A_o / A_{wall} 5% = A_{fhs} / A_{wall} 95% ASD Unit Shear Capacity Table - 2021 SDPWS Table 4.3A O.C. Spacing (in.) Adjusted Seismic Unit Shear Capacity (plf) Framing Member Thk At Adjoining Panel Edges Footnote 10d nail Factor Adjustment Factor Wind Reduction Factor Nominal Unit Shear Capacity (plf) Adjusted Wind Unit Shear Capacity (plf) eismic Reductio Factor Thickness (in.) Fire Treated WSP Factor Table 4.3A Nail Size¹ Factor Grade Ġ Z W

CD 1. See Global Parameter Sheet for Additional Notes.

Shear Wall Height:

4



8d

4 in. o.c.

Shear Panel Length Data Table

3/8

Full Height Lenç ft		% Trib	h/b	Aspect Ratio Factor	Aspect Ratio Check
7	10	14%	0.98 :1	1.00	ок
10	18	21%	0.67 :1	1.00	ок
5	9	10%	1.33 :1	1.00	ок
5	9	10%	1.33 :1	1.00	ок
5	9	10%	1.33 :1	1.00	ок
5	9	10%	1.33 :1	1.00	ок
5	9	10%	1.33 :1	1.00	ок
6	9	12%	1.14 :1	1.00	ок
Σb; =	54.83 ft.	Weighte	d Average:	1.00	

Notes:

2.8

1.00

1. Apply All Dead Load From Levels Above

1.0 No

2. Input Additional Concentrated Dead Load As Occurs Per Plan in Overturning Design Section Below

380

350

Resisting Dead Load Data Table

Level	psf	L _{trib} (ft.)	Uniform plf	M _{resisting} (ft-kips)
Roof	15.00	33	495.00	1518.69
Wall	15.00	7.7	115.50	354.36
			Total M _D :	1873.05 ft-kips



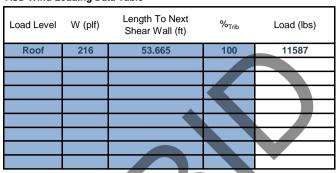
PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Seismic Loading Data Table

Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _{Trib}	Load (lbs)
Roof	16280.69	1		100	16281
		Line Lo	oads(lbs)		
					0
					0

Total V_(E): 16281 lbs

ASD Wind Loading Data Table



Total V_(w): 11586.8 lbs

Shear Panel Design: Apply 10d Nail Strength Reduction Factor Per Note 1											Above =	Yes
Load Type	V (lbs)	ρV (E) (lbs)	v _{max} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. S	W Type
Seimic:	16280.7	16280.69	328.6	350.0	4	8d	4 in. o.c.	3/8	F	0.9387	,	1
Wind:	11586.8	-	233.8	365.0	6	8d	6 in. o.c.	3/8		0.6406	4	





PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

Seism	nic: 0.6D	7E _v +.7E	_h = (.614S ₁	_{DS})D +.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.5
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.1
Overturni	ng Desig	n:								
Load Type	M_{OT}	M_{D}	M_{net}	HD	Strap		Net Uplift .7ρ	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	$C_o \sum b_i$ (ft.)	$C_o \sum b_i$ (ft.)		HD	Strap	HD	Strap
Seimic:	-124.82	685.91	561.09	49.6	49.6	output:	11323.1	11323.1	0.0	0.0
Wind:	-88.83	1123.83	1035.00	49.6	49.6	output:	20886.8	20886.8	0.0	0.0
							No Ne	t Uplift		·
									Apply Omega	(Ω)? Yes
								X	Include Uplift I	A.? Yes
	ASD Uplift	t F.A ³ . (-)	30%	Orthog	onal (-)		Total Net ASD	Tension Uplift	Ω1.0E Ten	sion Uplift
Load Type	(lb:	s) ⁴	Ortho. Increase ¹	Uplift	(lbs)	Point Load 1.0D _L (+) (lbs)	HD	Strap	HD	STRAP
	100%	30%	?	100%	30%		, nb	Зпар	пи	SIRAF
Seimic:		0			0.0		4146.5	4146.5	0.0	0.0
Wind:		0			0.0		12532.1	12532.1	-	-
1. Apply 30	% Orthogo	onal Increa	ase Per AS	CE Section	12.5.3.1 (Fo	r Uplift F.A.)				
2. (-) indica	tes uplift									
2 E A indi	cates Fron	n Above				,				
3. F.A. IIIuli										
	ould ASD	level but r	ot include	any dead lo	oad from abo	ove. Refer to "Upl	ift 1.0 _P E & 1.0W	(lbs) Section		

						F	oundation Type	Slab On Grade
Hold Down	Design:				Wood to Woo	d Connection	Post to Cor	nc. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	· ·	4455 #N/A	0.0000 0.0000	OUTPUT HOLDOWN SUMMARY:	NONE REQUIRED	2x	NONE REQUIRED	2x

 $\sum b_i =$

76.08 ft.

Weighted Average:

1.00



PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3 2021 SDPWS Applicable Code Reference: Level: SW ID: WB.L В **Grid Reference** Shear Wall Input Data: **General Data Inputs** Wood Species DF Redundancy Factor Overstrength Factor Ω_o Wall Size 2x6 2.5 # of Panel Sides 1 Discontinuous Lateral System? (Beam Below Strap) ft² A_0 Beam Depth ²Fire Treated Lumber Condition? ft² A_{fhs} 1533 ²Reduction to Allowable Capacity 1576.667 ft² 1.0 A_{wall} $\Sigma p^{!}$ 913 in. 76'-1" 137 in. 11'-5" L_{min} S.G. 0.5 S.G. Adjustment Factor 1.00 **Shear Wall Capacity Data:** C。 0.95 1.0 OK A_o / A_{wall} 3% = A_{fhs} / A_{wall} 97% ASD Unit Shear Capacity Table - 2021 SDPWS Table 4.3A O.C. Spacing (in.) Adjusted Seismic Unit Shear Capacity (plf) Framing Member Thk At Adjoining Panel Edges Footnote 10d nail Factor Adjustment Factor Wind Reduction Factor Nominal Unit Shear Capacity (plf) eismic Reduction Factor Adjusted Wind Unit Shear Capacity (plf) Thickness (in.) Fire Treated WSP Factor Table 4.3A Nail Size¹ Factor Grade Type Ġ Z W 895 2 3/8 CD 8d 2 in. o.c. 2.8 1.00 639 1.0 No 1. See Global Parameter Sheet for Additional Notes. Shear Wall Height: Notes: 86 0 1. Apply All Dead Load From Levels Above H_{OTM} (in.) 220 2. Input Additional Concentrated Dead Load As Occurs Per _ Plan in Overturning Design Section Below H_{ASPECT} (in.) = 220 18'-4 Shear Panel Length Data Table Resisting Dead Load Data Table Full Height Segment Aspect Aspect $M_{\text{resisting}}$ Lengths % Trib Ratio Level L_{trib} (ft.) Uniform plf Ratio psf (ft-kips) Check Factor 26 10 35% 0.68:1 15.00 1.00 ΟK Roof 33 495.00 1830.51 οк Wall 15.00 1015.10 0.78:1 1.00 18.3 274.50 31% 15% 1.61:1 1.00 oĸ 14 4 19% 1.28:1 1.00 ΟK

Total M_D: 2845.61 ft-kips



PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

ASD Seismic Loading Data Table

Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _{Trib}	Load (lbs)
Roof	36079.70	1		100	36080
		Line Lo	oads(lbs)		
					0
					0

Total V_(E): 36080 lbs

ASD Wind Loading Data Table

Load Level	W (plf)	Length To Next Shear Wall (ft)	% _{Trib}	Load (lbs)
Roof	216	53.375	100	11524

Total V_(w): 11524.2 lbs

Shear Pan	el Desig	n:				Aį	oply 10d Nail S	Strength Reduct	ion Factor	Per Note 1 A	Above =	Yes
Load Type	V (lbs)	ρV (E) (lbs)	v _{max} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW	/ Type
Seimic:	36079.7	36079.7	500.7	639.3	2	8d	2 in. o.c.	3/8	F	0.7832	2	
Wind:	11524.2	-	159.9	365.0	6	8d	6 in. o.c.	3/8	_	0.4381	2	





PERFORATED WOOD SHEAR PANEL DESIGN (SITE CONSTRUCTION) PER SECTION 4.3.2.3

		l Combin								
Seism	ic: 0.6D	7E _v +.7E	_h = (.614S ₁	_{DS})D +.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.5
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.
Overturni	ng Desig	n:								
Load Type	M_{OT}	M_{D}	M_{net}	HD	Strap		Net Uplift .7ρl	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
Load Type	(ft-kips)	(ft-kips)	(ft-kips)	$C_o \sum b_i$ (ft.)	$C_o \sum b_i$ (ft.)		HD	Strap	HD	Strap
Seimic:	-661.46	1042.06	380.60	72.1	72.1	output:	5281.6	5281.6	0.0	0.0
Wind:	-211.28	1707.37	1496.09	72.1	72.1	output:	20761.3	20761.3	0.0	0.0
							No Net	Uplift	Apply Omega	
	ASD Uplif	t F.A ³ . (-)	30% Ortho.	Orthog	onal (-)	Point Load	Total Net ASD	Tension Uplift	Ω1.0E Ter	sion Uplift
Load Type	(lb 100%	s) ⁴ 30%	Increase ¹	Uplift 100%	(lbs) 30%	1.0D _L (+) (lbs)	HD	Strap	HD	STRAP
Seimic:		0			0.0		1934.1	1934.1	0.0	0.0
		0			0.0		12456.8	12456.8	-	-
Wind:										

Hold Down	ı Design:				Wood to Woo	F d Connection	Foundation Type Post to Cor	: Slab On Grade
Type	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	<u>:</u>	4455 #N/A	0.0000 0.0000	OUTPUT HOLDOWN SUMMARY:	NONE REQUIRED	2x	NONE REQUIRED	2x



			FU	JLL HEIGH	IT WO	OD SHE	EAR PANEL	DESIGN (NO OPENIN	GS) - SI1	E CON	ISTRU	CTION				
Applicable	Code Refe	erence:		2021	SDPV										Level:		1
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					02.								,	5	SW ID:		wc
													,	Frid Refe	erence		С
Shear Wall	•									<u>G</u>	eneral						
	Wood S _I	pecies all Size	=	DF 2x4										cy Facto		=	1 2.5
	# of Panel		=	1					Discon	tinuous L	ateral S		_			_	1.2
														Beam	Depth	=	
S.G	6. Adjustment	S.G. t Factor	=	0.5 1.00							² Fire	e Treate	ed Lun	nber Con	dition?		No
		L _{total}	=		45'-10	0"								wable Ca		1	1.0
		L_{min}	=	190 in.	15'-10	0"								_ `		•	
					ASE	O Unit S	hear Capac	ity Table -	2021 SDPW	/S Table	4.3A						
	_			g)	er ig			= 2	5	ŧ			ā	.2		7
	Thickness (in.)	Φ	-e	E.N. O.C. Spacing	.	Framing Member Thk At Adjoining	Panel Edges		Villa Reduction Factor Caismic Bodustion		Adjustment Factor	ctor	ated	¹ Table 4.3A Footnote 10d nai	Adjusted Seismic	Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	cnes	Grade	Nail Size ¹	S 0	(in.)	M t Adj	nel Edg #REF!	i 3	Factor	Factor	\djus ⁻acto	WSP Factor	Fire Treated Factor	Table 4.3A otnote 10d r	usted Seisi	acity	djusted Win Unit Shear Sapacity (plf
	Thic		Ž			ramii hk A	Pan #				S.G.	WS	Fire	Ta potno	djust	Cap	Adjus Un Cap
														ιĽ			
3	3/8	CD	80	d 3 in	. o.c.	3x	137	70	2	2.8	0.00	1.00	1.00	-	48	89	685
1. See Glob	al Paramet	ter Shee	t for A	dditional N	lotes.					Notes							
Shear Wall H	eight:			ft. in.						Notes: 1. App	ly All De	ead Lo	ad Fro	m Levels	Above	:	
	H _{OTM} (in.)		=	18						2. Inpu	t Additi	onal Co	oncent	rated De	ad Loa	d As C	Occurs Per
	H _{ASPECT} (in.))	=	18						Plan in	Overtu	rning D	esign	Section E	Below		
Shear Pane	all angth F	Note Tak	ala							Resisti	na Doo	.d .a.	d Doto	Table			
		Jala Tal	Jie				Aspect			Kesisti	ilg Dea	iu Lua	u Data			D-	aiatin a M
Len	-	% T	rib	h/b		ct Ratio	Ratio Check			Leve	I	psf	L_{trib}	(ft.)	niform plf		sisting, M _D (ft-kips)
ft 30 ft.	in.	659	%	0.60 :1		.00	OK			Wall	1	5.00	14.	33 2	14.95		26.94
15 ft.	10 in.	35		1.14 :1		.00	OK			Roof	_	5.00	1.3		9.95		2.50
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
														(0.00		0.00
ΣL =	45.83 ft.	We	eighte	d Average:	1	.00								Tota	al M _D :	29.	.44 ft-kips
ASD Seism	ic Loading	Data T	able						ASD Wind	Loading	Data T	able					
Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A _{t2} (ft ²)	%	o _{Trib}	Load (lbs)		Load Leve	W (plf		₋ength Shear '			% _{Trib}	L	oad (lbs)
Roof	20327.68	1			1	00	20328		Roof	279			.08	•	100		8952
												<u> </u>					3332
		Li	ne Lo	ads(lbs)													
							0										
							0									ı	

Total V_(E): 20328 lbs

Total $V_{(w)}$:

8952.4 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Panel Design: Apply 10d Nail Strength Reduction Factor Per Note 1 Above											ove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	20327.7	20327.6809	443.5	489.3	3	8d	3 in. o.c.	3/8	E	0.9065	3
Wind:	8952.4	-	195.3	365.0	6	8d	6 in. o.c.	3/8	_	0.5351	

ASD Tension L	oad Combinations:
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$

0.6D + .7W =

Wind:

= **0.366** D -.7 ρ Q_E

0.6 D - .6W

ASCE 2.4.5

ASCE 2.4.1

Overturning	Design:							·		
Load Type	M _{OT}	M _D	M _{net}	HD	Strap		Net Uplift .7	DE & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-126.40	10.78	-115.62	190.0	188.5	output:	-7302.2	-7360.3	-11404.6	-11495.4
Wind:	-55.67	17.67	-38.00	190.0	188.5	output:	-2400.1	-2419.2	-5859.7	-5906.4
									Apply Omega	(Ω)? No
									Include Uplift F	F.A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0ρE Ter	nsion Uplift
Load Type	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	Yes	-5272	-1581.6		-8883.9	-8942.0	-13664.1	-13754.8
Wind:		0.0		-3136	-940.9		-3856.3	-3862.0	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:					For	undation Type:	Slab On Grade
					Wood to Woo	d Connection	Post to Con	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	HDU11 CMST12	9535 9215	0.9317 0.9704	OUTPUT HOLDOWN SUMMARY:	CMST12	2-2x4	HDU11	4x6



			FU	JLL HEIGH	IT WOO	D SHE	AR PANEL	DESIGN (NO OPENIN	GS) - SIT	E CON	STRU	CTION				
Annliaghla	Codo Defe			2021	SDPW										Level:		1
Applicable	Code Reie	erence.		2021	SDFW	3									W ID:		WD
													G	Frid Refe	rence		D
Shear Wall	Input Data	a:								Ge	eneral [Data Ir	puts				
	Wood S		=	DF	_								•	cy Facto	Γρ		1
	-	all Size	=	2x4								Over	streng	th Facto	Ω_{o}	=	2.5
	# of Panel	Sides	=	1					Discont	tinuous La	ateral S	ystem'	? (Bea	m Below Beam		=	
		S.G.	=	0.5										Deam	Deptil	=	
S.G	6. Adjustment	t Factor	=	1.00										ber Cond		-	No
		L _{total}	=		15'-11' 15'-11'						*Redi	uction	to Allo	wable Ca	pacity	=	1.0
		L _{min}	_	131 111.	13-11								1				
					ASD	Unit Sh	near Capac	ity Table -	2021 SDPW	/S Table	4.3A	M					
				ğ. Li		er Jg		9	<u>.</u> . <u>.</u>		ŧ			ā	Ji.		ъ о
0	s (ii.	Φ	Ze ₁	pac		lemb joinir	Panel Edges #REF!	:			Adjustment Factor	WSP Factor	Fire Treated Factor	1.3A 0d n or	eisn	Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	(nes	Grade	Nail Size ¹	S)	(ii)	ng N t Ad	nel Edg #REF!	2	Factor	Facto	^djus -acte	PF	e Trea Factor	¹ Table 4.3A otnote 10d r Factor	usted Seisr	acity	djusted Win Unit Shear Zapacity (plf
	Thickness (in.)		ž	E.N. O.C. Spacing		Framing Member Thk At Adjoining	Ta	Wiscons Doctor	Factor Factor Seismic Reduction		8.6.	MS	<u>_</u> <u>_</u>	¹ Table 4.3A Footnote 10d nai Factor	Adjusted Seismic	Cap	Adju Ur Cap
				ш		шг					0)			Ш	<		
2	3/8	CD	80	d 2 in	. O.C.	3x	179	90	2	2.8	0.00	1.00	1.00	-	63	39	895
1. See Glob	al Paramet	ter Shee	t for A	dditional N	otes.												
Shear Wall H	eiaht:			ft. in.						Notes:	v All De	ad Loa	ad Froi	m Levels	Above		
	H _{OTM} (in.)		=	18							•						Occurs Per
	H _{ASPECT} (in.))	=	18										Section E			
											_						
Shear Pane	el Length D	Data Tab	ole			_	Aspect			Resisti	ng Dea	d Loa	d Data	Table			
Len	gth	% T	rib	h/b	Aspect	Ratio	Ratio			Level	ļ	osf	L_{trib}	(11)	iform plf		sisting, M _D (ft-kips)
ft	in.				Fac		Check									'	
15 ft.	11 in.	100)%	1.13 :1	1.0	00	ок			Wall Roof		5.00 5.00	14.3		4.95 9.95		27.23
												<u> </u>			0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
ΣL =	15.92 ft.	We	eighte	d Average:	1.0	00									al M _D :	29.	75 ft-kips
ASD Seism	nic Loading	n Data T	ahla						ASD Wind	l oading	Data Ta	ahla					
Load											1		To Ne	kt			
Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	% _∃	Γrib	Load (lbs)		Load Level	W (plf) 's	Shear \	Wall (ft	9	6 _{Trib}	L	oad (lbs)
Roof	9085.21	1			10	00	9085		Roof	279		32	.08		50		4476
		Li	ne Lo	ads(lbs)			0										
							0										

Total V_(E): 9085 lbs

Total $V_{(w)}$:

4476.2 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Panel	Design:					Арр	ly 10d Nail S	trength Reduct	tion Factor Per Note 1 Above = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load U.C. Gov. SW Type
Seimic:	9085.2	9085.2076	570.8	639.3	2	8d	2 in. o.c.	3/8	0.8929 E 2
Wind:	4476.2	-	281.2	365.0	6	8d	6 in. o.c.	3/8	0.7705

ASD Tension L	oad Combinations:
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$

0.6D + .7W =

Wind:

= **0.366** D -. $7\rho Q_E$

= **0.6** D - .6W

ASCE 2.4.5

ASCE 2.4.1

Overturning	g Design:									
Load Type	M _{OT}	M _D	M _{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-163.53	10.90	-152.64	191.0	189.5	output:	-9589.8	-9665.7	-14677.7	-14793.9
Wind:	-80.57	17.85	-62.72	191.0	189.5	output:	-3940.4	-3971.6	-8436.8	-8503.6
									Apply Omega (
									Include Uplift F.	A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0pE Tens	sion Uplift
•	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-9589.8	-9665.7	-14677.7	-14793.9
Wind:		0.0			0.0		-3940.4	-3971.6	_	_

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Type Hardware Capacity U.C. HD: HDU14 13090 0.7326 STRAP: 2-CMST14 12950 0.7464 Wood to Wood Connection Post to Conc. Connection Design Strap Min. Design Post Post Design HD Min. Design Post Post 4 (4) 2x HDU14 4x6	Hold Down D	Design:					For	undation Type:	Slab On Grade
HD: HDU14 13090 0.7326 OUTPUT HOLDOWN SUMMARY: 2-CMST14 (4) 2x HDU14 4x6						Wood to Woo	d Connection	Post to Co	nc. Connection
OUTPUT HOLDOWN SUMMARY: 2-CMST14 (4) 2x HDU14 4x6	Туре	Hardware	Capacity	U.C.		Design Strap	•	Design HD	Min. Design Post
		_			OUTPUT HOLDOWN SUMMARY:	2-CMST14	(4) 2x	HDU14	4x6



			FI	II I HEIGH	T WO	OD SHEA	P PANEI	DESIGN	N (NO OPENING	CS) - SITE	CONSTRI	ICTION			
				JEE HEIGI	11 W	OD STILA	RPANEL	DESIG	(NO OFLINIA	33) - 3112	CONSTRU	CHON			
Applicable	Code Refe	erence:		2021	SDPV	vs								evel:	1
												Gri	SV d Refer	N ID:	WE E
												Gii	u Kelel	ence	_
Shear Wall	Input Data	a:								Ge	neral Data I	nputs			
	Wood Sp		=	DF								lundancy			1
	Wa # of Panel	III Size	=	2x6 1					Discont	inuous Lo	Ove l teral System	rstrength			
	# UI Failei	Sides	=	1					DISCOIL	illuous La	ierai Sysieri	ir (Deaili	Beam D		
		S.G.	=	0.5											
S.G	6. Adjustment		=	1.00	401.46	. "					² Fire Treat ² Reduction				No
		L _{total} L _{min}	=	154 in. 154 in.	12'-10						Reduction	TO Allowa	able Cap	acity =	1.0
		- min		104 1111		•									
					ASE	Unit She	ear Capac	ity Tabl	e - 2021 SDPW	S Table 4	.3A				
	_			i.	D	er Jg			ro Lion	-	į l		lai	je (D O
	Thickness (in.)	Φ	_ _	Spacing Spacing		Framing Member Thk At Adjoining Panel Edges	· 		Wind Reduction Factor Seismic Reduction		Factor WSP Factor	Fire Treated Factor	Footnote 10d nai Factor	Adjusted Seismic Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	nes	Grade	Nail Size ¹		(ji	ng M HAdj	, #RFF	į	Factor Factor	Factor	acto	Fire Treated Factor	able 4.5 note 10c Factor	usted Seisr Unit Shear	djusted Win Unit Shear Sapacity (plf
	hick	O	Z			amir ik Af Pane	#	ŧ	ind I	Ш	WSF	Fire	otno	juste Uni Sape	djus Uni
	-			Ц	i	Ë = _			S S	0	o l		ß.	A O	4 0
6	3/8	CD	80	d 6 in	n. o.c.	2x	73	30	2 2	2.8	0.00 1.00	1.00	-	261	365
1. See Glob	al Paramet	er Shee	et for A	dditional N	lotes.										
										Notes:					
Shear Wall H	_			ft. in.			\			1. Apply	All Dead Lo	ad From	Levels A	Above	
	H _{OTM} (in.)		=	12 9											Occurs Per
	H _{ASPECT} (in.))	=	12 9						Plan in C	verturning I	Jesign Se	ection Be	elow	
Shear Pane	el Lenath C)ata Tal	hle							Resistin	g Dead Loa	d Data T	able		
		otta Tai	<u> </u>				Aspect]		Resistin	g Dead Loc	u Data 1			N
Len	-	% T	rib	h/b		ct Ratio	Ratio			Level	psf	L _{trib} (ft)	form F olf	Resisting, M _D (ft-kips)
ft	in.	400	20/	0.00.4		ctor	Check			VA/II	45.00	40.75		1.25	
12 ft.	10 in.	100	J%	0.99 :1	1	.00	OK			Wall Roof	15.00 15.00	12.75		.95	15.75 1.64
											10.00			00	0.00
													0.	00	0.00
													0.	00	0.00
														00	0.00
								l						00	0.00
								ł						00	0.00
														00	0.00
ΣL =	12.83 ft.	W	eighte	d Average	: 1	.00		I					Total		7.39 ft-kips
ASD Seism	ia Landina	Date T	rabla.						ASD Wind I	l aadina F	Note Toble				
	iic Loading	Data I	able	l	1			1	ASD WING	Loading L		T. N	1		
Load Description	F _{xi} (psf)	A _{t1} ((ft ²)	A_{t2} (ft ²)	%	o _{Trib} L	oad (lbs)		Load Level	W (plf)		To Next Wall (ft)	%	Trib	Load (lbs)
Roof	3058.13	1			1	00	3058		Roof	279		7.5	10	00	2093
								ļ							
								ł							
		l i	ine I o	ads(lbs)				J							
			20				0	1							
							0								
. ————															

Total V_(E): 3058 lbs

Total $V_{(w)}$:

2093.0 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Panel	l Design:					Арр	ly 10d Nail S	trength Reduct	tion Factor Per Note 1 Above =	No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load U.C. Gov. SW Ty	уре
Seimic:	3058.1	3058.12896	238.3	260.7	6	8d	6 in. o.c.	3/8	0.9140 E 6	
Wind:	2093.0	-	163.1	365.0	6	8d	6 in. o.c.	3/8	0.4468	

ASD Tensio	n Load Co	mbinations	:				,			
Seismi	c: 0.6D	7E _v +.7E _h =	(.614S _{DS})D	+.7E _h	= 0.366	D7ρQ _E				ASCE 2.4.
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.
Overturning	j Design:									
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-38.99	6.37	-32.62	148.8	152.5	output:	-2631.7	-2567.0	-4493.6	-4383.1
Wind:	-26.69	10.44	-16.25	148.8	152.5	output:	-1311.0	-1278.7	-3588.0	-3499.7
									Apply Omega	(Ω)? N o
									Include Uplift F	.A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0pE Ten	sion Uplift
Loud Type	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-2631.7	-2567.0	-4493.6	-4383.1
Wind:		0.0			0.0		-1311.0	-1278.7	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	esign:					Fou	undation Type:	Slab On Grade
					Wood to Woo	d Connection	Post to Con	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 2-CS14	3815 4980	0.6898 0.5155	OUTPUT HOLDOWN SUMMARY:	2-CS14	2-2x6	STHD14 ALT: HTT4	4x6



 Sheet:
 Seismic Base Shear - FLEXIBLE

 Date:
 -

 Project ID:
 -

 Version:
 2022 CBC / ASCE 7-16

SEISMIC BASE SHEAR ANALYSIS - FLEXIBLE DIAPHRAGM

STRUCTU	JRE: Fire S	Station 227				VEDTIO	U DIOTRIE	NUTION OF	0510140	500050			Structural	period Facto	or, k : 1.	00
						VERTICA	AL DISTRIE	BUTION OF	SEISMIC	FORCES					-	
								L	Level Force	s - 1.0E Str	ength Leve	el	Alternate	ASD 0.7E	Diaphrag	m F _{px} (k) -
									Force (k)		Unit Fo	rce (psf)	Unit Fo	rce (psf)		0E
Level	Height from Base (ft)	Weight Summary (k)	Floor Plan Area (ft ²)	ΣWi (k)	Wi hi ^k	ΣWi hi ^k	C _{vx}	F _x	ΣF _x	1.0 E _h = ρF _x	F _x	1.0 E _h = ρF _x	F _x	0.7 E _h = ρF _x	F _{px}	ΩF_{px}
		0.0		0.0	0	0	0.000	0.0	0.0	0.0					0.0	0.0
1	26.00	350.9	10,920	350.9	9122	9122	1.000	135.3	135.3	135.3	12.39	12.39	8.67	8.67	175.8	439.6
Building W	eight, W =	350.9	10,920				Ва	se Shear, \	$V = C_s^*W =$	135.27	k					

																		4						$\overline{}$			
					ı	BUILE	ING	NEIG	HT &	SEIS	MIC 1	RIBU	TAR\	Y ANA	LYSI	S		42									
						+	Dir.		% D	istribu	ution t	o resi	stanc	e grid	lines		. ₽ [Dir.		% D	istrib	ution	to resi	stanc	e grid	lines	
			Unit							Grid	lines										Gric	llines]
Building Mass	Type	Leve	weight		Weight											Check											Check
Element	Τy	Le.	(psf)	Area (sf)	(k)	1	2	6.5	2.5	4.5	5	6	7	7.5	5.5	ပ်	A.5	Α	В	С	D	E					ည်
Apparatus Roof	R1	11	15.0	5,639	84.59	ļ	50%		ļ	ļ	ļ	<u> </u>	50%			100%	<u> </u>	50%	50%			ļ	ļ			İ	100%
Elec & Ickr Room Roof	R1	1	18.0	1,270	22.86	ļ	ļ	15%	17%	ļ	35%	<u> </u>			33%	100%	43%	57%	ļ	<u> </u>	ļ	<u>ļ</u> .	ļ	L	L	İ	100%
Day Room Roof	R1	11	18.0	3,601	64.82	ļ	<u> </u>		<u> </u>	50%	<u> </u>	50%	Ζ,			100%	<u> </u>	<u> </u>	35%	48%	16%	<u>!</u>	ļ	L	L	ļ	100%
Entry Roof & Awning	R1	11	15.0	202	3.03	ļ	İ		ļ	ļ	Ĺ	40%		60%		100%	<u> </u>	<u> </u>	100%		<u>i</u>	j	ļ	L	L	İ	100%
Awning	R1	11	15.0	53	0.80	ļ	ļ		ļ	100%	ļ	.		ļ <u>.</u>		100%			ļ	ļ	100%	ļ	ļ			Í	100%
Sleep Quarters Roof	R1	1	18.0	2,730	49.14	50%	<u> </u>		ļ	50%	ļ	ļ		V.		100%			29%	38%	20%	12%	ļ			İ	100%
Wall 1	W1	1	15.0	398	5.98	100%	ļ		ļ						<u> </u>	100%	<u> </u>	ļ	30%	40%	20%	9%	<u> </u>			İ	100%
Wall 2	W1	1	15.0	693	10.39	<u></u>	100%									100%		50%	50%	<u> </u>	<u> </u>	<u> </u>	<u> </u>			İ	100%
Wall 4.5	W1	1	15.0	96	1.45	<u> </u>	<u> </u>			100%	ļ					100%	<u> </u>	ļ	ļ	ļ	50%	50%	ļ			ļ	100%
Wall 2.5	W1	1	15.0	61	0.92		<u> </u>		100%	<u> </u>	ļ	ļ		\		100%	50%	50%	ļ	<u> </u>	ļ	ļ	ļ <u>.</u>				100%
Wall 4.5 Upper	W1	1	15.0	337	5.05		ļ		\ \	100%	<u></u>	<u> </u>			<u> </u>	100%		<u> </u>	37%	50%	13%	<u>.</u>	<u> </u>			İ	100%
Wall 4.5 Lower	W1	1	15.0	308	4.63					100%		<u> </u>	7	/	<u> </u>	100%		<u>. </u>	50%	50%	<u> </u>	İ	<u>i</u>			<u> </u>	100%
Wall 5	W1	1	15.0	74	1.11						100%			<u> </u>	<u> </u>	100%	50%	50%	<u> </u>	<u> </u>	<u> </u>	İ	<u> </u>			<u> </u>	100%
Wall 5.5	W1	1	15.0	74	1.11						_			<u> </u>	100%	100%	50%	50%	<u> </u>	<u> </u>		<u> </u>	<u> </u>				100%
Wall 6.5	W1	1	15.0	61	0.92			100%								100%	50%	50%									100%
Wall 6	W1	1	15.0	321	4.81							100%				100%			37%	50%	13%		T				100%
Wall 7	W1	1	15.0	515	7.73							[100%			100%		50%	50%								100%
Wall A.5	W1	1	15.0	356	5.34			15%	17%		35%	[33%	100%	100%	[[Ī		ļ	I				100%
Wall A	W1	1	15.0	715	10.72		50%				[[50%	[100%		100%	[1		[100%
Wall B Upper	W1	1	15.0	598	8.97		50%					[50%			100%		[100%	5							100%
Wall B Lower	W1	1	15.0	790	11.85		50%						50%			100%		ļ	100%	5	ļ	ļ	Ī				100%
Wall C.1	W1	1	15.0	62	0.93		Ī			100%		Ī				100%		Ī	ĵ	100%	Ī		Ī				100%
Wall C.2	W1	1	15.0	182	2.73		 					100%			ļ	100%		ļ	† 	100%	ļ		1				100%
Wall D.1	W1	1	15.0	71	1.07		ļ		<u> </u>	100%		ļ			ļ	100%		ļ	ļ	1	100%		† <u>-</u>				100%
Wall D.2	W1	1	15.0	190.6	2.86		ļ			100%		†		ļ	ļ	100%			† <u>-</u>	ļ	100%	ļ	†				100%
Wall E	W1	1	15.0	182.8	2.74	50%	 			50%		†			ļ	100%		ļ	† 	1	ļ	100%					100%
Int. Walls Apparatus	W2	1	10.0	500.0	5.00		50%		Ì	Ì		ļ	50%		[100%		50%	50%	,	ļ		1				100%
Int. Walls Sleep Quarters	W2	1	10.0	1,500.0	15.00	50%	!			50%		ļ				100%			30%	40%	20%	9%	†				100%
Int. Walls Day Room	W2	1	10.0	1,250.0	12.50		ļ			50%		50%			ļ	100%		ļ	35%	48%	16%	ļ	†				100%
Wall 7.5	W1	1	15.0	120.8	1.81		ļ					†		100%	ļ	100%			100%	!	ļ	ļ	†				100%
	V						† 					†			{ 				† <u>-</u>	†		 	†				
							†		Ì	ļ	·	†		İ	i			ļ	†	†	†	ļ	†				
							Ī		ļ	İ	ļ	İ		İ	T			ļ	İ	†	ļ	ļ	Ť				
							i			 		ļ		ļ	ļ				ļ	İ	ļ	ļ	†				
		İ					İ		·	ļ		İ		i	İ			ļ	İ	İ	İ	†	Ť			[
		†					i					†						<u> </u>		†	ļ	†	†				
		ļ										ļ						ļ		1		†	†				
		† 					 					† 		!				<u></u>	†	†		i	†				
				ΣWi=	350.9	39.4	71.0	5.1	5.7	88.9	11.1	47.4	68.3	3.6	10.4		17.3	79.5	133.7	75.3	33.7	11.3	0.0	0.0	0.0	0.0	

 . SEISMIC LOAD	SUMMARY BY ELEMENT
♣ Dir. % Distribution to resistance gridlines	Dir. % Distribution to resistance gridlines
Gridlines	Gridlines



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Sheet:	Seismic Base Shear - FLEXIBLE
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

SEISMIC BASE SHEAR ANALYSIS - FLEXIBLE DIAPHRAGM

STRUCTURE: Fire S	Station 227	7																							
Building Mass																									
Element	Level	Height (ft)	Notes	1	2	6.5	2.5	4.5	5	6	7	7.5	5.5	Α	.5	Α	В	С	D	Е					
Apparatus Roof	1	26		0.0	16.3	0.0	0.0	0.0	0.0	0.0	16.3	0.0	0.0	0	0.0	16.3	16.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Elec & lckr Room Roo	1	26		0.0	0.0	1.3	1.5	0.0	3.1	0.0	0.0	0.0	2.9	3	8.8	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Day Room Roof	1	26		0.0	0.0	0.0	0.0	12.5	0.0	12.5	0.0	0.0	0.0	0	0.0	0.0	8.9	12.0	4.1	0,0	0.0	0.0	0.0	0.0	
Entry Roof & Awning	1	26		0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.7	0.0	0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Awning	1	26		0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	
Sleep Quarters Roof	1	26		9.5	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	5.6	7.2	3.9	2.3	0.0	0.0	0.0	0.0	Ĺ
Wall 1	1	26		2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.7	0.9	0.5	0.2	0.0	0.0	0.0	0.0	<u> </u>
Wall 2	1	26		0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 4.5	1	26		0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	<u> </u>
Wall 2.5	1	26		0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0	.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 4.5 Upper	1	26		0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	a	.0	0.0	0.7	1.0	0.3	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 4.5 Lower	1	26		0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	C	.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	ļ
Wall 5	1	26		0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0	.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 5.5	1	26		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0	.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 6.5	1	26		0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 6	1	26		0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0	0.0	0.0	0.7	0.9	0.2	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall 7	1	26		0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0	0.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall A.5	1	26		0.0	0.0	0.3	0.4	0.0	0.7	0.0	0.0	0.0	0.7	2	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ļ
Wall A	1	26		0.0	2.1	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0	.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall B Upper	1	26		0.0	1.7	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	С	.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ļ
Wall B Lower	1	26		0.0	2.3	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall C.1	1	26		0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	ļ
Wall C.2	1	26		0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
Wall D.1	1	26		0.0	0.0	0.0	0.0	0.4	0.0	0.0	0,0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	ļ
Wall D.2	1	26		0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ļ
Wall E	1	26		0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	ļ
Int. Walls Apparatus	1	26		0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ļ
Int. Walls Sleep Quar	1	26		2.9	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	1.8	2.3	1.2	0.5	0.0	0.0	0.0	0.0	ļ
Int. Walls Day Room	1	26		0.0	0.0	0.0	0.0	2.4	0.0	2.4	0.0	0.0	0.0	0	0.0	0.0	1.7	2.3	0.8	0.0	0.0	0.0	0.0	0.0	ļ
Wall 7.5	1	26		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
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													<u> </u>												<u> </u>
		<u> </u>											<u> </u>												<u> </u>
			Σ	15.2	27.4	2.0	2.2	34.3	4.3	18.3	26.3	1.4	4.0	6	.7	30.7	51.5	29.0	13.0	4.4	0.0	0.0	0.0	0.0	<u> </u>

		SUMMARY OF SEISMIC LOADING BY GRIDLINE (KIPS - 1.0E STRENGTH LEVEL)																						
	→ Direction											Direction												
		Gridlines Gridlines																						
1		1.0 E _h =											eck											eck
	Level	ρF_x	1	2	6.5	2.5	4.5	5	6	7	7.5	5.5	ر ك	A.5	Α	В	С	D	Е					ပ်
	1	135.3	15.2	27.4	2.0	2.2	34.3	4.3	18.3	26.3	1.4	4.0	100%	6.7	30.7	51.5	29.0	13.0	4.4	0.0	0.0	0.0	0.0	100%
	Base	135.27	15.2	27.4	2.0	2.2	34.3	4.3	18.3	26.3	1.4	4.0	100%	6.7	30.7	51.5	29.0	13.0	4.4	0.0	0.0	0.0	0.0	100%



Sheet:	DIAPH 1
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Δ:	

HARDWARE LOADS									
ITEM	LBS								
A34	515								
A35	695								
LTP4	670								
LTP5	620								
LS50	730								
LS70	915								
RBC	435								
-	-								

ALLOWABLE DIAPHRAGM LOADS									
TYPE	DIAPHRAGM	(PLF)							
ROOF 1	UNBLOCKED - 15/32" SHEATHING W/ 8d AT 6" O.C. E.N.	180							
ROOF 2	2x BLOCKED - 15/32" SHEATHING W/ 8d AT 4" O.C. E.N.	360							
ROOF 3	-								
ROOF 4	-	- 7							
FLOOR 1	UNBLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	215							
FLOOR 2	2x BLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	320							
FLOOR 3		-							
FLOOR 4		-							

STRAP LOADS									
ITEM	LBS								
CS16	1670								
2-CS16	2510								
CMSTC16	4030								
CMST14	5380								
CMST12	7620								
2-CMST14	10760								

	ALLOWABLE TOP PLATE NAIL LOADS (Cd = 1.6)									
TYPE	NAIL SIZE	(LBS)								
16d SHORT	16d SHORT - 0.131" x 3.25"	155								
-	-	-								

	APPARATUS ROOF GRID	Α	В	2	7			
	Fx (0.7E) SHEAR LOAD (LBS)	14533.5	15351	16345	16345			
_	Fpx (0.7E) SHEAR (LBS)	18893.6	19956.6	21248.3	21248.3			
\GN	DIAPHRAGM TYPE	ROOF 2	ROOF 2	ROOF 2	ROOF 2			
HR/	EDGE LENGTH (FT)	78	78	60	60			
DIAPHRAGM	EDGE STRESS (PLF)	242.226	255.854	357.114	357.114	 		
	ALLOW STRESS (PLF)	360	360	360	360			
. <u>u</u> .	WALL LENGTH (FT)	78	78	60	60			
TOP PLATE CLIPS	HARDWARE USED	LTP5	LTP5	A35	A35			
. д	MAX, SPACING (IN) O.C.	39.93	37.80	30.36	30.36			
	Perp Fpx (0.7E) SHEAR (PLF)	544.828	544.828	652.945	652.945			
Q	PARALLEL LENGTH (FT)	78	78	60	60			
СНОВ	PERP. WIDTH (FT)	59.5	59.5	78	78			
7	CHORD TENSION (LBS)	8704.66	8704.66	4630.59	4630.59			
	STRAP AT CHORD BREAK	2-CMST14	2-CMST14	CMST14	CMST14			



Sheet:	DIAPH 1
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Δ:	

HARDWA	HARDWARE LOADS										
ITEM	LBS										
A34	515										
A35	695										
LTP4	670										
LTP5	620										
LS50	730										
LS70	915										
RBC	435										
-	-										

ALLOWABLE DIAPHRAGM LOADS									
TYPE	DIAPHRAGM	(PLF)							
ROOF 1	UNBLOCKED - 15/32" SHEATHING W/ 8d AT 6" O.C. E.N.	180							
ROOF 2	2x BLOCKED - 15/32" SHEATHING W/ 8d AT 4" O.C. E.N.	360							
ROOF 3	-								
ROOF 4	-	- 7							
FLOOR 1	UNBLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	215							
FLOOR 2	2x BLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	320							
FLOOR 3		-							
FLOOR 4		-							

STRAP LOADS						
ITEM	LBS					
CS16	1670					
2-CS16	2510					
CMSTC16	4030					
CMST14	5380					
CMST12	7620					
2-CMST14	10760					

	ALLOWABLE TOP PLATE NAIL LOADS (Cd = 1.6)						
TYPE	NAIL SIZE	(LBS)					
16d SHORT	16d SHORT - 0.131" x 3.25"	155					
-		-					

	CIVISTIT	10700									
SLEEPING QUARTERS ROOF GRID			В	C	D	E	1	4.5			
	Fx (0.7E) SHEAR LOAD (LBS)		6688.7	7583	5099	2318	9025	9564			
_		Fpx (0.7E) SHEAR (LBS)	8695.31	9857.85	6628.89	3013.72	11732.4	12433.7		
JIAPHRAGM		DIAF	HRAGM TYPE	ROOF 2	ROOF 2	ROOF 2	ROOF 2	ROOF 2	ROOF 2		
Ä		EDGI	LENGTH (FT)	28	28	28	28	78	79		
IAP		EDGE	STRESS (PLF)	310.55	352.07	236.75	107.63	150.41	157.39		
		ALLOW	/ STRESS (PLF)	360	360	360	360	360	360		
. ш s		WALI	L LENGTH (FT)		9.5	9.5	28	78			
TOP PLATE CLIPS		HAR	DWARE USED		A35	A35	A35	A35			
. 4		MAX. SPA	CING (IN) O.C.		10.4	15.5	48.0	48.0			
	Pe	rp Fpx (0. 7 É) SHEAR (PLF)	863.074		863.074		110	110		
Q.		PARALLEI	L LENGTH (FT)	28		28		47	47		
СНОКО		PER	P. WIDTH (FT)	64		64		28	28		
Ö		CHORD T	ENSION (LBS)	1651.98		1651.98		1362	1362		
		STRAP AT C	HORD BREAK	CS16	I	CS16		CS16	CS16	 	



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Date:	11/18/24
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HARDWARE LOADS					
ITEM	LBS				
A34	515				
A35	695				
LTP4	670				
LTP5	620				
LS50	730				
LS70	915				
RBC	435				
-	-				

ALLOWABLE DIAPHRAGM LOADS						
TYPE	DIAPHRAGM	(PLF)				
ROOF 1	UNBLOCKED - 15/32" SHEATHING W/ 8d AT 6" O.C. E.N.	180				
ROOF 2	2x BLOCKED - 15/32" SHEATHING W/ 8d AT 4" O.C. E.N.	360				
ROOF 3	-	- \				
ROOF 4	-	- 7				
FLOOR 1	UNBLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	215				
FLOOR 2	2x BLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	320				
FLOOR 3		-				
FLOOR 4		-				

STRAP LOADS					
ITEM	LBS				
CS16	1670				
2-CS16	2510				
CMSTC16	4030				
CMST14	5380				
CMST12	7620				
2-CMST14	10760				

	ALLOWABLE TOP PLATE NAIL LOADS (Cd = 1.6)						
TYPE	NAIL SIZE	(LBS)					
	16d SHORT - 0.131" x 3.25"	155					
-		-					

	CIVIDIT	10700									
DAY ROOM ROOF GRID			В	C	D	4.5	6				
	Fx (0.7E) SHEAR LOAD (LBS)		10303.5	12009	3986	11959	11497				
_		Fpx (0.7E) SHEAR (LBS)	13394.5	15611.9	5181.88	15 546.6	14945.6			
DIAPHRAGM		DIAF	PHRAGM TYPE	ROOF 2	ROOF 2	ROOF 2	ROOF 2	ROOF 2			
Ŧ		EDGI	E LENGTH (FT)	48	48	48	64	64			
IAP		EDGI	E STRESS (PLF)	279.05	325.25	107.96	242.92	233.53			
		ALLOW	/ STRESS (PLF)	360	360	360	360	360			
. ш «		WAL	L LENGTH (FT)		48.0	24.0	64	64			
TOP PLATE CLIPS		HAR	DWARE USED		A35	A35	A35	A35			
			CING (IN) O.C.		33.3	48.0	44.6	46.4			
		Perp Fpx (0.7 E) SHEAR (PLF)	635.254		635.254	558.105	558			
Q.		PARALLE	L LENGTH (FT)	48		48	48	48			
CHORD		PER	P. WIDTH (FT)	64		64	48	48			
5		CHORD	TENSION (LBS)	3573.31		3573.31	4185.79	4185.79			
		STRAP AT C	HORD BREAK	CMSTC16		CMSTC16	CMST14	CMST14		 	



Sheet:	DIAPH 1
Date:	11/18/24
#:	8400.32
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HARDWARE LOADS					
ITEM	LBS				
A34	515				
A35	695				
LTP4	670				
LTP5	620				
LS50	730				
LS70	915				
RBC	435				
-	-				

	ALLOWABLE DIAPHRAGM LOADS						
TYPE	DIAPHRAGM	(PLF)					
ROOF 1	UNBLOCKED - 15/32" SHEATHING W/ 8d AT 6" O.C. E.N.	180					
ROOF 2	2x BLOCKED - 15/32" SHEATHING W/ 8d AT 4" O.C. E.N.	360					
ROOF 3	-						
ROOF 4	-	- 7					
FLOOR 1	UNBLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	215					
FLOOR 2	2x BLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	320					
FLOOR 3		-					
FLOOR 4		-					

STRAP LOADS			
ITEM	LBS		
CS16	1670		
2-CS16	2510		
CMSTC16	4030		
CMST14	5380		
CMST12	7620		
2-CMST14	10760		

ALLOWABLE TOP PLATE NAIL LOADS (Cd = 1.6)				
TYPE	NAIL SIZE	(LBS)		
	16d SHORT - 0.131" x 3.25"	155		
-		-		

	2 01/3114 10/00										
		DAY ROO	M ROOF GRID	A.5	Α	2.5	5	5.5	6.5		
	Fx (0.7E) SHEAR LOAD (LBS)			3229.62	4036	1294	1695	1582	1142		
_		Fpx (0.7E) SHEAR (LBS)	4198.5	5246.81	1682.15	2203.89	2056.96	1484.25		
DIAPHRAGM		DIAF	PHRAGM TYPE	ROOF 1	ROOF 1	ROOF 1	ROOF 1	ROOF 1	ROOF 1		
Ä		EDGI	E LENGTH (FT)	70	70	15.5	15.5	15.5	15.5		
IAP		EDGE	E STRESS (PLF)	59.98	74.95	108.53	142.19	132.71	95.76		
		ALLOW	/ STRESS (PLF)	180	180	180	180	180	180		
. ш "	,	WALI	L LENGTH (FT)	70			15.5	15.5	15.5		
TOP PLATE		HAR	DWARE USED	A35			A35	A35	A35		
. 4	,	MAX. SPA	CING (IN) O.C.	48.0			48.0	48.0	48.0		
		Perp Fpx (0.7 É) SHEAR (PLF)	138.56	138.56	609.38			609.38		
Q		PARALLEI	L LENGTH (FT)	30.75	30.75	15.5			15.5		
СНОВ		PER	P. WIDTH (FT)	15.5	15.5	30.75			30.75		
5		CHORD T	TENSION (LBS)	1320.78	1320.78	743.91			743.91		
		STRAP AT C	HORD BREAK	CS16	CS16	CS16		 _	CS16	 	 -



Sheet:	DRAG (A) APP
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DRAG (A) APP Apparatus Roof Grid A

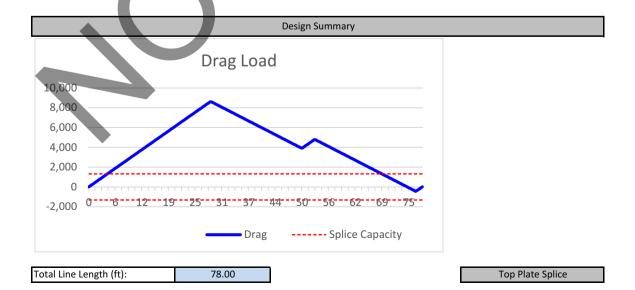
	DIAPHRAGM LOADS							
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7	
V _{SEISMIC} , lbs:	18,894							
Start:	0.00							
Length:	78.00							
End:	78.00	0.00	0.00	0.00	0.00	0.00	0.00	
	-	-						

v _{SEISMIC} , plf: 242.23 0.00	0.00 0.00	0.00	0.00	0.00
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			SHEAR WA	LL(s) below:			
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	28.50	52.83					
Length:	21.33	23.67					
End:	49.83	76.50	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	45.00

Shear Line	V,total	v,total	
Below	(lbs.)	(plf)	
V _{SEISMIC}	18,893.6	419.9	



Load Case:	Seismic
Seismic Drag Factor	1.25

	Drag I	Forces
Drag Load (lbs.)	Location (ft)	Splice Hardware
8596.6	28.4	2-CMST14
-440.9	76.4	Plate Splice OK
0.0	0.0	
0.0	0.0	
0.0	0.0	

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	Strap Loads (lbs)		
CS16	1670		
2-CS16	2510		
CMSTC16	4030		
CMST14	5380		
CMST12	7620		
2-CMST14	10760		



Sheet:	DRAG (2) APP
Ву:	11/18/24
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Δ:	2022 CBC

DRAG (2) APP Apparatus Roof Grid 2

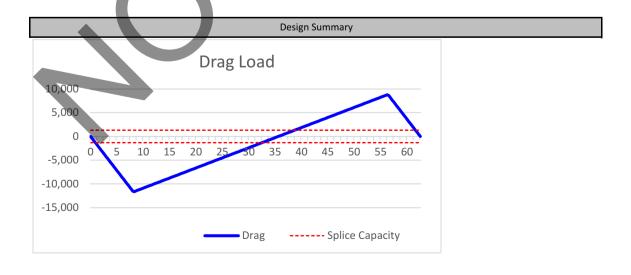
	DIAPHRAGM LOADS						
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	21,248						
Start:	0.00						
Length:	62.83						
End:	62.83	0.00	0.00	0.00	0.00	0.00	0.00
		<u>-</u>	_	<u>-</u>	_		

v _{SEISMIC} , plf: 338.19 0.00 0.00 0.00 0.00
--

SHEAR WALL(s) below:							
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	0.00	56.67					
Length:	8.17	6.17					
End:	8.17	62.83	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	14.33

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V _{SEISMIC}	21,248.3	1,482.4



Total Line Length (ft):	62.83
Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces				
Drag Load (lbs.)	Location (ft)	Splice Hardware		
8771.2	56.5	2-CMST14		
-11627.2	8.3	2-CMST12		
0.0	0.0			
0.0	0.0			
0.0	0.0			

(Max) (Min)

Note: Seismic Drag Loads have been increased 25% per ASCE 12.3.3.4

Top Plate Splice		
No. of 16d Nails:	8	
Nail Cap. (lbs):	103	
Cd:	1.6	
Capacity (lbs):	1318	

Strap Loads (lbs)		
CS16	1670	
2-CS16	2510	
CMSTC16	4030	
CMST14	5380	
CMST12	7620	
2-CMST14	10760	
2-CMST12	15240	



Sheet:	DRAG (E) SLEEP
Ву:	11/18/24
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DRAG (E) SLEEP Sleeping Quarters Roof Grid E

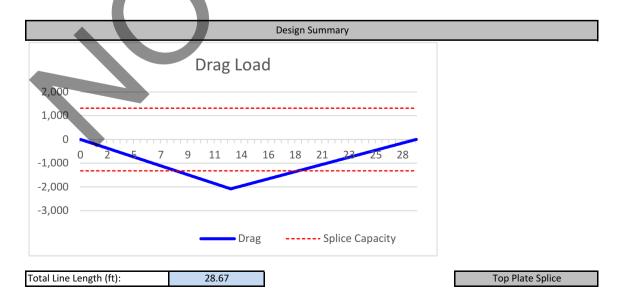
			DIAPHRAG	GM LOADS			
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	3,014						
Start:	0.00						
Length:	28.67						
End:	28.67	0.00	0.00	0.00	0.00	0.00	0.00
		_	_	<u>-</u>	_		

v _{SEISMIC} , plf: 105.12 0.00 0.00 0.00 0.00
--

SHEAR WALL(s) below:						
	Wall a	Wall b	Wall c	Wall d	Wall e V	Vall f Wall g
Start:	0.00					
Length:	12.83					
End:	12.83	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	12.83

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V _{SEISMIC}	3,013.7	234.9



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces					
Drag Load (lbs.)	Location (ft)	Splice Hardware			
0.0	28.7	Plate Splice OK			
-2079.5	12.8	2-CS16			
-1371.2	18.3	CS16			
0.0	0.0				
0.0	0.0				
0.0	0.0				

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	oads (lbs)
CS16	1670
2-CS16	2510
CMSTC16	4030
CMST14	5380
CMST12	7620
2-CMST14	10760



Sheet: DRAG (4.5) SLE		
By:	11/18/24	
Date:	8400.32	
Δ : 2022 CBC		

DRAG (4.5) SLEEP Sleeping Quarters Roof Grid 4.5

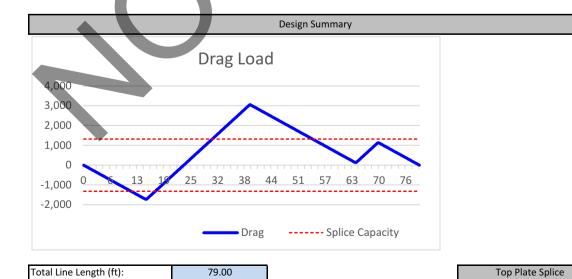
			DIAPHRAG	GM LOADS			
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	12,434						
Start:	0.00						
Length:	79.00						
End:	79.00	0.00	0.00	0.00	0.00	0.00	0.00
		-		-			

v _{SEISMIC} , plf: 157.39 0.00 0.00 0.00 0.00
--

	SHEAR WALL(s) below:						
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	0.00	39.16	69.33				
Length:	14.75	24.92	9.67				
End:	14.75	64.08	79.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	49.34

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V _{SEISMIC}	12,433.7	252.0



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces							
Drag Load (lbs.) Location (ft)		Splice Hardware					
3054.8	39.2	CMSTC16					
-1724.7	14.9	2-CS16					
1632.4	32.0	CS16					
0.0	0.0						
0.0	0.0						
0.0	0.0						

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

	Strap Loads (lbs)							
	CS16	1670						
	2-CS16	2510						
	CMSTC16	4030						
	CMST14	5380						
[CMST12	7620						
	2-CMST14	10760						



Sheet:	DRAG (B) LIVING		
By:	11/18/24		
Date:	8400.32		
Δ:	2022 CBC		

DRAG (B) LIVING Living Area Roof Grid B

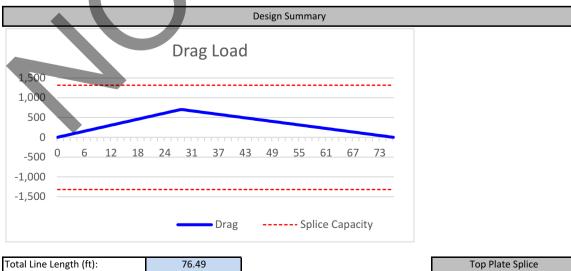
	DIAPHRAGM LOADS							
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7	
V _{SEISMIC} , lbs:	8,695	13,395						
Start:	0.00	28.16						
Length:	28.16	48.33						
End:	28.16	76.49	0.00	0.00	0.00	0.00	0.00	
		-	-	-	-			

308.78 277.15 0.00	0.00 0.00	0.00
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	SHEAR WALL(s) below:						
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	0.00						
Length:	76.49						
End:	76.49	0.00	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	76.49

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V_{SEISMIC}	22,089.8	288.8



Total Line Length (ft): 76.49

Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces						
Drag Load (lbs.)	Location (ft)	Splice Hardware				
703.3	28.1	Plate Splice OK				
0.0	76.5	Plate Splice OK				
0.0	0.0					
0.0	0.0					
0.0	0.0					

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	oads (lbs)
CS16	1670
2-CS16	2510
CMSTC16	4030
CMST14	5380
CMST12	7620
2-CMST14	10760



Sheet:	DRAG (C) LIVING
Ву:	11/18/24
Date:	8400.32
Δ:	2022 CBC

DRAG (C) LIVING Living Area Roof Grid C

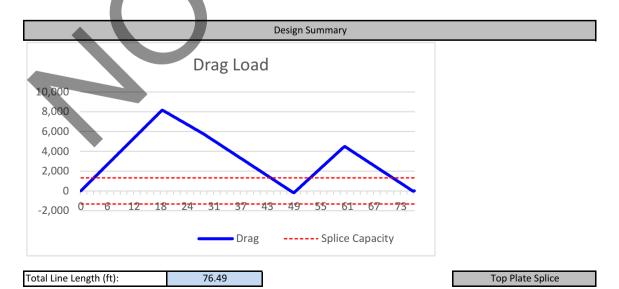
DIAPHRAGM LOADS							
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	9,858	15,612					
Start:	0.00	28.16					
Length:	28.16	48.33					
End:	28.16	76.49	0.00	0.00	0.00	0.00	0.00
	· · · · · · · · · · · · · · · · · · ·	-	-	-	-		

v _{SEISMIC} , plf: 350.07 323.	0.00 0.00	0.00 0.0	00	0.00
---	-----------	----------	----	------

			SHEAR WA	LL(s) below:			
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	18.67	60.50					
Length:	30.17	15.83					
End:	48.84	76.33	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	46.00

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
$V_{SEISMIC}$	25,469.8	553.7



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces						
	5.48	0.000				
Drag Load (lbs.)	Location (ft)	Splice Hardware				
8166.8	18.7	2-CMST14				
-161.9	49.0	Plate Splice OK				
5668.9	28.7	CMST12				
950.0	51.8	Plate Splice OK				
0.0	0.0					
0.0	0.0					

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	ads (lbs)
CS16	1670
2-CS16	2510
CMSTC16	4030
CMST14	5380
CMST12	7620
2-CMST14	10760



Sheet:	DRAG (D) LIVING
By:	11/18/24
Date:	8400.32
Δ:	2022 CBC

DRAG (D) LIVING LIVING Area ROOI GHO L	DRAG (D) LIVING	Living Area Roof Grid D
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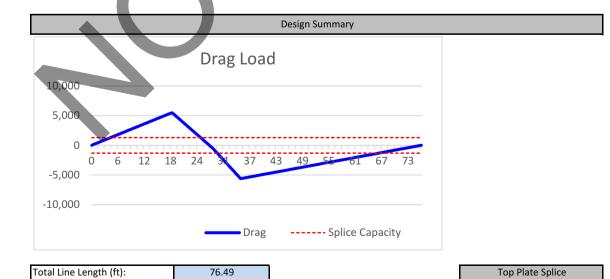
DIAPHRAGM LOADS									
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7		
V _{SEISMIC} , lbs:	6,629	5,182							
Start:	0.00	28.16							
Length:	28.16	48.33							
End:	28.16	76.49	0.00	0.00	0.00	0.00	0.00		

v _{SEISMIC} , plf:	235.40 107.22	0.00	0.00	0.00	0.00	1	0.00	
-----------------------------	---------------	------	------	------	------	---	------	--

			SHEAR WA	LL(s) below:			
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	18.67						
Length:	15.91						
End:	34.58	0.00	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	15.91

- 4			
	Shear Line	V,total	v,total
	Below	(lbs.)	(plf)
	V _{SEISMIC}	11,810.8	742.3



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces					
Drag Load (lbs.)	Location (ft)	Splice Hardware			
5491.8	18.7	CMST12			
-5611.7	34.6	CMST12			
-512.6	28.3	Plate Splice OK			
-3239.5	52.5	CMSTC16			
0.0	0.0				
0.0	0.0				

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	oads (lbs)
CS16	1670
2-CS16	2510
CMSTC16	4030
CMST14	5380
CMST12	7620
2-CMST14	10760



Sheet:	DRAG (4.5) LIVING
By:	11/18/24
Date:	8400.32
Δ:	2022 CBC

DRAG (4.5) LIVING Living Area Roof Grid 4.5

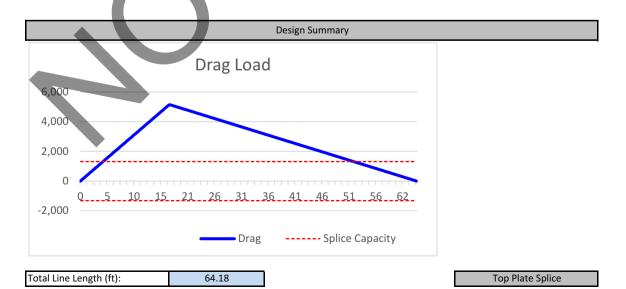
	DIAPHRAGM LOADS						
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	15,547						
Start:	0.00						
Length:	64.18						
End:	64.18	0.00	0.00	0.00	0.00	0.00	0.00
		2			2		

v _{SEISMIC} , plf: 242.23 0.00	0.00 0.00	0.00	0.00	0.00
---	-----------	------	------	------

			SHEAR WA	LL(s) below:			
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	17.00						
Length:	47.18						
End:	64.18	0.00	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	47.18

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V _{SEISMIC}	15,546.6	329.5



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces			
Drag Load (lbs.)	Location (ft)	Splice Hardware	
5130.4	16.9	CMST14	
0.0	64.2	Plate Splice OK	
0.0	0.0		
0.0	0.0		
0.0	0.0		

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Lo	ads (lbs)
CS16	1670
2-CS16	2510
CMSTC16	4030
CMST14	5380
CMST12	7620
2-CMST14	10760



Sheet:	DRAG (6) LIVING
Ву:	11/18/24
Date:	8400.32
Δ:	2022 CBC

DRAG (6) LIVING Living Area Roof Grid 6

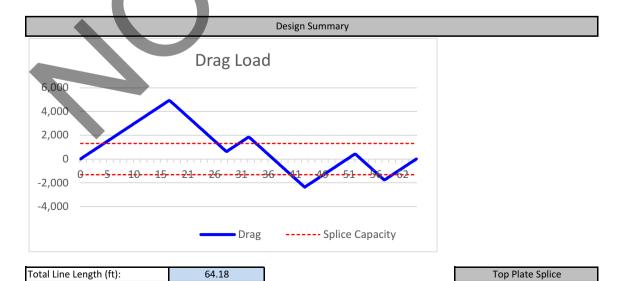
	DIAPHRAGM LOADS								
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7		
V _{SEISMIC} , lbs:	14,946								
Start:	0.00								
Length:	64.18								
End:	64.18	0.00	0.00	0.00	0.00	0.00	0.00		

v _{SEISMIC} , plf:	232.87	0.00	0.00	0.00	0.00	0.00	0.00

	SHEAR WALL(s) below:					
	Wall a	Wall b	Wall c	Wall d	Wall e W	/all f Wall g
Start:	17.00	32.18	52.50			
Length:	10.91	10.67	5.58			
End:	27.91	42.85	58.08	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	27.16

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
$V_{SEISMIC}$	14,945.6	550.3



Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces						
Drag Load (lbs.)	Location (ft)	Splice Hardware				
4932.1	16.9	CMST14				
-2364.2	42.9	2-CS16				
-2065.3	44.0	2-CS16				
0.0	0.0					
0.0	0.0					
0.0	0.0					

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Loads (lbs)					
CS16	1670				
2-CS16	2510				
CMSTC16	4030				
CMST14	5380				
CMST12	7620				
2-CMST14	10760				



Sheet:	DRAG (A.5) LIVING		
Ву:	11/18/24		
Date:	8400.32		
Δ:	2022 CBC		

DRAG (A.5) ELECTRICA Electrical Roof Grid A.5

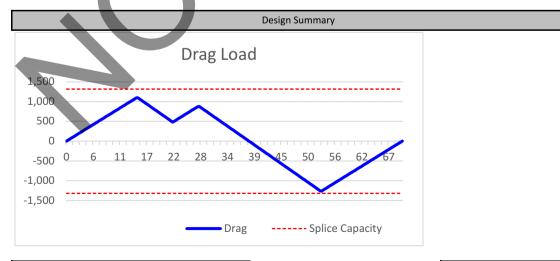
	DIAPHRAGM LOADS								
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7		
V _{SEISMIC} , lbs:	4,199								
Start:	0.00								
Length:	70.00								
End:	70.00	0.00	0.00	0.00	0.00	0.00	0.00		

v _{SEISMIC} , plf:	59.98	0.00	0.00	0.00	0.00	0.00	0.00

			SHEAR WA	LL(s) below:		
	Wall a	Wall b	Wall c	Wall d	Wall e Wall f	Wall g
Start:	14.75	27.57				
Length:	7.41	25.50				
End:	22.16	53.07	0.00	0.00	0.00 0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	32.91

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
$V_{SEISMIC}$	4,198.5	127.6



Total Line Length (ft): 70.00

Top Plate Splice

Load Case:	Seismic
Seismic Drag Factor	1.25

	Drag Forces				
Drag Load (lbs.)	Location (ft)	Splice Hardware			
1098.3	14.8	Plate Splice OK			
-1259.6	53.2	Plate Splice OK			
0.0	0.0				
0.0	0.0				
0.0	0.0				

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

_					
	Strap Loads (lbs)				
ſ	CS16	1670			
ľ	2-CS16	2510			
ľ	CMSTC16	4030			
ľ	CMST14	5380			
ľ	CMST12	7620			
Ī	2-CMST14	10760			



Sheet:	DRAG (A) APP
Ву:	11/18/24
Date:	8400.32
Δ:	2022 CBC

DRAG (A) ELECTRICAL Apparatus Roof Grid A

DIAPHRAGM LOADS							
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7
V _{SEISMIC} , lbs:	5,247						
Start:	0.00						
Length:	78.00						
End:	78.00	0.00	0.00	0.00	0.00	0.00	0.00

v _{SEISMIC} , plf: 67.27 0.00 0.00 0.00 0.00

			SHEAR WA	LL(s) below:			
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	28.50	52.83					
Length:	21.33	23.67					
End:	49.83	76.50	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	45.00

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
V _{SEISMIC}	5,246.8	116.6

Total Line Length (ft): 78.00

Top Plate Splice

Load Case:	Seismic
Seismic Drag Factor	1.25

Drag Forces					
Drag Load (lbs.)	Location (ft)	Splice Hardware			
2387.3	28.4	2-CS16			
-122.4	76.4	Plate Splice OK			
0.0	0.0				
0.0	0.0				
0.0	0.0				

Note: Seismic Drag Loads have been increased 25% per ASCE 12.3.3.4

No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Strap Loads (lbs)				
CS16	1670			
2-CS16	2510			
CMSTC16	4030			
CMST14	5380			
CMST12	7620			
2-CMST14	10760			

(Max) (Min)



BUILDING FOUNDATION DESIGN



Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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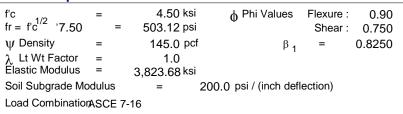
DESCRIPTION: GRADE BEAM AT APPARATUS ALONG GL-2&7 - Revised

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

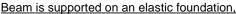
Load Combinations Used: ASCE 7-16

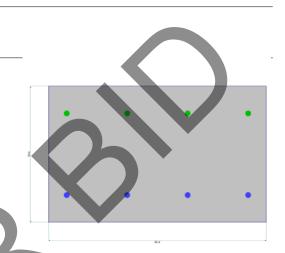
Material Properties



fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Stirrups E - Main Rebar 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # 3

Number of Resisting Legs Per Stirrup 2







Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 15.0 in Span #1 Reinforcing....

4-#5 at 3.0 in from Bottom, from 0.0 to 12.0 ft in this span

4-#5 at 3.0 in from Top, from 0.0 to 12.0 ft in this span Service loads entered. Load Factors will be applied for calculations.

Design OK

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 3.50 ft, (Main Sloped Roof (R1)) Uniform Load : D = 0.0150 ksf, Tributary Width = 23.125 ft, (Exterior Wall (W1))

Point Load : W = 5.50, E = 10.150 k @ 2.0 ft Point Load : W = 5.50, E = 10.150 k @ 8.170 ft

DESIGN SUMMARY

DESIGN SUMMANT			Design Oil
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.259: 1 Typical Section -19.088 k-ft 73.792 k-ft +1.520D-2.50E 8.188 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.043 in 0.006 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.232 ksf 2.660 ksf	at 0.00 ft LdComb: +D+0.70E OK	

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionlcr - Top Tension
Section 1 4- #5 @ d=12",4- #5 @ d=3",	73.79 73.79	6,750.00 971.62 971.62

Shear Stirrup Requirements

Beam on Elastic Foundation

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Structure.ec6

DESCRIPTION: GRADE BEAM AT APPARATUS ALONG GL-2&7 - Revised

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Enve	elope	· ·				
Span # 1	1	11.859	-0.02	73.79	0.00	
+1.40D						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+0.50Lr						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+1.60Lr						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+1.60Lr+0.50W						
Span # 1	1	8.188	2.07	73.79	0.03	
+1.20D+1.60Lr-0.50W						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+0.50W		0.400	0.07	70.70	0.00	
Span # 1	1	8.188	2.07	73.79	0.03	· ·
+1.20D-0.50W	4	44.050	0.00	70.70	0.00	
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+0.50Lr+W Span # 1	1	8.188	4.14	73.79	0.06	
+1.20D+0.50Lr-W	'	0.100	4.14	13.19	0.00	
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.20D+W	'	11.000	0.00	75.75	0.00	
Span # 1	1	8.188	4.14	73.79	0.06	
+1.20D-W	•	0.100		10.70	0.00	
Span # 1	1	11.859	-0.00	73.79	0.00	
+0.90D+W	•					
Span # 1	1	8.188	4.14	73.79	0.06	
+0.90D-W						
Span # 1	1	11.859	-0.00	73.79	0.00	
+1.520D+2.50E						
Span # 1	1	8.188	19.09	73.79	0.26	
+1.520D-2.50E						
Span # 1	1	11.859	-0.02	73.79	0.00	
+0.580D+2.50E				•		
Span # 1	1	8.188	19.09	73.79	0.26	
+0.580D-2.50E		~ ~				
Span # 1	1	11.859	-0.02	73.79	0.00	
Overall Maximum [Deflection	ons - Unfa	ctored Lo			
Load Combination	7		ax. "-" Defl Loca	ation in Span	Load Combination	on Max. "+" Defl Location in Spa

Load Combination	Span	Max. "-" Defi	Location in Span	Load Combination	Max. "+" Defi	Location in Span
Span 1	1	0.0428	0.000		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

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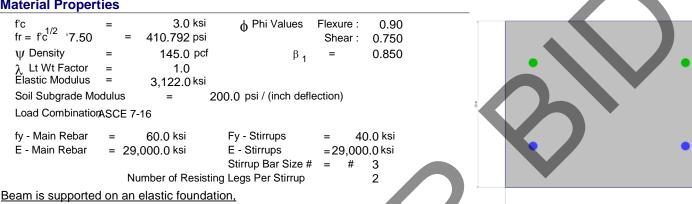
DESCRIPTION: FOOTING ALONG GL-5/5.5 WITH SHEAR WALL 5/5.5

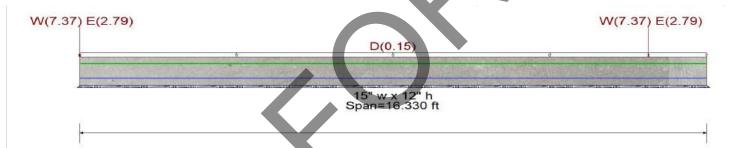
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties





Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 16.330 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 16.330 ft in this spa Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 10.0 ft, (WALL)

Point Load: W = 7.370, E = 2.790 k @ 14.830 ft Point Load: W = 7.370, E = 2.790 k @ 0.0 ft

DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.435: 1 Typical Section -11.825 k-ft 27.188 k-ft +1.20D+W 4.227 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.061 in 0.005 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.748 ksf 2.660 ksf	at 0.00 ft LdComb: +D+0.60W OK	

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionlicr - Top Tension
Section 1 2- #5 @ d=9",2- #5 @ d=3",	27.19 27.19	2,160.00 322.00 322.00

Shear Stirrup Requirements

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-5/5.5 WITH SHEAR WALL 5/5.5

Shear Stirrup Requirements

LIC#: KW-06014215, Build:20.24.10.03

Between 0.38 to 15.95 ft, Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ults (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	elope					
Span # 1	[.] 1	14.793	2.02	27.19	0.07	
+1.40D						
Span # 1	1	16.138	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	16.138	-0.00	27.19	0.00	
+1.20D+0.50W						
Span # 1	1	14.793	1.01	27.19	0.04	
+1.20D+W						
Span # 1	1	14.793	2.02	27.19	0.07	
+0.90D+W						
Span # 1	1	14.793	2.02	27.19	0.07	
+1.20D+E						
Span # 1	1	14.793	0.76	27.19	0.03	
+0.90D+E						
Span # 1	1	14.793	0.76	27.19	0.03	

Load Combination	Span	Max. "-" Defl Loca	ation in Span	Load Combination	Max. "+" Defl Locat	ion in Span
Span 1	1	0.0607	0.000		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

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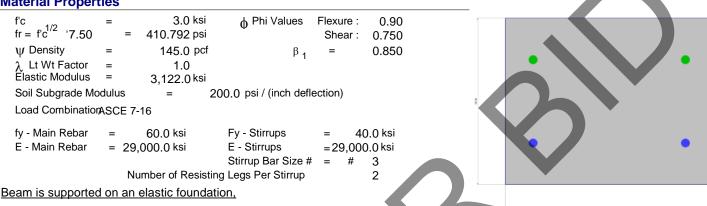
DESCRIPTION: FOOTING ALONG GL-6.5 WITH SHEAR WALL 6.5

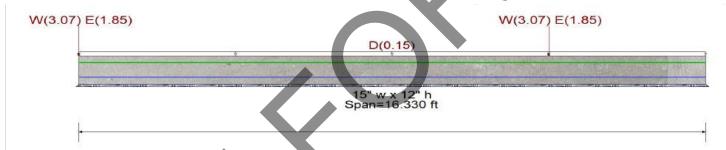
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties





Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 16.330 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 16.330 ft in this spa Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 10.0 ft, (WALL)

Point Load: W = 3.070, E = 1.850 k @ 12.250 ft Point Load: W = 3.070, E = 1.850 k @ 0.0 ft

DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.180: 1 Typical Section -4.897 k-ft 27.188 k-ft +1.20D+W 3.842 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.030 in 0.005 in
Maximum Soil Pressure = Allowable Soil Pressure =	0.868 ksf 2.660 ksf	at 0.00 ft LdComb: +D+0.60W OK	

Cross Section Strength & Inertia

		Phi*M	ln (k-ft)	Mor	nent of Inertia	(in^4)
Cross Section I	Bar Layout Description	Btm Tension	Top Tension	I gross Icr	- Btm Tensiorlic	r - Top Tension
Section 1	2- #5 @ d=9",2- #5 @ d=3",	27.19	27.19	2,160.00	322.00	322.00

Shear Stirrup Requirements

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Beam on Elastic Foundation

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-6.5 WITH SHEAR WALL 6.5

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Enve	elope					
Span # 1	· 1	12.296	2.56	27.19	0.09	
+1.40D						
Span # 1	1	16.138	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	16.138	-0.00	27.19	0.00	
+1.20D+0.50W						
Span # 1	1	12.296	1.28	27.19	0.05	
+1.20D+W						
Span # 1	1	12.296	2.56	27.19	0.09	
+0.90D+W						
Span # 1	1	12.296	2.56	27.19	0.09	
+1.20D+E						
Span # 1	1	12.296	1.54	27.19	0.06	
+0.90D+E						
Span # 1	1	12.296	1.54	27.19	0.06	

Load Combination	Span	Max. "-" Defl Loca	ation in Span	Load Co	mbination	Max. "+" Defl Loca	ition in Span
Span 1	1	0.0301	0.000			0.0000	0.000

Beam on Elastic Foundation

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Structure.ec6

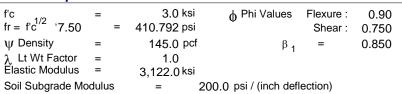
DESCRIPTION: FOOTING ALONG GL-6 WITH SHEAR WALL 6

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties

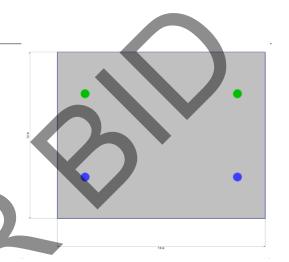


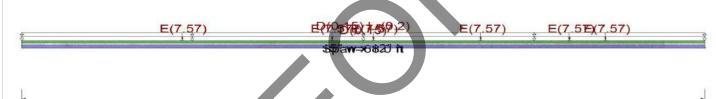
Load CombinationASCE 7-16

fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Stirrups E - Main Rebar = 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # # 3 2

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,





Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 68.0 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 68.0 ft in this span Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 10.0 ft, (ROOF) Point Load: E = 7.570 k @ 16.0 ft Point Load: E = 7.570 k @ 30.910 ft Point Load: E = 7.570 k @ 35.0 ft Point Load: E = 7.570 k @ 45.670 ft Point Load: E = 7.570 k @ 54.50 ft Point Load: E = 7.570 k @ 58.080 ft

DECI	CAI	CHIMALADY
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DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.306: 1 Typical Section 8.324 k-ft 27.188 k-ft +0.90D+E 16.000 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.042 in 0.003 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.206 ksf 2.660 ksf	at 56.67 ft LdComb: +D+0.70E OK	

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-6 WITH SHEAR WALL 6

Cross Section Strength & Inertia

LIC#: KW-06014215, Build:20.24.10.03

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensioner - Top Tension
Section 1 2- #5 @ d=9",2- #5 @ d=3",	27.19 27.19	2,160.00 322.00 322.00

Shear Stirrup Requirements

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Enve	elope					
Span # 1	[.] 1	16.000	8.32	27.19	0.31	
+1.40D						
Span # 1	1	67.200	-0.00	27.19	0.00	
+1.20D+0.50Lr						
Span # 1	1	67.200	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	67.200	-0.00	27.19	0.00	
+1.20D+1.60Lr						
Span # 1	1	67.200	-0.00	27.19	0.00	
+0.90D						
Span # 1	1	67.200	-0.00	27.19	0.00	
+1.20D+E						
Span # 1	1	16.000	8.32	27.19	0.31	
+0.90D+E						
Span # 1	1	16.000	8.32	27.19	0.31	▼

Load Combination	Span	Max. "-" Defl Loc	cation in Span [Load Combination	Max. "+" Defl Location	
Span 1	1	0.0419	56 667		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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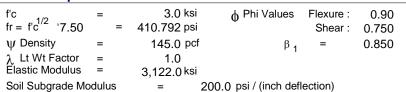
DESCRIPTION: FOOTING ALONG GL-A.5 WITH SHEAR WALL A.5

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties

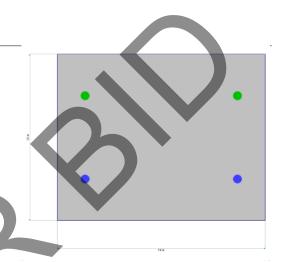


Load CombinationASCE 7-16

fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Main Rebar E - Stirrups = 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # 3

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,



E(2.236) E(-2.236) E(2.236) D(0.

2

Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 78.0 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 78.0 ft in this span Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 18.0 ft, (WALL)

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 7.50 ft, (ROOF)

Point Load : E = 2.236 k @ 29.0 ftPoint Load : E = -2.236 k @ 54.50 ftPoint Load: E = 2.236 k @ 15.670 ft Point Load: E = -2.236 k @ 22.410 ft

DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.118: 1 Typical Section -3.216 k-ft 27.188 k-ft +1.20D+E 22.024 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.020 in 0.005 in
Maximum Soil Pressure = Allowable Soil Pressure =	0.574 ksf 2.660 ksf	at 70.20 ft LdComb: +D+Lr OK	

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionhcr - Top Tension
Section 1 2- #5 @ d=9",2- #5 @ d=3",	27.19 27.19	2,160.00 322.00 322.00

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-A.5 WITH SHEAR WALL A.5

Shear Stirrup Requirements

LIC#: KW-06014215, Build:20.24.10.03

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	elope					
Span # 1	[.] 1	29.365	2.48	27.19	0.09	
+1.40D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+0.50Lr						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+1.60Lr						
Span # 1	1	77.082	-0.00	27.19	0.00	
+0.90D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+E						
Span # 1	1	29.365	2.47	27.19	0.09	
+0.90D+E						
Span # 1	1	29.365	2.48	27.19	0.09	

Load Combination	Span	Max. "-" Defl Lo	cation in Span	Load Combination	Max. "+" Defl Locat	ion in Span
Span 1	1	0.0199	70.200		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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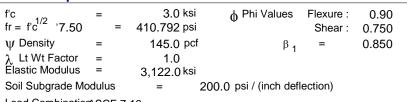
DESCRIPTION: FOOTING ALONG GL-A WITH SHEAR WALL A

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties

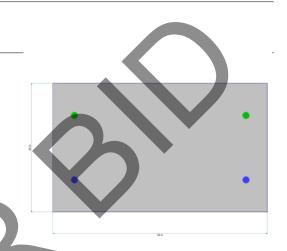


Load CombinationASCE 7-16

fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Main Rebar E - Stirrups = 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # 3

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,





2

Cross Section & Reinforcing Details

Rectangular Section, Width = 20.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 78.830 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 78.830 ft in this spa Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 18.0 ft, (WALL)

Uniform Load: D = 0.0150, Lr = 0.020 ksf, Tributary Width = 32.50 ft, (ROOF)

Point Load: E = 12.560 k @ 29.670 ft Point Load: E = 12.565 k @ 78.0 ft Point Load: E = 12.560 k @ 51.0 ft Point Load: E = 12.560 k @ 54.330 ft

DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.503: 1 Typical Section 14.781 k-ft 29.410 k-ft +0.90D+E 51.008 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.084 in 0.005 in
Maximum Soil Pressure = Allowable Soil Pressure =	2.414 ksf 2.660 ksf	at 78.83 ft LdComb: +D+0.70E OK	

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionlicr - Top Tension
Section 1 2- #5 @ d=9",2- #5 @ d=3",	29.41 29.41	2,880.00 340.60 340.60

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-A WITH SHEAR WALL A

Shear Stirrup Requirements

LIC#: KW-06014215, Build:20.24.10.03

Between 0.00 to 76.98 ft, Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Enve	elope					
Span # 1	[.] 1	51.008	14.78	29.41	0.50	
+1.40D						
Span # 1	1	77.903	-0.00	29.41	0.00	
+1.20D+0.50Lr						
Span # 1	1	77.903	-0.00	29.41	0.00	
+1.20D						
Span # 1	1	77.903	-0.00	29.41	0.00	
+1.20D+1.60Lr						
Span # 1	1	77.903	-0.01	29.41	0.00	
+0.90D						
Span # 1	1	77.903	-0.00	29.41	0.00	
+1.20D+E						
Span # 1	1	51.008	14.76	29.41	0.50	
+0.90D+E						
Span # 1	1	51.008	14.78	29.41	0.50	

Load Combination	Span	Max. "-" Defl Lo	cation in Span	Load Combination	Max. "+" Defl Locat	ion in Span
Span 1	1	0.0838	78.830		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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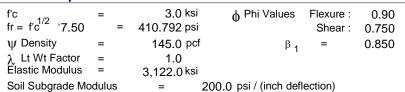
DESCRIPTION: FOOTING ALONG GL-C WITH SHEAR WALL C

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

Material Properties

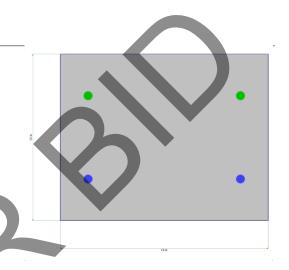


Load CombinationASCE 7-16

fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Main Rebar E - Stirrups = 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # # 3

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,





2

Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 78.0 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 78.0 ft in this span Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 18.0 ft, (WALL)

Uniform Load: D=0.0150 ksi, Tributary Width = 18.0 ft, (WALL) Uniform Load: D=0.0150, Lr=0.020 ksf, Tributary Width = 1.0 ft, (ROOF) Point Load: E=11.964 k @ 48.920 ft Point Load: E=11.964 k @ 60.50 ftPoint Load: E = 11.964 k @ 75.0 ft

DESIGN SUIVINARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.430: 1 Typical Section 11.699 k-ft 27.188 k-ft +0.90D+E 18.353 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.052 in 0.005 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.493 ksf 2.660 ksf	at 78.00 ft LdComb: +D+0.70E OK	

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)		
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionlicr - Top Tension		
Section 1 2- #5 @ d=9",2- #5 @ d=3",	27.19 27.19	2,160.00 322.00 322.00		

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-C WITH SHEAR WALL C

Shear Stirrup Requirements

LIC#: KW-06014215, Build:20.24.10.03

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ults (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	elope					
Span # 1	[.] 1	18.353	11.70	27.19	0.43	
+1.40D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+0.50Lr						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+1.60Lr						
Span # 1	1	77.082	-0.00	27.19	0.00	
+0.90D						
Span # 1	1	77.082	-0.00	27.19	0.00	
+1.20D+E						
Span # 1	1	18.353	11.69	27.19	0.43	
+0.90D+E						
Span # 1	1	18.353	11.70	27.19	0.43	

Load Combination	Span	Max. "-" Defl Loc	cation in Span	Load Combination	Max. "+" Defl Locat	ion in Span
Span 1	1	0.0518	78.000		0.0000	0.000

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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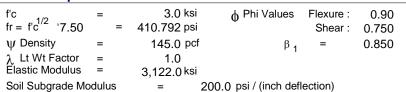
DESCRIPTION: FOOTING ALONG GL-D WITH SHEAR WALL D

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: ASCE 7-16

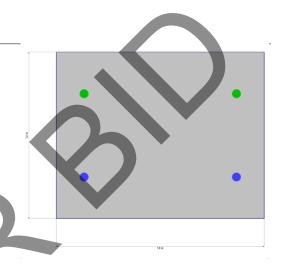
Material Properties



Load CombinationASCE 7-16

fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Stirrups E - Main Rebar = 29,000.0 ksi $=29,000.0 \, \text{ksi}$ Stirrup Bar Size # 3 2

Number of Resisting Legs Per Stirrup



Beam is supported on an elastic foundation,



Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 63.670 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 63.670 ft in this spa Service loads entered. Load Factors will be applied for calculations.

Design OK

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0150, Lr = 0.020 ksf, Tributary Width = 1.0 ft, (ROOF) Point Load : E = 14.872 k @ 31.670 ft Point Load : E = 14.872 k @ 47.580 ft

DESIGN SUMMARY

DESIGN SUMMANT			Design Oil
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.555: 1 Typical Section 15.086 k-ft 27.188 k-ft +0.90D+E 31.460 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.039 in 0.004 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.134 ksf 2.660 ksf	at 47.40 ft LdComb: +D+0.70E OK	

Cross Section Strength & Inertia

	_	Phi*Mn (k-ft)			Moment of Inertia (in^4)		
Cross Section Bar Layout Description	E	Stm Tension	Top Tension	I gross Icr	- Btm Tensiorho	r - Top Tension	
Section 1 2- #5 @ d=9",2- #5 @ d=	3",	27.19	27.19	2,160.00	322.00	322.00	

Shear Stirrup Requirements

Beam on Elastic Foundation

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Structure.ec6

DESCRIPTION: FOOTING ALONG GL-D WITH SHEAR WALL D

Shear Stirrup Requirements

LIC#: KW-06014215, Build:20.24.10.03

Between 30.71 to 31.46 ft, PhiVc/2 < Vu <= PhiVc, Req'd Vs = Min 9.6.3.1, use stirrups spaced at 4.500 in Between 32.21 to 45.69 ft, Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in Between 46.44 to 47.19 ft, PhiVc/2 < Vu <= PhiVc, Req'd Vs = Min 9.6.3.1, use stirrups spaced at 0.000 in Between 47.94 to 62.17 ft, Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Enve	elope					
Span # 1	1	31.460	15.09	27.19	0.55	
+1.40D						
Span # 1	1	62.921	-0.00	27.19	0.00	
+1.20D+0.50Lr						
Span # 1	1	62.921	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	62.921	-0.00	27.19	0.00	
+1.20D+1.60Lr						
Span # 1	1	62.921	-0.00	27.19	0.00	
+0.90D						
Span # 1	1	62.921	-0.00	27.19	0.00	
+1.20D+E						
Span # 1	1	31.460	15.08	27.19	0.55	
+0.90D+E				a= .a		
Span # 1	1	31.460	15.09	27.19	0.55	

Load Combination	Span	Max. "-" Defl Location in Span	Load Combination	Max. "+" Defl Location in Span	
Span 1	1	0.0394 47.399		0.0000 0.000	_

Beam on Elastic Foundation

Project File: 8400.32 - Structure.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

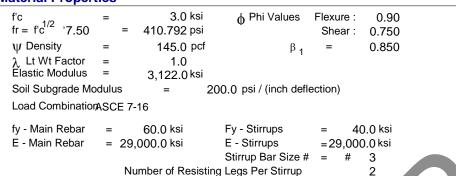
DESCRIPTION: FOOTING ALONG GL-E WITH SHEAR WALL E

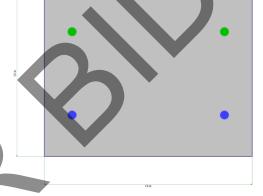
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

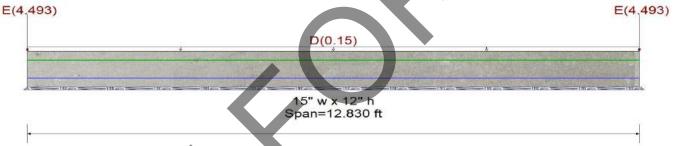
Load Combinations Used: ASCE 7-16

Material Properties





Beam is supported on an elastic foundation,



Cross Section & Reinforcing Details

Rectangular Section, Width = 15.0 in, Height = 12.0 in Span #1 Reinforcing....

2-#5 at 3.0 in from Bottom, from 0.0 to 12.830 ft in this span

2-#5 at 3.0 in from Top, from 0.0 to 12.830 ft in this spa Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0150 ksf, Tributary Width = 10.0 ft, (WALL)

Point Load: E = 4.493 k @ 0.0 ft Point Load: E = 4.493 k @ 12.830 ft

DESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio = Section used for this span Mu : Applied Mn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs	0.237: 1 Typical Section -6.456 k-ft 27.188 k-ft +1.20D+E 3.472 ft Span # 1	Maximum Deflection Max Downward L+Lr+S Deflection Max Upward L+Lr+S Deflection Max Downward Total Deflection Max Upward Total Deflection	0.000 in 0.000 in 0.048 in 0.002 in
Maximum Soil Pressure = Allowable Soil Pressure =	1.381 ksf 2.660 ksf	at 0.00 ft LdComb: +D+0.70E OK	

Cross Section Strength & Inertia

		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
Cross Section I	Bar Layout Description	Btm Tension	Top Tension	I gross Icr	- Btm Tensiorlic	r - Top Tension
Section 1	2- #5 @ d=9",2- #5 @ d=3",	27.19	27.19	2,160.00	322.00	322.00

Shear Stirrup Requirements

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Beam on Elastic Foundation

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Structure.ec6

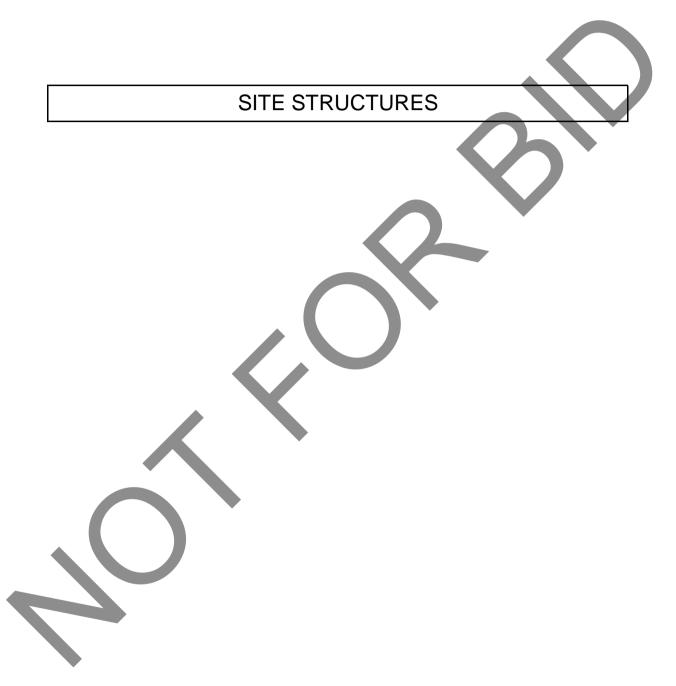
DESCRIPTION: FOOTING ALONG GL-E WITH SHEAR WALL E

Load Combination		Location (ft)	3ending Stress Results (k-ft		ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	velope					
Span # 1	1	12.679	-0.00	27.19	0.00	
+1.40D						
Span # 1	1	12.679	-0.00	27.19	0.00	
+1.20D						
Span # 1	1	12.679	-0.00	27.19	0.00	
+0.90D						
Span # 1	1	12.679	-0.00	27.19	0.00	
+1.20D+E						
Span # 1	1	12.679	-0.00	27.19	0.00	
+0.90D+E						
Span # 1	1	12.679	-0.00	27.19	0.00	

Load Combination	Span	Max. "-" Defl Loca	ation in Span	Load Combination	Max. "+" Defl Loc	ation in Span
Span 1	1	0.0479	0.000		0.0000	0.000









STRUCTURAL CALCULATIONS - TABLE OF CONTENTS

Project: SBC Fire Station 227

Description	Page Number
Site Structures	202
Site Structure Design Criteria	204
Site Retaining Masonry Walls	216
Storage Building	240
Trash Enclosure	271
Fuel Generator/Tank Canopy	314
Free-standing CMU Wall	335



Project: San Bernardino County, Fire Station 227 - Site Structures

Project Manager Sandy Fong
Engineer: Valeria Gallardo

General

Governing Building Code(s):

Building Risk Category:

Construction Fire Resistance Type:

2022 California Building Code, ASCE 7-16

Type V-B

(CBC Table 1604.5) (CBC Chapter 6)

Building Description:

Project site structures include a storage building, trash enclosure, and fuel tank/generator canopy. The storage building is conventional solid-sawn roof, wood stud wall, and slab on grade construction. The trash enclousre has a metal deck roof supported by steel framing enclosed by CMU wall on a conventional slab on grade foundation with continuous wall footings. The fuel tank/generator canopy has a similar metal roof deck assembly supported on steel ordinary moment frames on a conventional slab on grade foundation.

Building System:

Roof Shape Roof Framing System Roof Diaphragm System Floor Framing System Floor Diaphragm System Wall Framing System

Build Method

Storage Bldg	Fuel Canopy
Monoslope	Flat
Wood Rafter	Other
Wood Sheathed	N/A
N/A	N/A
N/A	N/A
Wood Stud	N/A
Site Built	Pre-Fabricated

Foundation System:

Slab on Grade
Footings/Grade Beams
Curbs/Stemwalls
Deep Foundation Members

Conventiona	al Rebar	N/A
Conventiona	al Rebar	N/A
N/A		Concrete
N/A		Drilled Piers



Masonry

Building System:	Trash Enclosure
Roof Shape	Monoslope
Roof Framing System	Other
Roof Diaphragm System	Metal Deck
Floor Framing System	N/A
Floor Diaphragm System	N/A

Wall Framing System **Build Method** Site Built

Foundation System:

Slab on Grade	Conventional Rebar
Footings/Grade Beams	Conventional Rebar
Curbs/Stemwalls	Concrete
Deep Foundation Members	Drilled Piers

Design Live Loads (CBC Table 1607.1)

Roofs:

20 Uniform load:

Reducible? Yes (CBC 1607.13.2.1)

Deflection Criteria (CBC, Table 1604.3)

E, S, W D+L L/ 360 L/ 360 L/ 240 Roof: L/ 600 Floor: L/ 240

L/ 360 Exterior Walls: Interior Walls: L/ 240

Load Combinations (CBC, Section 1605)

Strength Design or Load and Resistance Factor Design (LRFD) (CBC, Section 1605.2)

Alternate ASD Load Combinations (CBC, Section 1605.3.2)



Seismic Design Criteria

(ASCE 7-16, Chapter 11 & 12)

Golomia Boolgin Gillona			(71002 1 10) Onaptor 11 a 12)
Site Factors:			
Spectral acceleration for short	period buildings (S _s):	2.505	g
Spectral acceleration for 1-sec	1.002	g	
Soil Site Class:		D	
Seismic Importance Factor, St Enclosure: (I_E)	1.00		
Seismic Importance Factor, For Canopy: (I_E)	uel Tank/Generator	1.50	SO,
Effective Seismic Weight:	Dead		(ASCE 12.7.2)

Narrative of Design to resist Seismic Loads:

Wood framed, storage building with wood sheathed shear walls and a wood sheathed flexible diaphragm. Trash enclosure with combined reinforced masonry shear walls and steel ordinary moment frame system supporting a metal deck, flexible diaphragm. Fuel tank/generator canopy with steel ordinary moment frame system supporting a metal deck, flexible diaphragm.

Lateral Resisting System Parameters:

(ASCE Table 12.2-1, Table 12.12-1)

Description	R	Ωο	Cd	Allowable Drift, Δa
Light Framed Wood Sheathed Shear Walls	6.5	2.5	4.0	0.025h
Steel Ordinary Moment Frames	3.5	2.5	3.0	0.025h
Special Reinforced Masonry Shear Walls	5.0	2.0	3.5	0.025h

Redundancy Factor, p: 1.30 With exceptions per ASCE 12.3.4

Seismic Analysis Procedure: Equivalent Lateral Force Procedure, Section 12.8 (ASCE Table 12.6-1)

Structural Irregularities:

Horizontal Structural Irregularities:

(ASCE Table 12.3-1)

	Туре	Description	Location
	Type 1a	Torsional Irregularity	
	Type 1b	Extreme Torsional Irregularity	
	Type 2	Reentrant Corner Irregularity	
	Туре 3	Diaphragm Discontinuity Irregularity	
	Type 4	Out-of-Plane Offset Irregularity	
	Type 5	Nonparallel System Irregularity	



 Туре	Description	Location	(ASCE Table 12.3-2)
Type 1a	Stiffness-Soft Story Irregularity		
Type 1b	Stiffness-Extreme Soft Story Irregularity		
Type 2	Weight (Mass) Irregularity		
Type 3	Vertical Geometry Irregularity		
Type 4	In-Plane Discontinuity VLFR Element		
Type 5a	Discontinuity in Lateral - Weak Story		
Type 5b	Discont. in Lat Extreme Weak Story		

Wind Design Criteria

ASCE 7-16, Chapter 26)

Basic Wind Speed: 125 mph (3s Gust) (ASCE 26.5)

Special Wind Region Yes Source: ASCE 7 Hazard Tool/ Technical Bulletion IB-0003

Surface Roughness Category: C (ASCE 26.7.2)

Exposure Category: C (ASCE 26.7.3)

Enclosure Classification Enclosed (ASCE 26.12)

Design procedure for Main Wind Force Resisting System (MWFRS):

Directional Procedure, Ch. 27

Design procedure for Component & Cladding Wind Loads (C&C):

Component & Cladding, Ch. 30





Conventional slab on grade with Shallow grade beam footings

Geotechnical Design Criteria & Foundation Type

Geotechnical Report:

Prepared by: Inland Foundation Engineering, Inc.

Report Number: S168-193

Date: September 6, 2024

Expansive Soil: Non-expansive

Static Settlement: <1"

Liquefaction Settlemnt: Not significant

Seismic Hazards: None

Corrosive Soil: Not corrosive

Trash Enclosure and Storage Building

Foundation Type:

Fuel Canopy Foundation Type:

Drilled pier footings



PROJECT DEAD LOAD ANALYSIS

ROOF TYPES

			1 1		-	_	
R1	Main Sloped Roof, Storage Building:			R2	Main Sloped Roof, Trash Enclosure/Fuel Ca	nopy:	`
	Standing Seam Metal Roof:	2.0	psf		Standing Seam Metal Roof:	2.0	psf
	15/32" Sheathing:	2.5	psf		Rigid Insulation:	1.5	psf
	Roof Framing (2x Rafters at X" o.c.):	3.5	psf		HSB 36-SS Metal Deck, 20 gage:	3.0	psf
	Insulation (Batt):	0.5	psf		Misc/Mech/Elec/Plumbing:	0.5	psf
	(1) Layer 5/8" Drywall at Ceiling:	3.5	psf		-	0.0	psf
	Misc/Mech/Elec/Plumbing:	1.0	psf		-	0.0	psf
	Ceiling Framing:	0.0	psf		-	0.0	psf
	Total Dead Load =	13.0	psf		Total Dead Load =	7.0	psf

WALL TYPES

_		_					_
I	W1	2x6 Wood Stud Exterior Wall, Storage B	Building	W2	8" CMU Block Wall, Trash Enclosure		
		7/8" Plaster/Stucco	8.0	psf	8" CMU Block Wall	84.0	psf
		15/32" Sheathing:	1.5	psf	x	0.0	psf
		Wall Framing (2x6 at 16" o.c.):	1.5	psf	×	0.0	psf
		Insulation (Batt):	0.5	psf	x	0.0	psf
		(1) Layer 5/8" Drywall:	3.0	psf	x	0.0	psf
		Mech/Elec/Plumbing:	0.5	psf	Total Dead Load =	84.0	psf
		Total Dead Load =	15.0	psf			•'



Project: San Bernardino County, Fire Station 227 - Site Structures

Project Manager Sandy Fong
Engineer: Valeria Gallardo

General

Governing Building Code(s):

Building Risk Category:

Construction Fire Resistance Type:

2022 California Building Code, ASCE 7-16

Type V-B

(CBC Table 1604.5) (CBC Chapter 6)

Building Description:

Project site structures include a storage building, trash enclosure, and fuel tank/generator canopy. The storage building is conventional solid-sawn roof, wood stud wall, and slab on grade construction. The trash enclousre has a metal deck roof supported by steel framing enclosed by CMU wall on a conventional slab on grade foundation with continuous wall footings. The fuel tank/generator canopy has a similar metal roof deck assembly supported on steel ordinary moment frames on a conventional slab on grade foundation.

Building System:

Roof Shape Roof Framing System Roof Diaphragm System Floor Framing System Floor Diaphragm System Wall Framing System

Build Method

Storage Bldg	Fuel Canopy
Monoslope	Flat
Wood Rafter	Other
Wood Sheathed	N/A
N/A	N/A
N/A	N/A
Wood Stud	N/A
Site Built	Pre-Fabricated

Foundation System:

Slab on Grade
Footings/Grade Beams
Curbs/Stemwalls
Deep Foundation Members

Conventiona	al Rebar	N/A
Conventiona	al Rebar	N/A
N/A		Concrete
N/A		Drilled Piers



Site Built

Building System:	Trash Enclosure
Roof Shape	Monoslope
Roof Framing System	Other
Roof Diaphragm System	Metal Deck
Floor Framing System	N/A
Floor Diaphragm System	N/A
Wall Framing System	Masonry

Build Method

Foundation System:

Slab on Grade	Conventional Rebar
Footings/Grade Beams	Conventional Rebar
Curbs/Stemwalls	Concrete
Deep Foundation Members	Drilled Piers

Design Live Loads

(CBC Table 1607.1)

Roofs:

Uniform load: 20 psf

Reducible? Yes (CBC 1607.13.2.1)

Deflection Criteria

Load Combinations

(CBC, Table 1604.3)

	L	E, S, W	D+L
Roof:	L/ 360	L/ 360	L/ 240
Floor:	L/ 600		L/ 240
Exterior Walls:		L/ 360	
Interior Walls:	L/ 240		

(CBC, Section 1605)

Strength Design or Load and Resistance Factor Design (LRFD)

(CBC, Section 1605.2)

Alternate ASD Load Combinations

(CBC, Section 1605.3.2)



Seismic Design Criteria

(ASCE 7-16, Chapter 11 & 12)

	, , , , , , , , , , , , , , , , , , , ,
Site Factors:	
Spectral acceleration for short period buildings (S _s):	2.505 g
Spectral acceleration for 1-sec period buildings (S_1) :	1.002 g
Soil Site Class:	D
Seismic Importance Factor, Storage Building & Trash Enclosure: (I_{E})	1.00
Seismic Importance Factor, Fuel Tank/Generator Canopy: $(I_{\rm E})$	1.50
Effective Seismic Weight: Dead	(ASCE 12.7.

Narrative of Design to resist Seismic Loads:

Wood framed, storage building with wood sheathed shear walls and a wood sheathed flexible diaphragm. Trash enclosure with combined reinforced masonry shear walls and steel ordinary moment frame system supporting a metal deck, flexible diaphragm. Fuel tank/generator canopy with steel ordinary moment frame system supporting a metal deck, flexible diaphragm.

Lateral Resisting System Parameters:

(ASCE Table 12.2-1, Table 12.12-1)

Description	R	Ωο	Cd	Allowable Drift, Δa
Light Framed Wood Sheathed Shear Walls	6.5	2.5	4.0	0.025h
Steel Ordinary Moment Frames	3.5	2.5	3.0	0.025h
Special Reinforced Masonry Shear Walls	5.0	2.0	3.5	0.025h

Redundancy Factor, ρ: 1.30 With exceptions per ASCE 12.3.4

Seismic Analysis Procedure: Equivalent Lateral Force Procedure, Section 12.8

(ASCE Table 12.6-1)

Structural Irregularities:

Horizontal Structural Irregularities:

(ASCE Table 12.3-1)

	Туре	Description	Location
	Type 1a	Torsional Irregularity	
	Type 1b	Extreme Torsional Irregularity	
	Type 2	Reentrant Corner Irregularity	
	Туре 3	Diaphragm Discontinuity Irregularity	
	Type 4	Out-of-Plane Offset Irregularity	
	Type 5	Nonparallel System Irregularity	



	Туре	Description	Location	(ASCE Table 12.3-2)
	Type 1a	Stiffness-Soft Story Irregularity		
	Type 1b	Stiffness-Extreme Soft Story Irregularity		
	Type 2	Weight (Mass) Irregularity		
	Туре 3	Vertical Geometry Irregularity		
	Type 4	In-Plane Discontinuity VLFR Element		
	Туре 5а	Discontinuity in Lateral - Weak Story		
	Type 5b	Discont. in Lat Extreme Weak Story		

Wind Design Criteria

(ASCE 7-16, Chapter 26)

Basic Wind Speed: 125 mph (3s Gust) (ASCE 26.5)

Special Wind Region Yes Source: ASCE 7 Hazard Tool/ Technical Bulletion IB-0003

Surface Roughness Category: C (ASCE 26.7.2)

Exposure Category: C (ASCE 26.7.3)

Enclosure Classification Enclosed (ASCE 26.12)

Design procedure for Main Wind Force Resisting System (MWFRS):

Directional Procedure, Ch. 27

Design procedure for Component & Cladding Wind Loads (C&C):

Component & Cladding, Ch. 30



Conventional slab on grade with Shallow grade beam footings

Geotechnical Design Criteria & Foundation Type

Geotechnical Report:

Prepared by: Inland Foundation Engineering, Inc.

Report Number: S168-193

Date: September 6, 2024

Expansive Soil: Non-expansive

Static Settlement: <1"

Liquefaction Settlemnt: Not significant

Seismic Hazards: None

Corrosive Soil: Not corrosive

Trash Enclosure and Storage Building

Foundation Type:

Fuel Canopy Foundation Type:

Drilled pier footings



PROJECT DEAD LOAD ANALYSIS

ROOF TYPES

R1	Main Sloped Roof, Storage Building:			R2	Main Sloped Roof, Trash Enclosure/Fuel Ca	nopy:]
	Standing Seam Metal Roof: 2.0 p				Standing Seam Metal Roof:	2.0	psf
	15/32" Sheathing:	2.5	psf		Rigid Insulation:	1.5	psf
	Roof Framing (2x Rafters at X" o.c.): 3.5		psf		HSB 36-SS Metal Deck, 20 gage:	3.0	psf
	Insulation (Batt):	0.5	psf		Misc/Mech/Elec/Plumbing:	0.5	psf
	(1) Layer 5/8" Drywall at Ceiling:	3.5	psf		-	0.0	psf
	Misc/Mech/Elec/Plumbing:	1.0	psf		-	0.0	psf
	Ceiling Framing:	0.0	psf	_	-	0.0	psf
	Total Dead Load =	13.0	psf		Total Dead Load =	7.0	psf

WALL TYPES

	_					_
W1	2x6 Wood Stud Exterior Wall, Storage E	Building	W2	8" CMU Block Wall, Trash Enclosure		
	7/8" Plaster/Stucco	8.0	psf	8" CMU Block Wall	84.0	psf
	15/32" Sheathing:	1.5	psf	x	0.0	psf
	Wall Framing (2x6 at 16" o.c.):	1.5	psf	×	0.0	psf
	Insulation (Batt):	0.5	psf	x	0.0	psf
	(1) Layer 5/8" Drywall:	3.0	psf	x	0.0	psf
	Mech/Elec/Plumbing:	0.5	psf	Total Dead Load =	84.0	psf
	Total Dead Load =	15.0	psf		·	=



SITE RETAINING WALLS





27369 Via Industria Temecula, CA 92590 (951) 600-0032, (951) 600-0036 Fax

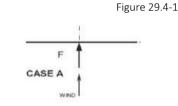
Sheet:	Wind on Wall
Job #:	24-8400.32
Date:	11/26/2024
Δ:	-
Designer:	VG

SOLID FREE STANDING WALLS AND SIGNS (ASCE 7-16 SECTION 29.3) Masonry Retaining Wall Ш Risk / Occupancy Category Table 1.5-1 Figure 26.5 C **Exposure Category** 10 Height above ground surface ft. 10 ft. Vertical dimension of wall or sign = В = 150 ft. Horizontal dimension of wall or sign 150 Figure 29.3-1 ft. Horizontal dimension of return corner s/h 1 Clearance ratio Figure 29.3-1 Figure 29.3-1 B/s = 15.00 Aspect ratio = Figure 29.3-1 L_r/s 15 Return corner aspect ratio 1500 = Gross area of solid free standing wall or sign Figure 29.3-1 125 Basic wind speed Figure 26.5-1A = mph 0.85 velocity exposure coefficient Table 29.3-1 K, K_{zt} = 1 = $(1 + K_1K_2K_3)_2$ directionality Factor (26.8-1) K_d 0.85 = Table 26.6-1 0.85 gust-effect factor G = 5.50 Resultant location of load above ground surface = $.00256K_zK_{zt}K_dV$ pressure at height h = **28.90** psf q_h

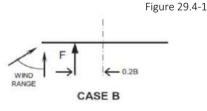
LOAD CASES

CASE A RESULTANT FORCE THROUGH THE GEOMETRIC CENTER

s/h = 1 $C_f = 1.3$ $c_f =$



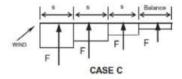
CASE B RESULTANT FORCE at .2B FROM GEOMETRIC CENTER



CASE C RESULTANT FORCE AT GEMETRIC CENTER OF REGIONS ALONG WALL OR SIGN

Figure 29.4-1

s/h =	1		Clea	rance r	atio
$RF_1 =$	-1.35	Reduction Fa	acto	for Cas	se C for C _f >3.0
$RF_2 =$	0.80	Reduction Fa	acto	r for Cas	se C
Redutio	n Factor	where $s/h > .8$	=	0.80	Reduction Factor Applied



C_f coeffcients shall be multiplied by the following reduction factor when a return corner is present

L _r /s	Reduction Factor			
0.3	0.9			
1	0.75			
≥2	0.6			

B/s = 15.00

Case C must be considered

FOR B/s > 2 CASE C MUST BE CONSIDERED

Aspect Ratio B/s ≤ 10 (15)							
Region Dist A_i C_F P_i (psf)					F (lbs)	И (kip-ft	
0 to s	10	100		0.00	0	0.00	
s to 2s	20	100		0.00	0	0.00	
2s to 3s	30	100		0.00	0	0.00	
3s to 10s	40	100		0.00	0	0.00	
max =	0.0	psf		Σ	0	0.00	

Aspect Ratio B/s > 10 (15)							
Region	Dist	A_{i}	C_F	P _i (psf) F (lbs) V (kip-ft			
0 to s	10	100		0.0 0 0			
s to 2s	20	100	2.597	51.0 5103 28.07			
2s to 3s	30	100	1.997	39.2 3924 21.58			
3s to 4s	40	100	1.522	29.9 2991 16.45			
4s to 5s	50	100	1.381	27.1 2714 14.93			
5s to 6s	60	100	0.913	17.9 1793 9.863			
>10s	150	100	0.55	10.8 1081 5.945			
max =	51.0	psf		Σ 17607 96.84			

DESIGN SUMMARY RESULTS

Design Summary:

		Strength
Max horizontal wind pressure	=	51.0 psf
Max horizontal force at centroi	id =	47.9 kips
Max overturning moment	=	263.5 p-ft
Max torsion at centroid	=	-1437.0 kip-ft

ASD
30.6 psf
28.7 kps
158.1 p-ft
-862.2 p-ft

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	4.00 ft
Wall height above soil	=	8.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf NOT Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf NOT Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

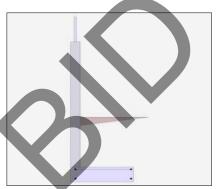
Soil Data

Allow Soil Bearing Equivalent Fluid Pressure	= Meth	2,660.0 psf
Active Heel Pressure	=	40.0 psf/ft
	=	
Passive Pressure	=	332.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in

Lateral Load Applied to Stem

Lateral Load Height to Top Height to Bottom	= = =	0.0 #/ft 0.00 ft 0.00 ft
Load Type	_	Wind (W)
		(Strength Level)
Wind on Exposed Stem		30.6 nsf

(Service Level)



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Cantilevered Retaining Wall LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A

Wall Stability Ratios Overturning = 1.81 OK Sliding = 2.21 OK Sliding = 2.21 OK Sliding = 2.21 OK Sliding = 2.21 OK Sliding = 2.21 OK Sliding = 3.13 Sliding = 3.13 Sliding = 3.13 Sliding = 3.13 Sliding Sliding Solid Pressure @ Toe 1.573 in Eccentricity outside middle third Soil Pressure @ Toe 2.588 psf OK Soil Pressure @ Toe 2.588 psf OK Soil Pressure @ Toe 2.588 psf OK Soil Pressure @ Toe 2.586 psf OK Soil Pressure Less Than Allowable Soil Pressure Less Than Allowable Solid Pressure @ Toe 0.0 psi OK Solid Pressure @ Toe 0.0 psi OK Solid Pressure @ Toe 0.0 psi OK Solid Pressure @ Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Toe 0.0 psi OK Solid Pressure & Strength Level Solid Pressure & Soli	Design Summary			Stem Construction	_	2nd	Bottom			
Wall Stability Ratios Overturning = 1.81 OK Wall Material Above "H1" = Fence Masonry SD SD SD SD SD SD SD SD SD SD SD SD SD S				Design Height Above Ftg	 ft =	10.00	Stem OK 0.00			
Design Method	Wall Stability Ratios									
Sliding	Overturning	=			=			SD	SD	
Total Bearing Load	Sliding	=	2.21 OK		=					
Rebar Spacing = 16.00 Rebar Placed at = Edge Rebar Placed at = Edge	Global Stability	=	3.13	Rebar Size	=		# 5			
Design Data Substitute Su	,			Rebar Spacing	=		16.00			
Design Data Eccentricity outside middle third Soil Pressure @ Toe 2,588 psf OK Soil Pressure @ Heel 0 psf OK Allowable 2,2660 psf Soil Pressure Less Than Allowable ACI Factored @ Toe 3,623 psf ACI Factored @ Toe 0,0 psi OK Footing Shear @ Toe 0,0 psi OK Footing Shear @ Toe 0,0 psi OK Footing Shear @ Heel 2,2 psi OK Allowable 75.0 psi Strength Level ft.# = 61.2 Strength Level ft.# = 3,816.1 MomentActual Service Level Strength Level ft.# = 3,816.1 MomentActual Service Level Strength Level ft.# = 3,816.1 MomentActual Service Level Strength Level ft.# = 4,929.7 Strength Level psi = 9.9 Str	Total Bearing Load	=	3.377 lbs		=		Edge			
Soil Pressure @ Toe		=	15.73 in	•						
Soil Pressure @ Heel					=		0.774			
Allowable = 2,660 psf								_	·	
Soil Pressure Less Than Allowable ACI Factored @ Toe				Service Level	lbs=	61.2				
ACI Factored @ Toe = 3,623 psf ACI Factored @ Heel = 0 psf Footing Shear @ Toe = 0.0 psi OK Footing Shear @ Heel = 2.2 psi OK Allowable = 75.0 psi Siliding Calcs Lateral Sliding Force = 778.7 lbs less 100% Passive Force - 295.1 lbs less 100% Friction Force = - 1,422.2 lbs Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK Corrected Component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Wind, W Indication Actual Service Level ft.# = 61.2 Strength Level ft.# = 4,929.7 ShearActual Service Level psi = 9.9 ShearActual Service Level psi = 9.9 ShearActual Service Level psi = 9.9 ShearAllowable = 69.7 Anet (Masonry) in2 = 91.50 91.50 139.50 Wall Weight psf = 84.0 Rebar Depth 'd' in = 5.25 Wasonry Data fm psi = 1,500 Psi = 60,000 Soil Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data ft psi = 5.25					lbs=		903.7			
ACI Factored @ Heel = 0 psf Footing Shear @ Toe = 0.0 psi OK Footing Shear @ Toe = 2.2 psi OK Allowable = 75.0 psi Sliding Calcs Lateral Sliding Force = 778.7 lbs less 100% Passive Force - 295.1 lbs Less 100% Priction Force = 1,422.2 lbs Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK Correte Data Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W ACI Factored @ Heel = 0.0 psi Strength Level ft.# = 3,816.1 MomentAllowable ft.# = 4,929.7 Strength Level psi = 4,929.7 ShearActual Service Level psi = 9.9 ShearAllowable = 69.7 Anet (Masonry) in2 = 91.50 91.50 139.50 Wall Weight psf = 84.0 Masonry Data Fm psi = 1,500 Psi = 60,000 Solid Grouting psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Design Method = SD Concrete Data fc psi = 60.000 Concrete Data fc psi = 60.000 Concrete Data										
Footing Shear @ Toe = 0.0 psi OK Footing Shear @ Heel = 2.2 psi OK Allowable = 75.0 psi Sliding Calcs Lateral Sliding Force = 778.7 lbs Less 100% Passive Force - 295.1 lbs Less 100% Friction Force = - 1,422.2 lbs Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Strength Level ShearAllowable ft.# = 4,929.7 ShearActual Service Level psi = 9.9 ShearAllowable = 69.7 Anet (Masonry) in2 = 91.50 91.50 139.50 Wall Weight psf = 84.0 Rebar Depth 'd' in = 5.25 Masonry Data Fim psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Design Method = SD Concrete Data Wind, W 1.600 To Concrete Data Fic psi = 1.600 Masonry Design Method = SD			' '			61.2				
Footing Shear @ Heel			•	Strength Level	ft-# =		3,816.1			
Silding Calcs	S .		•	MomentAllowable	ft-# =		4,929.7			
Service Level Service Level Strength Level Streng			•	ShearActual						
Lateral Sliding Force = 778.7 lbs	Allowable	=	75.0 psi	Service Level	psi =					
Lateral Sliding Force = 778.7 lbs ShearAllowable = 69.7	Sliding Calce			Strength Level	psi =		9.9			
less 100% Passive Force - 295.1 lbs less 100% Friction Force = - 1,422.2 lbs Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Anet (Masonry) in2 = 91.50 91.50 139.50 Wall Weight psf = 84.0 Rebar Depth 'd' in = 5.25 Masonry Data f'm psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 0.50 Masonry Data f'm psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 5.63 Masonry Design Method = SD Concrete Data f'c psi = 0.50 Figure 1.5000 Figure 1.500 Figure 1.500 Fi	•		779 7 lbc	Shear Allowable						
less 100% Friction Force = - 1,422.2 lbs Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK Masonry Data Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Mall Weight psf = 84.0 Rebar Depth 'd' in = 5.25 Masonry Data f'm psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 0.000 Concrete Data	· ·							91.50	139.50	
Added Force Req'd = 0.0 lbs OKfor 1.5 Stability = 0.0 lbs OK Wertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Rebar Depth 'd' Rebar Depth 'd' In = 5.25 Rebar Depth 'd' In = 5.25 Rebar Depth 'd' In = 5.25 Masonry Data Fy Psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 5.25		-						01.00	100.00	
Wertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Masonry Data fm psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 1,500 Fy psi = 60,000 Fy Solid Grouting = Yes Modular Ratio 'n' = 21.48 Fquiv. Solid Thick. = 5.63 Masonry Design Method = SD Concrete Data			*							
Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Masonry Data f'm psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 1,500 Concrete Data				Rebai Deptin d	III =		5.25			
Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W Description Fm Psi = 1,500 Fy psi = 60,000 Solid Grouting = Yes Modular Ratio 'n' = 21.48 Equiv. Solid Thick. = 7.63 Masonry Block Type = Masonry Design Method = SD Concrete Data f'c psi = 1,500 Fy psi = 1,500 Fy Solid Grouting = Yes All Solid Grouting = Yes Concrete Data	ioi 1.5 Stability	-	0.0 103 OK	Masonry Data						
NOT considered in the calculation of soil bearing Load Factors Building Code Dead Load Live Load Earth, H Wind, W NOT considered in the calculation of soil bearing Fy Solid Grouting Solid Grouting Equiv. Solid Thick. Equiv. Solid Thick. Masonry Block Type Masonry Design Method SD Concrete Data Fy Solid Grouting Fy Solid Grouting Fy Yes 21.48 Equiv. Solid Thick. Fy Solid Grouting Fy Yes Analysis Solid Grouting Fy So	Vertical component of active	e later	al soil pressure IS		nei =		1 500			
Solid Grouting				Fy	•		,			
Building Code Dead Load Live Load Earth, H Wind, W Equiv. Solid Thick. = 7.63 Masonry Block Type = 7.63 Masonry Design Method = SD Concrete Data Figuiv. Solid Thick. = 7.63 Masonry Design Method = SD Concrete Data			J	Solid Grouting	•		,			
Dead Load 1.200 Masonry Block Type = Live Load 1.600 Masonry Design Method = SD Earth, H 1.600 Concrete Data Wind, W 1.600 f'c psi =	Load Factors			Modular Ratio 'n'	=		21.48			
Dead Load 1.200 Masonry Block Type = Live Load 1.600 Masonry Design Method = SD Earth, H 1.600 Concrete Data Wind, W 1.600 f'c psi =				Equiv. Solid Thick.	=		7.63			
Live Load 1.600 Masonry Design Method = SD Earth, H 1.600 Concrete Data Wind, W 1.600 f'c psi =					=					
Earth, H 1.600 Concrete Data Wind, W 1.600 f'c psi =				Masonry Design Method	=	SD				
	•									
Seismic, E 1.000 Fy psi =	•				psi =					
	Seismic, E		1.000	Fy	psi =					

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A

Footing Data

Toe Width	=	0.00 ft
Heel Width	=	4.25
Total Footing Width	= _	4.25
Footing Thickness	=	14.00 in

f'c = 2,500 psi Fy = 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % = 0.0009 Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>		
Factored Pressure	=	3,623	0	psf	
Mu' : Upward	=	0	1,384	ft-#	
Mu' : Downward	=	0	5,179	ft-#	
Mu: Design	=	0	3,794	ft-#	
φMn	=	OK - Flush	11,942		
Actual 1-Way Shear	=	0.00	2.22	psi	
Allow 1-Way Shear	=	0.00	75.00	psi	
Toe Reinforcing	=	Flush toe condi	tion. No reii	nforcing	required.
Heel Reinforcing	=	# 5 @ 16.00 in			
Key Reinforcing	=	# 5 @ 9.00 in			
Footing Torsion, Tu		=	0.00 ft-lk	os	

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: Flush toe condition. No reinforcing required.

Heel: #4@ 15.87 in, #5@ 24.60 in, #6@ 34.92 in, #7@ 47.61 in, #8@ 62.69 in, #9@

0.00 ft-lbs

79.36 in, #10@ 100.79 in

Key: No key defined

Footing Allow. Torsion, ϕ Tn

Min footing T&S reinf Area per foot 1.29 in2
Min footing T&S reinf Area per foot 0.30 in2 /ft

If one layer of horizontal bars: If two layers of horizontal bars:

#4@ 7 94 in #4@ 15.87 in #5@ 12.30 in #5@ 24.60 in #6@ 17.46 in #6@ 34.92 in

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A

Summary of Overturning & Resisting Forces & Moments

		ERTURNING.		RESISTING
Item	Force lbs	Distance ft	Moment ft-#	Force Distance Moment lbs ft -#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force	533.9	1.72	919.5	Soil Over HL (ab. water tbl) 1,576.7 2.46 3,876.0 Soil Over HL (bel. water tbl) 2.46 3,876.0 Water Table 3,876.0
Buoyant Force = Surcharge over Heel = Surcharge Over Toe =				Sloped Soil Over Heel = Surcharge Over Heel = Adjacent Footing Load =
Adjacent Footing Load = Added Lateral Load = Load @ Stem Above Soil =	244.8	9.17	2,244.0	Axial Dead Load on Stem = * Axial Live Load on Stem = Soil Over Toe =
=	211.0		2,2 1	Surcharge Over Toe = Stem Weight(s) = 840.0 0.33 280.0 Earth @ Stem Transitions =
Total =	778.7	O.T.M. =	3,163.5	Footing Weight = 743.8 2.13 1,580.5 Key Weight =
Resisting/Overturning R			1.81	Vert. Component =
Vertical Loads used for S	Soil Pressure	= 3,376.7	lbs	Total = 3,160.4 lbs R.M.= 5,736.4 * Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 100.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.507 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

K_cover=2.0625, K_spacing=16, K_diam=5.625, and K_min=2.0625 Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

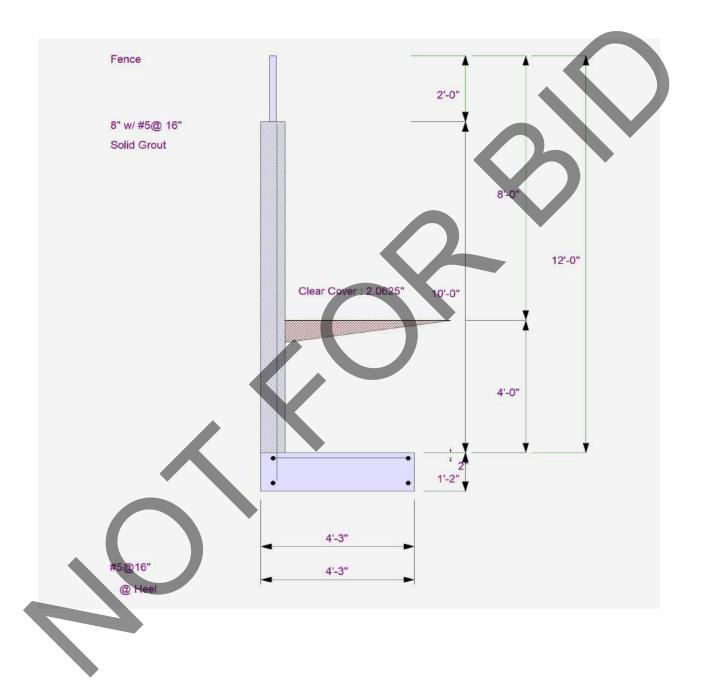
38.14 in 38.14 in

7.57 in 0.2325 in2/ft 0.1677 in2/ft LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A



Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind A-A



LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	4.50 ft
Wall height above soil	=	7.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	24.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf NOT Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf NOT Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

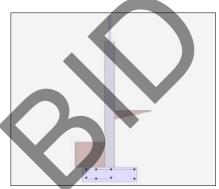
Soil Data

Allow Soil Bearing Equivalent Fluid Pressure	= Meth	2,660.0 psf od
Active Heel Pressure	=	40.0 psf/ft
	=	
Passive Pressure	=	332.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in

Lateral Load Applied to Stem

Lateral Load Height to Top Height to Bottom	= =	0.0 #/ft 0.00 ft 0.00 ft
Load Type	=	Wind (W)
W. 1 5 10		(Strength Level)
Wind on Exposed Stem		30.6 nsf

(Service Level)



Adjacent Footing Load

•		
Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B

Design Summary			Stem Construction	_	2nd	Bottom		
		·	Design Height Above Ftg	— ft =	10.00	Stem OK 0.00		
Wall Stability Ratios			Wall Material Above "Ht"	=	Fence	Masonry		
Overturning	=	1.52 OK	Design Method	=	1 01100	SD	SD	SD
Sliding	=	3.04 OK	Thickness	=		8.00		-
Global Stability	=	2.58	Rebar Size	=		# 5		
,			Rebar Spacing	=		16.00		
Total Bearing Load	=	2,817 lbs	Rebar Placed at	=		Edge		
resultant ecc.	=	13.74 in	Design Data					
Eccentricity outsi			fb/FB + fa/Fa	=		0.811		
Soil Pressure @ Toe Soil Pressure @ Heel	=	2,471 psf OK	Total Force @ Section				_	
	=	0 psf OK	Service Level	lbs =	61.2			
Allowable Soil Pressure Less	= Than	2,660 psf	Strength Level	lbs =		1,015.2		
ACI Factored @ Toe	= =	3,459 psf	MomentActual					
ACI Factored @ Heel	=	0 psf	Service Level	ft-# =	61.2			
Footing Shear @ Toe	=	19.6 psi OK	Strength Level	ft-# =		4,001.4		
Footing Shear @ Heel	=	8.8 psi OK	MomentAllowable	ft-# =		4,929.7		
Allowable	=	75.0 psi	ShearActual					
/ea.s.e		. o.o po.	Service Level	psi =				
Sliding Calcs			Strength Level	psi =		11.1		
Lateral Sliding Force	=	871.7 lbs	ShearAllowable	-		69.7		
less 100% Passive Force	e -	1,498.6 lbs	Anet (Masonry)	in2 =		91.50	91.50	139.50
less 100% Friction Force	= -	1,150.4 lbs	Wall Weight	psf =		84.0		
Added Force Req'd	=	0.0 lbs OK	Rebar Depth 'd'	in=	•	5.25		
for 1.5 Stability	=	0.0 lbs OK						
			Masonry Data					
Vertical component of active		•	f'm	psi =		1,500		
NOT considered in the calc	ulatior	n of soil bearing	Fy Call 4 Counting	psi =		60,000		
Load Factors			Solid Grouting	=		Yes		
Building Code			Modular Ratio 'n'	=		21.48		
Dead Load		1.200	Equiv. Solid Thick.	=		7.63		
Live Load		1.600	Masonry Block Type	=	CD			
Earth, H		1.600	Masonry Design Method		SD			
Wind, W		1.600	Concrete Data	psi =				
Seismic, E		1.000	Fy	psi =				
,			• 7	ے. –				

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B

Footing Data

Toe Width	=	1.50 ft
Heel Width	=	2.17
Total Footing Width	= _	3.67
Footing Thickness	=	14.00 in

2,500 psi 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % 0.0009 Cover @ Top @ Btm.= 3.00 in 2.00

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	3,459	0	psf
Mu' : Upward	=	2,951	0	ft-#
Mu': Downward	=	652	1,110	ft-#
Mu: Design	=	2,299	1,110	ft-#
φ Mn	=	10,896	11,942	ft-#
Actual 1-Way Shear	=	19.56	8.76	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	#5 @ 16.00 in		
Heel Reinforcing	=	# 5 @ 16.00 in		
Key Reinforcing	=	# 5 @ 9.00 in		
Footing Torsion, Tu		=	0.00 ft-lb	s
Footing Allow. Torsion	n, φ	Tn =	0.00 ft-lb	s

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 15.87 in, #5@ 24.60 in, #6@ 34.92 in, #7@ 47.61 in, #8@ 62.69 in, #9@ 79.36 in, #10@ 100.79 in

Heel: #4@ 15.87 in, #5@ 24.60 in, #6@ 34.92 in, #7@ 47.61 in, #8@ 62.69 in, #9@ 79.36 in, #10@ 100.79 in

Key: No key defined

Min footing T&S reinf Area Min footing T&S reinf Area per foot 1.11 in2 0.30 in2 /ft

f one layer of horizontal bars: If two layers of horizontal bars:

#4@ 7.94 in #5@ 12.30 in #4@ 15.87 in #5@ 24.60 in #6@ 17.46 in #6@ 34.92 in

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B

Summary of Overturning & Resisting Forces & Moments

	OV Force	ERTURNING. Distance	 Moment			ISTING Distance	Moment
Item	lbs	ft	ft-#		lbs	ft	ft-#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force	642.2	1.89	1,213.1	Soil Over HL (ab. water tbl) Soil Over HL (bel. water tbl) Water Table	744.2	2.92 2.92	2,171.7 2,171.7
Buoyant Force = Surcharge over Heel = Surcharge Over Toe = Adjacent Footing Load =				Sloped Soil Over Heel = Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem =			
Added Lateral Load = Load @ Stem Above Soil = =	229.5	9.42	2,161.1	* Axial Live Load on Stem = Soil Over Toe = Surcharge Over Toe = Stem Weight(s) =	330.0 840.0	0.75 1.83	247.5 1,540.0
Total =		O.T.M. =	3,374.2 1.52	Earth @ Stem Transitions = Footing Weight = Key Weight = Vert. Component =	642.3	1.84 1.50	1,178.5
Vertical Loads used for S	oil Pressure	= 2,816.6	5 lbs	Total = * Axial live load NOT included in to resistance, but is included for so		d, or used for	5,137.7 overturning

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 100.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.561 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

LIC#: KW-06014215, Build:20.24.10.03

Stem Design Height: 0.00 ft above top of footing

K_cover=2.0625, K_spacing=16, K_diam=5.625, and K_min=2.0625 Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

38.14 in 38.14 in

7.94 in 0.2325 in2/ft 0.1758 in2/ft

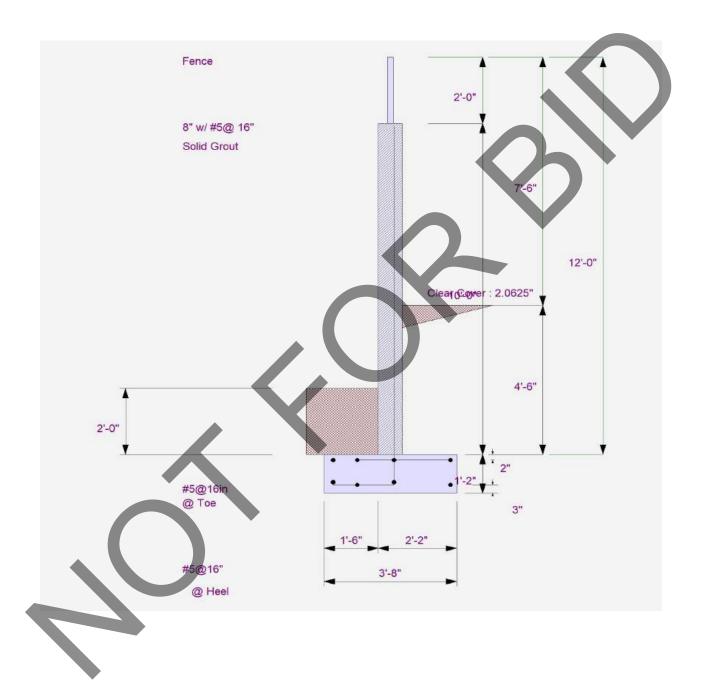
Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B



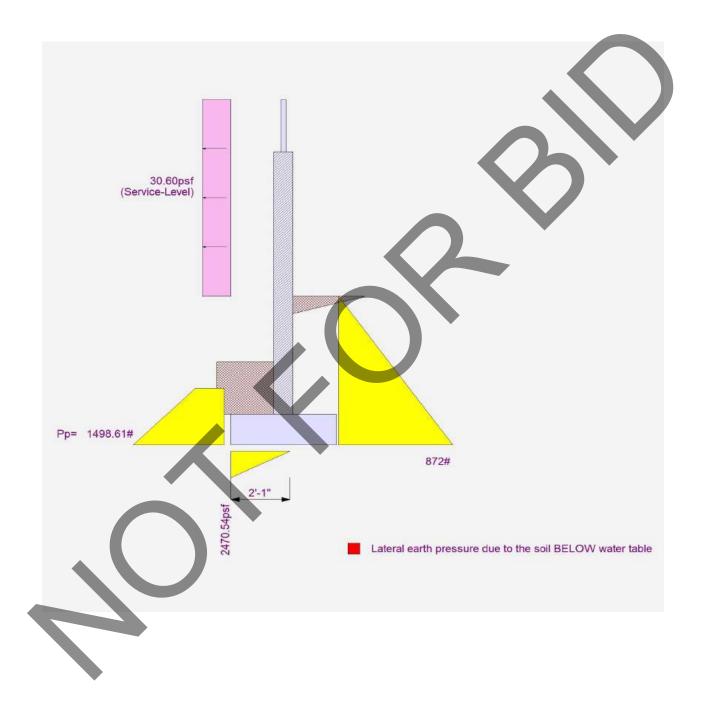
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LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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DESCRIPTION: CMU Retaining Wall 4' Retained +H=6', Wind B-B



LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
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DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	6.00 ft
Wall height above soil	=	6.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	36.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf Used for Sliding & Overturning

Axial Load Applied to Stem

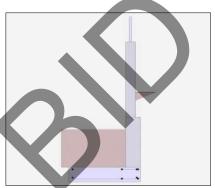
Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Soil Data

Allow Soil Bearing Equivalent Fluid Pressure	= Meth	2,660.0 psf
Active Heel Pressure	=	40.0 psf/ft
	=	
Passive Pressure	=	332.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.450
Soil height to ignore for passive pressure	=	12.00 in

Lateral Load Applied to Stem

Lateral Load Height to Top Height to Bottom	= =	0.0 #/ft 0.00 ft 0.00 ft
Load Type	_	Wind (W)
Wind on Exposed Stem	1	(Service Level) 30.6 psf
(Service Level)	=	30.0 ps.



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Cantilevered Retaining Wall LIC#: KW-06014215, Build:20.24.10.03

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C

Design Summary			Stem Construction		3rd	2nd	Bottom	
			Design Height Above Ftg	 ft =	10.00	Stem OK 4.00	Stem OK 0.00	
Wall Stability Ratios			Wall Material Above "Ht"	=	Fence	Masonry	Masonry	
Overturning	=	2.13 OK	Design Method	=		SĎ	SD	SD
Sliding	=	3.44 OK	Thickness	=		8.00	12.00	
Global Stability	=	2.27	Rebar Size	=		# 5	# 5	
			Rebar Spacing	=		16.00	16.00	
Total Bearing Load	=	3,635 lbs	Rebar Placed at	=		Edge	Edge	
resultant ecc.	.= .	10.77 in	Design Data			0.315	0.558	
Eccentricity outsid			fb/FB + fa/Fa	=		0.313	0.550	
Soil Pressure @ Toe Soil Pressure @ Heel	=	1,414 psf OK 0 psf OK	Total Force @ Section		21.2		_	
Allowable	_	2,660 psf	Service Level	lbs =	61.2			
Soil Pressure Less			Strength Level	lbs=		421.8	1,445.8	
ACI Factored @ Toe	=	1,979 psf	MomentActual	ft-# =	04.0			
ACI Factored @ Heel	=	0 psf	Service Level		61.2	4.554.4	4.047.0	
Footing Shear @ Toe	=	12.4 psi OK	Strength Level	ft-# =		1,554.1	4,947.8	
Footing Shear @ Heel	=	0.0 psi OK	MomentAllowable	ft-# =		4,929.7	8,853.2	
Allowable	=	75.0 psi	ShearActual					
		•	Service Level	psi =				
Sliding Calcs			Strength Level	psi=		4.6	10.4	
Lateral Sliding Force	=	1,210.8 lbs	ShearAllowable	=		69.7	69.7	
less 100% Passive Force	-	_,	Anet (Masonry)	in2 =		91.50	139.50	91.50
less 100% Friction Force	≡ -	1,448.3 lbs	Wall Weight	psf =		84.0	133.0	
Added Force Req'd	=	0.0 lbs OK	Rebar Depth 'd'	in=		5.25	9.00	
for 1.5 Stability	=	0.0 lbs OK						
			Masonry Data	7				
Vertical component of active				psi =		1,500	1,500	
NOT considered in the calcu	llation	n or soil bearing	Fy Solid Grouting	psi =		60,000	60,000	
Load Factors				=		Yes	Yes	
Building Code			Modular Ratio 'n'	=		21.48	21.48	
Dead Load		1.200	Equiv. Solid Thick.	=		7.63	11.63	
Live Load		1.600	Masonry Block Type	=	SD			
Earth, H		1.600	Masonry Design Method Concrete Data		งบ			
Wind, W		1.600	f'c	psi =				
Seismic, E		1.000	Fy	psi =				
23.31110, 2		1.000	· y	P31 —				

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C

Footing Data

Toe Width	=	3.83 ft
Heel Width	=	1.00
Total Footing Width	=	4.83
Footing Thickness	=	14 00 in

f'c = 2,500 psi Fy = 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % = 0.0009 Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	1,979	0	psf
Mu' : Upward	=	10,446	0	ft-#
Mu': Downward	=	5,025	0	ft-#
Mu: Design	=	5,421	3,794	ft-#
φ Mn	=	10,896	OK - Flush	
Actual 1-Way Shear	=	12.43	0.00	psi
Allow 1-Way Shear	=	75.00	0.00	psi
Toe Reinforcing	=	# 5 @ 16.00 in		
Heel Reinforcing	=	Flush heel cond	dition. No rein	nforcing require
Key Reinforcing	=	None Spec'd		

Footing Torsion, Tu = 0.00 ft-lbs Footing Allow. Torsion, φ Tn = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 15.21 in, #5@ 23.57 in, #6@ 33.46 in, #7@ 45.63 in, #8@ 60.08 in, #9@

76.06 in, #10@ 96.60 in

Heel: Flush heel condition. No reinforcing required.

Key: No key defined

Min footing T&S reinf Area per foot 1.46 in2
Min footing T&S reinf Area per foot 0.30 in2 /ft

If one layer of horizontal bars: If two layers of horizontal bars:

#4@ 7 94 in #4@ 15.87 in #5@ 12.30 in #5@ 24.60 in #6@ 17.46 in #6@ 34.92 in

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C

Summary of Overturning & Resisting Forces & Moments

	OV Force	ERTURNING Distance	 Moment		RES	SISTING Distance	Moment
Item	lbs	ft	ft-#		lbs	ft	ft-#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force	1,027.2	2.39	2,453.9	Soil Over HL (ab. water tbl) Soil Over HL (bel. water tbl) Water Table			
Buoyant Force =				Sloped Soil Over Heel =			
Surcharge over Heel = Surcharge Over Toe = Adjacent Footing Load = Added Lateral Load =				Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem = * Axial Live Load on Stem =	2		
Load @ Stem Above Soil =	183.6	10.17	1,866.6	Soil Over Toe =	1,263.9	1.92	2,420.4
=				Surcharge Over Toe = Stem Weight(s) =	1,036.0	4.25	4,401.9
Total =	1,210.8	O.T.M. =	4,320.5	Earth @ Stem Transitions = Footing Weight =	7 3.3 845.3	4.66 2.42	342.0 2,041.3
				Key Weight =	040.0	0.75	2,041.0
Resisting/Overturning Ra			2.13	Vert. Component =	7		
Vertical Loads used for S	oil Pressure	= 3,634.7	' lbs	Total = * Axial live load NOT included i resistance, but is included for		d, or used for	9,205.5 overturning

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 100.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.244 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe,

because the wall would then tend to rotate into the retained soil.

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd

Stem Design Height: 4.00 ft above top of footing

K_cover=2.0625, K_spacing=16, K_diam=5.625, and K_min=2.0625

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =

Development length for #5 bar specified in this stem design segment =

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing

K_cover=2.3125, K_spacing=16, K_diam=5.625, and K_min=2.3125

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =

Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

38.14 in

34.02 in

34.02 in

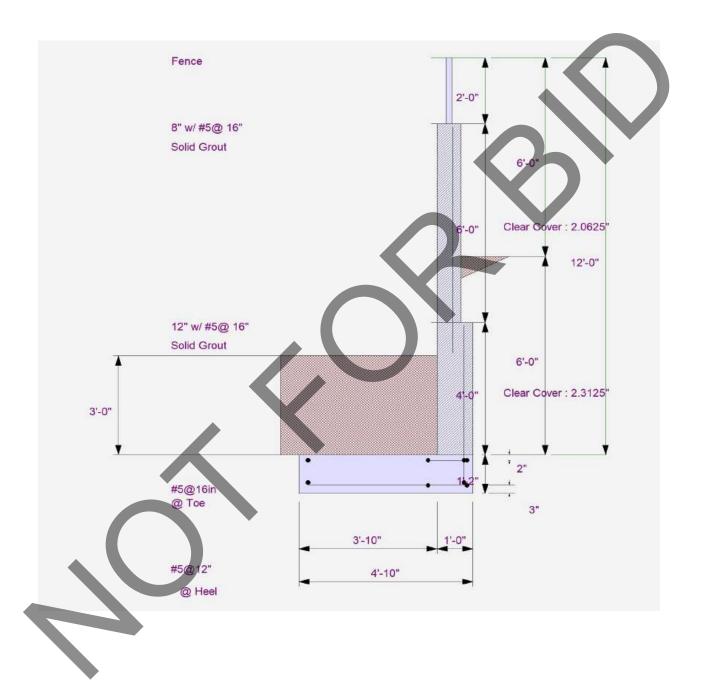
6.00 in

0.2325 in2/ft 0.1248 in2/ft LIC#: KW-06014215, Build:20.24.10.03

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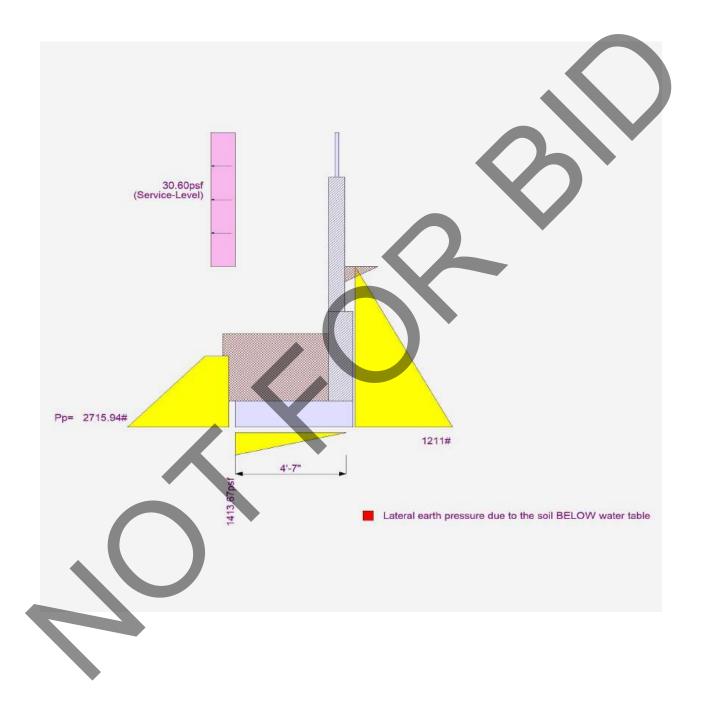
DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C



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DESCRIPTION: CMU Retaining Wall 6ft Retained + H=6'-0", Wind C-C



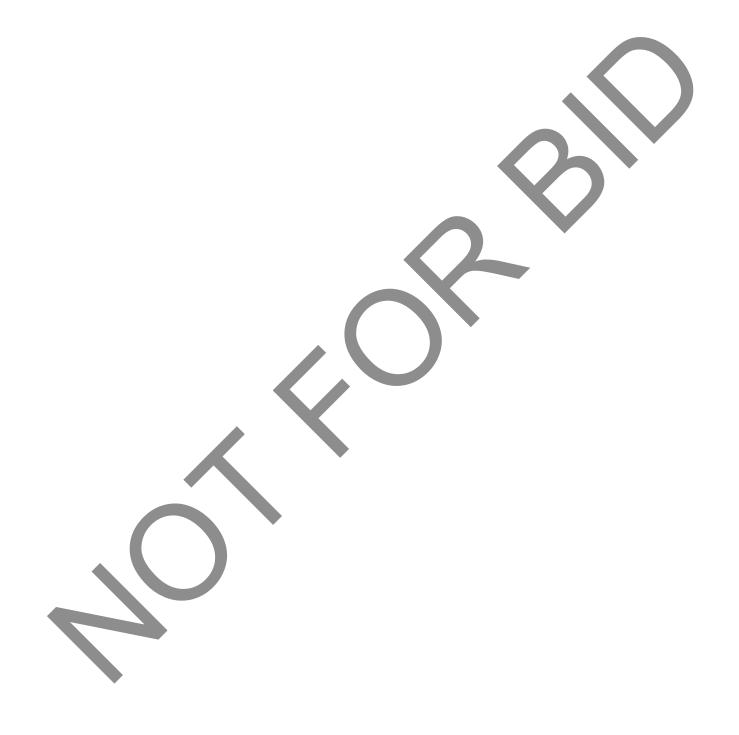


SITE STRUCTURES - STORAGE BUILDING



Fire Station 227

Storage Building			
Member Name	Results (Max UTIL %)	Current Solution	Comments
RJ1 - SB Roof	Passed (86% M)	1 piece(s) 2 x 12 DF No.2 @ 24" OC	
B1 - SB Roof	Passed (58% M)	1 piece(s) 6 x 10 DF No.1	



ForteWEB Software Operator	Job Notes
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com	



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File Name: Fire Station 227



MEMBER REPORT

Storage Building, RJ1 - SB Roof

1 piece(s) 2 x 12 DF No.2 @ 24" OC

Sloped Length: 22' 7 11/16"

18' 9"

18' 9"

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)	742 @ 1' 7 3/4"	3327 (3.50")	Passed (22%)		1.0 D + 1.0 Lr (Adj Spans)
Shear (lbs)	562 @ 2' 8 5/8"	2531	Passed (22%)	1.25	1.0 D + 1.0 Lr (Adj Spans)
Moment (Ft-lbs)	2945 @ 11' 2"	3411	Passed (86%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Live Load Defl. (in)	0.419 @ 11' 2"	0.965	Passed (L/552)		1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.691 @ 11' 2"	1.287	Passed (L/335)	/	1.0 D + 1.0 Lr (Alt Spans)

Member Length: 22' 9 9/16" System: Roof

Member Type : Joist Building Use : Residential Building Code : IBC 2021 Design Methodology : ASD Member Pitch : 2/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- · Applicable calculations are based on NDS.

	В	earing Leng	th	Loads	to Support		
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories
1 - Beveled Plate - DF	3.50"	3.50"	1.50"	294	448	742	Blocking
2 - Beveled Plate - DF	3.50"	3.50"	1.50"	294	448	742	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)	Continuous	
Bottom Edge (Lu)	End Bearing Points	

[•]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)	Comments
1 - Uniform (PSF)	0 to 22' 4"	24"	13.0	20.0	Roof

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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
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com	



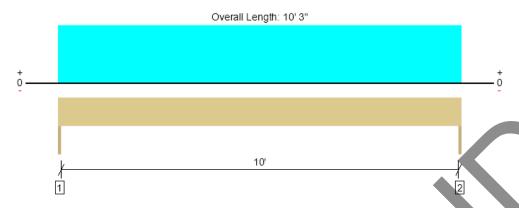
12/18/2024 12:14:08 AM UTC ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3

File Name: Fire Station 227



MEMBER REPORT

Storage Building, B1 - SB Roof 1 piece(s) 6 x 10 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)	2621 @ 0	5156 (1.50")	Passed (51%)		1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2153 @ 11"	7402	Passed (29%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	6717 @ 5' 1 1/2"	11634	Passed (58%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.091 @ 5' 1 1/2"	0.512	Passed (L/999+)		1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.202 @ 5' 1 1/2"	0.683	Passed (L/609)	4	1.0 D + 1.0 Lr (All Spans)

Member Length : 10' 3" System : Roof Member Type : Flush Beam Building Use : Residential Building Code : IBC 2021

Design Methodology : ASD Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- \bullet Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

	В	earing Leng	th	Load	s to Support			
Supports	Total	Available	Required	Dead	Roof Live	Factored	Accessories	
1 - Trimmer - DF	1.50"	1.50"	1.50"	1443	1179	2621	None	
2 - Trimmer - DF	1.50"	1.50"	1.50"	1443	1179	2621	None	

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	Continuous	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	0 to 10' 3"	N/A	13.2		
1 - Uniform (PSF)	0 to 10' 3" (Top)	3' 3"	15.0	-	Exterior 2x6 Stud Wall
2 - Uniform (PSF)	0 to 10' 3" (Top)	11' 6"	13.0	20.0	Roof
3 - Uniform (PLF)	0 to 10' 3" (Top)	N/A	70.0		Garage Overhead door weight (550# max)

[•] 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
vALERIA GALLARDO ISE Engineers (619) 600-8807 valeria@iseengineers.com	



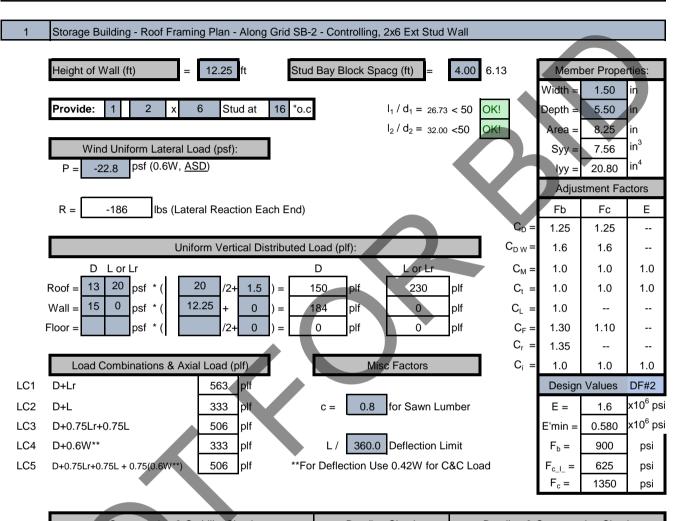
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File Name: Fire Station 227



Sht:	STUD WALL	1			
Date:	-				
#:					
Version:	2022 CBC				

2x Stud Wall Size & Spacing Calculation - Per NDS 2018



	Compression & Stability Check								Bending Check				Bending & Compression Check					k		
						Fce				· ·							(1+Fc			
	Axial	P/A	Fce	Fc*		/	(1+Fce/		F'c	eck	Mu	fb	F'b	Check	Fc*	Fce /	e/Fc*)		F'c	Check
	Ibs	psi	psi	psi	E'min	Fc*	Fc*)/2c	Ср	psi	Ch	ft-lb	psi	psi	S.	psi	Fc*	/2c	Ср	psi	Ch
LC1	751	91	466	1856	0.6	0.25	0.782	0.236	518	OK!	0	0	2527	OK!	1856	0.25	0.782	0.236	438.47	OK!
LC2	444	54	466	1856	0.6	0.25	0.782	0.236	518	OK!	0	0	2527	OK!	1856	0.25	0.782	0.236	438.47	OK!
LC3	674	82	466	1856	0.6	0.25	0.782	0.236	518	OK!	0	0	2527	OK!	1856	0.25	0.782	0.236	438.47	OK!
LC4	444	54	466	1856	0.6	0.25	0.782	0.236	518	OK!	-570	-905	2527	OK!	2376	0.20	0.747	0.187	445.07	OK!
LC5	674	82	466	1856	0.6	0.25	0.782	0.236	518	OK!	-428	-678	2527	OK!	2376	0.20	0.747	0.187	445.07	OK!

		Defle	ction Check		Combined Stress Check							
	Wind w, plf	Deflection in	Allow Deflctn in	Check	$\{(fc/F'c)2+(fb/(F'b(1-fc/FcE)))\} \le 1$	Check						
LC1	-30	0.00	0.41	OK	0.04	OK!						
LC2	-30	0.00	0.41	OK	0.02	OK!						
LC3	-30	0.00	0.41	OK	0.03	OK!						
LC4	-21	-0.32	0.41	OK	-0.39	OK!						

LC5 -16 -0.24 0.41 OK -0.29 OK!





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Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

11.4.4

SEISMIC DESIGN LOAD - EQUIVALENT LATERAL FORCE PROCEDURE

Structure: Storage Building - Fire Station 227	
Pulletin a Calauria Panton Ortenia	
Building Seismic Design Criteria	(ASCE - Chapter 11)
Risk Category of Building or Structure:	II Table 1.5-1
Short-Period Spectral Response Acceleration, S_s :	2.506 Per ASCE 7 Hazard Tool
Long-Period Spectral Response Acceleration, S_1 :	1.002 Per ASCE 7 Hazard Tool
Average Height of Building Roof, h_n :	11.59 ft
Site-specific ground motion analysis provided?	Yes 11.4.8
Analytical procedure (Limit per Table 12.6-1)	ELF Equivalent Lateral Force 12.8
Structural irregularities per 12.3.2?	No 12.8.1.3 - Item 1
Exceed 5 story above base/grade including mezzanines?	No 12.8.1.3 - Item 2
Site Class	11.4.3 & 11.4.4
Soil Site Class:	Per Geotech Report

Site Coefficients & Spectral Response Acceleration Parameters

	Table 11.4-1 & 11.4-2	11.4.8 Exceptions	Site-specific analysis per Geotech Report	Calculation Warnings/Notes
Site Coefficient, Fa:	1.00	N/A	1.20	
Site Coefficient, Fv:	Site Specific	1.70	1.70	

$S_{MS} = F_a * S_s$:	2.51	Equation 11.4-1
$S_{M1} = F_V * S_1$: $S_{DS} = 2/3 * S_{MS}$:	2.43	Equation 11.4-2
	1.67	Equation 11.4-3
$S_{D1} = 2/3 * S_{M1}$:	1.62	Equation 11.4-4
$Ts = S_{D1} / S_{DS}$	0.97	11.4.6
Seismic Design Category (SDC):	E	11.6 & Table 11.6-1 & 2

Seismic Equivalent Lateral Force Procedure

Impotance Factor, I_e:

Response Modification Factor, R: Table 12.2-1 Overstrength Amplification factor, Ω_o :

Approximate Period Values: Table 12.8-2:

Approximate Fundamental Period, $Ta = C_t (h_n)^{x}$ Long Period Transition Period, T_L

		Section 12.8
	1.00	Table 1.5-2
	6.50	Light Framed Shear Walls
	2.5	Table 12.2-1
$C_{t:}$	0.02	All other systems
x:	0.75	
	0.13	s Equation 12.8-7
	8	Figure 22 (14-17)



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Sheet:	Seismic ELF Analysis
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Seismic Response Coefficient, Cs:

 $C_s = S_{DS} / (R / I_e)$: Maximum C_s:

 $C_s = S_{D1} / T_a (R / I_e)$: $T \le T_L$ $C_s = S_{D1} T_L / T_a^2 (R / I_e) T > T_L$

Minimum Cs:

 $C_s = 0.044 \, S_{DS} \, I_e$: <u>></u> 0.01 $C_s = 0.5 S_1 / (R / I_e)$: for $S_1 \ge 0.6$

Seismic Base Shear, $V = C_s W$:

Equation 12.8-2 0.257

MAX Equation 12.8-3 1.984 Equation 12.8-4 126.360

MIN

0.074 0.077

Equation 12.8-5

Equation 12.8-6

Equation 12.8-1

Building Structure - Horizontal Seismic Load Effect, Eh

Redundancy Factor, ρ: (Strength Level) $1.0E_h = \rho Qe$: (ASD Level) $0.7E_h = \rho Qe$:

1.30	
0.334 W	
0.234 W	

Section 12.3.4.2 Equation 12.4-3

Equation 12.4-3

Section 12.10

Diaphragm Design Forces per 12.10.1

 $F_{px} = 0.2S_{DS}I_eW_{px} =$ $F_{px} = 0.4S_{DS}I_ew_{px} =$

Equation 12.10-2 Equation 12.10-3

 $F_{px} = W_{px} * \Sigma F_i / \Sigma W_i$ Equation 12.10-1



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Sheet:	Seismic Base Shear - FLEXIBLE
Date:	
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SEISMIC BASE SHEAR ANALYSIS - FLEXIBLE DIAPHRAGM

STRUCTU	JRE: Stora	ige Building	g - Light Fra	amed Wood	d Sheathed	Shear Wal	ls									
	Structural period Factor, k: 1.00														00	
	VERTICAL DISTRIBUTION OF SEISMIC FORCES															
									Level Force	s - 1.0E Sti	ength Leve	el	Alternate	ASD 0.7E	Diaphragr	m F _{px} (k) -
									Force (k)			rce (psf)	Unit Force (psf)		1.0	DE
			Floor Plan Area		w: r:k	ΣWi hi ^k	0	F _x	ΣF _x	1.0 E _h = ρF _x	F _x	1.0 E _h = ρF _x	F _x	0.7 E _h = ρF _x	F _{px}	ΩF_{px}
Level	(ft)	(k)	(ft ²)	(k)	Wi hi ^k		C _{vx}	0.0	0.0	0.0					0.0	00
		0.0		0.0	0	0	0.000	0.0	0.0	0.0					0.0	0.0
		0.0		0.0	0	0	0.000	0.0	0.0	0.0					0.0	0.0
1	11.59	13.2	529	13.2	153	153	1.000	3.4	3.4	4.4	6.43	8.35	4.50	5.85	4.4	11.0
Building W	/eiaht. W =	13.2	529				Ba	se Shear, '	V = C _s *W =	4.42	k					

										.=						_				_		_					_
						BUILE	DING '	WEIG	HT &	SEIS	MIC T	RIBU	TAR	Y ANA	LYSI	S	4						7				
						\leftrightarrow	Dir.		% D	istribu	ution t	o resi	stanc	e grid	lines		\$ □)ir.		% D	istribu	ition t	o resi	stanc	e grid	lines	
			Unit							Grid	llines								47		Grid	lines					
Building Mass Element	Туре	Level	weight (psf)	Area (sf)	Weight (k)	SB-	SB-									Check	SB-	SB- B									Check
Roof	R1	1	13.0	529	6.88	50%	50%			l						100%	50%	50%								<u> </u>	100%
West Wall (upper 1/2)	W1	1	15.0	90	1.35	100%										100%	50%	50%									100%
East Wall (upper 1/2)			15.0	122	1.83		100%	<u>. </u>		<u> </u>				<u> </u>		100%	50%	50%					Ĺ			i	100%
North Wall (upper 1/2)	W1	1	15.0	106	1.59	50%	50%	ļ		<u> </u>	<u> </u> 	K				100%	100%	0%		ļ			<u> </u>			ļ	100%
South Wall (upper 1/2)	W1	1	15.0	106	1.59	50%	50%	<u></u>		<u> </u>					4	100%	0%	100%					Ĺ			İ	100%
	Ĺ	<u> </u>		j	0.00		<u> </u>	<u> </u> j							j	0%	<u></u>						<u>. </u>			<u> </u>	0%
	Ĺ	<u> </u>		<u>.</u>	0.00		<u> </u>	<u> </u>								0%	<u></u>									<u> </u>	0%
					0.00											0%											0%
		<u></u>			0.00											0%											0%
				ΣWi=	13.2	6.4	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

				SEISMIC LOAD SUMMARY BY ELEMENT																					
				‡ [Dir.	/	% Distribution to resistance gridlines ← Dir. % Distribution to resistance gridlines										lines								
						_	Gridlines Gridlines							ĺ											
Building Mass Element	Level	Height (ft)	Notes	SB-	SB-										SB- A	SB- B									
Roof	1	11.585		1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
West Wall (upper 1/2)	1	11.585		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ĺ
East Wall (upper 1/2)	1	11.585		0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ĺ
North Wall (upper 1/2	1	11.585		0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L
South Wall (upper 1/2	1	11.585		0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L
																									L
																									L
																									L
			Σ	2.1	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	SUMMARY OF SEISMIC LOADING BY GRIDLINE (KIPS - 1.0E STRENGTH LEVEL)																						
			← Direction													‡ [Directi	on					
			Gridlines														Grid	lines					
	1.0 E _h =	SB-	SB-									eck	SB-	SB-									eck
Level	ρF_x	1	2									ر ک	Α	В									чэ
1	4.4	2.1	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%
Base	4.42	2.1	2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0								0.0	100%	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%



Sheet:	CC-Walls
Date:	12/17/2024
#:	-
Version:	2

ASCE 7-16 Chapter 30 Component and Cladding -Part I Low Rise Buildings ($h \le 60 \text{ ft.}$)

	lα	

Basic Wind Speed Nominal Wind Speed (√.6)V _{ult.}	V_{nom}	=	125 n 96.825 n	•			ASCE Hazard Tool
Ground elevation above sea level	z_g	=	1287 ft	t.			ASCE Hazard Tool
Risk Category Factor		=	П				Table 1.5-1
Surface Roughness		=	С				26.7.2
Exposure Category		=	С				26.7.3
Mean roof height of building or height of s	structur h	=	11.59 ft	t.			
Enclosure Classification =	En	clos	ed				Table 26.13-1
Roof Slope		=	2	12 →	θ = 9.46 °		
			1/-1	(00-) 5		ll b 400/	

Values of (GCp) for walls shall be reduced by 10%

Wind Load Parameters:

K _z Velocity pressure exposure coefficient	=	0.85	Table 26.10-1
$K_{\scriptscriptstyle d,}$ Wind load directionality factor	=	0.85	Table 26.6-1
K _{e,} Ground Elevation Factor	=	0.9545	Table 26.9-1
K _{zt} Topographic Factor	=		(26.8.2)

-	Velocity Pressure:	a-	=	$.00256K_{z}K_{zt}K_{d}K_{e}V^{2}$	 27.5	8	psf	ASD : q ₇	=	16 55	psf	(26.10-1)
- 1	velocity Flessule.	Чz	_	.00230NzNztr\dr\e v	 21.0	00	psi	ASD . Yz	_	10.55	psi	(20.10-1)

 $G \qquad \text{Gust effect factor} \qquad \qquad = \qquad 0.85 \\ Gc_{pi} \qquad \text{Internal pressure coefficient} \qquad \qquad = \qquad +/- \qquad 0.18$

 $\ensuremath{G_{\text{cp}}}$ Product of external pressure coefficient and gust-effect factor

	G _{cp} coeffcients												
Dire	ection	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf					
(-)	Away	4	-1.10	-1.05	-0.95	-0.92	-0.87	-0.80					
(-)	₹	5	-1.40	-1.29	-1.15	-1.04	-0.94	-0.80					
(+)	Toward	4&5	1	0.94	0.88	0.82	0.77	0.7					

	30.3.2
	30.3.2
5 5 4	Table 26.13-1
ELEVATION	Figure 30.3-1

			G _{cp} *	- G _{cpi}			
Direction	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf
(a)	4	-1.17	-1.13	-1.04	-1.01 -1.12	-0.96	-0.90
(-)	5	-1.44	-1.34	-1.22	-1.12	-1.03	-0.90
(+)Toward	ALL	0.72	0.67	0.61	0.56	0.51	0.45

	$G_{cp}^* + Gc_{pi}$												
Direc	ction	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf					
(<u>-</u>)	way	4	-0.81	-0.765	-0.675	-0.648	-0.603	-0.54					
(-)	ð	5	-1.08	-0.981	-0.855	-0.756	-0.666	-0.54					
(+) Tc	ward	ALL	1.08	1.026	0.972	0.918	0.873	0.81					

*GCp reduction applied

		N	et Surfa	ace Pre	ssures	(G _{cp} - G _{cp}	_i)	
Dire	ection	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf
()	way	4	-32.3	-31.0	-28.5	-27.8	-26.6	-24.8
(-)	Ą	5	-39.7	-37.0	-33.5	-30.8	-28.3	-24.8
(+)1	Toward	ALL	19.9	18.4	16.9	15.4	14.2	12.4

*GCp reduction applied

	Net Surface Pressures (G _{cp} + G _{cpi})										
Di	irection	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf			
(-)	way	4	-22.3	-21.1	-18.6	-17.9	-16.6	-14.9			
	٨						-18.4				
(+)	Toward	ALL	29.8	28.3	26.8	25.3	24.1	22.3			

	Design Wind Surface Pressures										
	Governing GC _p +/- Gc _{pi} Factors Max Net									x Net S	
Dire	ection	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf	D	irection	Zone
(-)	Away -	4	-1.17	-1.13	-1.04	-1.01	-0.96	-0.90	(-)	Away	4
(-)	Ą	5	-1.44	-1.34	-1.22	-1.12	-1.03	-0.90	(-)	Ā	5
(+)1	Toward	ALL	1.08	1.03	0.97	0.92	0.87	0.81	(+)	Toward	ALL

Max Net Surface Pressures (psf) $p = q_h[(GC_p - (Gcpi))]$								
	Direction	Zone	10 sf	20 sf	50 sf	100 sf	200 sf	500 sf
ſ	Away (-)	4	-32.27	-31.03	-28.55	-27.81	-26.56	-24.83
L	(-) §	5	-39.72	-36.99	-33.52	-30.78	-28.30	-24.83
E	(+) Toward	ALL	29.79	28.30	26.81	25.32	24.08	22.34

	Tributary Areas (sq ft) - User Input									
	10< x <20	20< x <50	50< x <100	100< x <200	200< x< 500					
Area	16	33	56	150	250					

	Strength (1.0W) - Effective Wind Pressure at "h" (psf)										
		10< x <20	20< x <50	50< x <100	100< x <200	200< x< 500					
	Α	16.3 sq ft	33.0 sq ft	56.0 sq ft	150.0 sq ft	250.0 sq ft					
()	4	-31.49	-29.96	-28.46	-27.18	-26.27					
(-)	5	-37.99	-35.48	-33.19	-29.54	-27.72					
(+)	ALL	28.85	27.66	26.63	24.70	23.79					

	ASD (.6W) - Effective Wind Pressure at "h" (psf)										
10< x <20 20< x <50 50< x <100 100< x <200 200< x <											
A 16.3 sq ft 33.0 sq ft 56.0 sq ft 150.0 sq ft 25											
	<i>(</i>)	4	-18.89	-17.97	-17.08	-16.31	-15.76				
	(-)	5	-22.80	-21.29	-19.91	-17.73	-16.63				
	(+)	ALL	17.31	16.59	15.98	14.82	14.27				

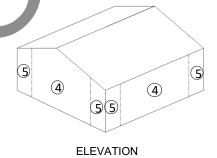


Figure 30.3-1



Sheet:	Wind Analysis
Date:	
Project ID:	
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Chapter 27 - Wind Loads on Buildings: Main Wind Force Resisting System (Directional Procedure) Enclosed & Partially Enclosed Structures - Gable, Hip, Monoslope, & Mansard Roof

Storage Building - Light Framed Wood Sheathed Shear Walls Structure:

Building Data:

Type of Roof:

Horiz building dimension parallel to wind, L:

Horiz building dimension normal to wind, B:

h/L:

L/B:

Roof Pitch, O:

slope ratio: 2 :12 =

9.5 1 287

degrees

ft, above sea level

Ground Elevation, Zg:

General Wind Load Requirements:

Risk category:

V, Basic wind speed (3-s gust): mph

 $V_{asd} = V\sqrt{0.6}$: mph

Wind directionality factor, Kd

Exposure category:

Topographic factor, Kzt:

Ground elevation factor, Ke:

Gust-effect factor, Gf:

Enclosure classification:

Internal pressure coefficient, +/- GCpi

Velocity pressure exposure coefficient, Kz or Kh

Minimum design wind loading, ASD

1,201	11,
125	
97	ν
0.85	
C	
1.0	
0.95	

0.85

Enclosed

0.18

0.85

8.0

psf

Monoslope

20.0

20.0

0.66

1.00

(ASCE 7-16) Table 1.5-1

ASCE 7 Hazard Tool & Fig 26.5-1A, B, C, & D Where exceptions 4 & 5 of Sec. 16.9.1.1 apply

Section 26.6 & Table 26.6-1

Section 26.7

Section 26.8 & Fig 26.8-1

Section 26.9

Section 26.11

Section 26.13 & Table 26.13-1

Table 26.10-1

Section 27.1.5

Determine Velocity Pressure: $qz = 0.00256 \text{ Kz Kzt Kd Ke V}^2$, psf

Section 26.10.2

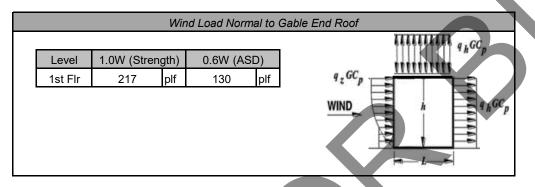
1-Story Building Wind Analysis							
Level	Height (ft)	Kz or Kh	qz (psf)				
Ridge Height	13.17	0.85	27.58	=qh			
Mean Roof, h	11.59	0.85	27.58				
1st Level	10.00	0.85	27.58				

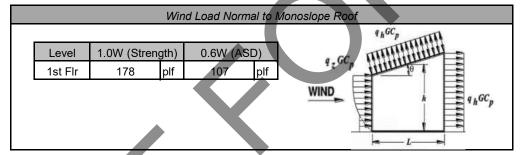
Pressure on Building By Component (Roof Loads Normal to Roof Surface)									
					External	Internal	(psf)		
	Level		qh or	q	External Pressure.	Pressure.			
Surface	(ft)	Ср	qz	(psf)	q(GCp) (psf)	qh(+/-GCpi)	+(GCpi)	-(GCpi)	
Windward Roof - (-Cp)	13.17	0.00	qh	27.58	0.00	0.0	0.00	0.00	
Windward Roof - (+Cp)	13.17	0.00	qh	27.58	0.00	0.0	0.00	0.00	
Leeward Roof	13.17	-0.53	qh	27.58	-12.50	5.0	-7.53	-17.47	
Windward Wall	10.00	0.8	qz	27.58	18.76	5.0	23.72	13.79	
Leeward Wall	10.00	-0.50	qh	27.58	-11.72	5.0	-6.76	-16.69	



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Wind Loading - Horizontal Components									
		+Internal	-Internal	Design	Min.				
Surface	Level (ft)	psf		(psf)	(psf)				
Windward Roof	13.17	0.00	0.00						
Leeward Roof	13.17	-1.24	-2.87	1.24	8				
Windward Wall	10.00	23.72	13.79						
Leeward Wall	10.00	-6.76	-16.69	30.48	16				

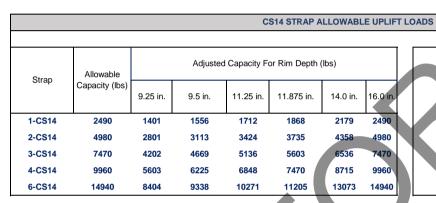






WOOD SITE BUILDING HARDWARE ALLOWABLE LOADS $f'_{c\ min} = 2{,}500\ psi$

	CS14	Reduced (Capacity Comparis	on Table
Floor Rim	Max	Min. Nail	1-CS Strap	1-CS Strap
Depth	10d Nails	Reqs	Reduced Factor	Reduced Capacity (lbs)
9.25	16	9	56%	1401
9.5	16	10	63%	1556
11.25	16	11	69%	1712
11.875	16	12	75%	1868
14	16	14	88%	2179
16	16	16	100%	2490



		/	
STANDARD TENSI	ON STRAP	ALLOWABLE LOA	ADS
Strap	Allowable Capacity (lbs)	Fasteners (in.)	End Length (in.)
1-CS14	2490	(30) 0.131 x 2 1/2	16
2-CS14	4980	(60) 0.131 x 2 1/2	16
CMST14	6475	(66) 0.148 x 2 1/2	30
CMST12	9215	(86) 0.148 x 2 1/2	39
2-CMST14	12950	(132) 0.148 x 2 1/2	30
CMST12	18430	(172) 0.148 x 2 1/2	39

						HOLDO	WN TABL	.E						
HD	Notes	Height, H (in")	Anchor Bolt	Anchor Bolt Capacity SDC C-F (lbs)	Minimum Embed (d _e)	Minimum End Post	Hold Cap		F (in.)	2F (in.)	Minimum Square Pad	Foundation Condition	(It	on Load os) ²
STHD14				3815	40			5285			Footing			SPF/HF 3815
	1	-	-		18	4x4	5285		-	-	-	-	3815	
HTT4	-	12 3/8	SSTB20	4785	16 5/8	4x4	4455	3830	-	-	-	Slab on Grade	4455	3830
HTT4	-	12 3/8	SB5/8X24	5730	18	4x4	4455	3830	-	-	-	Concrete Stemwall	4455	3830
HDU5	-	13 3/8	SSTB24	5790	20 5/8	4x4	5645	4340	-	-	-	Slab on Grade	5645	4340
HDU5	-	13 3/8	SB5/8X24	5730	18	4x4	5645	4340	-	-	-	Concrete Stemwall	5645	4340
HDU8	-	16 5/8	SSTB28	8475	29 7/8	4x6	7870	6580	-	-	-	Slab on Grade	7870	6580
HDU8	1	16 5/8	SB7/8X24	7855	18	4x6	7870	6580	-	-	-	Concrete Stemwall	7855	6580
HDU11		22 1/4	SB1X30	13090	24	4x6	9535	8030	-	-	-	Slab on Grade	9535	8030
HDU11	-	22 1/4	PAB8	17080	11.50	4x6	9535	8030	17.5	35.0	36" square	Concrete Stemwall	9535	8030
HDU11	-	22 1/4	SB1X30	13090	24	4x8	11175	9610	-	-	-	Slab on Grade	11175	9610
HDU11		22 1/4	PAB8	17080	11.50	4x8	11175	9610	17.5	35.0	36" square	Concrete Stemwall	11175	9610
HDU14	3	25 11/16	SB1X30	13090	24	4x8	14390	12375	-	-	-	Slab on Grade	13090	12375
HDU14	3	25 11/16	PAB8	17080	11.50	4x8	14390	12375	17.5	35.0	36" square	Concrete Stemwall	14390	12375
HDU14	3	25 11/16	SB1X30	13090	24	6x6	14445	12425	17.5	-	-	Slab on Grade	13090	12425
HDU14	3	25 11/16	PAB8	17080	11.50	6x6	14445	12425	17.5	35.0	36" square	Concrete Stemwall	14445	12425
HD12	-	20 5/16	PAB8	17080	11.50	4x8	15435	13120	17.5	35.0		Slab on Grade	15435	13120
HD12	-	20 5/16	PAB8	17080	11.50	6x6	15510	12690	17.5	35.0	36" square	Concrete Stemwall	15510	12690
HD19	-	24 1/2	PAB10	26690	15	6x6 DF#1	19070	16210	22.5	45.0		Slab on Grade	19070	16210
HD19	-	24 1/2	PAB10	26690	15	4x8 DF#1	19360	15270	22.5	45.0	48" square	Concrete Stemwall	19360	15270
11013	_	_T 1/Z	LADIO	20000	10	4A0 D1 #1	10000	13210	22.3	45.0		Scholete Steinwall	10000	

^{1.}Load is based on Cracked Concrete Corner Condition

^{2. 12&}quot; Minimum Concrete Footing Width

 $^{3. \} Where \ SB1X30 \ or \ PAB8 \ is \ used \ with \ HDU14, \ 18" \ minimum \ width \ footing \ each \ way \ is \ required \ to \ achieve \ tabulated \ loads$



SHEAR WALL DESIGN GLOBAL PARAMETERS

Input Data:

Applicable Code References:

AWC NDS-18:ASD **2021 SDPWS** 2022 CBC

Seismic Design Properties

Overstrength Factor Ω_o

S.G. of Studs S.G. Adjustment Factor¹

Table 4.3A

Default Wood Framing Species: Strap & Holdown Manufacture:

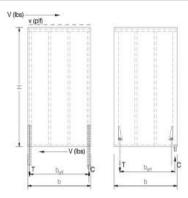
Douglas Fir-Larch SIMPSON STRONG TIE

				ASE	Unit She	ar Capacit	y Table - 2	021 SDPW	/S Table 4.	3A				
Туре	Thickness (in.)	Grade	Nail Size ¹	E.N. O.C. Spacing (in.)	⁶ Framing Member Thk At Adjoining Panel Edges	Mominal Unit Shear Capacity (plf)	Wind Reduction Factor	Seismic Reduction Factor	S.G. Adjustment Factor	⁵ WSP Factor	² Fire Treated Factor	¹ Table 4.3A Footnote 10d nail Factor	Adjusted Seismic Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
6	3/8	CD	8d	6 in. o.c.	2x	730	2	2.8	1	1.0	1.0	-	261	365
4	3/8	CD	8d	4 in. o.c.	2x	1065	2	2.8	1	1.0	1.0	-	350	490
3	3/8	CD	8d	3 in. o.c.	3x	1370	2	2.8	1	1.0	1.0	-	489	685
2	3/8	CD	8d	2 in. o.c.	3x	1790	2	2.8	1	1.0	1.0	-	639	895
2A	3/8	S1	8d	2 in. o.c.	3x	2045	2	2.8	1	1.0	1.0	-	730	1023
2B	15/32	S1	10d	2 in. o.c.	3x	2435	2	2.8	1	1.0	1.0	-	870	1218

- 1. Nail Size Reduction Factor Applied for 10d Nails where Holdown is attached to the inside face of the end post
- 2. Based off of Manuf. Fire Retardant-Treated Wood ICC-ES report #
- 3. Stud Max Spacing 16" O.C. & Panels are applied with long dimension across studs
- 4. Nominal unit shear capacities have been increased to values shown for 15/32 inch (nominal) sheathing per NDS Table 4.3A
- 5. WSP Indicates Aspect Ratio Factor = 1.25-.125 h/b for wood structural panel shear walls
- 6. Type 4 values have been adjusted off a max nominal 980 plf capacity for SDC D,E or F to allow for 2x framing member at panel edges
- 7. Individual Shear Wall Panel Capacities may vary from this table depending on S.G. of wood used, WSP factor, or per foot note comment 10 of Table 4.3A



FULL HEIGHT SHEAR WALL SEGMENT



Terms & Definitions:

T = Tension Force Induced by Seismic or Wind Forces

= Compression Forced Induced by Seismic or Wind Forces

= effective width of overturning moment

= nominal width of shear wall

= Shear Force Induced by the ASD Design Seismic or Wind Load

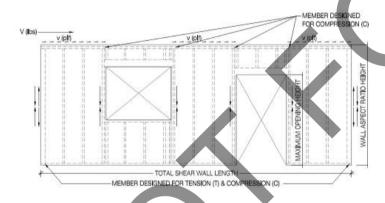
= unit shear force acting along length of shear wall

= Overturning Moment Induced by Seismic or Wind Forces

Resisting Moment Induced by Dead Load

Tension Force,
$$T = \frac{-M_{OT} + M_R}{b_{eff}}$$

PERFORATED SHEAR WALL



Terms & Definitions:

Shear Capacity Adjustment Factor

Sum of Perforated Shear Wall Segment Lengths $\sum b_i$

Maximum unit hsear forces induced by the designseismic or

= Total area sheathed with full-height sheathing

Total area of openings in the perforated shea wall

Total area of perforated shear wall

 ${\textstyle \sum} b_i$ Sum of perforated shear wall segment lengths

Max. unit shear force induced by the design load V_{max}

$$V_n = v_n C_o \sum B_i \tag{4.3-5}$$

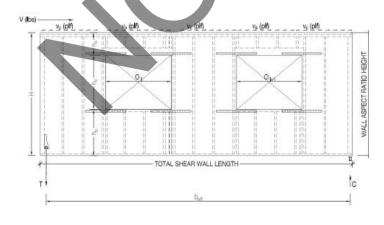
$$C_o = \frac{A_{wall}}{(3A_o + A_{fhs})} \le 1.0$$
 (4.3-6)

$$Tension\ Force, T = \frac{Vh}{C_{O\ \Sigma\ b_I}}$$
 (4.3-8)

Tension Force,
$$T = \frac{Vh}{Cont}$$
 (4.3-8)

$$v_{max} = \frac{V}{c_{O \sum b_I}} \tag{4.3-9}$$

FORCE TRANSFER SHEAR WALL



Terms & Definitions:

= Full Height of Shear Wall

= Wall Height Above Opening

= Clear Height of Opening

= Wall Height Below Opening

= Width of Wall Pier Segment

= Width of Opening

= effective width of overturning moment

$$Tension \ Force, T \ = \frac{-M_{OT} + M_R}{b_{eff}}$$



			FU	LL HEIGI	HT WO	OD SHEA	R PANEL	DESIGI	N (NO OPENING	GS) - SITE	CONSTRU	ICTION			
							,	D20.0.	1 (110 01 211111	30, 0.12	CONCINC				
Applicable	Code Refe	erence:		2021	SDP	NS								.evel: W ID:	SW1
												Gı	rid Refer	rence	1
Shear Wall	Input Data	ı:								Ger	neral Data I	nputs			
	Wood Sp	oecies	=	DF						-	Red	undanc	y Factor	ρ	= 1
		Il Size	=	2x6					5.			_	h Factor		= 2.5
	# of Panel		=	1					Discont	inuous Lat	eral System	ı? (Beam	Beam I		= No =
S G	6. Adjustment	S.G.	=	0.5 1.00							² Fire Treat	ed Lumb	er Cond	lition?	= No
0.0	. rajuotinoni	L _{total}	=	96 in.	8'-0"						² Reduction				= 1.0
		L_{min}	=	96 in.	8'-0"								_ `		
					ASI	D Unit She	ear Capac	ity Tabl	e - 2021 SDPW	S Table 4.	3A				
				5	ח	ja g			с 6	+			i <u>e</u>	.≌	
	Thickness (in.)	0	- -			Framing Member Thk At Adjoining Panel Edges			Wind Reduction Factor Seismic Reduction	T T T	Factor SP Factor	ated	Table 4.3A Footnote 10d nai Factor	Adjusted Seismic Unit Shear	Capacity (pff) Adjusted Wind Unit Shear Capacity (pff)
Туре	ness	Grade	Nail Size ¹	ď) (E)	ig M Adje	, HR HR	į	Factor Factor ic Reduc	Factor	Factor WSP Factor	Fire Treated Factor	'Table 4.3A otnote 10d r Factor	usted Seisr Unit Shear	Sapacity (plf djusted Win Unit Shear Sapacity (plf
	hick	U	Na	C) ;	amin k At Pane	#		find F	П () ≥	Fire '	'Tat otno F	ljuste Uni	Capacity (plf) Adjusted Winc Unit Shear Capacity (plf)
	-			Ц	j	Ĕ F _			S S	V.			6	A	
6	3/8	CD	80	l 6 ir	n. o.c.	2x	73	10	2 2	2.8 0	0.00 1.00	1.00	-	261	365
1. See Glob	al Paramet	er Shee	t for A	dditional N	lotes.			7							
										Notes:	All Decelle			۸ اد حد د	
Shear Wall H	eignt: H _{OTM} (in.)		_	ft. in.			/				All Dead Lo				A - O
	H _{ASPECT} (in.)		_	9 0							verturning I				As Occurs Per
	· ASPECT (····)		_	•											
Shear Pane	el Length D	ata Tab	ole					1		Resisting	g Dead Loa	d Data	Table		
Len	gth	% T	rib	h/b	Aspe	ct Ratio	Aspect Ratio			Level	psf	L _{trib} (f	T)	form olf	Resisting, M _D (ft-kips)
ft	in.					actor	Check								
8 ft.	0 in.	100)%	1.13 :1	1	.00	OK			Roof Wall	13.00 15.00	11.5		9.50 5.00	4.78 4.32
										wan	13.00	3		.00	0.00
													0.	.00	0.00
													0.	.00	0.00
				_										.00	0.00
														.00	0.00
				_										.00	0.00
														.00	0.00
Σ1 =	8.00 ft.	We	eighted	d Average	: 1	.00		l						I M _D :	9.10 ft-kips
ASD Seism	ic Loading	Data T	able			1		1	ASD Wind I	_oading D	ata Table				
Load Description	F _{xi} (psf)	A _{t1} (ft ²)	A_{t2} (ft ²)	9	% _{Trib} L	oad (lbs)		Load Level	W (plf)		To Next		PTrib	Load (lbs)
	1404.00					100	1101		Dest	400					4004
Roof	1491.36	1				100	1491		Roof	130		20	,	50	1301
		Li	ne Loa	ads(lbs)				ì							
							0								
							0						Total		

Total V_(E): 1491 lbs

Total $V_{(w)}$:

1301.1 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Panel	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Per Note 1 Al	pove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load U.C.	Gov. SW Type
Seimic:	1491.4	1491.36237	186.4	260.7	6	8d	6 in. o.c.	3/8	0.7150 E	6
Wind:	1301.1	-	162.6	365.0	6	8d	6 in. o.c.	3/8	0.4456	

ACD Tanaia	. l aad Ca	mbinations:								
Seismi		7E _v +.7E _h =		⊥ 7F	= 0.4	D7ρQ _E				ASCE 2.4.
Seismi	U. 0.0D	/ L _V +./ L _h -	(.o140 _{DS})D	+./ ∟ _h	= 0.4	D/ pQE				ASCE 2.4.
Wind:	0.6D	+ .7W =			= 0.6	D6W				ASCE 2.4.
Overturning	Design:									
Load Type	M_{OT}	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE & 1	.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-13.42	3.33	-10.09	90.8	94.5	output:	-1334.0	-1281.1	-2535.5	-2434.9
Wind:	-11.71	5.46	-6.25	90.8	94.5	output:	-826.2	-793.4	-2580.8	-2478.3
									Apply Omega (Ω)?	No
									Include Uplift F.A.?	No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift	1 1	Point Load	Total Net ASD	Tension Uplift	1.0pE Tensio	n Uplift
Loau Туре	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP

-2309.4

-826.2

-2293.5

-793.4

-3488.0

-3457.8

1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)

Yes

2. (-) indicates uplift

Seimic:

Wind:

- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section

909

-572.7

0.0

5. Orthogonal uplift should be the net uplift from the other direction

0.0

0.0

Hold Down D)esian:					Foi	undation Type:	Slab On Grade
	g				Wood to Woo	d Connection	Post to Cor	nc. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 CS14	3815 2490	0.6053 0.9211	OUTPUT HOLDOWN SUMMARY:	CS14	2x6	STHD14 ALT: HTT4	4x6



			FL	JLL HEIG	HT WO	OD SHE	EAR PANEL	DESIGN	(NO OPENIN	IGS) - SI	TE CO	ONSTRU	CTION	1			
Applicable	Code Refe	erence:		2021	SDPV					,					Level:		1
														Grid Ref	SW ID:		SW2
Chara Wall	In most Date									_		al Data la		ona ive	CICIOC		
Shear Wall	•									G	ener	al Data Ir					
	Wood S	pecies all Size	=	DF 2x6										cy Fact			1 2.5
	# of Panel		_	1					Discon	tinuous I	atera	l System	-				No
	" or r arror	S.G.	=	0.5					Biocom	illiadad E	atora	ii Oyotoiii	. (200		n Depth		
S.G	3. Adjustmen		=	1.00							² F	ire Treate	ed Lur	nber Co	ndition?		No
	,	L_{total}	=	70 in.	5'-10	"					^{2}R	eduction	to Allo	wable C	apacity	1	1.0
		L_{min}	=	70 in.	5'-10'	"										•	
					ASI	D Unit S	hear Capac	ity Table	- 2021 SDPV	VS Table	4.3A	V					
				0	ח	ja 6			_	5	Ŧ			=	. <u>ಲ</u>		
	Thickness (in.)				2	Framing Member Thk At Adjoining	Panel Edges		Wind Reduction Factor		Adjustment Factor	ig	ated	¹ Table 4.3A Footnote 10d nai	Factor Adjusted Seismic	Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (plf)
Туре	iess	Grade	Nail Size ¹) ((E)	J Me Adjo	nel Edg #REF!		Factor	Factor	djust	WSP Factor	Fire Treated Factor	¹ Table 4.3A otnote 10d r	Factor sted Sei	Unit Snear Sapacity (pl	djusted Win Unit Shear Sapacity (plf
	ickr	Ō	Za.			ming A	ane #F		4 bc	i ii		NSP .	ē ņ	Tab	Fa uste	apa	ljust Unit apa
	Ę			2 U		Fra Ti	Ф.		Wind Reduction Factor	200	S.G.	>	_	F00	Adji	S	¥ - 0
4	3/8	CD	80	d 4 i	n. o.c.	2x	106	65	2	2.8	0.00	0.99	1.00	-	3	50	527
1. See Glob	al Parame	ter Shee	et for A	dditional I	Notes.					7							
							- (Notes:							
Shear Wall H	•			ft. in.						1. App	ly All	Dead Lo	ad Fro	m Level	s Above	9	
	H _{OTM} (in.)		=	12 2								ditional Co turning D				d As (Occurs Per
	H _{ASPECT} (in.)	=	12 2						Pian in	Over	turning L	esign	Section	below		
Shear Pane	all angth [Data Tal	hlo							Posist	ina D	ead Loa	d Dota	Table			
	_	Jala Tai	DIE				Aspect			Kesist	ilig D	eau Lua	u Data				
Len	gth	% T	rib	h/b	Aspe	ct Ratio	Ratio			Leve	el	psf	L_{trib}	(ft.)	Iniform plf		sisting, M _D
ft	in.					actor	Check								ріі		(ft-kips)
5 ft.	10 in.	100	0%	2.09 :1	0).99	OK			Roo	_	13.00			149.50		2.54
					—					Wal	I	15.00	1	2 1	0.08		3.06
															0.00		0.00
															0.00		0.00
		7													0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
														т.	0.00		0.00
ΣL =	5.83 ft.	W	eighte	d Average	: 0).99								10	tal M _D :	5.	61 ft-kips
ASD Seism	ic Loading	Data T	Table	1	ı				ASD Wind	Loading I	Data					1	
Load Description	F _{xi} (psf)	A _{t1} ((ft ²)	A_{t2} (ft ²)	9	∕ _{Trib}	Load (lbs)		Load Leve	W (pl	f)	Length Shear			% _{Trib}	L	oad (lbs)
Roof	1602.5	1			1	100	1602		Roof	130		2	20		50		1301
		1:	ine I c	ads(lbs)													
		L	ine LO	uua(IDS)			0										
							0										

Total V_(E): 1602 lbs

Total $V_{(w)}$:

1301.1 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Pane	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	r Note 1 Ab	pove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	1602.5	1602.4617	274.7	350.0	4	8d	4 in. o.c.	3/8	E	0.7849	4
Wind:	1301.1	-	223.1	361.1	6	8d	6 in. o.c.	3/8	_	0.6177	

Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	=	0.4 D7	$^{\prime}\rho Q_{E}$
Wind:	0.6D + .7W =	=	0.6 D -	.6W

ASCE 2.4.5

ASCE 2.4.1

ASD Tension Load Combinations:

Overturning	g Design:									
Load Type	M_{OT}	M_{D}	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
2000 1)70	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-19.50	2.05	-17.44	64.8	68.5	output:	-3232.8	-3055.8	-5161.8	-4879.2
Wind:	-15.83	3.36	-12.47	64.8	68.5	output:	-2310.4	-2184.0	-4889.7	-4622.0
									Apply Omega (Ω)? No
									Include Uplift F	A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0pE Ten	sion Uplift
, , , , , , , , , , , , , , , , , , ,	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-3232.8	-3055.8	-5161.8	-4879.2
Wind:		0.0	1.0		0.0		-2310.4	-2184.0	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0ρΕ & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Hold Down D	Design:					Fou	undation Type:	Slab On Grade
					Wood to Woo	d Connection	Post to Con	c. Connection
Туре	Hardware	Capacity	U.C.		Design Strap	Min. Design Post	Design HD	Min. Design Post
HD: STRAP:	STHD14 2-CS14	3815 4980	0.8474 0.6136	OUTPUT HOLDOWN SUMMARY:	2-CS14	2-2x6	STHD14 ALT: HTT4	4x6



			FU	JLL HEIGI	HT WO	OD SHEAR	PANEL	DESIG	N (NO OPENIN	GS) - SITE	CONSTRU	CTION			
Annlinghia	Code Defe				_					.,					4
Applicable	Code Refe	erence:		2021	SDPV	VS								.evel: W ID:	1 SW3
												Gr	id Refer	ence	Α
Shear Wall	Input Data	a:								Gei	neral Data I	nputs			
	Wood S		=	DF								•	y Factor	ρ	1
	-	all Size	=	2x6									h Factor		= 2.5
	# of Panel	Sides	=	1					Discont	inuous Lat	teral System	? (Beam			= No
		S.G.	=	0.5									Beam [Depth :	=
S.G	6. Adjustment		=	1.00							² Fire Treat				No
		L _{total}	=	96 in.	8'-0"						² Reduction	to Allow	able Cap	pacity :	1.0
		L _{min}	=	96 in.	8'-0"								`		
					ASE	O Unit Shea	ar Capac	ity Tab	le - 2021 SDPW	S Table 4	.3А				
					D	e G			_ 5	; ;			- -	. <u>o</u>	
	Thickness (in.)	4)	-@		5	Framing Member Thk At Adjoining Panel Edges	_		Wind Reduction Factor Seismic Reduction		Factor SP Factor	Fire Treated Factor	Table 4.3A Footnote 10d nai Factor	Adjusted Seismic Unit Shear	Capacity (pir.) Adjusted Wind Unit Shear Capacity (plf.)
Туре	ness	Grade	Nail Size ¹	. C	i)	g M Adjo	#BE		Reduc Factor	Factor	Factor WSP Factor	re Trea Factor	'Table 4.3A otnote 10d r Factor	usted Seisr Unit Shear	djusted Win Unit Shear Capacity (plf
	hick	0	Sa			amir ik Af	#	ŧ .	indi	LL C	W SF	F F	'Tat otno	juste	Japa Ajus Capa
	-			Ш	i	Ë = _			≥ .₫	V			ů.	₹ ,	4 5
6	3/8	CD	80	d 6 ir	n. o.c.	2x	73	30	2	2.8 (0.00 1.00	1.00	-	261	365
1. See Glob	al Paramet	ter Shee	t for A	dditional N	lotes.			7							
										Notes:	All Decide				
Shear Wall H	eignt: H _{OTM} (in.)		_	ft. in.) \				All Dead Lo				
	H _{ASPECT} (in.)	١	_	9 0			^				Additional C Verturning [As Occurs Per
	TASPECT (III.)	,	_	9 0							J	Ū			
Shear Pane	el Length D	Data Tab	ole					•		Resistin	g Dead Loa	d Data 1	Table		
Len	gth	% T	rih	h/b		_	Aspect Ratio			Level	psf	L _{trib} (f	t) Unit	form	Resisting, M _D
ft	in.	/0 1	TID	11/15		ct Ratio ictor	Check			Level	ры	⊏trib (1	, p	olf	(ft-kips)
8 ft.	0 in.	100)%	1.13 :1	1	.00	ок]		Roof	13.00	2	26	5.00	0.83
			- 4							Wall	15.00	10		0.00	4.80
														.00	0.00
														00	0.00
						_		1						.00	0.00
														.00	0.00
													0.	.00	0.00
								1					0.	.00	0.00
]					0.	.00	0.00
ΣL =	8.00 ft.	We	eighted	d Average	: 1	.00							Total	I M _D :	5.63 ft-kips
ASD Seism	ic Loading	Data T	able						ASD Wind	Loading D	ata Table				
Load				2	_	,],		1				To Next			
Description	F _{xi} (psf)	A _{t1} (ft ⁻)	A_{t2} (ft ²)	9/	o _{Trib} Lo	ad (lbs)		Load Level	W (plf)		Wall (ft)		Trib	Load (lbs)
Roof	1546.9	1			1	00	1547	1	Roof	130	:	20	5	50	1301
								ļ							
								ł							
								ł							
								1							
		l i	ne Lo:	ads(lbs)				J							
		=1	25				0	1							
							0	1							

Total V_(E): 1547 lbs

Total $V_{(w)}$:

1301.1 lbs



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Panel	Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Per	Note 1 Ab	ove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	1546.9	1546.91203	193.4	260.7	6	8d	6 in. o.c.	3/8	E	0.7417	6
Wind:	1301.1	-	162.6	365.0	6	8d	6 in. o.c.	3/8	-	0.4456	

ASD Tension L	_oad Combinations:		
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	=	0.4 D7 ρQ_E
Wind:	0.6D + .7W =	=	0.6 D6W

ASCE 2.4.5

ASCE 2.4.1

Overturning	Design:									
Load Type	M _{OT}	M _D	M _{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-16.50	2.06	-14.44	90.8	94.5	output:	-1909.2	-1833.4	-3117.0	-2993.3
Wind:	-13.88	3.38	-10.50	90.8	94.5	output:	-1388.4	-1333.3	-3058.7	-2937.3
									Apply Omega (Ω)? No
									Include Uplift F.	A.? No
Load Type	•	ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift		Point Load	Total Net ASD	Tension Uplift	1.0ρE Ten	sion Uplift
Loud Type	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	Yes	-1334	-400.2		-2309.4	-2233.6	-3688.7	-3565.0
Wind:		0.0	163		0.0		-1388.4	-1333.3	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Type Hardware Capacity U.C. HD: STHD14 3815 0.6053 STRAP: CS14 2490 0.8970 Wood to Wood Connection Post to Conc. Connection Design Strap Min. Design Post Design Strap 2x6 STHD14 ALT: HTT4 Ax6	Hold Down D	esign:					For	undation Type:	Slab On Grade
Type Hardware Capacity U.C. HD: STHD14 3815 0.6053 OUTPUT HOLDOWN SUMMARY: CS14 2x6 STHD14 Ax6						Wood to Woo	d Connection	Post to Cor	nc. Connection
OUTPUT HOLDOWN SUMMARY: CS14 2x6 4x6	Туре	Hardware	Capacity	U.C.		Design Strap	Ū	Design HD	Min. Design Post
		_			OUTPUT HOLDOWN SUMMARY:	CS14	2x6		4x6



			EI	II I HEIGI	JT WO	OD SUE	AD DANEI	DESIGN (NO OPENING	CC) CIT	TE CON	ICTDIII	CTION	d .			
			FC	JLL REIGI	11 WO	JU SHE	AR PANEL	DESIGN (NO OPENING	33) - 311	IE CON	ISTRU	CHOR	N			
Applicable	Code Refe	erence:		2021	SDPV	VS									Level:		1 SW4
													(Grid Re	ference		В
Shear Wall	Innut Date	۵.								G	onoral	Data li	nute				
Snear wan	Wood S			DF	_					<u> </u>	eneral			ncy Fact	ior o		1
		all Size	=	2x6										gth Fac			2.5
	# of Panel	l Sides	=	1					Discont	inuous L	ateral S	System	? (Bea	am Belo	w Strap)	=	No
		0.0		0.5										Bear	n Depth	=	
S.G	3. Adjustmen	S.G. t Factor	=	0.5 1.00							² Fire	Treate	ed Lur	mber Co	ndition?		No
	,	L_{total}	=	96 in.	8'-0"						² Red	luction	to Allo	owable (Capacity	-	1.0
		L_{min}	=	96 in.	8'-0"												
					ASE	Unit Sh	near Capac	ity Table -	2021 SDPW	S Table	4.3A		/				
				5										78			
	Thickness (in.)				5	Framing Member Thk At Adjoining	ges		Wind Reduction Factor Seismic Reduction		Adjustment Factor	ļģ.	ated	¹ Table 4.3A Footnote 10d na	Factor Adjusted Seismic	pE)	Adjusted Wind Unit Shear Capacity (plf)
Туре	less	Grade	Nail Size ¹		(i.	g Me Adjo	nel Edg #REF!	<u> </u>	Factor ic Redi	Factor	djust actor	Fac	e Trea	le 4.	Factor sted Sei	Unit Shear Sapacity (plf	djusted Win Unit Shear Zapacity (plf
	Pick K	O	Z			amir K At	Panel Edges #REF!		S in S	iii	Ą i⊑	WSP Factor	Fire Treated	¹ Table 4.3A otnote 10d r	juste	Unit Shear Capacity (plf)	Adjusted Wind Unit Shear Capacity (pff)
	F			Ц		張七,	_	3	Sei:		Ś			Ğ	Ad		∀ ∪
6	3/8	CD	80	d 6 ir	n. o.c.	2x	73	0	2 2	2.8	0.00	1.00	1.00	-	2	61	365
1. See Glob	al Parame	ter Shee	et for A	dditional N	lotes.			7		7							
										Notes:							
Shear Wall H	H _{OTM} (in.)		=	ft. in.							-				ls Above		
	H _{ASPECT} (in.	١	_	9 0										trated D Section		id As (Occurs Per
	I ASPECT (III.	,	=	9 0								Ü	J				
Shear Pane	el Length [Data Tal	ble							Resisti	ing Dea	ıd Loa	d Data	a Table			
Len	gth	% T	rib	h/b	Aspec	ct Ratio	Aspect Ratio			Leve	I	psf	L_{trib}	(ft.)	Jniform plf		sisting, M _D (ft-kips)
ft	in.				_	ctor	Check			_				_		T	
8 ft.	0 in.	100	0%	1.13 :1	1.	.00	OK			Roof	_	3.00 5.00		0	26.00 150.00		0.83 4.80
										VVali		3.00	'	0	0.00	 	0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
															0.00		0.00
ΣL =	8.00 ft.	W	eighte	d Average	: 1	.00								To	otal M _D :	5.	63 ft-kips
ASD Seism	nic Loading	g Data 1	Гablе						ASD Wind	Loading	Data T	able					
Load	F _{xi} (psf)	A _{t1} ((ft ²)	A_{t2} (ft ²)	0/	PTrib	Load (lbs)		Load Level	W (plf		ength			% _{Trib}	,	oad (lbs)
Description	x (psi)	A _{t1} ((11)	A _{t2} (II)	/	PTrib	LUAU (IDS)		Load Level	vv (þli	" ;	Shear '	Wall (f	ft)	/oTrib	-	.oau (ibs)
Roof	1546.9	1			1	00	1547		Roof	130		2	20		50		1301
		Li	ine Lo	ads(lbs)													
							0										

Total V_(E): 1547 lbs

1301.1 lbs

Total $V_{(w)}$:



FULL HEIGHT WOOD SHEAR PANEL DESIGN (NO OPENINGS) - SITE CONSTRUCTION CONTINUED

Shear Pane	l Design:					Арр	ly 10d Nail S	trength Reduct	ion Factor Pe	r Note 1 Ab	pove = No
Load Type	V (lbs)	ρV (E) (lbs)	v _{req.} (plf)	v _{ava.} (plf)	SW Type	Nail Type	Req. Spacing	Panel Thickness	Gov. Load	U.C.	Gov. SW Type
Seimic:	1546.9	1546.91203	193.4	260.7	6	8d	6 in. o.c.	3/8	E	0.7417	6
Wind:	1301.1	-	162.6	365.0	6	8d	6 in. o.c.	3/8		0.4456	

ASD Tension L	oad Combinations:			
Seismic:	$0.6D7E_v + .7E_h = (.614S_{DS})D + .7E_h$	=	0.4 D7ρQ _E	
Wind:	0.6D + .7W =	=	0.6 D6W	

ASCE 2.4.5

ASCE 2.4.1

Overturning	Design:									
Load Type	M_OT	M_D	M_{net}	HD	Strap		Net Uplift .7p	E & .6W (lbs)	Uplift 1.0ρE	& 1.0W (lbs)
2000 .) po	(ft-kips)	(ft-kips)	(ft-kips)	b _{eff} (in.)	b _{eff} (in.)		HD	Strap	HD	Strap
Seimic:	-16.50	2.06	-14.44	90.8	94.5	output:	-1909.2	-1833.4	-3117.0	-2993.3
Wind:	-13.88	3.38	-10.50	90.8	94.5	output:	-1388.4	-1333.3	-3058.7	-2937.3
									Apply Omega (Ω)? No
									Include Uplift F.	A.? No
Load Type		ift F.A ³ . (-)	30% Ortho.	Orthogo Uplift (-	Point Load	Total Net ASD	Tension Uplift	1.0ρE Ten	sion Uplift
2000 1990	100%	30%	Increase ¹	100%	30%	1.0D _L (+) (lbs)	HD	STRAP	HD	STRAP
Seimic:		0.0	No		0.0		-1909.2	-1833.4	-3117.0	-2993.3
Wind:		0.0	1.0		0.0		-1388.4	-1333.3	-	-

- 1. Apply 30% Orthogonal Increase Per ASCE Section 12.5.3.1 (For Uplift F.A.)
- 2. (-) indicates uplift
- 3. F.A. indicates From Above
- 4. Uplift should ASD level but not include any dead load from above. Refer to "Uplift 1.0pE & 1.0W (lbs) Section
- 5. Orthogonal uplift should be the net uplift from the other direction

Type Hardware Capacity U.C. HD: STHD14 3815 0.5004 STRAP: CS14 2490 0.7363 Wood to Wood Connection Post to Conc. Connection Design Strap Min. Design Post Design HD Min. Design Post STHD14 ALT: HTT4 4x6	Hold Down D	esign:					For	undation Type:	Slab On Grade
Type Hardware Capacity U.C. HD: STHD14 3815 0.5004 OUTPUT HOLDOWN SUMMARY: CS14 2x6 STHD14 Ax6						Wood to Woo	d Connection	Post to Cor	nc. Connection
OUTPUT HOLDOWN SUMMARY: CS14 2x6 4x6	Туре	Hardware	Capacity	U.C.		Design Strap	Ū	Design HD	Min. Design Post
		_			OUTPUT HOLDOWN SUMMARY:	CS14	2x6		4x6



Sheet:	DIAPH 1
Date:	-
#:	-
Δ:	-

SHEAR TRANSFER LOAD CHECK - DIAPHRAGM, HARDWARE, TOP PLATE, COLLECTORS & CHORDS AT SITE BUILT WOOD STUD WALL FRAMED BUILDINGS - DF LUMBER

HARDWARE LOADS					
ITEM	LBS				
A34	515				
A35	695				
LTP4	670				
LTP5	620				
LS50	730				
LS70	915				
RBC	435				
-	-				

	ALLOWABLE DIAPHRAGM LOADS					
TYPE	DIAPHRAGM	(PLF)				
ROOF 1	UNBLOCKED - 15/32" SHEATHING W/ 8d AT 6" O.C. E.N.	180				
ROOF 2	2x BLOCKED - 15/32" SHEATHING W/ 8d AT 4" O.C. E.N.	360				
ROOF 3	-	-				
ROOF 4	-	- 7				
FLOOR 1	UNBLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	215				
FLOOR 2	2x BLOCKED - 23/32" SHEATHING W/ 10d AT 6" O.C.	320				
FLOOR 3		V -				
FLOOR 4		-				

STRAP LOADS				
ITEM	LBS			
CS16	1705			
2-CS16	3410			
CMSTC16	4585			
CMST14	6490			
CMST12	9215			

	ALLOWABLE TOP PLATE NAIL LOADS (Cd = 1.6)						
TYPE	NAIL SIZE	(LBS)					
16d SHORT	16d SHORT - 0.131" x 3.25"	155					
-	-	-					

	SHEAR WALL	W1	W2	W3	W4				
	Fx (0.7E) SHEAR LOAD (LBS)	1491.36	1602	1547	1547				
_	Fpx (0.7E) SHEAR (LBS)	1938.77	2083.2	2010.99	2010.99				
AGN	DIAPHRAGM TYPE	ROOF 1	ROOF 1	ROOF 1	ROOF 1				
Ŧ,	EDGE LENGTH (FT)	20	20	20	20				
DIAPHRAGM	EDGE STRESS (PLF)	96.9386	104.16	100.549	100.549				
	ALLOW STRESS (PLF)	180	180	180	180				
. ш s	WALL LENGTH (FT)	20	20	20	20				
TOP PLATE CLIPS	HARDWARE USED	RBC	RBC	RBC	RBC				
	MAX. SPACING (IN) O.C.	48	48	48	48	 			
<u> </u>	TRIB SPLICE LENGTH (FT)	12	14	12	8				
PLATE	SPLICE LOAD (LBS)	894.817	1135.34	928.147	618.765	 			
P SPL	#16d SHORT NAILS	6	8	6	4				
TOP	ALT. STRAP	CS16	CS16	CS16	CS16				
æ	Fpx (0.7E) SHEAR (LBS)	1938.77	2083.2	2010.99	2010.99				
CTO	TRIB COLLECT. LENGTH (FT)	12		12					
COLLECTOR	COLLECTOR LOAD (LBS)	1163.26	0	1206.59	0	 			
Ö	STRAP TO COLLECTOR	CS16	CS16	CS16	CS16				
	Perp Fpx (0.7E) SHEAR (PLF)	201	201	201	201				
Q	PARALLEL LENGTH (FT)	20	20	20	20				
СНОВ	PERP. WIDTH (FT)	20	20	20	20				
Ö	CHORD TENSION (LBS)	502.75	502.75	502.75	502.75	 	<u> </u>		
	STRAP AT CHORD BREAK	CS16	CS16	CS16	CS16]		



Sheet:	DRAG (2)
Ву:	1
Date:	ī
Δ:	2022 CBC

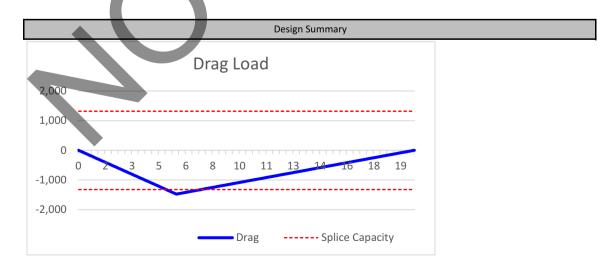
DRAG (2)	Drag along wall 2

	DIAPHRAGM LOADS								
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7		
V _{SEISMIC} , lbs:	2,083								
Start:	0.00								
Length:	20.00								
End:	20.00	0.00	0.00	0.00	0.00	0.00	0.00		

	SHEAR WALL(s) below:						
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	0.00						
Length:	5.83						
End:	5.83	0.00	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wall j	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	5.83

Shear Line	V,total	v,total
Below	(lbs.)	(plf)
$V_{SEISMIC}$	2,083.2	357.3



Total Line Length (ft):	20.00
Load Case:	Seismic
Seismic Drag Factor	1.00

Drag Forces						
Drag Load (lbs.)		Splice Hardware				
0.0 20.0		Plate Splice OK				
-1474.9	5.8	CS16				
0.0	0.0					
0.0	0.0					
0.0	0.0					

(M	ах
(M	in

Top Plate Splice					
No. of 16d Nails:	8				
Nail Cap. (lbs):	103				
Cd:	1.6				
Capacity (lbs):	1318				

Strap Loads (lbs)					
CS16	1705				
2-CS16	3410				
CMSTC16	4690				
CMST14	6475				
CMST12	9215				



Sheet:	DRAG (4)
By:	1
Date:	-
Δ:	2022 CBC

DRAG (4)	Drag along wall 4

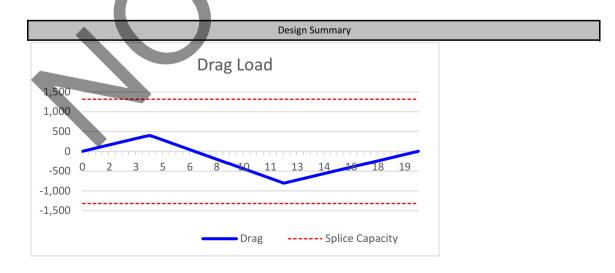
DIAPHRAGM LOADS								
DIAPHRAGM	D1	D2	D3	D4	D5	D6	D7	
V _{SEISMIC} , lbs:	2,011							
Start:	0.00							
Length:	20.00							
End:	20.00	0.00	0.00	0.00	0.00	0.00	0.00	
		·						

v _{SEISMIC} , plf: 100.55 0.00 0.00 0.00 0.00	0.00		0.00	
--	------	--	------	--

	SHEAR WALL(s) below:						
	Wall a	Wall b	Wall c	Wall d	Wall e	Wall f	Wall g
Start:	4.00						
Length:	8.00						
End:	12.00	0.00	0.00	0.00	0.00	0.00	0.00

	Wall h	Wall i	Wallj	Wall k	Wall I	Wall m	
Start:							
Length:							Total L _{sw}
End:	0.00	0.00	0.00	0.00	0.00	0.00	8.00

Shear Line	V,total	v,total	
Below	(lbs.)	(plf)	
$V_{SEISMIC}$	2,011.0	251.4	



Total Line Length (ft):	20.00
Load Case:	Seismic
Seismic Drag Factor	1.00

Drag Forces				
Drag Load (lbs.)	Location (ft)	Splice Hardware		
402.2	4.0	Plate Splice OK		
-804.4	12.0	Plate Splice OK		
0.0	0.0			
0.0	0.0			
0.0	0.0			

(M	ax
(M	in

Top Plate Spl	ice
No. of 16d Nails:	8
Nail Cap. (lbs):	103
Cd:	1.6
Capacity (lbs):	1318

Stra	ap Lo	ads (lbs)
CS16		1705
2-CS16	,	3410
CMSTC1	6	4690
CMST14	4	6475
CMST1	2	9215



Sheet:	CORNER COL
Date:	-
#:	-
Δ:	-

CORNER COLUMN CHECK PER ASCE 7-16 SECTION 12.5.3 & 12.5.4 ORTHOGONAL COMBINATION PROCEDURE

	COLUMN INFORMATION (Assumes minor D+L Axial Load)					
GRID	RID POST SIZE Seismic Axia		al Load (lbs)	Worst case Axial load:	POST CAPACITY	CHECK
OND	1 001 0121	Х	Υ	100%+30% (lbs)	(LBS)	OFILOR
1&A	4X6	2309	2309	3002	4455	ОК



Sheet:	Cont. & Spread Footing
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

Conventional Footing & Spread Footing Design - Bearing wall footings (Non-Retaining)

Design Values:

Allowable Soil Bearing Pressure (psf) = 2,000

Soils Report by: Job Number:

Date:

Inland Foundation Engineering, Inc.
S168-193
September 6, 2024

Max. Conventional Footing Load:

Roof = psf *(23.33 151.6 plf 13 / 2 91.3 plf 2x6 Wall = psf *(/ 2 15 12.167 0 0.0 psf * (9 0) ft psf * (0 0.0 / 2 0) ft psf * (0 0.0 / 2) ft 0 psf * (0.0 242.9 plf

50)=

0.12

ft

Required Footing Width= 243 / (2000

Use Footing: 12 Wide " x 18 " Deep w/ Steel Reinforcing Per Plans

Allowable Point Load at Footing: (Soil Governed)

Bearing Length at Point Load = 2 x (Depth + Slab Edge Thickness) + Post Width

Slab Edge Thickness: 8 in (Depth of slab and subgrade)

Post Width: 3.5 in

	Footing Size (in)		Allowable Point	Longitudinal	# Longitudinal
ſ	Width	Depth	Load, P (lbs)	Rebar Size	Bar T & B
	12	18	9,250	4	2
		T			

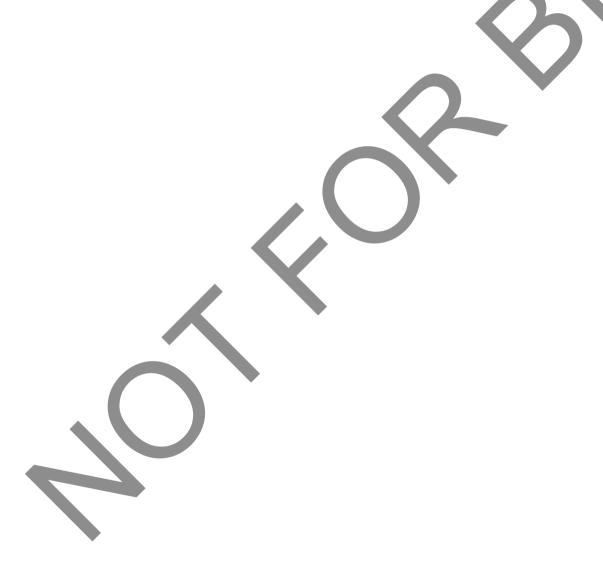
Spread Footing: (Soil Governed)

 $P = Width^{2} / S.B.P.$

Spread Ftg Size (in)		Allowable Point	Rebar	#
Width (SQ)	Depth	Load, P (k)	Size	Bar
24	18	7.1	4	4
30	18	11.1	4	5
36	18	16.0	4	6
42	18	21.7	4	7
48	18	28.4	4	8



SITE STRUCTURES - TRASH ENCLOSURE





Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

SEISMIC DESIGN LOAD - EQUIVALENT LATERAL FORCE PROCEDURE

Structure: Trash Enclosure - Steel Ordinary Moment Frames	
Building Seismic Design Criteria	(ASCE - Chapter 11)
Risk Category of Building or Structure:	II Table 1.5-1
Short-Period Spectral Response Acceleration, S_s :	2.506 Per ASCE 7 Hazard Tool
Long-Period Spectral Response Acceleration, S_1 :	1.002 Per ASCE 7 Hazard Tool
Average Height of Building Roof, h_n :	11.00 ft
Site-specific ground motion analysis provided?	Yes 11.4.8
Analytical procedure (Limit per Table 12.6-1)	ELF Equivalent Lateral Force 12.8
Structural irregularities per 12.3.2?	No 12.8.1.3 - Item 1
Exceed 5 story above base/grade including mezzanines?	9? No 12.8.1.3 - Item 2
Site Class	11.4.3 & 11.4.4
Soil Site Class:	Per Geotech Report

Site Coefficients & Spectral Response Acceleration Parameters

Table

11.4.4

				3 - 3
Site Coefficient, Fa:	1.00	N/A	1.20	
Site Coefficient, Fv:	Site Specific	1.70	1.70	
$S_{MS} = F_a * S_s$: $S_{M1} = F_v * S_1$: $S_{DS} = 2/3 * S_{MS}$: $S_{D1} = 2/3 * S_{M1}$: $Ts = S_{D1} / S_{DS}$			2.51 2.43 1.67 1.62 0.97	Equation 11.4-1 Equation 11.4-2 Equation 11.4-3 Equation 11.4-4 11.4.6
Seismic Design Categ	ory (SDC):		Е	11.6 & Table 11.6-1 & 2

11.4.8

Exceptions

Site-specific

analysis per

Geotech Report

Seismic Equivalent Lateral Force Procedure

Imp	otance	Factor,	1.:
	olunioo	i doloi,	'e-

Response Modification Factor, R: Table 12.2-1 Overstrength Amplification factor, Ω_o :

Approximate Period Values: Table 12.8-2:

Approximate Fundamental Period, $Ta = C_t (h_n)^{x}$: Long Period Transition Period , T_{L} :

		Section 12.8
	1.00	Table 1.5-2
	3.50	Steel Ordinary Moment Frames
	2.5	Table 12.2-1
C_t	0.02	All other systems
x:	0.75	
	0.12	s Equation 12.8-7
	8	Figure 22 (14-17)

Calculation

Warnings/Notes



Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

Seismic Response Coefficient, Cs:

 $C_s = S_{DS} / (R / I_e)$:

Maximum C_s:

 $C_s = S_{D1} / T_a (R / I_e)$: $T \le T_L$ $C_s = S_{D1} T_L / T_a^2 (R / I_e) T > T_L$

Minimum Cs:

 $C_s = 0.044 \ S_{DS} \ I_e$: ≥ 0.01 $C_s = 0.5 \ S_1 \ / \ (R \ / \ I_e)$: for $S_1 \geq 0.6$

Seismic Base Shear, $V = C_s W$:

0.477

MAX 3.830 253.635

MIN

0.074

0.170

0.477

Equation 12.8-5

Equation 12.8-2

Equation 12.8-3

Equation 12.8-4

Equation 12.8-6

Equation 12.8-1

Building Structure - Horizontal Seismic Load Effect, Eh

Redundancy Factor, ρ : (Strength Level) 1.0 $E_h = \rho Qe$: (ASD Level) 0.7 $E_h = \rho Qe$:

1.30	
0.621	W
0.434	W

Section 12.3.4.2

Equation 12.4-3

Equation 12.4-3

Diaphragm Design Forces per 12.10.1

 $F_{px} = 0.2S_{DS}I_{e}W_{px} =$ $F_{px} = 0.4S_{DS}I_{e}W_{px} =$

$F_{px} =$	W_{px}	*	ΣF_i	Σw_i

0.334 W (Min) 0.668 W (Max) Section 12.10 Equation 12.10-2

Equation 12.10 2

Equation 12.10-3

Equation 12.10-1



Sheet:	Seismic Base Shear - FLEXIBLE
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

SEISMIC BASE SHEAR ANALYSIS - FLEXIBLE DIAPHRAGM

TRUCTU	JRE: Trash	Enclosure	e - Steel Ord	dinary Mom	ent Frames	S										
													Structural	period Facto	or, k : 1.0	00
						VERTICA	L DISTRIB	UTION OF	SEISMIC I	FORCES					_	
								l	evel Force	s - 1.0E Str	ength Leve	el	Alternate	ASD 0.7E	Diaphragr	n F _{nx} (k) -
									Force (k)		Unit Fo	rce (psf)	Unit Fo	rce (psf)	1.0)E
	Height from Base	Weight Summary	Floor Plan Area	ΣWi				F _x	ΣF_x	1.0 E _h = ρF _x	F _x	1.0 E _h = ρF _x	F _x	0.7 E _h = ρF _x	F _{px}	ΩF_{px}
Level	(ft)	(k)	(ft ²)	(k)	Wi hi ^k	ΣWi hi ^k	C _{vx}									
		0.0		0.0	0	0	0.000	0.0	0.0	0.0					0.0	0.0
		0.0		0.0	0	0	0.000	0.0	0.0	0.0					0.0	0.0
1	11.00	1.2	140	1.2	13	13	1.000	0.6	0.6	0.7	4.05	5.26	2.83	3.68	0.6	1.4
uildina W	/eight. W =	1.2	140				Ba	se Shear. \	/ = C _s *W =	0.74	k					

																-				_		_					_
						BUILD	DING	WEIG	HT &	SEIS	MIC T	RIBU	TAR\	/ ANA	LYSI	S	4										
						→ Dir. % Distribution to resistance gridlines Dir.													% D	istribu	ution t	o resi	stance	e gridl	lines		
			Unit							Grid	lines										Grid	llines					
Building Mass Element	Туре	Level	weight (psf)	Area (sf)	Weight (k)	TE-	TE- 2									Check	TE- A	TE- B									Check
Roof	R1	1	7.0	140	0.98	50%	50%	<u> </u>	l	l	<u> </u>					100%	50%	50%		4		<u> </u>	<u> </u>				100%
NW Col (upper 1/2)	-	1	12.2	4	0.05	100%										100%	100%										100%
SW Col (upper 1/2)	<u>L</u> .	1	12.2	4	0.05	100%	<u> </u>	<u> </u>	Ĺ	<u> </u>	Ĺ			<u> </u>		100%		100%		<u> </u>	<u> </u>	<u> </u>	Ĺ		Ĺj	İ	100%
NE Col (upper 1/2)	<u>L</u>	1	12.2	4	0.05		100%	<u> </u>	<u> </u>	<u> </u>	Ĺ	K		<u> </u>	,	100%	100%			<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u>. </u>	İ	100%
SE Col (upper 1/2)	<u> </u>	1	12.2	4	0.05		100%	<u> </u>	<u>. </u>	<u> </u>	Ĺ				4	100%		100%		<u></u>	<u> </u>	<u>. </u>	Ĺ			İ	100%
	Ĺ	<u></u>	! !	j	0.00		<u></u>	<u> </u>							<u></u>	0%		Ĺ		<u></u>	<u> </u>	j	<u>. </u>		Ĺ]	İ	0%
	<u> </u>	İ		j	0.00		İ									0%		L		İ		j	<u>. </u>		اــــا	İ	0%
	<u> </u>				0.00											0%											0%
	į	ļ		ļ	0.00											0%											0%
				ΣWi=	1.2	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

					SEISMIC LOAD SUMMAR											Y BY	BY ELEMENT											
				- \$ [Dir.		% D	istribu	tion t	o resi	stanc	e grid	lines		‡	Dir.		% D	istribu	ıtion t	o resi	stanc	e gridl	lines				
							Gridlines								Gridlines													
Building Mass Element	Level	Height (ft)	Notes	TE- 1	TE- 2										TE- A	TE- B												
Roof	1	11		0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
NW Col (upper 1/2)	1	11		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ĺ			
SW Col (upper 1/2)	1	11		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ĺ			
NE Col (upper 1/2)	1	11		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L			
SE Col (upper 1/2)	1	11		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L			
																							Ш	ш	L			
			y , .																				Ш	ш	ļ			
																							Ш	ш	 			
																								ш				
			Σ	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				

	SUMMARY OF SEISMIC LOADING BY GRIDLINE (KIPS - 1.0E STRENGTH LEVEL)																									
	→ Direction															Direction										
						Grid	lines					Gridlines														
	1.0 E _h =	TE-	TE-									eck	TE-	TE-									eck			
Level	ρF_x	1	2									ر ک	Α	В									ပ်			
1	0.7	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%			
Base	0.74	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%			



Sheet:	Seismic ELF Analysis
Date:	
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SEISMIC DESIGN LOAD - EQUIVALENT LATERAL FORCE PROCEDURE

Structure: Trash Enclosure - Special Reinforced Masonry Shea	ur Walls
Building Seismic Design Criteria	(ASCE - Chapter 11)
Risk Category of Building or Structure:	Table 1.5-1
Short-Period Spectral Response Acceleration, S _s :	2.506 Per ASCE 7 Hazard Tool
Long-Period Spectral Response Acceleration, S1:	1.002 Per ASCE 7 Hazard Tool
Average Height of Building Roof, h_n :	6.67 ft
Site-specific ground motion analysis provided?	Yes 11.4.8
Analytical procedure (Limit per Table 12.6-1)	ELF Equivalent Lateral Force 12.8
Structural irregularities per 12.3.2?	No 12.8.1.3 - Item 1
Exceed 5 story above base/grade including mezzanines?	No 12.8.1.3 - Item 2
Site Class	11.4.3 & 11.4.4
Soil Site Class:	Per Geotech Report

Site Coefficients & Spectral Response Acceleration Parameters

Table

11.4.4

Site Coefficient, Fa:	1.00	N/A	1.20	
Site Coefficient, Fv:	Site Specific	1.70	1.70	
0 5 40		ı		
$S_{MS} = F_a^* S_s$:			2.51	Equation 11.4-1
$S_{MS} = F_a * S_s$: $S_{M1} = F_v * S_1$: $S_{DS} = 2/3 * S_{MS}$:			2.43	Equation 11.4-2
$S_{DS} = 2/3*S_{MS}$:			1.67	Equation 11.4-3
$S_{D1} = 2/3*S_{M1}$: $Ts = S_{D1} / S_{DS}$			1.62	Equation 11.4-4
$Ts = S_{D1} / S_{DS}$			0.97	11.4.6
Seismic Design Categ		Е	11.6 & Table 11.6-1 & 2	

11.4.8

Exceptions

Site-specific

analysis per

Geotech Report

Seismic Equivalent Lateral Force Procedure

Impotance Factor, I_e:

Response Modification Factor, R: Table 12.2-1 Overstrength Amplification factor, Ω_o :

Approximate Period Values: Table 12.8-2:

Approximate Fundamental Period, $Ta = C_t (h_n)^{x}$: Long Period Transition Period, T_{L} :

		Section 12.8
	1.00	Table 1.5-2
	5.00	Special Reinforced Masonry SW
	2.0	Table 12.2-1
C_t	0.02	All other systems
x:	0.75	
	0.08	s Equation 12.8-7
	8	Figure 22 (14-17)

Calculation

Warnings/Notes



Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

Seismic Response Coefficient, Cs:

 $C_s = S_{DS} / (R / I_e)$: <u>Maximum C_s :</u>

> $C_s = S_{D1} / T_a (R / I_e): T \le T_L$ $C_s = S_{D1} T_L / T_a^2 (R / I_e) T > T_L$

Minimum Cs:

 $C_s = 0.044 S_{DS} I_e$: ≥ 0.01 $C_s = 0.5 S_1 / (R / I_e)$: for $S_1 \geq 0.6$

Seismic Base Shear, $V = C_s W$:

0.334

MAX 3.902 376.017

MIN

0.074
0.100

0.334 W

Equation 12.8-5

Equation 12.8-2

Equation 12.8-3

Equation 12.8-4

Equation 12.8-6

Equation 12.8-1

Building Structure - Horizontal Seismic Load Effect, Eh

Redundancy Factor, ρ : (Strength Level) 1.0 $E_h = \rho Qe$: (ASD Level) 0.7 $E_h = \rho Qe$:

1.30	
0.434	W
0.304	W

0.668

Section 12.3.4.2 Equation 12.4-3

Equation 12.4-3

Section 12.10

Diaphragm Design Forces per 12.10.1

 $F_{px} = 0.2S_{DS}I_{e}W_{px} =$ $F_{px} = 0.4S_{DS}I_{e}W_{px} =$

_ \	* Z L / Z	

0.334 W (Min)

W (Min) Equation 12.10-2
W (Max) Equation 12.10-3

Equation 12.10-1



27369 Via Industria Temecula, CA 92590 (951) 600-0032, (951) 600-0036 Fax

Sheet:	Wind on Wall
Job #:	24-8400.32
Date:	11/26/2024
Δ:	-
Designer:	VG

			£		Designer:	VG
				SOLID FREE STANDING WALLS AND SIGNS (ASCE 7-16 SEC	TION 29.3)	
				Trash Enclosure - Special Reinforced Masonry Shear	Walls	
		П		Risk / Occupancy Category		Table 1.5-1
		С		Exposure Category	F	igure 26.5
h	=	6.667	ft.	Height above ground surface		
S	=	6.667	ft.	Vertical dimension of wall or sign		
В	=	13.67	ft.	Horizontal dimension of wall or sign		
L_r	=	10	ft.	Horizontal dimension of return corner	Fig	ure 29.3-1
s/h	=	1		Clearance ratio		ure 29.3-1
B/s	=	2.05		Aspect ratio		ure 29.3-1
L _r /s	=	1.5	5.2	Return corner aspect ratio		ure 29.3-1
A_s	=	91.14		Gross area of solid free standing wall or sign		ure 29.3-1
V	=		mph	Basic wind speed		re 26.5-1/
K _z	=	0.85	,	velocity exposure coefficient	Ta	able 29.3-1
K _{zt}	=	1	$= (1 + K_1 K_2 K_3)_2$	directionality Factor		(26.8-1)
K _d	=	0.85			Ta	ble 26.6-1
G	=	0.85	c.	gust-effect factor		
h'	=		ft.	Resultant location of load above ground surface pressure at height h $q_h = .00256K_zK_{zt}K_dV^2$		
q _h	=	28.90	psī	pressure at height h $q_h = .00256 K_z K_{zt} K_d V^s$ LOAD CASES		
				EUAD CASES		
CAS	EΑ	RES	ULTANT FORCE	THROUGH THE GEOMETRIC CENTER	Fig	ure 29.4-1
s/h	_	1		Clearance ratio		
C _f	=	1.4		net force coefficient (pg. 323)	F A	
q _h	=	28.90	nsf	velocity pressure at height, h	CASEA	
P P	=		$psf = q_hGC_f$	pressure at height h	CASEA	
'		37.7	psi q _n oc _f		WIND	
CAS	ΕB	RES	ULTANT FORCE	at .2B FROM GEOMETRIC CENTER	Fig	ure 29.4-1
		_			1	
s/h	=	1		Clearance ratio		_
C_f	=	1.4		net force coefficient	√ F ↑	
q_h	=	28.90	psf	velocity pressure at height, h	WIND → (← 0.28	
Р	=	34.4	psf	pressure at height h	CASE B	
CAS	E C	RES	ULTANT FORCE	AT GEMETRIC CENTER OF REGIONS ALONG WALL OR SIGN		ure 29.4-1
						,
s/h		1		Clearance ratio	← → ← → ← → Balance	9
RF ₁	1	0.68	Reduction I	Factor for Case C for C _f >3.0	/ + + + +	
RF ₂	=	0.80	Reduction F	actor for Case C	WIND F F F	
Red	utio	n Factor	where $s/h > .8$	= 0.80 Reduction Factor Applied	CASE C	
					CASE C	

C _f coeffcients sha	ıll be multiplied	by the fo	llowing red	luction fact	tor when a ret	urn corner is present
		,	0			

L _r /s	Reduction Factor
0.3	0.9
1	0.75
≥2	0.6

B/s = 2.05

Case C must be considered



Sheet:	Wind on Open Roof				
Date:	12/17/2024				
#:	24-8400.32				
Version:	-				

ASCE 7-16 Chapter 27.3.2 - Design Wind Loads On Open Structure - Monoslope Free Roof

Trash Enclosure

27.58

Basic Wind Speed Nominal Wind Speed (v.6)V_{ult.}
Ground elevation above sea level
Risk Category Factor
Surface Roughness
Exposure Category
Mean roof height of building or height of structure
Enclosure Classification

Roof Slope
Gust effect factor

ASCE Hazard Tool

ASCE Hazard Tool Table 1.5-1 26.7.2

Table 26.13-1

26.11

Wind Load Parameters:

Equation for Open Buildings with Monoslope, Pitched or Troughed Free Roofs

 $.00256K_zK_{zt}K_dK_eV^2$

psf ASD: .6W = 16.55

Table 26.10-1 Table 26.6-1 Table 26.9-1

(26.8.2)

(27.3-2)

q_h = velocity pressure evaluated at mean roof height h

q_h =

G = Gust effect Factor

Velocity Pressure:

C_N = Net Pressure Coefficient determined form Figures 27.3-4 through 27.3-7 Include contributions from top & bottom surfaces

 $p = q_h GC_n$

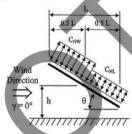
Table 26.13-1

	Interpolated Values									
			-	: 0°				180°		
			Clear Flow		Obstructed Clea		ear Flow C		Obstructed	
LC	C _{NW}	C _{NL}	C _{NW}	C _{NL}	C _{NW}	C _{NL}	C _{NW}	C _{NL}		
7.5°-15°	Α	-0.68	-1.08	-1.03	-1.50	1.00	1.53	-0.04	-1.17	
7.5°	В	-1.53	0.00	1.75	0.43	1.65	0.34	0.85	-0.30	

Strength Level Wind Pressure (psf)						
: 0°	=1	180°				
Flow	Clear Flow					
C_{NL}	C_{NW}	C _{NL}				
-25.29	23.56	35.78				
0.00	38.74 7.95					
	0° Flow C _{NL} -25.29	0° =1 Flow Clear C _{NL} C _{NW} -25.29 23.56				

Wind P	h Level ressure sf)
C _{NW}	C _{NL}
23.56	35.78
38.74	7.95





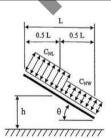




Figure 27.3-4

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.67 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 Used for Sliding & Overturning

Axial Load Applied to Stem

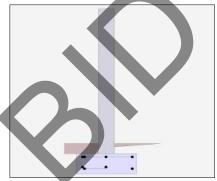
Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Soil Data

Allow Soil Bearing Equivalent Fluid Pressure	= Meth	_,	psf
Active Heel Pressure	=		psf/ft
	=		
Passive Pressure	=	333.0	psf/ft
Soil Density, Heel	=	110.00	pcf
Soil Density, Toe	=	110.00	pcf
Footing Soil Friction	=	0.400	
Soil height to ignore for passive pressure	=	12.00	in

Lateral Load Applied to Stem

Lateral Load Height to Top Height to Bottom	= =	0.0 #/ft 0.00 ft 0.00 ft
Load Type	=	Wind (W)
		(Service Level)
Wind on Exposed Stem (Strength Level)	=	34.4 psf



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan

Design Summary			Stem Construction		Bottom			
			Design Height Above Ftg	ft =	Stem OK 0.00			
Wall Stability Ratios			Wall Material Above "Ht"	=	Masonry			
Overturning	=	1.96 OK	Design Method	=	ASD	SD	SD SD	SD
Sliding	=	3.50 OK	Thickness	=	8.00			
Global Stability	=	3.13	Rebar Size	=	# 4			1
ŕ			Rebar Spacing	=	16.00			/
Total Bearing Load	=	1,096 lbs	Rebar Placed at	=	Center			,
resultant ecc.	=	7.66 in	Design Data ————		0.040			
Eccentricity outside			fb/FB + fa/Fa	=	0.619			
Soil Pressure @ Toe	=	1,175 psf OK	Total Force @ Section					
Soil Pressure @ Heel	=	0 psf OK	Service Level	lbs =	142.7			
Allowable Soil Pressure Less	= Than	2,000 psf	Strength Level	lbs =				
ACI Factored @ Toe			MomentActual					
ACI Factored @ Toe ACI Factored @ Heel	=	1,645 psf 0 psf		ft-# =	528.8			
- · · · · · · - · · · -		·	Strength Level	ft-# =				
Footing Shear @ Toe	=	8.7 psi OK	MomentAllowable	/=	854.2			
Footing Shear @ Heel Allowable	=	1.7 psi OK	ShearActual					
Allowable	=	75.0 psi	Service Level	psi =	1.6			
Sliding Calcs			Strength Level	psi=				
Lateral Sliding Force	=	182.7 lbs	ShearAllowable	psi =	45.5			
less 100% Passive Force		208.1 lbs	Anet (Masonry)	in2 =	91.50			
less 100% Friction Force		431.2 lbs	Wall Weight	psf =	84.0			
Added Force Reg'd	=	0.0 lbs OK	Rebar Depth 'd'	in=	3.81			
for 1.5 Stability	=	0.0 lbs OK	Rebai Deptin d	III) =	3.01			
ioi 1.5 Stability	_	0.0 ibs OR	Masonry Data					
Vertical component of active	latera	al soil pressure IS	f'm	psi =	1,500			
NOT considered in the calcu			Fs	psi =	20,000			
		ŭ	Solid Grouting	=	Yes			
Load Factors			Modular Ratio 'n'	=	21.48			
Building Code			Equiv. Solid Thick.	in =	7.63			
Dead Load		1.200	Masonry Block Type	=				
Live Load		1.600	Masonry Design Method	=	ASD			
Earth, H		1.600	Concrete Data					
Wind, W		1.600	f'c	psi =				
Seismic, E		1.000	Fy	psi =				

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan

Footing Data

Toe Width	=	0.92 ft
Heel Width	=	1.58
Total Footing Width	= -	2.50
Footing Thickness	=	12.00 in

f'c = 2,500 psi Fy = 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % = 0.0018 Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	1,645	0	psf
Mu' : Upward	=	576	2	ft-#
Mu' : Downward	=	141	141	ft-#
Mu: Design	=	435	139	ft-#
φMn	=	11,610	13,005	ft-#
Actual 1-Way Shear	=	8.68	1.73	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	# 5 @ 12.00 in		
Heel Reinforcing	=	# 5 @ 12.00 in		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu		=	0.00 ft-lb	os
Footing Allow. Torsio	n, q	Tn =	0.00 ft-lb	os

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area per foot 0.65 in2 // in2 // fit

f one layer of horizontal bars: If two layers of horizontal bars:

#4@ 9.26 in #4@ 18.52 in #5@ 28.70 in #6@ 20.37 in #6@ 40.74 in

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan

Summary of Overturning & Resisting Forces & Moments

		ERTURNING				SISTING	
Item	Force lbs	Distance ft	Moment ft-#		Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force	45.0	0.50	22.5	Soil Over HL (ab. water tbl) Soil Over HL (bel. water tbl) Water Table	50.4	2.04 2.04	102.9 102.9
Buoyant Force = Surcharge over Heel Surcharge Over Toe = Adjacent Footing Load = Added Lateral Load =				Sloped Soil Over Heel = Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem = * Axial Live Load on Stem =	2		
Load @ Stem Above Soil =	137.7	4.84	665.6	Soil Over Toe = Surcharge Over Toe =	50.4	0.46	23.1
				Stem Weight(s) = Earth @ Stem Transitions =	602.3	1.25	752.9
Total =	182.7	O.T.M. =	688.1	Footing Weight = Key Weight =	375.0	1.25	468.8
Resisting/Overturning R			1.96	Vert. Component =			
Vertical Loads used for S	Soil Pressure	= 1,096.3	3 lbs	Total = * Axial live load NOT included in		ed, or used for	1,347.6 overturning

resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 200.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.117 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing Calculated Rebar Stress, fs = 12381.32 psi

Lap Splice length for #4 bar specified in this stem design segment (25.4.2.3a) = $\frac{1}{2}$

Development length for #4 bar specified in this stem design segment =

Hooked embedment length into footing for #4 bar specified in this stem design segment =

As Provided =

As Required =

20.00 in 12.38 in

6.00 in

0.1500 in2/ft 0.0932 in2/ft

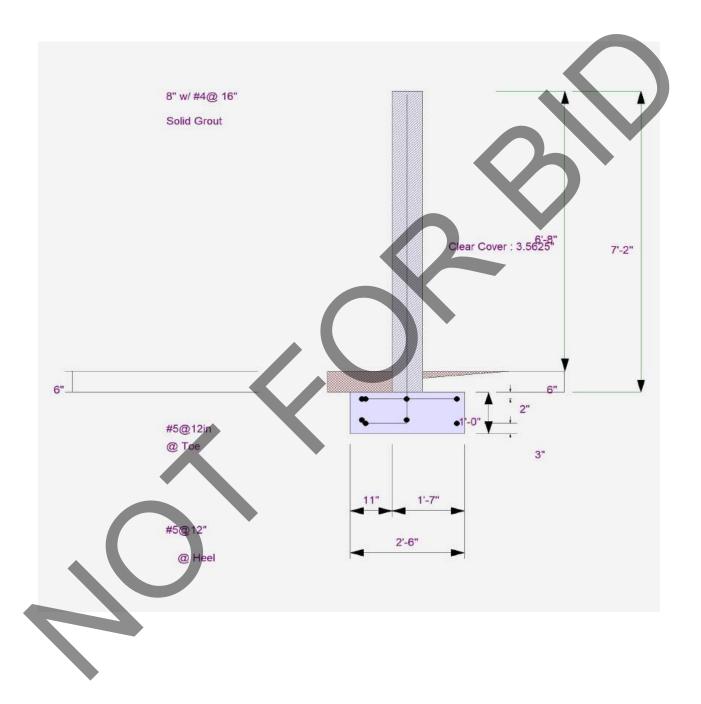
Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan



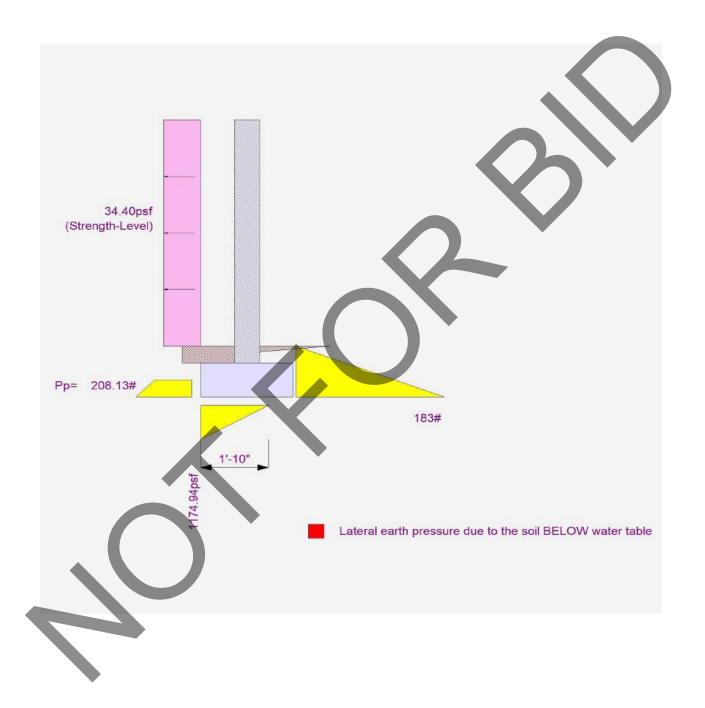
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LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Wind Check - Trash Enclosure - Foundation Plan



LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

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DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	6.67 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	6.0 in

Stem Weight Seismic Load

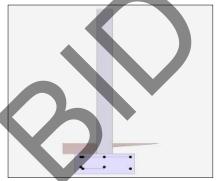
Soil Data

Allow Soil Bearing Equivalent Fluid Pressure	= Metl	2,000.0 psf
Active Heel Pressure	=	40.0 psf/f
	=	
Passive Pressure	=	333.0 psf/f
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in

Lateral Load Applied to Stem

Lateral Load	= 0.0 #/ft	
Height to Top Height to Bottom	= 0.00 ft = 0.00 ft	
Load Type	= Wind (W)	
	(Service Leve	el)
Wind on Exposed St (Strength Level)	em = 0.0 psf	•

F_p / W_p Weight Multiplier = 0.800 g



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300
Added seismic base force	е	337.3 lbs

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan

Design Summary	Stem Construction		Bottom			
Wall Stability Ratios	Design Height Above Ftg		Stem OK 0.00			
Overturning = 0.86 UNSTA	Wall Material Above "Ht"	=	Masonry ASD	SD	SD SD	SD
Sliding = 1.67 OK	BLE! Design Method Thickness	=	8.00	20	20 20	SD
Global Stability = 3.13	Rebar Size	=	# 5			
Global Stability = 3.13	Rebar Spacing	=	16.00			
Total Bearing Load = 1,096 lbs	Rebar Placed at	=	Center			
resultant ecc. = 17.46 in	Design Data					
	fb/FB + fa/Fa	=	0.934			
Soil Pressure @ Toe = 0 psf OK	Total Force @ Section					
Soil Pressure @ Heel = 0 psf OK	Service Level	lbs=	342.3			
Allowable = $2,000 \text{ psf}$	Strength Level	lbs=				
Soil Pressure Less Than Allowable	MomentActual					
ACI Factored @ Toe = 0 psf	Service Level	ft-# =	1,210.0			
ACI Factored @ Heel = 0 psf	Strength Level	ft-# =				
Footing Shear @ Toe = 2.4 psi OK	MomentAllowable	/=	1,294.8			
Footing Shear @ Heel = 2.0 psi OK	ShearActual	7				
Allowable = 75.0 psi	Service Level	psi =	3.7			
Cliding Color		psi=				
Sliding Calcs Lateral Sliding Force = 382.3 lbs	ShearAllowable	psi =	45.5			
•		in2 =	91.50			
less 100% Passive Force - 208.1 lbs less 100% Friction Force ≡ - 431.2 lbs		psf =	84.0			
Added Force Reg'd = 0.0 lbs OK		_	_			
for 1.5 Stability = 0.0 lbs OK	Rebar Depth 'd'	in=	3.81			
101 1.3 Stability = 0.0 lb3 OR	Masonry Data					
Vertical component of active lateral soil pressure IS		psi =	1,500			
NOT considered in the calculation of soil bearing	Fs	psi =	20,000			
· ·	Solid Grouting	=	Yes			
Load Factors	Modular Ratio 'n'	=	21.48			
Building Code	Equiv. Solid Thick.	in =	7.63			
Dead Load 1.200	Masonry Block Type	=				
Live Load 1.600	Masonry Design Method	=	ASD			
Earth, H 1.600	Concrete Data					
Wind, W 1.600		psi =				
Seismic, E 1.000	Fy	psi =				

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan

Footing Data

Toe Width	=	0.92 ft
Heel Width	=	1.58
Total Footing Width	= _	2.50
Footing Thickness	=	12.00 in

f'c = 2,500 psi Fy = 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % = 0.0018 Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	0	0	psf
Mu': Upward	=	0	0	ft-#
Mu': Downward	=	141	141	ft-#
Mu: Design	=	-141	141	ft-#
φ Mn	=	9,777	10,944	ft-#
Actual 1-Way Shear	=	2.41	1.98	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	# 5 @ 14.35 in		
Heel Reinforcing	=	# 5 @ 14.35 in		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu		=	0.00 ft-lb	s
Footing Allow. Torsio	n, q	7 Tn =	0.00 ft-lb	os

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area per foot 0.65 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars: If two layers of horizontal bars:

#4@ 9.26 in #4@ 18.52 in #5@ 14.35 in #5@ 28.70 in #6@ 20.37 in #6@ 40.74 in

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan

Summary of Overturning & Resisting Forces & Moments

ltem	Force	ERTURNING Distance ft	Moment	RESISTING Force Distance Moment lbs ft ft-#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force Buoyant Force =	45.0	0.50	22.5	Soil Over HL (ab. water tbl) 50.4 2.04 102.9 Soil Over HL (bel. water tbl) 2.04 102.9 Water Table Sloped Soil Over Hee =
Surcharge over Heel = Surcharge Over Toe = Adjacent Footing Load = Added Lateral Load =				Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem = * Axial Live Load on Stem =
Load @ Stem Above Soil =				Soil Over Toe = 50.4 0.46 23.1 Surcharge Over Toe =
Seismic Stem Self Wt	337.3	4.59	1,546.4	Stem Weight(s) = 602.3 1.25 752.9 Earth @ Stem Transitions =
Total =	382.3	O.T.M. =	1,568.9	Footing Weight = 375.0 1.25 468.8 Key Weight =
Resisting/Overturning Ra Vertical Loads used for S			0.86	Vert. Component =
If seismic is included, the O		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	o ius	Total = 1,078.1 lbs R.M.= 1,347.6 * Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 200.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.000 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing Calculated Rebar Stress, fs = 18689.64 psi

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

35.04 in 35.04 in

6.49 in 0.2325 in2/ft 0.2156 in2/ft

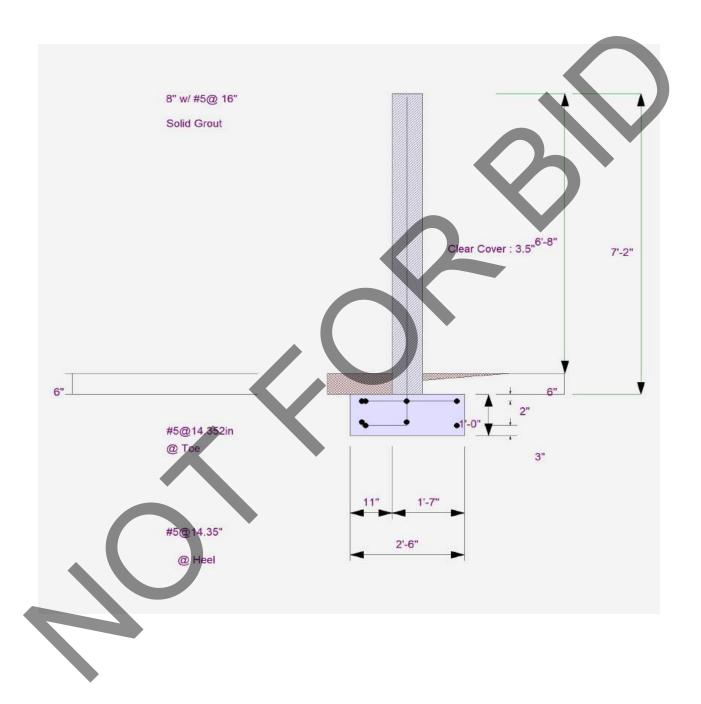
Project File: 8400.32 - Site Structures.ec6

LIC# : KW-06014215, Build:20.24.10.03

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DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan



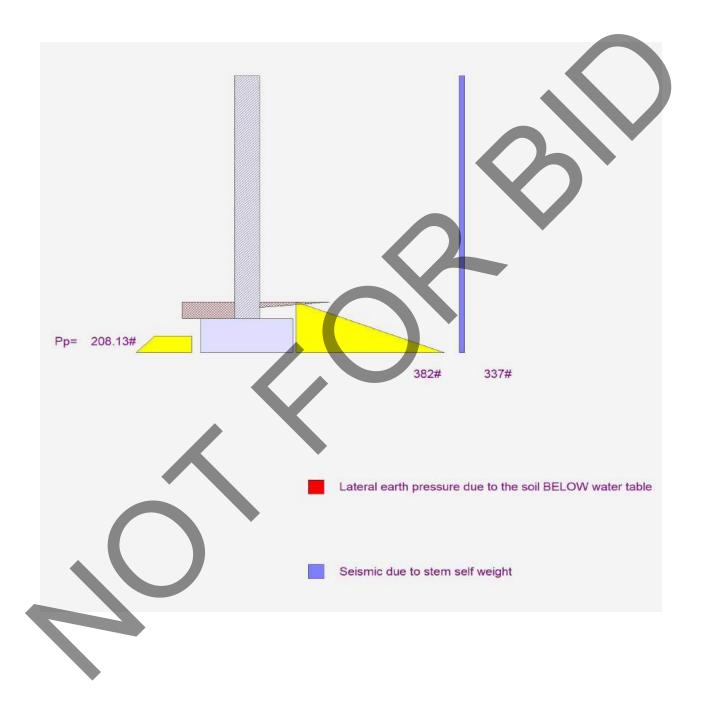
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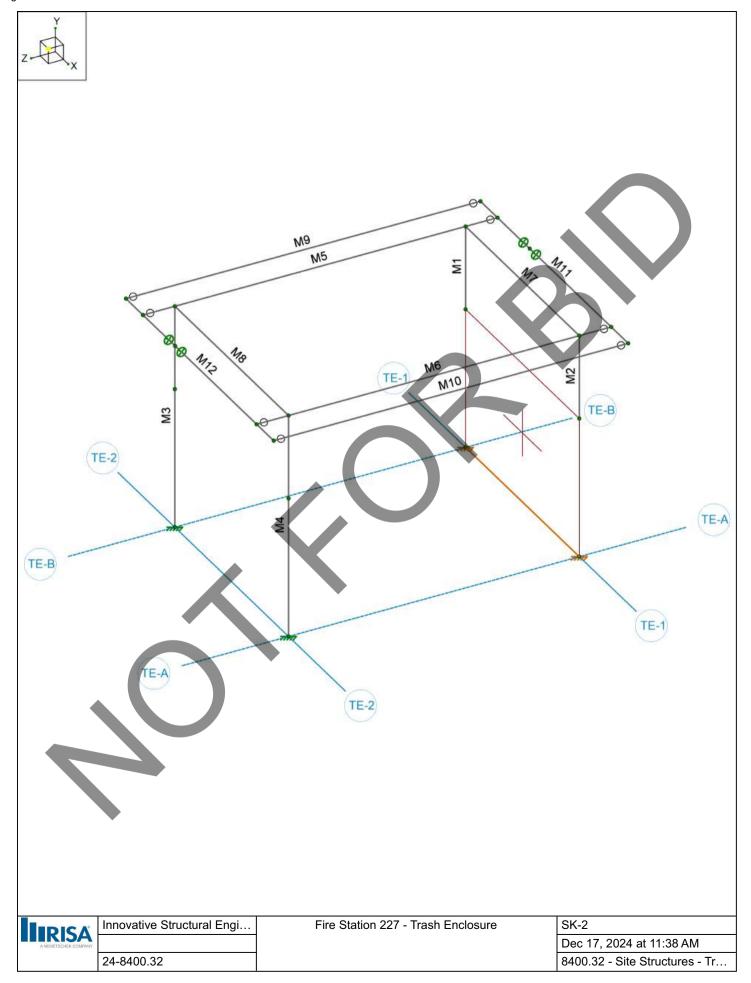
LIC# : KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Typical, Free Standing CMU Wall, Seismic Check - Trash Enclosure - Foundation Plan







Designer : Job Number : 24-8400.32

Model Name: Fire Station 227 - Trash Enclosure

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Checked By : __

Project Grid Lines

	Label	Start [ft]	End [ft]	Start [ft]	End [ft]	Start Bubble	End Bubble
1	TE-1	0	0	-5	15	Yes	Yes
2	TE-2	13.667	13.667	-5	15	Yes	Yes
3	TE-A	-5	18.667	10	10	Yes	Yes
4	TE-B	-5	18.667	0	0	Yes	Yes

Project Grid Arcs

No Data to Print.

Node Coordinate	29
-----------------	----

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	0	0	0	
2	N2	10	0	0	
3	N3	0	0	13.6667	
4	N4	10	0	13.6667	
5	N5	0	6.6667	0	
6	N6	10	6.6667	0	
7	N7	0	6.6667	<u>13.6667</u>	
8	N8	10	6.6667	13.6667	
9	N9	0	10.6667	0	
10	N10	10	10.6667	0	
11	N11	0	10.6667	13.6667	
12	N12	10	10.6667	13.6667	
13	N13	0	10.6667	-1. <mark>5</mark>	
14	N14	10	10.6667	-1 <u>.5</u>	
15	N15	0	10.6667	15.1667	
16	N16	10	10.6667	15.1667	
17	N17	-1.5	10.6667	-1.5	
18	N18	-1.5	10.6667	15.1667	
19	N19	11.5	10.6667	-1.5	
20 21	N20	11.5	10.6667	15.1667	
	N21	2.833333	10.6667	15.1667	
22	N22	2.833333	10.6667	-1.5	

Masonry Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e ⁵ °F ⁻¹]	Self Weight [k/ft³]	f'm [ksi]	Flex Steel [ksi]	Shear Steel [ksi]
1	Concrete Matl	1350	540	0.25	0.6	Custom	1.5	60	60
2	Clay Matl	10 50	420	0.25	0.6	Custom	1.5	60	60
3	Gen Masonry	1050	420	0.25	0.6	0.08	1.5	60	60

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1



Designer : Job Number : 24-8400.32

Model Name: Fire Station 227 - Trash Enclosure

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Checked By : __

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	lyy [in⁴]	Izz [in⁴]	J [in⁴]
1	COLUMN	HSS4X4X4	Column	SquareTube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
2	BEAM	HSS4X4X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
3	RIM	HSS4X2X4	Beam	Tube	A500 Gr.B Rect	Typical	2.44	1.48	4.49	3.82

Member Primary Data

	Label	l Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N5	N9	COLUMN	Column	SquareTube	A500 Gr.B Rect	Typical
2	M2	N6	N10	COLUMN	Column	SquareTube	A500 Gr.B Rect	Typical
3	M3	N3	N11	COLUMN	Column	SquareTube	A500 Gr.B Rect	Typical
4	M4	N4	N12	COLUMN	Column	SquareTube	A500 Gr.B Rect	Typical
5	M5	N13	N15	BEAM	Beam	Tube	A500 Gr.B Rect	Typical
6	M6	N14	N16	BEAM	Beam	Tube	A500 Gr.B Rect	Typical
7	M7	N9	N10	BEAM	Beam	Tube	A500 Gr.B Rect	Typical
8	M8	N11	N12	BEAM	Beam	Tube	A500 Gr.B Rect	Typical
9	M9	N17	N18	RIM	Beam	Tube	A500 Gr.B Rect	Typical
10	M10	N19	N20	RIM	Beam	Tube	A500 Gr.B Rect	Typical
11	M11	N17	N19	RIM	Beam	Tube	A500 Gr.B Rect	Typical
12	M12	N18	N20	RIM	Beam	Tube	A500 Gr.B Rect	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]		Lcomp top [ft]	Channel Conn.	a [ft]	Function
1	M1	COLUMN	4		Lbyy	N/A	N/A	Lateral
2	M2	COLUMN	4		Lbyy	N/A	N/A	Lateral
3	M3	COLUMN	10.667		Lbyy	N/A	N/A	Lateral
4	M4	COLUMN	10.667		Lbyy	N/A	N/A	Lateral
5	M5	BEAM	16.667		Lbyy	N/A	N/A	Lateral
6	M6	BEAM	16.667		Lbyy	N/A	N/A	Lateral
7	M7	BEAM	10		Lbyy	N/A	N/A	Lateral
8	M8	BEAM	10		Lbyy	N/A	N/A	Lateral
9	M9	RIM	16.667		Lbyy	N/A	N/A	Lateral
10	M10	RIM	16.667	~	Lbyy	N/A	N/A	Lateral
11	M11	RIM	13		Lbyy	N/A	N/A	Lateral
12	M12	RIM	13		Lbvv	N/A	N/A	Lateral

Member Advanced Data

	Label	l Release	J Release	Col-Wall Vert Release	Physical	Deflection Ratio Options	Seismic DR
1	M1				Yes	** NA **	OMF
2	M2				Yes	** NA **	OMF
3	M3				Yes	** NA **	OMF
4	_M4				Yes	** NA **	OMF
5	M5	BenPIN	BenPIN		Yes	Default	None
6	M6	BenPIN	BenPIN		Yes	Default	None
7	M7				Yes	Default	None
8	M8				Yes	Default	None
9	M9	BenPIN	BenPIN		Yes	Default	None
10	M10	BenPIN	BenPIN		Yes	Default	None
11	M11				Yes	Default	None
12	M12				Yes	Default	None



Designer

Job Number : 24-8400.32

Model Name: Fire Station 227 - Trash Enclosure

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Wall Panel Data

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
1	WP1	N2	N6	N5	N1	Masonry	Concrete Matl	8	Typical	16

Wall Panel Advanced Data

	Label	Seismic Rule	Design Method	SSAF	Cm In-Plane	Cm Out-Plane	Stud Bracing	Sheathing Connect Dist [in]
1	WP1	Special	N/A	N/A	N/A	N/A	N/A	N/A

Design Size and Code Check Parameters

Label	Max Axial/Bending Chk	Max Shear Chk
1 Typical	1	1

Deflection Design

Label	LC	Ratio	LC	Ratio	LC	Ratio
1 Typical	1	240	2	360	3	240

Masonry Wall Panel Parameters

	Label	Block Nom Width	Block Grouting	Reinforced	Wall Area Method
1	Typical	8"	Fully Grouted	Yes	NCMA

Masonry Wall Panel In-Plane Parameters

	Label	Vert Bar Size	Bars Per Cell	Min E	Sound Zone W	idth [in]	Max Bound Zone Width [in]	Horz Bar Size	Transfer Load
1	Typical	#4	1		8		40	# Δ	

Masonry Wall Panel Out-of-Plane Parameters

	Label	Bar Size	Bar Space Min	Bar Space Max	Bar	Placement	Cover [in]	Mortar Type	Cement Type	Transfer Load
1	Typical	#4	8"	72"		Center	Min	Type M or S	Portland, Lime/Mortar	

Masonry Wall Panel Lintel Parameters

Label Depth [in] E	Bear Length [in] Bar Size Min #	Bars Per Layer	Max # Bars Per Layer	Num of Layers	c/c Sp of Layers [in]	Dist To Bot [in]	Stirrup Size	Analysis Method
1 Typical 16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported

Masonry Wall Seismic Design Rule

	Label	Wall Types	Special Boundary Elements	1.5x Shear ASD
1	Ordinary	Ordinary		
2	Intermediate	Intermediate		
3	Special	Special	Yes	Yes

Member Distributed Loads (BLC 3 : ELX)

	Member LabelDirectionStart Magnitude [k/ft, F, ksf, k-ft/ft]End Magnitude [k/ft, F, ksf, k-ft/ft]Start Location [(ft, %)]End Location [(ft, %)]									
1	M7	Χ	0.08	0.08	0	%100				
2	M8	X	0.08	0.08	0	%100				



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Member Distributed Loads (BLC 4 : ELZ)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M5	Z	0.048	0.048	0	%100
2	M6	Z	0.048	0.048	0	%100

Member Distributed Loads (BLC 5 : WLX)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M10	Χ	0.008	0.008	0	%100
2	M9	Χ	0.008	0.008	0	%100
3	M3	Χ	0.008	0.008	6.667	%100
4	M4	Χ	0.008	0.008	6.667	%100
5	M2	Χ	0.008	0.008	0	%100
6	M1	Χ	0.008	0.008	0	%100

Member Distributed Loads (BLC 6 : WLZ)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M11	Z	0.008	0.008	0	%100
2	M12	Z	0.008	0.008	0	%100
3	M2	Z	0.008	0.008	0	%100
4	M1	Z	0.008	0.008	0	%100
5	M3	Z	0.008	0.008	6.667	%100
6	M4	Ζ	0.008	0.008	6.667	%100

Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M5	Υ	-0.051	-0.041	0	2.083
2	M5	Υ	-0.041	-0.037	2.083	4.167
3	M5	Υ	-0.037	-0.038	4.167	6.25
4	M5	Υ	-0.038	-0.038	6.25	8.333
5	M5	Υ	-0.038	-0.038	8.333	10.417
6	M5	Υ	-0.038	-0.037	10.417	12.5
7	M5	Υ	-0.037	-0.042	12.5	14.583
8	M5	Υ	-0.042	-0.051	14.583	16.667
9	M6	Υ	-0.051	-0.041	0	2.083
10	M6	Υ	-0.041	-0.037	2.083	4.167
11	M6	Y	-0.037	-0.038	4.167	6.25
12	M6	Υ	-0.038	-0.038	6.25	8.333
13	M6	Y	-0.038	-0.038	8.333	10.417
14	M6	Y	-0.038	-0.037	10.417	12.5
15	M6	Y	-0.037	-0.041	12.5	14.583
16	M6	Υ	-0.041	-0.051	14.583	16.667
17	_M9	Y	-0.006	-0.005	0	2.083
18	M9	Y	-0.005	-0.005	2.083	4.167
19	M9	Y	-0.005	-0.005	4.167	6.25
20	M9	Y	-0.005	-0.005	6.25	8.333
21	M9	Υ	-0.005	-0.005	8.333	10.417
22	M9	Y	-0.005	-0.005	10.417	12.5
23	M9	Y	-0.005	-0.005	12.5	14.583
24	M9	Υ	-0.005	-0.006	14.583	16.667
25	M10	Υ	-0.006	-0.005	0	2.083
26	M10	Υ	-0.005	-0.005	2.083	4.167
27	M10	Υ	-0.005	-0.005	4.167	6.25
28	M10	Υ	-0.005	-0.005	6.25	8.333



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Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
29	M10	Υ	-0.005	-0.005	8.333	10.417
30	M10	Υ	-0.005	-0.005	10.417	12.5
31	M10	Υ	-0.005	-0.005	12.5	14.583
32	M10	Υ	-0.005	-0.006	14.583	16.667

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

			do DEO O . DEO E Transione Ai			
_	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)] End Location [(ft, %)]
1	M9	Υ	-0.014	-0.014	4.167	6.25
2	M9	Υ	-0.014	-0.014	6.25	8.333
3	M9	Υ	-0.014	-0.014	8.333	10.417
4	M9	Υ	-0.014	-0.014	10.417	12.5
5	M9	Υ	-0.014	-0.015	12.5	14.583
6	M9	Υ	-0.015	-0.018	14.583	16.667
7	M10	Υ	-0.018	-0.015	0	2.083
8	M10	Υ	-0.015	-0.014	2.083	4.167
9	M10	Υ	-0.014	-0.014	4.167	6.25
10	M10	Υ	-0.014	-0.014	6.25	8.333
11	M10	Υ	-0.014	-0.014	8.333	10.417
12	M10	Υ	-0.014	-0.014	10.417	12.5
13	M10	Υ	-0.014	-0.015	12.5	14.583
14	M10	Υ	-0.015	-0.018	14.583	16.667
15	M5	Υ	-0.145	-0.118	0	2.083
16	M5	Υ	-0.118	-0.106	2.083	4.167
17	M5	Υ	-0.106	-0.108	4.167	6.25
18	M5	Υ	-0.108	-0.109	6.25	8.333
19	M5	Υ	-0.109	-0.108	8.333	10.417
20	M5	Υ	-0.108	-0.106	10.417	12.5
21	M5	Υ	-0.106	-0.119	12.5	14.583
22	M5	Υ	-0.119	-0.146	14.583	16.667
23	M6	Υ	-0.145	-0.118	0	2.083
24	M6	Υ	-0.118	-0.106	2.083	4.167
25	M6	Υ	-0.106	-0.108	4.167	6.25
26	M6	Υ	-0.108	-0.109	6.25	8.333
27	M6	Υ	-0.109	-0.108	8.333	10.417
28	M6	Υ	-0.108	-0.106	10.417	12.5
29	M6	Υ	-0.106	-0.119	12.5	14.583
30	M6	Y	-0.119	-0.146	14.583	16.667
31	M9	Y	-0.018	-0.015	0	2.083
32	M9	Y	-0.015	-0.014	2.083	4.167

Member Distributed Loads (BLC 9 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M5	Y	-0.283	-0.231	0	2.083
2	M5	Y	-0.231	-0.207	2.083	4.167
3	M5	Υ	-0.207	-0.211	4.167	6.25
4	M5	Υ	-0.211	-0.212	6.25	8.333
5	M5	Υ	-0.212	-0.211	8.333	10.417
6	M5	Υ	-0.211	-0.208	10.417	12.5
7	M5	Υ	-0.208	-0.231	12.5	14.583
8	M5	Υ	-0.231	-0.284	14.583	16.667
9	M6	Υ	-0.283	-0.231	0	2.083
10	M6	Υ	-0.231	-0.207	2.083	4.167
11	M6	Υ	-0.207	-0.211	4.167	6.25



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Member Distributed Loads (BLC 9 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
12	M6	Υ	-0.211	-0.212	6.25	8.333
13	M6	Υ	-0.212	-0.211	8.333	10.417
14	M6	Υ	-0.211	-0.207	10.417	12.5
15	M6	Υ	-0.207	-0.231	12.5	14.583
16	M6	Υ	-0.231	-0.284	14.583	16.667
17	M9	Υ	-0.036	-0.03	0	2.083
18	M9	Υ	-0.03	-0.027	2.083	4.167
19	M9	Υ	-0.027	-0.028	4.167	6.25
20	M9	Υ	-0.028	-0.028	6.25	8.333
21	M9	Υ	-0.028	-0.028	8.333	10.417
22	M9	Υ	-0.028	-0.027	10.417	12.5
23	M9	Υ	-0.027	-0.03	12.5	14.583
24	M9	Υ	-0.03	-0.036	14.583	16.667
25	M10	Υ	-0.036	-0.03	0	2.083
26	M10	Υ	-0.03	-0.027	2.083	4.167
27	M10	Υ	-0.027	-0.028	4.167	6.25
28	M10	Υ	-0.028	-0.028	6.25	8.333
29	M10	Υ	-0.028	-0.028	8.333	10.417
30	M10	Υ	-0.028	-0.027	10.417	12.5
31	M10	Υ	-0.027	-0.03	12.5	14.583
32	M10	Υ	-0.03	-0.036	14.583	16.667

Member Distributed Loads (BLC 10 : BLC 6 Transient Area Loads)

			ide (BEO 10 : BEO 0 Transient A			
			Start Magnitude [k/ft, F, ksf, k-ft/ft]			
1	M9	Υ	-0.028	-0.027	10.417	12.5
2	M9	Υ	-0.027	-0.03	12.5	14.583
3	M9	Υ	-0.03	-0.036	14.583	16.667
4	M10	Υ	-0.036	-0.03	0	2.083
5	M10	Υ	-0.03	-0.027	2.083	4.167
6	M10	Y	-0.027	-0.028	4.167	6.25
7	M10	Υ	-0.028	-0.028	6.25	8.333
8	M10	Y	-0.028	-0.028	8.333	10.417
9	M10	Υ	-0.028	-0.027	10.417	12.5
10	M10	Υ	-0.027	-0.03	12.5	14.583
11	M10	Υ	-0.03	-0.036	14.583	16.667
12	M5	Υ	-0.283	-0.231	0	2.083
13	M5	Y	-0.231	-0.207	2.083	4.167
14	M5	Υ	-0.207	-0.211	4.167	6.25
15	M5	Y	-0.211	-0.212	6.25	8.333
16	M5	Y	-0.212	-0.211	8.333	10.417
17	M5	Y	-0.211	-0.208	10.417	12.5
18	M5	Y	-0.208	-0.231	12.5	14.583
19	_M5	Y	-0.231	-0.284	14.583	16.667
20	M6	Y	-0.283	-0.231	0	2.083
21	M6	Y	-0.231	-0.207	2.083	4.167
22	M6	Υ	-0.207	-0.211	4.167	6.25
23	M6	Υ	-0.211	-0.212	6.25	8.333
24	M6	Υ	-0.212	-0.211	8.333	10.417
25	M6	Υ	-0.211	-0.207	10.417	12.5
26	M6	Υ	-0.207	-0.231	12.5	14.583
27	M6	Υ	-0.231	-0.284	14.583	16.667
28	M9	Υ	-0.036	-0.03	0	2.083
29	M9	Υ	-0.03	-0.027	2.083	4.167
30	M9	Υ	-0.027	-0.028	4.167	6.25
31	M9	Υ	-0.028	-0.028	6.25	8.333



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Member Distributed Loads	(BLC 10 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
32	M9	Υ	-0.028	-0.028	8.333	10.417

Wall Panel Distributed Loads (BLC 3 : ELX)

Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1 WP1(6.667ft)	X	0.18	0.18	0	10

Member Area Loads (BLC 1 : DL)

	Node A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]C Magnitude [l	<sf]d magnit<="" th=""><th>ude [ksf</th><th>Exclude Braces</th></sf]d>	ude [ksf	Exclude Braces
1	N19	N20	N18	N17	Υ	Perp to A-B	-0.007	-0.007	-0.007	-0.0	007	Yes

Member Area Loads (BLC 2 : RLL)

Node ANode E	BNode C	Node D	Direction	Load Direction.	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]	D Magnitude [ksf]	Exclude Braces
1 N19 N20	N18	N17	Υ	Perp to A-B	-0.02	-0.02	-0.02	-0.02	Yes

Member Area Loads (BLC 5 : WLX)

	Node A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]	D Magnitude [ksf]	Exclude Braces
1	N19	N20	N18	N17	Υ	Perp to A-B	-0.039	-0.039	-0.039	-0.039	Yes

Member Area Loads (BLC 6 : WLZ)

N	lode A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]	D Magnitude [ksf]	Exclude Braces
1	N19	N20	N18	N17	Υ	Perp to A-B	-0.039	-0.039	-0.039	-0.039	Yes

Wall Panel Surface Loads (BLC 4 : ELZ)

	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP1	Z	0.027	0.027	0	0

Wall Panel Surface Loads (BLC 6 : WLZ)

_	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP1	7	0.034	0.034	0	0

Basic Load Cases

	BLC Description	Category	Y Gravity	Distributed	Area(Member)	Surface(Plate/Wall)
1	DL	DL	-1		1	
2	RLL	RLL			1	
3	ELX	ELX		3		
4	ELZ	ELZ		2		1
5	WLX	WLX		6	1	
6	WLZ	WLZ		6	1	1
7	BLC 1 Transient Area Loads	None		32		
8	BLC 2 Transient Area Loads	None		32		
9	BLC 5 Transient Area Loads	None		32		
10	BLC 6 Transient Area Loads	None		32		



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Load Combinations

	ad Combinations												
	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Deflection 1	Yes	Υ	DL	1								
2	Deflection 2	Yes	Υ	RLL	1								
3	Deflection 3	Yes	Υ	DL	1	RLL	1						
4	IBC 16-1	Yes	Υ	DL	1.4								
5	IBC 16-2 (a)	Yes	Υ	DL	1.2	LL	1.6	LLS	1.6	RLL	0.5		
6	IBC 16-2 (b)	Yes	Υ	DL	1.2	LL	1.6	LLS	1.6				
7	IBC 16-3 (a)	Yes	Υ	DL	1.2	RLL	1.6	LL	0.5	LLS	1		
8	IBC 16-5 (a)	Yes	Υ	DL	1.2	Sds*DL	0.2	Rho*ELX	1	LL	0.5	LLS	1
9	IBC 16-5 (b)	Yes	Υ	DL	1.2	Sds*DL	0.2	Rho*ELZ	1	LL	0.5	LLS	1
10	IBC 16-7 (a)	Yes	Υ	DL	0.9	Sds*DL		Rho*ELX	1				
11	IBC 16-7 (b)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Rho*ELZ	1				
12	IBC 16-5 (os-a)	Yes	Υ	DL	1.2	Sds*DL	0.2	Om*ELX	1		0.5	LLS	1
13	IBC 16-5 (os-b)	Yes	Υ	DL	1.2	Sds*DL	0.2	Om*ELZ	1	1	0.5	LLS	1
14	IBC 16-7 (os-a)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Om*ELX	1				
15	IBC 16-7 (os-b)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Om*ELZ	1				
16	DL	Yes	Υ	DL	1								
17	RLL	Yes	Υ	RLL	1								
18	ELX	Yes	Υ	ELX	1								
19	ELZ	Yes	Υ	ELZ	1								
20	WLX	Yes	Υ	WLX	1								
21	WLZ	Yes	Υ	WLZ	1								
22	?*ELX	Yes	Υ	Om*ELX	1								
23	?*ELZ	Yes	Υ	Om*ELZ	1								
24	IBC 16-3 (b) (a)	Yes	Υ	DL	1.2	RLL	1.6	WLX	0.5				
25	IBC 16-3 (b) (b)	Yes	Υ	DL	1.2	RLL	1.6	WLZ	0.5				
26	IBC 16-3 (b) (c)	Yes	Υ	DL	1.2	RLL	1.6	WLX	-0.5				
27	IBC 16-3 (b) (d)	Yes	Υ	DL	1.2	RLL	1.6	WLZ	-0.5				
28	IBC 16-3 (d) (a)	Yes	Υ	DL	1.2	WLX	0.5						
29	IBC 16-3 (d) (b)	Yes	Υ	DL	1.2	WLZ	0.5						
30	IBC 16-3 (d) (c)	Yes	Y	DL	1.2	WLX	-0.5		_	_			
31	IBC 16-3 (d) (d)	Yes	Υ	DL	1.2	WLZ	-0.5						
32	IBC 16-4 (a) (a)	Yes	Y	DL	1.2	WLX	1	LL	0.5	LLS	11	RLL	0.5
33	IBC 16-4 (a) (b)	Yes	Y	DL	1.2	WLZ	1	LL	0.5	LLS	1	RLL	0.5
34	IBC 16-4 (a) (c)	Yes	Y	DL	1.2	WLX	-1	LL	0.5	LLS	1	RLL	0.5
35	IBC 16-4 (a) (d)	Yes	Y	DL	1.2	WLZ	1	LL	0.5	LLS	1	RLL	0.5
36	IBC 16-4 (b) (a)	Yes	Y	DL	1.2	WLX	1	LL	0.5	LLS	1		
37	IBC 16-4 (b) (b)	Yes	Υ	DL	1.2	WLZ	1	LL	0.5	LLS	1		
38	IBC 16-4 (b) (c)	Yes	Υ	DL	1.2	WLX	-1	LL	0.5	LLS	1		
39	IBC 16-4 (b) (d)	Yes	Υ	ĎL	1.2	WLZ	-1	LL	0.5	LLS	1		
40	IBC 16-6 (a)	Yes	Y	DL	0.9	WLX	1						
41	IBC 16-6 (b)	Yes	Y	DL	0.9	WLZ	1						
42	IBC 16-6 (c)	Yes	Y	DL	0.9	WLX	-1						
43	IBC 16-6 (d)	Yes	Υ	DL	0.9	WLZ	-1						

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	Deflection 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Deflection 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Deflection 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	IBC 16-1		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	IBC 16-2 (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	IBC 16-2 (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	IBC 16-3 (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	IBC 16-5 (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



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Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
9	IBC 16-5 (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	IBC 16-7 (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	IBC 16-7 (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	IBC 16-5 (os-a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	IBC 16-5 (os-b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	IBC 16-7 (os-a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	IBC 16-7 (os-b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	DL	Yes	Yes	Yes	Yes	Yes	Yes ◀	Yes	Yes	Yes
17	RLL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	ELX	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	ELZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	WLX	Yes	Yes	Yes	Yes	Yeş	Yes	Yes	Yes	Yes
21	WLZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	?*ELX	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	?*ELZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	IBC 16-3 (b) (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	IBC 16-3 (b) (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	IBC 16-3 (b) (c)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	IBC 16-3 (b) (d)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	IBC 16-3 (d) (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	IBC 16-3 (d) (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	IBC 16-3 (d) (c)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	IBC 16-3 (d) (d)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	IBC 16-4 (a) (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	IBC 16-4 (a) (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	IBC 16-4 (a) (c)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	IBC 16-4 (a) (d)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	IBC 16-4 (b) (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	IBC 16-4 (b) (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	IBC 16-4 (b) (c)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	IBC 16-4 (b) (d)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	IBC 16-6 (a)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	IBC 16-6 (b)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	IBC 16-6 (c)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	IBC 16-6 (d)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N21	max	0	43	0	43	0	43	0	43	0	43	0	43
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N22	max	0	43	0	43	0	43	0	43	0	43	0	43
4		min	0	1	0	1	0	1	0	1	0	1	0	1
5	N3	max	0.109	38	3.804	25	0.328	43	1.428	43	0.03	34	2.668	8
6		min	-0.449	10	-1.44	43	-0.511	33	-2.197	33	-0.111	8	-0.568	38
7	N4	max	0.068	34	3.816	24	0.328	43	1.427	43	0.029	34	2.676	8
8		min	-0.447	8	-1.464	42	-0.511	33	-2.196	33	-0.111	8	-0.424	34
9	WP1	max	0.224	34	13.995	24	2.158	35	7.464	35	0.22	34	28.437	8
10		min	-3.525	8	-0.334	19	-3.776	11	-20.292	11	-1.309	8	-2.286	34
11	Totals:	max	0.395	38	21.558	25	2.629	39						
12		min	-4.42	10	-0.651	42	-4.41	9						



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Envelope Node Reactions - Overstrength or Capacity Limit

1	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N21	max	0	23*	0	23*	0	23*	0	23*	0	23*	0	23*
2		min	0	12*	0	12*	0	12*	0	12*	0	12*	0	12*
3	N22	max	0	23*	0	23*	0	23*	0	23*	0	23*	0	23*
4		min	0	12*	0	12*	0	12*	0	12*	0	12*	0	12*
5	N3	max	0.001	13*	1.664	13*	-0.086	22*	-0.448	22*	0.001	23*	5.135	12*
6		min	-0.869	22*	-0.792	22*	-0.629	13*	-3.711	13*	-0.214	12*	-0.004	13*
7	N4	max	0	23*	2.042	12*	0.086	22*	0.452	22*	-0.001	13*	5.143	12*
8		min	-0.855	12*	0.417	23*	-0.629	13*	-3.711	13*	-0.214	12*	0	23*
9	WP1	max	0	13*	10.809	12*	0.158	12*	0.722	12*	0	13*	54.686	12*
10		min	-6.778	12*	-0.835	23*	-7.375	23*	-39.441	23*	-2.518	12*	-0.001	13*
11	Totals:	max	0	13*	13.294	12*	0	22*						
12		min	-8.5	22*	0	22*	-8.48	13*						

Envelope Beam Deflections

	Member Label	Span		Location [ft]	y' [in]	(n) L'/y' Ratio	LC
1	M5	1	max	1.389	0.001	NC	6
2		1	min	0	0.106	338	33
3		2	max	15.104	0.001	NC	19
4		2	min	8.333	-0.533	307	24
5		3	max	15.278	-0.001	NC	31
6		3	min	16.667	0.091	396	24
7	M6	1	max	1.389	0.001	NC	6
8		1	min	0	0.106	339	33
9		2	max	15.104	0.001	NC	19
10		2	min	8.333	-0.533	307	25
11		3	max	15.278	-0.001	NC	31
12		3	min	16.667	0.09	398	24
13	M7	1	max	2.396	-0.001	NC	5
14		1	min	2.292	-0.03	3994	8
15	M8	1	max	8.854	-0.001	NC	9
16		1	min	2.292	-0.027	4376	8
17	M9	1	max	16.493	-0.001	NC	30
18		1	min	8.333	-0.903	221	24
19	M10	1	max	16.493	-0.001	NC	31
20		1	min	8.333	-0.903	221	25
21	M11	1	max	1.49	-0.001	NC	30
22		1	min	7.042	0.053	2938	24
23	M12	1	max	0.948	-0.001	NC	30
24		1	min	7.042	0.059	2646	24

Envelope Beam Deflection Checks

	Beam	Design Rule	Span	Defl [in]	Ratio	LC	Defl [in]	Ratio	LC	Defl [in]	Ratio	LC
1	M5	Typical	1	0.01	3693	1(DL)	0.034	1054	2(RLL)	0.044	819	3(DL+RLL)
2			2	-0.07	2335	1(DL)	-0.174	944	2(RLL)	-0.244	672	3(DL+RLL)
3			3	0.009	4135	1(DL)	0.031	1159	2(RLL)	0.04	904	3(DL+RLL)
4	M6	Typical	1	0.01	3695	1(DL)	0.034	1055	2(RLL)	0.044	819	3(DL+RLL)
5			2	-0.07	2336	1(DL)	-0.174	945	2(RLL)	-0.244	672	3(DL+RLL)
6			3	0.009	4139	1(DL)	0.031	1160	2(RLL)	0.04	905	3(DL+RLL)
7	M7	Typical	1	0	NC	1(DL)	0	NC	2(RLL)	0	NC	3(DL+RLL)
8	M8	Typical	1	0	NC	1(DL)	0	NC	2(RLL)	0	NC	3(DL+RLL)
9	M9	Typical	1	-0.233	856	1(DL)	-0.242	827	2(RLL)	-0.475	421	3(DL+RLL)
10	M10	Typical	1	-0.233	856	1(DL)	-0.242	827	2(RLL)	-0.475	421	3(DL+RLL)



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Envelope Beam Deflection Checks (Continued)

	Beam	Design Rule	Span	Defl [in]	Ratio	LC	Defl [in]	Ratio	LC	Defl [in]	Ratio	LC
11	M11	Typical	1	0	NC	1(DL)	0.018	8529	2(RLL)	0.023	6767	3(DL+RLL)
12	M12	Typical	1	0	NC	1(DL)	0.021	7587	2(RLL)	0.025	6158	3(DL+RLL)

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Membe	r_Shape	Code Check	kLoc[ft]LC	Shear Checl	kLoc[ft]	Dirl	LC	ohi*Pnc [k]]phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-f	t] Cb Eqn
1	M1	HSS4X4X4	0.3	4 22	* 0.057	4	y 1	12*	130.482	139.518	16.181	16.181	1.667H1-1b
2	M2	HSS4X4X4	0.338	4 12	* 0.056	4	y 1	12*	130.482	139.518	16.181	16.181	1.667H1-1b
3	M3	HSS4X4X4	0.367	0 12	* 0.038	6.667	y 1	12*	86.662	139.518	16.181	16.181	2.234H1-1b
4	M4	HSS4X4X4	0.347	0 22	* 0.038	6.667	y 1	12*	86.662	139.518	16.181	16.181	2.234H1-1b
5	M5	HSS4X4X4	0.276	15.104 25	0.068	1.389	y :	32	44.053	139.518	16.181	16.181	1.799H1-1b
6	M6	HSS4X4X4	0.275	15.104 25	0.064	1.389	y	25	44.053	139.518	16.181	16.181	1.799H1-1b
7	M7	HSS4X4X4	0.142	10 8	0.02	10	у	8	91.807	139.518	16.181	16.181	2.299H1-1b
8	M8	HSS4X4X4	0.136	10 8	0.011	10	У	8	91.807	139.518	16.181	16.181	2.302H1-1b
9	M9	HSS4X2X4	0.224	8.333 32	0.012	0	y	24	8.359	101.016	6.176	10.143	1.135H1-1b
10	M10	HSS4X2X4	0.224	8.333 32	0.012	0	у :	25	8.359	101.016	6.176	10.143	1.135H1-1b
11	M11	HSS4X2X4	0.071	1.49 24	0.013	1.49	y :	24	13.739	101.016	6.176	10.143	2.834H1-1b
12	M12	HSS4X2X4	0.07	1.49 24	0.013	1.49	y	24	13.739	101.016	6.176	10.143	2.671H1-1b

Masonry Wall Reinforcement

	Wall	Region	Hor. Bar Size	Vert. Bar Size	Boundary Reinf.
1	WP1	R1	#4@27in oc	#4@16" oc (ctr)	1-#4

TMS 402-16: STRENGTH Wall Panel Masonry Code Checks (Out-of-Plane)

	Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Pn*phi[k]	Mn*phi[k-ft]	
1	WP1	R1	Typical	0.013	11	0.87	11	27 45	2 333	

TMS 402-16: STRENGTH Wall Panel Masonry Code Checks (In-Plane)

Wall Panel	Region	Design Rule A	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
1 WP1	R1	Typical	0.018	24	0.236	10	0.037	10	790.56	120.247	94.811

TMS 402-16: STRENGTH Wall Panel Masonry Code Checks (Seismic)

	Wall Panel	Seismic Design Rule	Region	UC Shear In Plane	LC	Seismic Detailing	BZ Req'd?
1	WP1	Special	R1	0.037	10	PASS	No

Envelope X-Direction Story Drift - Service

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	N9 (10.667 ft)	max	0.548	0, 0	18	1.142	0, 0	18	1.019	0, 0	20
2		min	0	0, 0	19	0	0, 0	19	1	0, 0	18
3	N11 (10.667 ft)	max	0.513	13.667, 0	18	1.069	13.667, 0	18	1.023	13.667, 0	20
4		min	-0.007	13.667, 0	21	0	13.667, 0	19	1	13.667, 0	18
5	N5 (6.667 ft)	max	0.006	0, 0	18	0.008	0, 0	18	1.001	0, 0	18
6		min	-0.001	0, 0	21	0	0, 0	19	1	0, 0	1
7	N7 (6.667 ft)	max	0.812	13.667, 0	18	1.015	13.667, 0	18	1.018	13.667, 0	20
8		min	0	13 667 0	1	0	13 667 0	19	1	13.667.0	1



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Envelope Z-Direction Story Drift - Service

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	N9 (10.667 ft)	max	0.514	0, 0	19	1.071	0, 0	19	1.012	0, 0	21
2		min	0.014	0, 0	1	0.028	0, 0	1	0.998	0, 0	18
3	N11 (10.667 ft)	max	0.37	13.667, 0	19	0.772	13.667, 0	19	1.002	13.667, 0	3
4	,	min	-0.046	13.667, 0	20	0.017	13.667, 0	21	0.955	13.667, 0	21
5	N5 (6.667 ft)	max	0.404	0, 0	19	0.505	0, 0	19	1.016	0, 0	21
6		min	-0.015	0, 0	20	0.004	0, 0	1	0.984	0, 0	20
7	N7 (6.667 ft)	max	0.549	13.667, 0	19	0.686	13.667, 0	19	1.01	13.667, 0	21
8		min	0.019	13.667, 0	1	0.023	13.667, 0	1	0.998	13.667, 0	18

Envelope X-Direction Story Drift - Strength

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	N9 (10.667 ft)	max	0.555	0, 0	8	1.156	0, 0	8	1.032	0, 0	24
2		min	-0.039	0, 0	42	0	0, 0	31	0.987	0, 0	42
3	N11 (10.667 ft)	max	0.519	13.667, 0	8	1.081	13.667, 0	8	1.055	13.667, 0	24
4		min	-0.033	13.667, 0	34	0.001	13.667, 0	6	0.984	13.667, 0	42
5	N5 (6.667 ft)	max	0.006	0, 0	10	0.007	0, 0	10	1.003	0, 0	8
6		min	-0.001	0, 0	25	0	0, 0	31	0.999	0, 0	24
7	N7 (6.667 ft)	max	0.82	13.667, 0	8	1.025	13.667, 0	- 8	1.03	13.667, 0	32
8		min	-0.07	13.667, 0	38	0	13.667, 0	- 6	0.988	13.667, 0	42

Envelope Z-Direction Story Drift - Strength

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	N9 (10.667 ft)	max	0.566	0, 0	9	1.179	0, 0	9	1.02	0, 0	33
2		min	-0.108	0, 0	43	0.034	0, 0	6	0.992	0, 0	43
3	N11 (10.667 ft)	max	0.361	13.667, 0	11	0.751	13.667, 0	11	1.008	13.667, 0	9
4		min	-0.073	13.667, 0	24	0.002	13.667, 0	8	0.888	13.667, 0	39
5	N5 (6.667 ft)	max	0.401	0, 0	11	0.501	0, 0	11	1.717	0, 0	25
6		min	-0.048	0, 0	35	0.003	0, 0	25	0.977	0, 0	32
7	N7 (6.667 ft)	max	0.619	13.667, 0	9	0.774	13.667, 0	9	1.017	13.667, 0	25
8		min	-0,151	13.667, 0	43	0.028	13.667, 0	6	0.993	13.667, 0	42

Material Take-Off

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A500 Gr.B Rect	HSS4X2X4	4	59.3	0.53
3	A500 Gr.B Rect	HSS4X4X4	8	82.7	1.02
4	Total HR Steel		12	142	1.549
5					
6	Masonry Walls			Volume (yds^3)	
7	Concrete Matl		1	1.6	3.389
8	Total Masonry		1	1.6	3.389

Warning Log

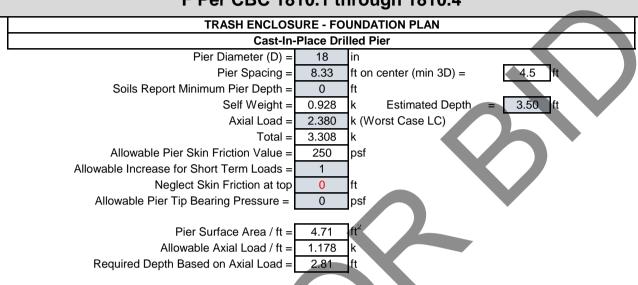
No Data to Print...



40810 County Center Drive, ste. 110 Temecula, CA 92591 (951) 600-0032, (951) 600-0036 Fax

Sheet:	PIER REINF.
Date:	12/17/24
#:	22-7067
Δ:	-

Cast-In-Place - Drilled Pier Reinforcement in Seismic Design Category D, E & F Per CBC 1810.1 through 1810.4





27369 Via Industria Temecula, CA 92590 (951)600-0032, (951)600-0036 Fax

Sht:	Drilled Pier Rebar
Date:	12/17/2024
#:	24-8400.32
Δ:	

Cast In Place Deep Foundation Element Analysis & Design in Seismic Design Category D, E & F Per 2019 CBC

	1-1810.4		
Trash Enclosur	re - Foundation Plan		
r Design Parameters			
Diameter, D Seismic Design Category Depth, H f' _c f _y Clear spacing from outside edge of transverse reinforcement A _{g, Pier} A _{ch} Factored (ASD) Vertical Axial Load	= 18 in. = E = 3.50 ft. = 2500 psi = 60 ksi = 3 in = 254.47 in ² = 113.10 in ² = 2380 lbs		
ismic Longitudinal Reinforcement ninimum of four longitudinal bars			
Logitudinal Reinforcement Size # of bars Bar Dia.	= #5 bars 6 = 0.625 in. = 1.84 in ²	4 Min OK	CBC 1810.3.9.4 CBC 1810.3.9.4
As, provided Ps long, min	= 1.84 in ² = 0.005		CBC 1810.3.9.4
$oldsymbol{eta}_{ extsf{S}}$ long, provided	= 0.007234	> 0.005 OK	CBC 1810.3.9.4
Ill consist of closed ties or spirals Transverse Reinforcement Size (#3 for D ≤ 20", #4 for larger) Bar Dia. A _{s, provided} (per closed tie / spiral) Transverse Confinement Reinforcement within 3D	= #3 bars = 0.375 in. = 0.22 in ² = 54 in.		CBC 1810.3.9.4 CBC 1810.3.9.4.2
from top of element or point of fixity	34		CBC 1010.3.3.4.2
$\rho_{s (min)}$ for spiral or circular hoop greater of			ACI 318-14 Table 18.10.6.4
(a) .45 (A_g/A_{ch} - 1) (f' _c /f _{yt}) (b) .12(f' _c /f _{yt})	= 0.023		CBC 1810.3.9.4.2 CBC 1810.3.9.4.2
Ps (provided) Spacing of transverse reinforcement within confinement range shall no S	= 0.031	> 0.023 in. OK < 3.75 in. OK	ACI 318-14 18.7.
exceed the least of: (a) D/2 = 9 in.			
(b) $6d_{b \text{ long}} = 3.75 \text{ in}.$ (c) $6 \text{ in}. = 6 \text{ in}.$			
			CBC 1810.3.9.

Pole Footing Embedded in Soil

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

Surface Lateral Restraint

DESCRIPTION: TYPICAL DRILLED PIER FOOTING - TRASH ENCLOSURE - FOUNDATION PLAN - ALONG TE-2

Point Load

Soil Surface

Code References

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Load Combinations Used: IBC 2018

LIC#: KW-06014215, Build:20.24.10.03

General Information

Lateral Restraint at Ground Surface

 Allow Passive
 333.0 pcf

 Max Passive
 1,500.0 psf

Controlling Values

Governing Load Combinati**e**f1.224D+1.750E

Lateral Load 0.6055 k

Moment 4.432 k-ft

Restraint @ Ground Surface

Pressure at Depth

Actual 1,102.52 psf Allowable 1,123.88 psf Surface Retraint Force 3,396.24 lbs

Minimum Required Depth 3.375 ft

Footing Base Area 1.767 ft^2 Maximum Soil Pressure 1.445 ksf

Applied Loads

Lateral Concentrated L	oad (k)	Lateral Distributed Loads	Lateral Distributed Loads (k		Vertical Load	(k)
D : Dead Load	k		k/ft	0.2170 k-ft	0.8150 k	
Lr : Roof Live	0.1650 k		k/ft	0.6460 k-ft	1.104 k	
L : Live	k		k/ft	k-ft	k	
S : Snow	k		k/ft	k-ft	k	
W : Wind	0.3670 k		k/ft	1.603 k-ft	2.022 k	
E : Earthquake	0.3460 k		k/ft	2.035 k-ft	0.3170 k	
H : Lateral Earth	k		k/ft	k-ft	k	
Load distance above		TOP of Load above ground surface				
ground surface	1.0 ft		ft			
		BOTTOM of Load above ground surface				
		,	ft			

Load Combination Results

	Forces @	Ground Surface	Required	Required Pressure at Depth		Soil Increase	
Load Combination	Loads - (k)	Moments - (ft-k)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor	
D Only	0.000	0.217	1.25	393.5	416.3	1.000	
+D+Lr	0.165	1.028	2.13	645.0	707.6	1.000	
+D+0.750Lr	0.124	0.825	2.00	584.6	666.0	1.000	
+D+0.60W	0.220	1.399	2.38	702.7	790.9	1.000	
+D-0.60W	0.220	0.965	2.13	605.5	707.6	1.000	
+1.224D+1.750E	0.606	4.432	3.38	1,102.5	1,123.9	1.000	
+1.224D-1.750E	0.606	3.901	3.25	1,046.5	1,082.3	1.000	
+D+0.750Lr+0.450W	0.289	1.712	2.50	776.0	832.5	1.000	
+D+0.750Lr-0.450W	0.041	0.061	0.88	226.7	291.4	1.000	

Pole Footing Embedded in Soil Project File: 8400.32 - Site Structures.ec6										
LIC#: KW-06014215, Bu	ild:20.24.10.03	Innovative Str	uctural Engineer	ing, Inc. (IS	((c) ENERCALC, LLC	C 1982-2024			
DESCRIPTION:	TYPICAL DRILLED PI	ER FOOTING	- TRASH E	NCLOSURE - FC	UNDATION	PLAN - ALON	IG TE-2			
+D+0.450W		0.165	1.104	2.13	692.4	707.6	1.000			
+D-0.450W		0.165	0.670	1.88	539.6	624.4	1.000			
+1.168D+1.313E		0.454	3.379	3.13	980.2	1,040.6	1.000			
+1.168D-1.313E		0.454	2.872	3.00	904.0	999.0	1.000			
+0.60D+0.60W		0.220	1.312	2.25	734.4	749.3	1.000			
+0.60D-0.60W		0.220	1.052	2.13	660.0	707.6	1.000			
+0.3760D+1.750E		0.606	4.248	3.38	1,056.7	1,123.9	1.000			
+0.3760D-1.750E		0.606	4.085	3.38	1.016.2	1.123.9	1.000			



Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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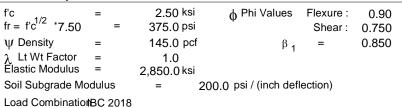
DESCRIPTION: CF1 - CMU Wall Footing Check, In-Plane - Trash Enclosure - Foundation Plan - Along Grid TE-1

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: IBC 2018

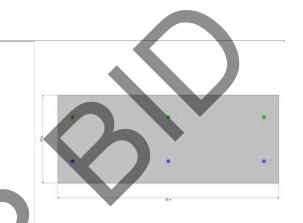
Material Properties

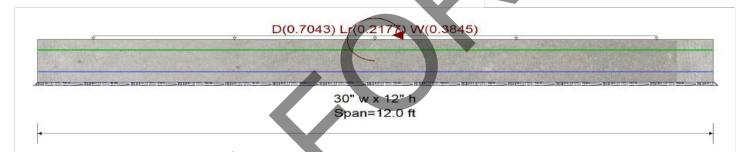


fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Main Rebar E - Stirrups 29,000.0 ksi = 29,000.0 ksi Stirrup Bar Size # 3

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,





2

Cross Section & Reinforcing Details

Rectangular Section, Width = 30.0 in, Height = 12.0 in Span #1 Reinforcing....

3-#4 at 3.0 in from Bottom, from 0.0 to 12.0 ft in this span

3-#4 at 3.0 in from Top, from 0.0 to 12.0 ft in this span Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Moment: D = 0.0440, Lr = 0.1260, W = -2.082, E = -21.827 k-ft, Location = 6.0 ft from left end of this span

Uniform Load: D = 0.7043, Lr = 0.2177, W = 0.3845 k/ft, Extent = 1.0 -->> 11.0 ft, Tributary Width = 1.0 ft, (RISA REACTION)

Design OK DESIGN SUMMARY Maximum Bending Stress Ratio 0.792:1 Maximum Deflection Section used for this span Max Downward L+Lr+S Deflection 0.000 in **Typical Section** Max Upward L+Lr+S Deflection 0.000 in Mu: Applied 23.255 k-ft Max Downward Total Deflection 0.019 in Mn * Phi : Allowable 29.351 k-ft Max Upward Total Deflection 0.002 in **Load Combination** +1.520D-2.0E Location of maximum on span 6.071 ft Span # where maximum occurs Span #1 Maximum Soil Pressure = 0.548 ksf 11.07 ft LdComb: +D-0.70E at Allowable Soil Pressure = 2.0 ksf OK

Cross Section Strength & Inertia

		Phi*Mn (k-ft)	Mo	Moment of Inertia (in^4)		
Cross Section	n Bar Layout Description	Btm Tension Top Tension	n I gross Ic	r - Btm Tension	cr - Top Tension	
Section 1	3- #4 @ d=9",3- #4 @ d=3",	29.35 29.35	4,320.00	383.50	383.50	

Shear Stirrup Requirements

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combination

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: CF1 - CMU Wall Footing Check, In-Plane - Trash Enclosure - Foundation Plan - Along Grid TE-1

Load Combination		Location (ft)	3ending	Stress Resu	Its (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	elope	•				
Span # 1	1	6.071	23.26	29.35	0.79	
+1.40D	•				• • • • • • • • • • • • • • • • • • • •	
Span # 1	1	6.071	1.70	29.35	0.06	
+1.20D+0.50Lr						
Span # 1	1	6.071	1.67	29.35	0.06	
+1.20D						
Span # 1	1	6.071	1.46	29.35	0.05	
+1.20D+1.60Lr						
Span # 1	1	6.071	2.14	29.35	0.07	
+1.20D+1.60Lr+0.50W						
Span # 1	1	5.929	2.73	29.35	0.09	
+1.20D+1.60Lr-0.50W						
Span # 1	1	6.071	2.33	29.35	0.08	
+1.20D+0.50W						
Span # 1	1	5.929	2.24	29.35	0.08	
+1.20D-0.50W						
Span # 1	1	6.071	1.64	29.35	0.06	
+1.20D+0.50Lr+W						
Span # 1	1	5.929	3.23	29.35	0.11	
+1.20D+0.50Lr-W						
Span # 1	1	6.071	2.04	29.35	0.07	
+1.20D+W						
Span # 1	1	5.929	3.08	29.35	0.10	
+1.20D-W						
Span # 1	1	6.071	1.83	29.35	0.06	
+1.520D+2.0E		5 000	00.40		2.70	
Span # 1	1	5.929	23.19	29.35	0.79	
+1.520D-2.0E		0.074	00.00	400.05	0.70	
Span # 1	1	6.071	23.26	29.35	0.79	
+0.90D+W		F 000	0.70	00.05	0.00	
Span # 1 +0.90D-W	1	5.929	2.72	29.35	0.09	
	4	0.074	4.40	20.25	0.05	
Span # 1	1	6.071	1.46	29.35	0.05	
+0.580D+2.0E	4	F 020	22.00	20.25	0.75	
Span # 1	1	5.929	22.09	29.35	0.75	
+0.580D-2.0E	4	6.071	22.11	29.35	0.75	
Span # 1	ı	•		29.30	0.75	
Overall Maximum [Deflection					
Load Combination		Span Ma	v "-" Deft Loca	ation in Span	Land Camb:	May "+" Deft Location in Span

Load Combination	4	Span	Max. "-" Defi	Location in Spar	Load Combination	Max. "+" Defi	Location in Span
Span 1	7	1	0.0190			0.0000	0.000

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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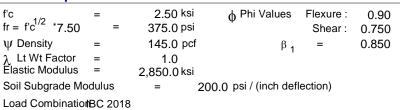
DESCRIPTION: CF2 - CMU Wall Footing Check, In-Plane - Trash Enclosure - Foundation Plan - Along Grid TE-A

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, SDPWS 2015

Load Combinations Used: IBC 2018

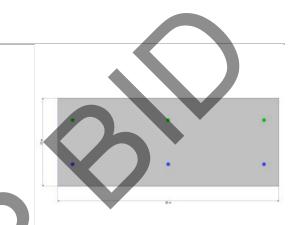
Material Properties

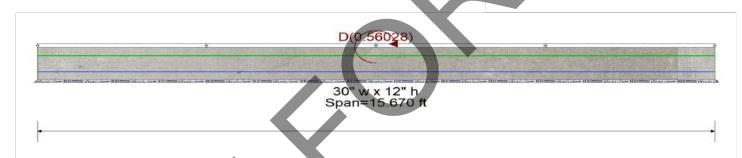


fy - Main Rebar 60.0 ksi Fy - Stirrups 40.0 ksi E - Stirrups E - Main Rebar 29,000.0 ksi =29,000.0 ksi Stirrup Bar Size # 3

Number of Resisting Legs Per Stirrup

Beam is supported on an elastic foundation,





2

Cross Section & Reinforcing Details

Rectangular Section, Width = 30.0 in, Height = 12.0 in Span #1 Reinforcing....

3-#4 at 3.0 in from Bottom, from 0.0 to 15.670 ft in this span

3-#4 at 3.0 in from Top, from 0.0 to 15.670 ft in this spar Service loads entered. Load Factors will be applied for calculations.

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load: D = 0.0840 ksf, Tributary Width = 6.670 ft, (CMU WALL, SELF-WEIGHT (W2))

Moment: E = 8.170 k-ft, Location = 7.835 ft from left end of this span, (CMU WALL, SELF-WEIGHT (W2))

DESIGN SUMMARY Design OK Maximum Bending Stress Ratio Maximum Deflection **0.272**: 1 Section used for this span Max Downward L+Lr+S Deflection 0.000 in **Typical Section** Max Upward L+Lr+S Deflection 0.000 in Mu: Applied -7.998 k-ft Max Downward Total Deflection 0.014 in Mn * Phi : Allowable 29.351 k-ft Max Upward Total Deflection 0.003 in **Load Combination** +1.520D+2.0E Location of maximum on span 7.743 ft Span # where maximum occurs Span #1 Maximum Soil Pressure = 0.411 ksf 12.01 ft LdComb: +D+0.70E at Allowable Soil Pressure = 2.50 ksf OK

Cross Section Strength & Inertia

	Phi*Mn (k-ft)	Moment of Inertia (in^4)
Cross Section Bar Layout Description	Btm Tension Top Tension	I gross Icr - Btm Tensionlicr - Top Tension
Section 1 3- #4 @ d=9",3- #4 @ d=3",	29.35 29.35	4,320.00 383.50 383.50

Shear Stirrup Requirements

Entire Beam Span Length: Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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DESCRIPTION: CF2 - CMU Wall Footing Check, In-Plane - Trash Enclosure - Foundation Plan - Along Grid TE-A

Load Combination		Location (ft)	3ending	Stress Resu	ılts (k-ft	
Segment Length	Span #	in Span	Mu : Max	Phi*Mnx	Stress Ratio	
MAXimum Bending Env	elope					
Span # 1	[.] 1	7.927	7.99	29.35	0.27	
+1.40D						
Span # 1	1	15.486	-0.00	29.35	0.00	
+1.20D						
Span # 1	1	15.486	-0.00	29.35	0.00	
+1.520D+2.0E						
Span # 1	1	7.927	7.99	29.35	0.27	
+0.90D						
Span # 1	1	15.486	-0.00	29.35	0.00	
+0.580D+2.0E						
Span # 1	1	7.927	7.99	29.35	0.27	

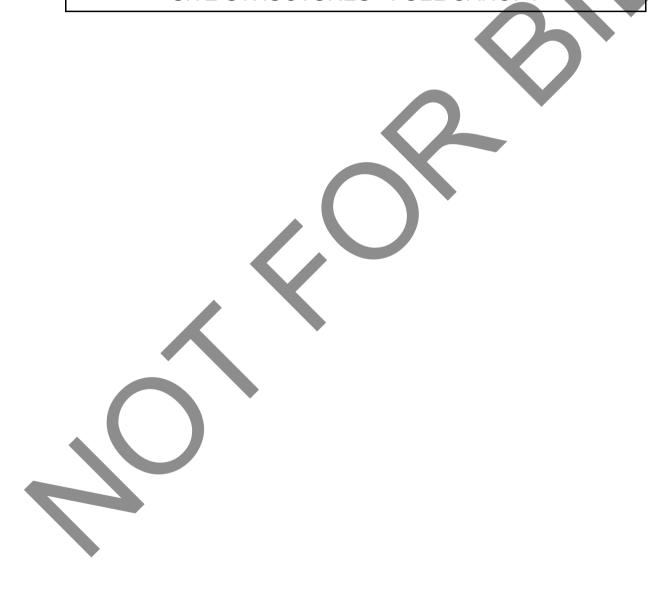
Overall Maximum Deflections - Unfactored Lo

Load Combination	Span	Max. "-" Defl Loc	ation in Span	Load Combination	Max. "+" Defl Loc	ation in Span
Span 1	1	0.0143	12 014		0.0000	0.000





SITE STRUCTURES - FUEL CANOPY





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Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

11.4.4

SEISMIC DESIGN LOAD - EQUIVALENT LATERAL FORCE PROCEDURE

Structure: Fuel Tank/Generator Canopy - Steel Ordinary Mome	ent Frames
Building Seismic Design Criteria	(ASCE - Chapter 11)
Risk Category of Building or Structure:	IV Table 1.5-1
Short-Period Spectral Response Acceleration, S_s :	2.506 Per ASCE 7 Hazard Tool
Long-Period Spectral Response Acceleration, S1:	1.002 Per ASCE 7 Hazard Tool
Average Height of Building Roof, h_n :	10.00 ft
Site-specific ground motion analysis provided?	Yes 11.4.8
Analytical procedure (Limit per Table 12.6-1)	ELF Equivalent Lateral Force 12.8
Structural irregularities per 12.3.2?	No 12.8.1.3 - Item 1
Exceed 5 story above base/grade including mezzanines?	No 12.8.1.3 - Item 2
Site Class	11.4.3 & 11.4.4
Soil Site Class:	Per Geotech Report

Site Coefficients & Spectral Response Acceleration Parameters

	Table 11.4-1 & 11.4-2	11.4.8 Exceptions	Site-specific analysis per Geotech Report	Calculation Warnings/Notes
Site Coefficient, Fa:	1.00	N/A	1.20	
Site Coefficient, Fv:	Site Specific	1.70	1.70	

$S_{MS} = F_a * S_s$:	2.51	Equation 11.4-1
$S_{M1} = F_{\nu}^* S_1:$	2.43	Equation 11.4-2
$S_{DS} = 2/3*S_{MS}:$	1.67	Equation 11.4-3
$S_{D1} = 2/3 * S_{M1}$:	1.62	Equation 11.4-4
$Ts = S_{D1} / S_{DS}$	0.97	11.4.6
Seismic Design Category (SDC):	F	11.6 & Table 11.6-1 & 2

Seismic Equivalent Lateral Force Procedure

Imp	otance	Factor, I	: ۵

Response Modification Factor, R: Table 12.2-1 Overstrength Amplification factor, Ω_o :

Approximate Period Values: Table 12.8-2:

Approximate Fundamental Period, $Ta = C_t (h_n)^{x}$ Long Period Transition Period, T_L

		Section 12.8
	1.50	Table 1.5-2
	3.50	Steel Ordinary Moment Frames
	2.5	Table 12.2-1
C_t	0.02	All other systems
x:	0.75	
	0.11	s Equation 12.8-7
	8	Figure 22 (14-17)



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Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16 supp3

Seismic Response Coefficient, Cs:

 $C_s = S_{DS} / (R / I_e)$: Maximum C_s:

 $C_s = S_{D1} / T_a (R / I_e)$: $T \le T_L$ $C_s = S_{D1} T_L / T_a^2 (R / I_e) T > T_L$

Minimum C_s:

 $C_s = 0.044 S_{DS} I_e$: <u>></u> 0.01 $C_s = 0.5 S_1 / (R / I_e)$: for $S_1 \ge 0.6$

Seismic Base Shear, $V = C_s W$:

0.716	Equation 12.8-2
MAX	

6.171 438.924

MIN 0.110 0.215

> 0,716 Equation 12.8-1

Building Structure - Horizontal Seismic Load Effect, Eh

Redundancy Factor, p:

Strength Level) $1.0E_h = \rho Qe$:	
(ASD Level) $0.7E_h = \rho Qe$:	
	.

Diaphragm Design Forces per 12.10.1

 $F_{px} = 0.2S_{DS}I_eW_{px} =$ $F_{px} = 0.4S_{DS}I_ew_{px} =$

_		*	ςc /	ζ
$F_{px} =$	W_{px}		۲۲ _i /	۷Wi



0.501	W (Min)
1.002	W (Max)

Section 12.10

Equation 12.8-3

Equation 12.8-4

Equation 12.8-5

Equation 12.8-6

Equation 12.10-2

Equation 12.10-3

Equation 12.10-1



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Sheet:	Seismic Base Shear - FLEXIBLE
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

SEISMIC BASE SHEAR ANALYSIS - FLEXIBLE DIAPHRAGM

STRUCTU	JRE: Fuel	Tank/Gene	erator Cano	py - Steel C	Ordinary Mo	oment Fram	es									
	•												Structural	period Facto	or, k : 1.0	00
						VERTICA	L DISTRIB	SUTION OF	SEISMIC I	FORCES					_	
								I	Level Force	s - 1.0E Str	ength Leve	el	Alternate	ASD 0.7E	Diaphragi	m F _{px} (k) -
									Force (k)		Unit Fo	rce (psf)	Unit Fo	rce (psf)	1.0	DE
Level	Height from Base (ft)	Weight Summary (k)	Floor Plan Area (ft ²)	ΣWi (k)	Wi hi ^k	ΣWi hi ^k	C _{vx}	F _x	ΣF _x	1.0 E _h = ρF _x	F _x	1.0 E _h = ρF _x	F _x	0.7 E _h = ρF _x	F _{px}	ΩF_{px}
Level	(it)	0.0	(11)	0.0	0	0	0.000	0.0	0.0	0.0			_		0.0	0.0
		0.0		0.0	0	0	0.000	0.0	0.0	0.0			-		0.0	0.0
1	10.00	2.1	270	2.1	21	21	1.000	1.5	1.5	2.0	5.56	7.23	3.89	5.06	1.5	3.8
Building W	/eight W -	2.1	270				Ba	se Shear \	V = C-*W =	1 95	k					

																				_		_			_		
						BUILD	DING '	WEIG	HT &	SEIS	MIC 7	ΓRIBL	JTAR'	Y ANA	ALYSI	S	45						7				
						\leftrightarrow	Dir.		% D	istribu	ution 1	o res	istanc	e gric	lines		+	ìr.		% D	istribu	ition to	o resi	stance	e grid	lines	
			Unit			Gridlines								47		Grid	lines										
Building Mass Element	Туре	Level	weight (psf)	Area (sf)		FC-	FC-									Check	FC-	FC- B									Check
Roof	R1	1	7.0	270	1.89	50%	50%		İ	l		<u> </u>	İ			100%	50%	50%									100%
NW Col (upper 1/2)	-	1	12.2	4	0.05	100%										100%	100%										100%
SW Col (upper 1/2)	<u></u>	1	12.2	4	0.05	100%	<u> </u>	<u> </u>	Ĺ	<u> </u>	<u> </u>			<u> </u>		100%		100%							Ĺ	İ	100%
NE Col (upper 1/2)	L	1	12.2	4	0.05		100%		<u> </u>	<u> </u>	<u> </u>	K		<u> </u>		100%	100%								Ĺ	İ	100%
SE Col (upper 1/2)		1	12.2	4	0.05		100%		<u> </u>	<u> </u>	<u> </u>				4	100%		100%							<u> </u>	İ	100%
	L	<u> </u>		j	0.00		<u> </u>		<u> </u>						<u> </u>	0%									Ĺ	İ	0%
	L	<u> </u>		<u>.</u>	0.00		<u> </u>									0%									Ĺ	İ	0%
					0.00				7							0%											0%
	L	ļ		ļ	0.00											0%											0%
				ΣWi=	2.1	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

											SEIS	MIC I	LOAD	SUN	1MAR	Y BY	ELEM	1ENT							
				- \$ 1	♣ Dir. % Distribution to resistance gridlines									Dir.	ir. % Distribution to resistance gridlines										
								Grid	lines										Grid	lines					1
Building Mass Element	Level	Height (ft)	Notes	FC- 1	FC- 2										FC- A	FC- B									
Roof	1	10		0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NW Col (upper 1/2)	1	10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ĺ
SW Col (upper 1/2)	1	10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<u> </u>
NE Col (upper 1/2)	1	10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L
SE Col (upper 1/2)	11	10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	L
																							\sqcup	$\vdash \vdash$	
		J	Σ	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	SUMMARY OF SEISMIC LOADING BY GRIDLINE (KIPS - 1.0E STRENGTH LEVEL)																						
	◆ Direction								Direction														
			Gridlines								Gridlines												
	1.0 E _h =	FC-	FC-									eck	FC-	FC-									eck eck
Level	ρF_x	1	2									ر ک	Α	В									Ch
1	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%
Base	1.95	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100%



Sheet:	Wind on Open Roof
Date:	12/17/2024
#:	24-8400.32
Version:	-

ASCE 7-16 Chapter 27.3.2 - Design Wind Loads On Open Structure - Monoslope Free Roof

Fuel Tank/Generator Canopy

27.58

psf

Basic Wind Speed Nominal Wind Speed (v.6)V_{ult.}
Ground elevation above sea level
Risk Category Factor
Surface Roughness
Exposure Category
Mean roof height of building or height of structure
Enclosure Classification

Roof Slope
Gust effect factor

ASCE Hazard Tool

ASCE Hazard Tool Table 1.5-1 26.7.2

Table 26.13-1

26.11

Wind Load Parameters:

 $.00256K_zK_{zt}K_dK_eV^2$

ASD: .6W = 16.55

Table 26.10-1 Table 26.6-1 Table 26.9-1

(26.8.2)

(26.10-1)

Equation for Open Buildings with Monoslope, Pitched or Troughed Free Roofs

 $p = q_hGC_n$

4.76

(27.3-2)

q_h = velocity pressure evaluated at mean roof height h

G = Gust effect Factor

Velocity Pressure:

C_N = Net Pressure Coefficient determined form Figures 27.3-4 through 27.3-7 Include contributions from top & bottom surfaces

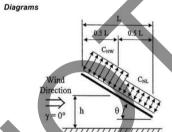
q_h

Table 26.13-1

	Interpolated Values												
			-	= 0°				180°					
		Clear	Flow	Obstr	ructed	Clear	Flow	Obst	ructed				
	LC	C _{NW}	C _{NL}	C _{NW}	C _{NL}	C _{NW}	C _{NL}	C _{NW}	C _{NL}				
- 7.5°	Α	0.06	-0.53	-0.82	-1.39	1.01	1.06	-0.31	-1.20				
0 7	В	-1.29	-0.04	-1.48	0.29	0.61	0.61	0.11	-0.41				

	Strength Level Wind Pressure (psf)									
	-	: 0°	=180°							
	Clear	Flow	Clear Flow							
ľ	C_{NW}	C_{NL}	C_{NW}	C_{NL}						
	1.33	-12.33	23.67	24.90						
	-30.26	-0.86	14.42	14.42						

Wind P	h Level ressure sf)
C _{NW}	C _{NL}
23.67	24.90
30.26	14.42



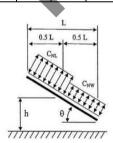
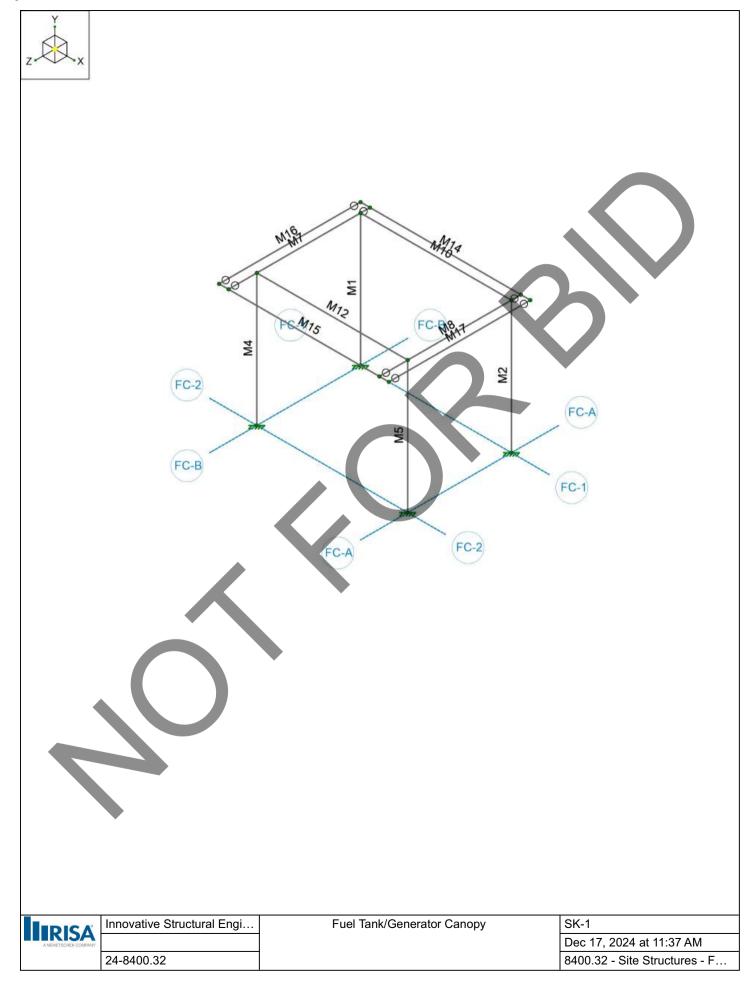




Figure 27.3-4





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Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	0	0	0	
2	N2	16	0	0	
3	N4	0	0	11	
4	N5	16	0	11	
5	N7	-1	14	-1	
6	N8	17	14	-1	
7	N9	17	14	14	
8	N10	-1	14	14	
9	N11	0	14	0	
10	N12	16	14	0	
11	N13	16	14	11	
12	N14	0	14	11	
13	N17	0	14	-1	
14	N20	0	14	14	
15	N21	16	14	-1	
16	N22	16	14	14	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e ⁵ °F ⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	lyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Column	HSS4X4X6	Column	Tube	A500 Gr.B Rect	Typical	4.78	10.3	10.3	17.5
2	Beam	HSS6X4X4	Beam	Tube	A500 Gr.B Rect	Typical	4.3	11.1	20.9	23.6
3	Rim	HSS6X2X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	2.21	13.1	6.55

Member Primary Data

	Label	I Node	J Node	Section/Shape	Туре	Design List	Material	Design Rule
1	M1	N1	N11	Column	Column	Tube	A500 Gr.B Rect	Typical
2	M2	N2	N12	Column	Column	Tube	A500 Gr.B Rect	Typical
3	M4	N4	N14	Column	Column	Tube	A500 Gr.B Rect	Typical
4	M5	N5	N13	Column	Column	Tube	A500 Gr.B Rect	Typical
5	M7	N17	N20	Beam	Beam	Tube	A500 Gr.B Rect	Typical
6	M8	N21	N22	Beam	Beam	Tube	A500 Gr.B Rect	Typical



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Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
7	M10	N11	N12	Beam	Beam	Tube	A500 Gr.B Rect	Typical
8	M12	N14	N13	Beam	Beam	Tube	A500 Gr.B Rect	Typical
9	M14	N7	N8	Rim	Beam	Tube	A500 Gr.B Rect	Typical
10	M15	N10	N9	Rim	Beam	Tube	A500 Gr.B Rect	Typical
11	M16	N7	N10	Rim	Beam	Tube	A500 Gr.B Rect	Typical
12	M17	N8	N9	Rim	Beam	Tube	A500 Gr.B Rect	Typical

Member Advanced Data

	Label	I Release	J Release	Col-Wall Vert Release	Physical	Deflection Ratio Options	Seismic DR
1	M1				Yes	** NA **	OMF
2	M2				Yes	** NA **	OMF
3	M4				Yes	** NA **	OMF
4	M5				Yes	** NA **	OMF
5	M7	BenPIN	BenPIN		Yes	Default	OMF
6	M8	BenPIN	BenPIN		Yes	Default	OMF
7	M10				Yes	Default	OMF
8	M12				Yes	Default	OMF
9	M14				Yes	Default	None
10	M15				Yes	Default	None
11	M16	BenPIN	BenPIN		Yes	Default	None
12	M17	BenPIN	BenPIN		Yes	Default	None

Basic Load Cases

	BLC Description	Category	Y Gravity	Distributed	Area(Member)
1	DL	DL	_1		1
2	RLL	RLL			1
3	ELX	ELX		2	
4	ELZ	ELZ		2	
5	WLX	WLX		6	1
6	WLZ	WLZ		6	1
7	BLC 1 Transient Area Loads	None		34	
8	BLC 2 Transient Area Loads	None		34	
9	BLC 5 Transient Area Loads	None		34	
10	BLC 6 Transient Area Loads	None		34	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Deflection 1	Yes	Υ	DL	1								
2	Deflection 2	Yes	Υ	RLL	1								
3	Deflection 3	Yes	Υ	DL	1	RLL	1						
4	IBC 16-1	Yes	Υ	DL	1.4								
5	IBC 16-2 (a)	Yes	Υ	DL	1.2	LL	1.6	LLS	1.6	RLL	0.5		
6	IBC 16-2 (b)	Yes	Υ	DL	1.2	LL	1.6	LLS	1.6				
7	IBC 16-3 (a)	Yes	Υ	DL	1.2	RLL	1.6	LL	0.5	LLS	1		
8	IBC 16-3 (b) (a)	Yes	Υ	DL	1.2	RLL	1.6	WLX	0.5				
9	IBC 16-3 (b) (b)	Yes	Υ	DL	1.2	RLL	1.6	WLZ	0.5				
10	IBC 16-3 (b) (c)	Yes	Υ	DL	1.2	RLL	1.6	WLX	-0.5				
11	IBC 16-3 (b) (d)	Yes	Υ	DL	1.2	RLL	1.6	WLZ	-0.5				
12	IBC 16-3 (d) (a)	Yes	Υ	DL	1.2	WLX	0.5						
13	IBC 16-3 (d) (b)	Yes	Υ	DL	1.2	WLZ	0.5						
14	IBC 16-3 (d) (c)	Yes	Υ	DL	1.2	WLX	-0.5						
15	IBC 16-3 (d) (d)	Yes	Υ	DL	1.2	WLZ	-0.5						



Model Name: Fuel Tank/Generator Canopy

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Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
16	IBC 16-4 (a) (a)	Yes	Υ	DL	1.2	WLX	1	LL	0.5	LLS	1	RLL	0.5
17	IBC 16-4 (a) (b)	Yes	Υ	DL	1.2	WLZ	1	LL	0.5	LLS	1	RLL	0.5
18	IBC 16-4 (a) (c)	Yes	Υ	DL	1.2	WLX	-1	LL	0.5	LLS	1 _	RLL	0.5
19	IBC 16-4 (a) (d)	Yes	Υ	DL	1.2	WLZ	-1	LL	0.5	LLS	1	RLL	0.5
20	IBC 16-4 (b) (a)	Yes	Υ	DL	1.2	WLX	1	LL	0.5	LLS	1		
21	IBC 16-4 (b) (b)	Yes	Υ	DL	1.2	WLZ	1	LL	0.5	LLS 4	1		
22	IBC 16-4 (b) (c)	Yes	Υ	DL	1.2	WLX	-1	LL	0.5	LLS	1		
23	IBC 16-4 (b) (d)	Yes	Υ	DL	1.2	WLZ	-1	LL	0.5	LLS	1		
24	IBC 16-6 (a)	Yes	Υ	DL	0.9	WLX	1						
25	IBC 16-6 (b)	Yes	Υ	DL	0.9	WLZ	1						
26	IBC 16-6 (c)	Yes	Υ	DL	0.9	WLX	-1						
27	IBC 16-6 (d)	Yes	Υ	DL	0.9	WLZ	-1						
28	IBC 16-5 (a)	Yes	Υ	DL	1.2	Sds*DL	0.2	Rho*ELX	1	LL	0.5	LLS	1
29	IBC 16-5 (b)	Yes	Υ	DL	1.2	Sds*DL	0.2	Rho*ELZ	1	LL	0.5	LLS	1
30	IBC 16-7 (a)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Rho*ELX	1				
31	IBC 16-7 (b)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Rho*ELZ	1				
32	IBC 16-5 (os-a)	Yes	Υ	DL	1.2	Sds*DL	0.2	Om*ELX	1	UL.	0.5	LLS	1
33	IBC 16-5 (os-b)	Yes	Υ	DL	1.2	Sds*DL	0.2	Om*ELZ	1	LL	0.5	LLS	1
34	IBC 16-7 (os-a)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Om*ELX	1				
35	IBC 16-7 (os-b)	Yes	Υ	DL	0.9	Sds*DL	-0.2	Om*ELZ	1				
36	DL	Yes	Υ	DL	1								
37	RLL	Yes	Υ	RLL	1								
38	ELX	Yes	Υ	ELX	1								
39	ELZ	Yes	Υ	ELZ	1								
40	WLX	Yes	Υ	WLX	1								
41	WLZ	Yes	Υ	WLZ	_1								
42	?*ELX	Yes	Υ	Om*ELX	1								
43	?*ELZ	Yes	Υ	Om*ELZ	1 🔨								

Connection Design Rules

	Label	Conn Type	Туре	Beam Conn	Col/Girder Conn	Eccentricity
1	Col/Bm Single Angle Shear	Shear	Column/Beam Clip Single Angle Shear	Bolted	Bolted	1.5
2	Col/Bm Double Angle Shear	Shear	Column/Beam Clip Double Angle Shear	Bolted	Bolted	0
3	Col/Bm Two Side Clip Angle Shear	Shear	Column/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
4	Col/Bm End Plate Shear	Shear	Column/Beam End-Plate Shear	N/A	Bolted	N/A
5	Col/Bm Shear Tab Shear	Shear	Column/Beam Shear Tab Shear	Bolted	N/A	0
6	Girder/Bm Single Angle Shear	Shear	Girder/Beam Clip Single Angle Shear	Bolted	Bolted	N/A
7	Girder/Bm Double Angle Shear	Shear	Girder/Beam Clip Double Angle Shear	Bolted	Bolted	N/A
8	Grd/Bm Two Side Clip Angle Shear	Shear	Girder/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
9	Girder/Bm End Plate Shear	Shear	Girder/Beam End-Plate Shear	N/A	Bolted	N/A
10	Girder/Bm Shear Tab Shear	Shear	Girder/Beam Shear Tab Shear	Bolted	N/A	N/A
11	Beam Shear Splice	Shear	Beam Shear Tab Splice	Bolted	N/A	N/A
12		Shear	Column Shear Tab Splice	N/A	Bolted	N/A
13	Col/Bm Ext. End Plate Moment	Moment	Column/Beam Extended End-Plate Moment	N/A	N/A	N/A
14	Col/Bm PartExt. End Plate Moment	Moment	Column/Beam Partially Extended End-Plate Moment (Tension side)	N/A	N/A	N/A
_	Col/Bm Flush End Plate Moment		Column/Beam Flush End-Plate Moment	N/A	N/A	N/A
16	Col/Bm Flange Plate Moment	Moment	Column/Beam Flange Plate Moment	Bolted	N/A	N/A
17	Col/Bm Direct Weld Moment	Moment	Column/Beam Direct Weld Moment	Bolted	N/A	N/A
18	Col/Bm Seismic Moment	Moment	Column/Beam Seismic Moment	N/A	N/A	N/A
19	Beam Moment Plate Splice	Moment	Beam Moment Plate Splice	Bolted	N/A	N/A
20	Column Moment Plate Splice	Moment	Column Moment Plate Splice	N/A	Bolted	N/A
21	Beam Direct Weld Moment Splice	Moment	Beam Direct Weld Splice	Bolted	N/A	N/A
22	Col Direct Weld Moment Splice	Moment	Column Direct Weld Splice	N/A	Bolted	N/A
23	Bm Ext. End Plate Moment Splice	Moment	Beam Extended End Plate Splice	Bolted	N/A	N/A
24	Col Ext. End Plate Moment Splice	Moment	Column Extended End Plate Splice	N/A	Bolted	N/A



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Connection Design Rules (Continued)

	Label	Conn Type	Туре	Beam Conn	Col/Girder Conn	Eccentricity
25	Diagonal Vertical Brace	Brace	Diagonal Vertical Brace	N/A	N/A	N/A
26	Chevron Vertical Brace	Brace	Chevron Vertical Brace	N/A	N/A	N/A
27	Seismic Diagonal Brace	Brace	Diagonal Brace Seismic	N/A	N/A	N/A
28	Seismic Chevron Brace	Brace	Chevron Brace Seismic	N/A	N/A	N/A
29	Knee Brace	Brace	Knee Brace	N/A	N/A	N/A
30	Single Column Base Plate	Baseplate	Single Column Baseplate	N/A	N/A	N/A
31	Base Plate with Vertical Brace	Baseplate	Brace to Column Base Plate	N/A	N/A	N/A
32	HSS Truss Connection	Truss	HSS T-Connection	N/A	N/A	N/A

Seismic Detailing - Columns

	Label Seismic Design Rule Ductility Req'd UC MaxLC Slenderness Checks Panel Zone Checks Panel Zone Eqn Cont. Plate Req'd Cont. Plate Eqn SC/WB Ratio SC/WB Beam Misc. Checks													
1	M1	OMF	Minimal	0.43	3* Pass	N/A	N/A	No	N/A	N/A	N/A	Pass		
2	M2	OMF	Minimal	0.43	3* Pass	N/A	N/A	No	N/A	N/A	N/A	Pass		
3	M4	OMF	Minimal	0.437	3* Pass	N/A	N/A	No	N/A	N/A	N/A	Pass		
4	M5	OMF	Minimal	0.437	3* Pass	N/A	N/A	No	N/A	N/A	N/A	Pass		

Material Take-Off

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A500 Gr.B Rect	HSS4X4X6	4	56	0.98
3	A500 Gr.B Rect	HSS6X2X4	4	66	0.814
4	A500 Gr.B Rect	HSS6X4X4	4	62	0.976
5	Total HR Steel		12	184	2.769

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Membe	r_ Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	ohi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-f	t] Cb Eqn
1	M1	HSS4X4X6	0.43	0	33*	0.024	14	z	33*	81.993	197.892	22.046	22.046	2.173H1-1b
2	M2	HSS4X4X6	0.43	0	33*	0.024	14	Z	33*	81.993	197.892	22.046	22.046	2.174H1-1b
3	M4	HSS4X4X6	0.437	0	33*	0.023	14	z	43*	81.993	197.892	22.046	22.046	2.173H1-1b
4	M5	HSS4X4X6	0.437	0	33*	0.023	14	У	43*	81.993	197.892	22.046	22.046	2.174H1-1b
5	M7	HSS6X4X4	0.179	11.875	29	0.091	0.938	У	8	76.523	178.02	22.252	29.429	1.748H1-1b
6	M8	HSS6X4X4	0.179	11.875	29	0.082	0.938	У	9	76.523	178.02	22.252	29.429	1.748H1-1b
7	M10	HSS6X4X4	0.231	7.833	8	0.047	16	У	8	68.024	178.02	22.252	29.429	1.254H1-1b
8	M12	HSS6X4X4	0.274	7.833	8	0.054	16	у	8	68.024	178.02	22.252	29.429	1.247H1-1b
9	M14	HSS6X2X4	0.164	9	17	0.008	16.875	z	17	10.701	139.518	9.005	20.148	1.071H1-1b
10	M15	HSS6X2X4	0.206	9	17	0.015	16.875	У	8	10.701	139.518	9.005	20.148	1.15 H1-1b
11	M16	HSS6X2X4	0.071	7.5	22	0.011	15	z	16	15.409	139.518	9.005	20.148	1.136H1-1b
12	M17	HSS6X2X4	0.071	7.5	16	0.012	15	Z	16	15.409	139.518	9.005	20.148	1.136H1-1b

Envelope Z-Direction Story Drift - Strength

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	14 ft	max	1.906	11, 16	29	1.135	11, 16	29	1.06	11, 0	8
2		min	-0.398	11 16	27	0.008	11 16	14	0.98	11 0	26

Envelope Beam Deflections

	Member Label	Span		Location [ft]	y' [in]	(n) L'/y' Ratio	LC
1	M7	1	max	0.781	-0.001	NC	15
2		1	min	0	0.024	990	31
3		2	max	3.281	0.001	NC	14



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Envelope Beam Deflections (Continued)

	Member Label	Span		Location [ft]	y' [in]	(n) L'/y' Ratio	LC
4		2	min	7.813	0.071	1847	9
5		3	max	14.063	-0.001	NC	18
6		3	min	15	-0.162	444	9
7	M8	1	max	0.938	-0.001	NC	8
8		1	min	0	0.024	990	31
9		2	max	11.25	0.001	NC	14
10		2	min	7.813	0.072	1821	9
11		3	max	12.031	-0.001	NC	16
12		3	min	15	-0.164	438	9
13	M10	1	max	0.167	0.001	NC	14
14		1	min	8	-0.551	348	8
15	M12	1	max	15.833	0.001	NC	18
16		1	min	7.833	-0.659	291	8
17	M14	1	max	9.375	0.001	NC	14
18		1	min	8.813	-0.403	536	8
19	M15	1	max	0.188	-0.001	NC	38
20		1	min	9	-0.514	420	8
21	M16	1	max	14.844	-0.001	NC	25
22		1	min	7.5	-0.057	3173	29
23	M17	1	max	14.844	-0.001	NC	25
24		1	min	7.5	-0.057	3173	29

Envelope Z-Direction Story Drift - Service

_	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	14 ft	max	1.829	11, 16	39	1.088	11, 16	39	1.033	11, 0	40
2		min	-0.002	0. 16	38	0.001	0. 16	38	1	11. 16	39

Envelope X-Direction Story Drift - Service

	Story (Elevation)	_	Story Drift[in]	Loc (Z,X)	L C	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	14 ft	max	1.492	11, 16	38	0.888	11, 16	38	1.026	11, 0	41
2		min	.0	0, 16	39	0	0, 16	39	1	11, 0	1

Envelope X-Direction Story Drift - Strength

	Story (Elevation)		Story Drift[in]	Loc (Z,X)	LC	Drift Ratio (%)	Loc (Z,X)	LC	2nd/1st Ratio	Loc (Z,X)	LC
1	14 ft	max	1.523	11, 0	28	0.907	11, 0	28	1.058	11, 0	8
2		min	-0.356	11. 0	18	0	11. 0	15	0.984	11. 0	27

Envelope Member End Reactions

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	LC
1	M1		max	3.768	8	0.946	42*	0.28	27	0.003	22	9.021	33*	7.02	42*
2			min	-1.388	43*	-0.356	9	-1.223	33*	-0.009	32*	-1.735	27	-1.654	9
3		J	max	3.474	8	0.946	42*	0.168	27	0.003	22	1.399	_27	3.33	9
4			min	-1.388	43*	-0.356	9	-1.223	33*	-0.009	32*	-8.099	33*	-6.229	42*
5	M2		max	3.894	8	1.059	32*	0.28	27	0.003	10	9.022	33*	7.594	32*
6			min	-1.388	43*	-0.348	26	-1.223	33*	-0.008	32*	-1.737	27	-1.949	26
7		J	max	3.6	8	1.059	32*	0.168	27	0.003	10	1.403	27	2.138	26
8			min	-1.388	43*	-0.236	26	-1.223	33*	-0.008	32*	-8.1	33*	-7.235	32*
9	M4	1	max	5.432	9	0.934	42*	0.253	19	0.045	18	8.669	33*	6.98	42*
10			min	-1.43	27	-0.434	9	-1.163	43*	-0.047	16	-1.595	19	-2.017	9
11		J	max	5.138	9	0.934	42*	0.141	19	0.045	18	1.199	11	4.06	9



: Innovative Structural Engineering

Company : Innovative S Designer : Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Envelope Member End Reactions (Continued)

	Member	Member End		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Moment[k-ft]	LC	z-z Moment[k-ft]	l LC
12			min	-1.65	27	-0.434	9	-1.163	43*	-0.047	16	-7.636	43*	-6.091	42*
13	M5		max	5.417	9	1.063	32*	0.253	19	0.045	18	8.667	33*	7.636	32*
14			min	-1.423	27	-0.392	26	-1.163	43*	-0.048	16	-1.593	19	-2.194	26
15		J	max	5.123	9	1.063	32*	0.141	19	0.045	18	1.208	11	2.513	26
16		-	min	-1.644	27	-0.28	26	-1.163	43*	-0.048	16	-7.636	43*	-7.245	32*
17	M7		max	0.144	17	0.105	38	0.118	18	1.615	8	0	41	0	41
18			min	-0.144	27	-0.877	9	-0.111	40	-0.987	26	0	1	0	1
19		J	max	0.144	19	1.315	9	0.119	40	0.577	26	0	41	0	41
20			min	-0.144	41	-0.275	27	-0.12	18	-0.892	16	0	1	0	1
21	M8	I	max	0.144	17	0.131	26	0.126	26	1.022	30	0	41	0	41
22			min	-0.144	27	-0.903	8	-0.135	16	-1.403	9	0	1	0	1
23		J	max	0.144	19	1.355	8	0.121	16	0.701	9	0	41	0	41
24			min	-0.144	41	-0.315	26	-0.12	26	-0.656	30	0	1	0	1
25	M10	I	max	0.338	9	2.815	9	0.01	40	0.031	28	0.082	18	4.508	9
26			min	-0.457	30	-1.026	27	-0.01	26	-0.015	22	-0.078	40	-1.785	30
27		J	max	0.577	28	1.104	26	0.01	40	0.031	28	0.083	40	4.838	8
28			min	-0.118	26	-2.847	8	-0.01	26	-0.015	22	-0.085	26	-2.349	26
29	M12	1	max	0.434	9	3.277	9	0.026	18	0.01	26	0.214	16	5.059	9
30			min	-0.45	30	-1.224	_27	-0.027	16	-0.042	28	-0.211	_18	-2.016	_30
31		J	max	0.597	28	1.305	26	0.026	18	0.01	26	0.212	22	5.431	8
32			min	-0.157	26	-3.287	_ 8	-0.027	_16	-0.042	28	-0.218	_16	-2.702	26
33	M14	I	max	0.12	16	0	40	0	29	0	41	0	41	0.015	27
34			min	-0.12	18	-0.142	29	0	26	0	_1_	0	1_	-0.037	9
35		J	max	0.12	18	0.142	29	0	27	0	41	0	41	0.018	26
36			min	-0.12	_16	0	2	0	29	0	1	0	1_	-0.039	8
37	M15	I	max	0.12	40	0	40	0	26	0	41	0	41	0.037	9
38	_		min	-0.12	_26	-0.142	28	0	_29	0	1	0	1_	-0.015	27
39		J	max	0.12	26	0.142	28	0	29	0	41	0	41	0.039	8
40			<u>min</u>	-0.12	_40	0	39	0	_27	0	_1_	0	_1_	-0.018	26
41	M16	I	max	0	26	0.142	29	0.12	40	0.037	9	0	41	0	41
42			min	0	29	0	2	-0.12	18	-0.015	27	0	1_	0	1
43		J	max	0	26	0	41	0.12	26	0.037	9	0	41	0	41
44			min	0	29	-0.142	28	-0.12	16	-0.015	27	0	_1_	0	1
45	M17		max	0	27	0.142	29	0.12	40	0.018	26	0	41	0	41
46			min	0	29	0	2	-0.12	_18	-0.039	8	0	_1_	0	1
47		J	max	0	27	0	41	0.12	26	0.018	26	0	41	0	41
48			min	0	29	-0.142	28	-0.12	16	-0.039	8	0	1_	0	1

Warning Log

No Data to Print...

Envelope Node Reactions - Overstrength or Capacity Limit

1	Vode Label		X [k]	LC	Y [k]	LC	_ Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0.096	33*	0.788	32*	0.011	42*	0.049	42*	0	43*	7.02	42*
2		min	-0.955	42*	-1.388	43*	-1.223	33*	-9.021	33*	-0.009	32*	-0.445	33*
3	N2	max	0	43*	2.354	32*	-0.011	42*	-0.049	42*	0.001	33*	7.594	32*
4		min	-1.035	32*	-1.388	43*	-1.223	33*	-9.022	33*	-0.008	32*	0	43*
5	N5	max	0	43*	3.416	33*	0.058	32*	0.233	32*	0	43*	7.636	32*
6		min	-1.034	32*	0.77	42*	-1.144	43*	-8.667	33*	-0.009	32*	0	43*
7	N4	max	0.11	33*	3.418	33*	0.018	32*	0.042	32*	0	33*	6.98	42*
8		min	-0.942	42*	-0.77	42*	-1.144	43*	-8.669	33*	-0.008	32*	-0.513	33*
9	N21	max	NC		NC		NC		LOCKED		NC		NC	
10		min	NC		NC		NC		LOCKED		NC		NC	
11	N20	max	NC		NC		NC		LOCKED		NC		NC	



Company : Innovative Structural Engineering

Designer : Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Envelope Node Reactions - Overstrength or Capacity Limit (Continued)

ı	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
12		min	NC		NC		NC		LOCKED		NC		NC	
13	Totals:	max	0	33*	7.147	32*	0	32*						
14		min	-3.76	32*	0	43*	-4.65	43*						

Envelope Node Displacements

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Node Label X [in] LC Y [in] LC Z [in] LC X Rotation [rad] LC Y Rotation [rad] LC Z Rotation [rad] LC													LC	
1	N1	max	0	30	0	26	0	29	0	29	0	16	0	9
2		min	0	9	0	8	0	27	0	27	0	22	0	30
3	N2	max	0	28	0	26	0	29	0	29	0	28	0	26
4		min	0	26	0	8	0	27	0	27	0	10	0	28
5	N4	max	0	30	0	27	0	31	0	31	0	16	0	9
6		min	0	9	0	9	0	19	0	19	0	18	0	30
7	N5	max	0	16	0	27	0	31	0	31	0	16	0	26
8		min	0	26	0	9	0	19	0	19	0	18	0	28
9	N7	max	0.98	28	0.057	9	1.239	29	0	41	5.985e-3	19	2.458e-3	26
10		min	-0.328	18	-0.028	27	-0.326	27	0	7	-5.983e-3	41	-6.447e-3	8
11	N8	max	0.98	28	0.057	9	1.239	29	0	41	5.98e-3	41	6.227e-3	9
12		min	-0.328	18	-0.028	27	-0.326	27	0	1	-5.983e-3	19	-2.097e-3	27
13	N9	max	0.992	28	0.03	27	1.239	29	0	41	5.99e-3	17	7.329e-3	9
14		min	-0.381	18	-0.118	29	-0.326	27	0	1	-5.987e-3	27	-2.548e-3	27
15	N10	max	0.992	28	0.029	27	1.239	29	0	41	5.99e-3	27	2.817e-3	26
16		min	-0.381	18	-0.118	29	-0.326	27	0	1	-5.994e-3	17	-7.486e-3	8
17	N11	max	0.981	28	0.001	26	1.239	29	2.061e-3	31	6.713e-5	16	2.985e-3	26
18		min	-0.328	18	-0.005	8	-0.398	27	-1.221e-3	8	-2.925e-5	22	-7.357e-3	8
19	N12	max	0.981	28	0.001	26	1.239	29	2.06e-3	31	4.054e-5	28	7.021e-3	9
20		min	-0.328	18	-0.006	8	-0.398	27	-1.306e-3	8	-3.022e-5	10	-2.432e-3	27
21	N13	max	0.99	28	0.002	27	1.239	29	3.352e-3	17	4.975e-4	16	8.536e-3	9
22		min	-0.356	18	-0.008	9	-0.398	27	-1.374e-3	27	-4.684e-4	18	-3.087e-3	27
23	N14	max	0.99	28	0.002	27	1.239	29	3.318e-3	29	4.804e-4	16	3.761e-3	26
24		min	-0.356	18	-0.008	9	-0.398	27	-1.355e-3	27	-4.657e-4	18	-8.964e-3	8
25	N17	max	0.98	28	0.025	31	1.239	29	0	41	5.991e-3	19	2.445e-3	26
26		min	-0.328	18	-0.022	8	-0.398	27	0	1	-5.989e-3	41	-6.474e-3	8
27	N20	max	0.992	28	0.06	27	1.239	29	0	41	5.995e-3	27	2.814e-3	26
28		min	-0.381	18	-0.171	9	-0.398	27	0	1	-6.e-3	17	-7.542e-3	8
29	N21	max	0.98	28	0.025	31	1.239	29	0	41	5.986e-3	41	6.253e-3	9
30		min	-0.328	18	-0.023	8	-0.398	27	0	_ 1	-5.99e-3	19	-2.083e-3	27
31	N22	max	0.992	28	0.061	27	1.239	29	0	41	5.996e-3	17	7.386e-3	9
32		min	-0.381	18	-0.173	9	-0.398	27	0	1	-5.993e-3	27	-2.546e-3	27

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0.356	9	3.768	8	0.281	27	1.735	27	0.003	22	3.511	30
2		min	-0.459	30	-0.614	26	-0.649	29	-4.795	29	-0.006	16	-1.654	9
3	N2	max	0.35	26	3.894	8	0.282	27	1.737	27	0.003	10	4.163	28
4		min	-0.586	28	-0.867	26	-0.65	29	-4.796	29	-0.004	28	-1.949	26
5	N5	max	0.395	26	5.417	9	0.254	19	1.593	19	0.045	18	4.218	28
6		min	-0.618	16	-1.423	27	-0.585	31	-4.473	31	-0.048	16	-2.194	26
7	N4	max	0.434	9	5.432	9	0.254	19	1.595	19	0.045	18	3.467	30
8		min	-0.447	30	-1.43	27	-0.585	31	-4.473	31	-0.047	16	-2.017	9
9	N21	max	NC	_	NC		NC	_	LOCKED		NC		NC	
10		min	NC		NC		NC		LOCKED		NC		NC	
11	N20	max	NC		NC		NC		LOCKED		NC		NC	
12		min	NC		NC		NC		LOCKED		NC		NC	



: Innovative Structural Engineering

Company : Innovative S Designer : Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Envelope Node Reactions (Continued)

Node L				LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
13 Tota	ls:	max	0.928	18	18.281	8	1.024	19						
14		min	-1.955	28	-3.907	26	-2.418	31						

Load Combination Design

<u>LO</u>	<u>Load Combination Design</u> Description Service Hot Rolled Cold Formed Wood Concrete Masonry Aluminum Stainless Connection													
	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection				
1	Deflection 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
2	Deflection 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
3	Deflection 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
4	IBC 16-1		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
5	IBC 16-2 (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
6	IBC 16-2 (b)		Yes	Yes		Yes	Yeş	Yes	Yes	Yes				
7	IBC 16-3 (a)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
8	IBC 16-3 (b) (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
9	IBC 16-3 (b) (b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
10	IBC 16-3 (b) (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
11	IBC 16-3 (b) (d)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
12	IBC 16-3 (d) (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
13	IBC 16-3 (d) (b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
14	IBC 16-3 (d) (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
15	IBC 16-3 (d) (d)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
16	IBC 16-4 (a) (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
17	IBC 16-4 (a) (b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
18	IBC 16-4 (a) (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
19	IBC 16-4 (a) (d)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
20	IBC 16-4 (b) (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
21	IBC 16-4 (b) (b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
22	IBC 16-4 (b) (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
23	IBC 16-4 (b) (d)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
24	IBC 16-6 (a)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
25	IBC 16-6 (b)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
26	IBC 16-6 (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
27	IBC 16-6 (d)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
28	IBC 16-5 (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
29	IBC 16-5 (b)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
30	IBC 16-7 (a)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
31	IBC 16-7 (b)		Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
32	IBC 16-5 (os-a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
33	IBC 16-5 (os-b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
34	IBC 16-7 (os-a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
35	IBC 16-7 (os-b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes				
36	DL	Yes	Yes	Yes	_	Yes	Yes	Yes	Yes	Yes				
37	RLL	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
38	ELX	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
39	ELZ	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
40	WLX	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
41	WLZ	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
42	?*ELX	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				
43	?*ELZ	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				

Member Area Loads (BLC 1 : DL)

	Node A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]	D Magnitude [ksf]	Exclude Braces
1	N8	N9	N10	N7	Υ	Perp to B-C	-0.007	-0.007	-0.007	-0.007	Yes



Company : Innovative Structural Engineering

Designer :

Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Node A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf	C Magnitude [ksf]	D Magnitude [ksf	Exclude Braces
1 N8	N9	N10	N7	Υ	Perp to B-C	-0.02	-0.02	-0.02	-0.02	Yes

Member Area Loads (BLC 5 : WLX)

	Node A	Node E	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]	D Magnitude [ksf	Exclude Braces
1	N8	N9	N10	N7	Y	Perp to B-C	-0.03	-0.03	-0.03	-0.03	Yes

Member Area Loads (BLC 6 : WLZ)

	Node A	Node B	Node C	Node D	Direction	Load Direction	A Magnitude [ksf]	B Magnitude [ksf]	C Magnitude [ksf]D Magnitude [ksf]	Exclude Braces
1	N8	N9	N10	N7	Υ	Perp to B-C	-0.03	-0.03	-0.03	-0.03	Yes

Member Distributed Loads (BLC 3 : ELX)

_	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
	1 M10	Х	0.047	0.047	0	%100
1	2 M12	Х	0.047	0.047	0	%100

Member Distributed Loads (BLC 4 : ELZ)

_	Member LabelDirectionStart Magnitude [k/ft, F, ksf, k-ft/ft]End Magnitude [k/ft, F, ksf, k-ft/ft]Start Location [(ft, %)]End Location [(ft, %)							
1	M8	Z	0.062		0.062	0	%100	
2	M7	Z	0.062		0.062	0	%100	

Member Distributed Loads (BLC 5 : WLX)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M4	X	0.008	0.008	0	%100
2	M1	Χ	0.008	0.008	0	%100
3	M17	Χ	0.016	0.016	0	%100
4	M16	Χ	0.016	0.016	0	%100
5	M5	Χ	0.008	0.008	0	%100
6	M2	Χ	0.008	0.008	0	%100

Member Distributed Loads (BLC 6 : WLZ)

ľ	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M14	Z	0.016	0.016	0	%100
2	M15 🌰	Z	0.016	0.016	0	%100
3	M2	Z	0.008	0.008	0	%100
4	M1	Z	0.008	0.008	0	%100
5	M4	Z	0.008	0.008	0	%100
6	M5	Z	0.008	0.008	0	%100

Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M10	Υ	-0.041	-0.043	0	2
2	M10	Υ	-0.043	-0.042	2	4
3	M10	Υ	-0.042	-0.041	4	6
4	M10	Υ	-0.041	-0.042	6	8
5	M10	Υ	-0.042	-0.045	8	10



: Innovative Structural Engineering

Company : Innovative S Designer : Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads) (Continued)

Ν	lember Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
6	M10	Υ	-0.045	-0.039	10	12
7	M10	Υ	-0.039	-0.038	12	14
8	M10	Υ	-0.038	-0.05	14	16
9	M12	Υ	-0.048	-0.051	0	2
10	M12	Υ	-0.051	-0.05	2	4
11	M12	Υ	-0.05	-0.048	4	6
12	M12	Υ	-0.048	-0.049	6	8
13	M12	Υ	-0.049	-0.051	8	10
14	M12	Υ	-0.051	-0.045	10	12
15	M12	Υ	-0.045	-0.044	12	14
16	M12	Υ	-0.044	-0.058	14	16
17	M14	Υ	-0.039	-0.014	0	2
18	M14	Υ	-0.014	-0.002	2	4
19	M14	Υ	-0.002	-0.002	4	6
20	M14	Υ	-0.002	-0.002	6	8
21	M14	Υ	-0.002	-0.002	8	10
22	M14	Υ	-0.002	-0.002	10	12
23	M14	Υ	-0.002	-0.002	12	14
24	M14	Υ	-0.002	-0.014	14	16
25	M14	Υ	-0.014	-0.039	16	18
26 27	M15	Υ	-0.044	-0.019	0	2
27	M15	Υ	-0.019	-0.007	2	4
28	M15	Υ	-0.007	-0.009	4	6
29	M15	Υ	-0.009	-0.01	6	8
30	M15	Υ	-0.01	-0.01	8	10
31	M15	Υ	-0.01	-0.01	10	12
32	M15	Υ	-0.01	-0.008	12	14
33	M15	Υ	-0.008	-0.019	14	16
34	M15	Υ	-0.019	-0.044	16	18

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label Direction Start Magnitude [k/ft, F, ksf, k-ft/ft] End Magnitude [k/ft, F, ksf, k-ft/ft] Start Location [(ft, %)] End Location [(ft, %)]							
1	M14	Υ	-0.041	-0.005	2	4		
2	M14	Υ	-0.005	-0.006	4	6		
3	M14	Υ	-0.006	-0.006	6	8		
4	M14	Υ	-0.006	-0.006	8	10		
5	M14	Y	-0.006	-0.006	10	12		
6	M14	Y	-0.006	-0.005	12	14		
7	M14	Y	-0.005	-0.041	14	16		
8	M14	Y	-0.041	-0.113	16	18		
9	M15	Y	-0.127	-0.055	0	2		
10	M15	Υ	-0.055	-0.02	2	4		
11	M15	Y	-0.02	-0.025	4	6		
12	M15	Y	-0.025	-0.028	6	8		
13	M15	Y	-0.028	-0.028	8	10		
14	M15	Y	-0.028	-0.029	10	12		
15	M15	Υ	-0.029	-0.024	12	14		
16	M15	Y	-0.024	-0.055	14	16		
17	M15	Y	-0.055	-0.127	16	18		
18	M10	Υ	-0.117	-0.124	0	2		
19	M10	Υ	-0.124	-0.121	2	4		
20	M10	Υ	-0.121	-0.117	4	6		
21	M10	Υ	-0.117	-0.121	6	8		
22	M10	Υ	-0.121	-0.127	8	10		
23	M10	Υ	-0.127	-0.111	10	12		



Company : Innovative Structural Engineering

Designer : Job Number : 24-8400.32

Model Name: Fuel Tank/Generator Canopy

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Checked By : __

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
24		Υ	-0.111	-0.109	12	14
25	M10	Υ	-0.109	-0.143	14	16
26	M12	Υ	-0.137	-0.146	0	2
27	M12	Υ	-0.146	-0.143	2	4
28	M12	Υ	-0.143	-0.137	4	6
29	M12	Υ	-0.137	-0.141	6	8
30	M12	Υ	-0.141	-0.147	8	10
31	M12	Υ	-0.147	-0.128	10	12
32		Υ	-0.128	-0.126	12	14
33	M12	Υ	-0.126	-0.167	14	16
34	M14	Υ	-0.113	-0.041	0	2

Member Distributed Loads (BLC 9 : BLC 5 Transient Area Loads)

Member Distributed Loads (BLC 9 : BLC 5 Transient Area Loads)								
1	Member Label	Start Location [(ft, %)]	End Location [(ft, %)]					
1	M10	Υ	-0.175	-0.186	0	2		
2	M10	Υ	-0.186	-0.182	2	4		
3	M10	Υ	-0.182	-0.175	4	6		
4	M10	Υ	-0.175	-0.181	6	8		
5	M10	Υ	-0.181	-0.191	8	10		
6	M10	Υ	-0.191	-0.167	10	12		
7	M10	Υ	-0.167	-0.163	12	14		
8	M10	Υ	-0.163	-0.215	14	16		
9	M12	Υ	-0.206	-0.219	0	2		
10	M12	Υ	-0.219	-0.215	2	4		
11	M12	Υ	-0.215	-0.206	4	6		
12	M12	Υ	-0.206	-0.212	6	8		
13	M12	Υ	-0.212	-0.22	8	10		
14	M12	Υ	-0.22	-0.192	10	12		
15	M12	Υ	-0.192	-0.189	12	14		
16	M12	Υ	-0.189	-0.251	14	16		
17	M14	Υ	-0.169	-0.061	0	2		
18	M14	Υ	-0.061	-0.008	2	4		
19	M14	Υ	-0.008	-0.009	4	6		
20	M14	Υ	-0.009	-0.009	6	8		
21	M14	Υ	-0.009	-0.009	8	10		
22	M14	Υ	-0.009	-0.009	10	12		
23	M14	Y	-0.009	-0.008	12	14		
24	M14	Υ	-0.008	-0.061	14	16		
25	M14	Y	-0.061	-0.169	16	18		
26	M15	Y	-0.19	-0.083	0	2		
27	M15	Y	-0.083	-0.031	2	4		
28	M15	Υ	-0.031	-0.038	4	6		
29	_M15	Y	-0.038	-0.042	6	8		
30	M15	Y	-0.042	-0.042	8	10		
31	M15	Y	-0.042	-0.043	10	12		
32	M15	Υ	-0.043	-0.036	12	14		
33	M15	Υ	-0.036	-0.083	14	16		
34	M15	Y	-0.083	-0.19	16	18		

Member Distributed Loads (BLC 10 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Location [(ft, %)]	End Location [(ft, %)]		
1	M14	Υ	-0.169	-0.061	0	2
2	M14	Υ	-0.061	-0.008	2	4



Company : Innovative S Designer : Job Number : 24-8400.32 : Innovative Structural Engineering

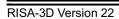
Model Name: Fuel Tank/Generator Canopy

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Checked By:___

Member Distributed Loads (BLC 10 : BLC 6 Transient Area Loads) (Continued)

M	nember Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
3	M14	Υ	-0.008	-0.009	4	6
4	M14	Υ	-0.009	-0.009	6	8
5	M14	Υ	-0.009	-0.009	8	10
6	M14	Υ	-0.009	-0.009	10	12
7	M14	Υ	-0.009	-0.008	12	14
8	M14	Υ	-0.008	-0.061	14	16
9	M14	Υ	-0.061	-0.169	16	18
10	M15	Υ	-0.19	-0.083	0	2
11	M15	Υ	-0.083	-0.031	2	4
12	M15	Υ	-0.031	-0.038	4	6
13	M15	Υ	-0.038	-0.042	6	8
14	M15	Υ	-0.042	-0.042	8	10
15	M15	Υ	-0.042	-0.043	10	12
16	M15	Υ	-0.043	-0.036	12	14
17	M15	Υ	-0.036	-0.083	14	16
18	M15	Υ	-0.083	-0.19	16	18
19	M10	Υ	-0.175	-0.186	0	2
20	M10	Υ	-0.186	-0.182	2	4
21	M10	Υ	-0.182	-0.175	4	6
22	M10	Υ	-0.175	-0.181	6	8
23	M10	Υ	-0.181	-0.191	8	10
24	M10	Υ	-0.191	-0.167	10	12
25	M10	Υ	-0.167	-0.163	12	14
26	M10	Υ	-0.163	-0.215	14	16
27	M12	Υ	-0.206	-0.219	0	2
28	M12	Υ	-0.219	-0.215	2	4
29	M12	Υ	-0.215	-0.206	4	6
30	M12	Υ	-0.206	-0.212	6	8
31	M12	Υ	-0.212	-0.22	8	10
32	M12	Υ	-0.22	-0.192	10	12
33	M12	Υ	-0.192	-0.189	12	14
34	M12	Y	-0.189	-0 251	14	16



Pole Footing Embedded in Soil

Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: TYPICAL DRILLED PIER FOOTING - FUEL TANK/GENERATOR CANOPY - FOUNDATION PLAN

Code References

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Load Combinations Used: IBC 2018

General Information

 Allow Passive
 333.0 pcf

 Max Passive
 1,500.0 psf

Controlling Values

Governing Load Combinatie1.224D+1.750E

Lateral Load 0.8729 k

Moment 6.446 k-ft

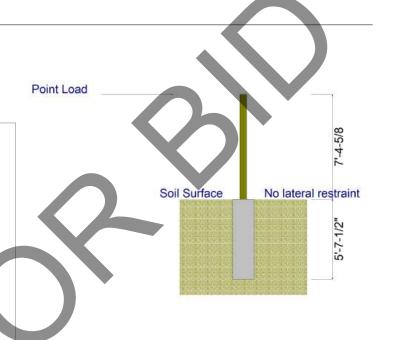
NO Ground Surface Restraint

Pressures at 1/3 Depth

Actual 608.73 psf Allowable 611.24 psf

Minimum Required Depth 5.625 ft

Footing Base Area 1.767 ft^2 Maximum Soil Pressure 1.487 ksf



Applied Loads

Lateral Concentrated	Load (k)	Lateral Distri	buted Loads (k	Vertical Load (k)
D : Dead Load	0.0440 k		k/ft	1.213 k
Lr : Roof Live	0.1050 k		k/ft	1.414 k
L : Live	k		k/ft	k
S : Snow	k		k/ft	k
W: Wind	k		k/ft	k
E : Earthquake	0.4680 k		k/ft	0.5550 k
H : Lateral Earth	k		k/ft	k
Load distance above		TOP of Load above ground	surface	
ground surface	7.385 ft		ft	
		BOTTOM of Load above gro	ound surface	
		-	ft	

Load Combination Results

Forces @ Ground coads - (k) Mo		Required	Pressure at 1/3	Depth Sc	oil Increase
oads - (k) Mo	nments - (ft-k)	D (1 (11)			
	omonto (it it)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor
0.044	0.325	1.88	202.5	203.1	1.000
0.149	1.100	2.88	312.9	315.8	1.000
0.123	0.907	2.75	293.2	293.3	1.000
0.044	0.325	1.88	202.5	203.1	1.000
0.044	0.325	1.88	202.5	203.1	1.000
0.873	6.446	5.63	608.7	611.2	1.000
0.765	5.651	5.25	579.2	580.7	1.000
0.123	0.907	2.75	293.2	293.3	1.000
0.123	0.907	2.75	293.2	293.3	1.000
	0.149 0.123 0.044 0.044 0.873 0.765 0.123	0.149 1.100 0.123 0.907 0.044 0.325 0.044 0.325 0.873 6.446 0.765 5.651 0.123 0.907	0.149 1.100 2.88 0.123 0.907 2.75 0.044 0.325 1.88 0.044 0.325 1.88 0.873 6.446 5.63 0.765 5.651 5.25 0.123 0.907 2.75	0.149 1.100 2.88 312.9 0.123 0.907 2.75 293.2 0.044 0.325 1.88 202.5 0.044 0.325 1.88 202.5 0.873 6.446 5.63 608.7 0.765 5.651 5.25 579.2 0.123 0.907 2.75 293.2	0.149 1.100 2.88 312.9 315.8 0.123 0.907 2.75 293.2 293.3 0.044 0.325 1.88 202.5 203.1 0.044 0.325 1.88 202.5 203.1 0.873 6.446 5.63 608.7 611.2 0.765 5.651 5.25 579.2 580.7 0.123 0.907 2.75 293.2 293.3

Pole Footing	Embedded in Soil				Project File: 8	3400.32 - Site Structi	ures.ec6
LIC# : KW-06014215, Bu	ild:20.24.10.03	Innovative	Structural Engine	eering, Inc. (IS		(c) ENERCALC, LLC	1982-2024
DESCRIPTION:	TYPICAL DRILLED PIE	R FOOTIN	G - FUEL T	ANK/GENERATOR	CANOPY -	- FOUNDATION	PLAN
+D+0.450W		0.044	0.325	1.88	202.5	203.1	1.000
+D-0.450W		0.044	0.325	1.88	202.5	203.1	1.000
+1.168D+1.313E		0.666	4.916	5.00	549.6	550.3	1.000
+1.168D-1.313E		0.563	4.157	4.75	514.4	517.0	1.000
+0.60D+0.60W		0.026	0.195	1.63	169.2	169.5	1.000
+0.60D-0.60W		0.026	0.195	1.63	169.2	169.5	1.000
+0.3760D+1.750E		0.836	6.170	5.50	599.7	600.3	1.000
+0.3760D-1.750E		0.802	5.926	5.38	590.4	591.1	1.000

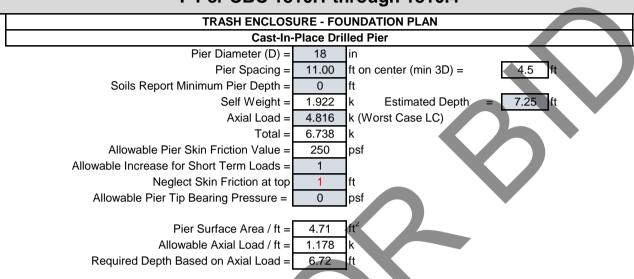




40810 County Center Drive, ste. 110 Temecula, CA 92591 (951) 600-0032, (951) 600-0036 Fax

Sheet:	PIER REINF.
Date:	12/17/24
#:	24-8400.32
Δ:	-

Cast-In-Place - Drilled Pier Reinforcement in Seismic Design Category D, E & F Per CBC 1810.1 through 1810.4





FREE STANDING CMU WALL 8C/A1.2





www.ISEengineers.com

Sheet:	Non-Structural Components
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

SEISMIC FORCES AT NON STRUCTURAL COMPONENTS ASCE 7-16

Building Seismic Design Criteria:

(ASCE - Chapter 11 & 13)

Short period spectral acceleration, S_{DS} =	1.67	Per 11.4.5
Component Factor, a_p =	1.00	Table 13.5-1 or 13.6-1
Component Response Modification Factor, R_p =	2.50	Table 13.5-1 or 13.6-1
Component Importance Factor, $I_p =$	1.00	Per 13.1.3
Average roof height of structure, h =	8.00	ft

Component Max Seismic Design Force, $F_{p \text{ max}} = 2.67$ $W_p = 1.6 \text{ S}_{DS} \text{ I}_p W_p$ Per 13.3-2 Component Min Seismic Design Force, $F_{p \text{ min}} = 0.50$ $W_p = 0.3 \text{ S}_{DS} \text{ I}_p W_p$ Per 13.3-3

Component Horizontal Seismic Loads:

$$F_p = 0.4 a_p S_{DS} W_p (1+2z/h) / (R_p / I_p)$$

Per 13.3-1

Component description:	Freestanding	CMU Wall
Height of component, Z =	8.00	ft
Use F _p =	0.80	W_p



LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Free Standing CMU Wall, Seismic Check

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	8.17 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf Used for Sliding & Overturning

Axial Load Applied to Stem

Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	6.0 in

Stem Weight Seismic Load

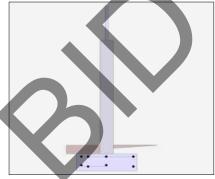
Soil Data

Allow Soil Bearing Equivalent Fluid Pressure		2,660.0	psf
Active Heel Pressure	=		psf/ft
	=		
Passive Pressure	=	333.0	psf/ft
Soil Density, Heel	=	110.00	pcf
Soil Density, Toe	=	110.00	pcf
Footing Soil Friction	=	0.400	
Soil height to ignore for passive pressure	=	12.00	in

Lateral Load Applied to Stem

Lateral Load Height to Top	=	0.0 #/ft 0.00 ft
Height to Bottom	=	0.00 ft
Load Type	=	Wind (W)
		(Service Level)
Wind on Exposed Sten (Strength Level)	n =	0.0 psf

F_D / W_D Weight Multiplier = 0.800 g



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Added seismic base force 313.8 lbs



Cantilevered Retaining Wall LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Free Standing CMU Wall, Seismic Check

Design Summary		S	Stem Construction		2nd	Bottom		
Wall Stability Ratios Overturning Sliding Global Stability Total Bearing Loadresultant ecc. Eccentricity outsi Soil Pressure @ Toe	= = = = de middl	1.24 Ratio < 1.5 1.85 OK 3.27 1,157 lbs 14.57 in	Design Height Above Ftg Wall Material Above "Ht"	ft = = = = = =	6.67 Fence	Stem OK 0.00 Masonry ASD 8.00 # 5 16.00 Center	SD SD	SD
Soil Pressure @ Heel Allowable Soil Pressure Less ACI Factored @ Toe ACI Factored @ Heel	=	0 psf OK 2,660 psf	Service Level Strength Level MomentActual Service Level	lbs = lbs = ft-# = ft-# =		318.8 1,047.2)	
Footing Shear @ Toe Footing Shear @ Heel Allowable Sliding Calcs	= = =	12.6 psi OK 2.5 psi OK 75.0 psi	MomentAllowable ShearActual Service Level	ft-# = psi = psi =		1,294.8		
Lateral Sliding Force less 100% Passive Force less 100% Friction Force Added Force Req'dfor 1.5 Stability		358.8 lbs 208.1 lbs 455.4 lbs 0.0 lbs OK 0.0 lbs OK	ShearAllowable Anet (Masonry)	= in2 = psf = in =		45.5 91.50 84.0 3.81		
Vertical component of activ NOT considered in the calc			f'm	psi = psi = =		1,500 20,000 Yes		
Load Factors Building Code Dead Load Live Load Earth, H Wind, W Seismic, E	4	1.200 1.600 1.600 1.600 1.000		= = = = psi = psi =	ASD	21.48 7.63		

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS Project File: 8400.32 - Site Structures.ec6 (c) ENERCALC, LLC 1982-2024

DESCRIPTION: Free Standing CMU Wall, Seismic Check

Footing Data

Toe Width	=	1.17 ft
Heel Width	=	1.83
Total Footing Width	= -	3.00
Footing Thickness	=	12.00 in

2,500 psi 60,000 psi Footing Concrete Density = 150.00 pcf 0.0018 Min. As % Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	3,720	0	psf
Mu': Upward	=	1,404	0	ft-#
Mu': Downward	=	215	215	ft-#
Mu: Design	=	1,189	215	ft-#
φ Mn	=	11,610	13,005	ft-#
Actual 1-Way Shear	=	12.56	2.52	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	# 5 @ 12.00 in		
Heel Reinforcing	=	# 5 @ 12.00 in		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu		=	0.00 ft-lb	os
Footing Allow. Torsio	n, q	7n =	0.00 ft-lk	os

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area Min footing T&S reinf Area per foot 0.78 in2 0.26 in2 /ft

f one layer of horizontal bars: If two layers of horizontal bars:

#4@ 9.26 in #4@ 18.52 in #5@ 14.35 in #5@ 28.70 in #6@ 20.37 in #6@ 40.74 in



LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6

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DESCRIPTION: Free Standing CMU Wall, Seismic Check

Summary of Overturning & Resisting Forces & Moments

Item		Force lbs	ERTURNING Distance ft	Moment ft-#		RE Force lbs	SISTING Distance ft	Moment ft-#
HL Act Pres (ab water tb HL Act Pres (be water tb Hydrostatic Force	ĺ)	45.0	0.50	22.5	Soil Over HL (ab. water tbl) Soil Over HL (bel. water tbl) Water Table Sloped Soil Over Hee =	64.2	2.42 2.42	155.1 155.1
Buoyant Force Surcharge over Heel Surcharge Over Toe Adjacent Footing Load	= = =				Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem = * Axial Live Load on Stem =	2		
Added Lateral Load Load @ Stem Above Soi	= il = =				Soil Over Toe = Surcharge Over Toe =	64.2	0.58	37.4
Seismic Stem Self Wt	_	313.8	4.34	1,360.1	Stem Weight(s) = Earth @ Stem Transitions =	560.3	1.50	840.4
Total Resisting/Overturning	= g Rat	358.8 io	O.T.M. =	1,382.6 1.24	Footing Weight = Key Weight = Vert. Component =	450.0	1.50	675.0
Vertical Loads used f	or So	il Pressure	,	8 lbs	Total = * Axial live load NOT included iresistance, but is included for		ed, or used fo	1,707.9 r overturning

If seismic is included, the OTM and sliding ratios may be 1.1 per section 1807.2.3 of IBC.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 200.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.267 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: Free Standing CMU Wall, Seismic Check

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing Calculated Rebar Stress, fs = 16175.62 psi

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

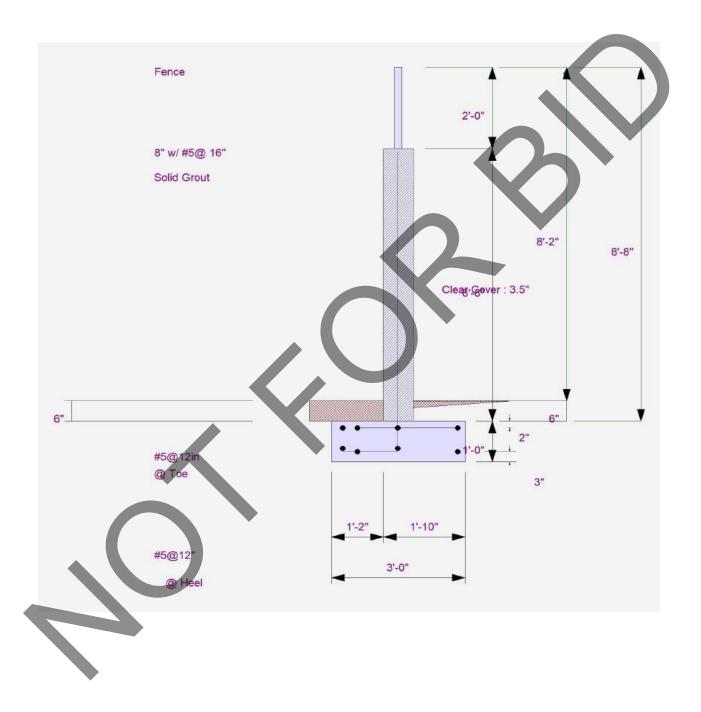
30.33 in 30.33 in

6.00 in 0.2325 in2/ft 0.1861 in2/ft

Innovative Structural Engineering, Inc. (IS

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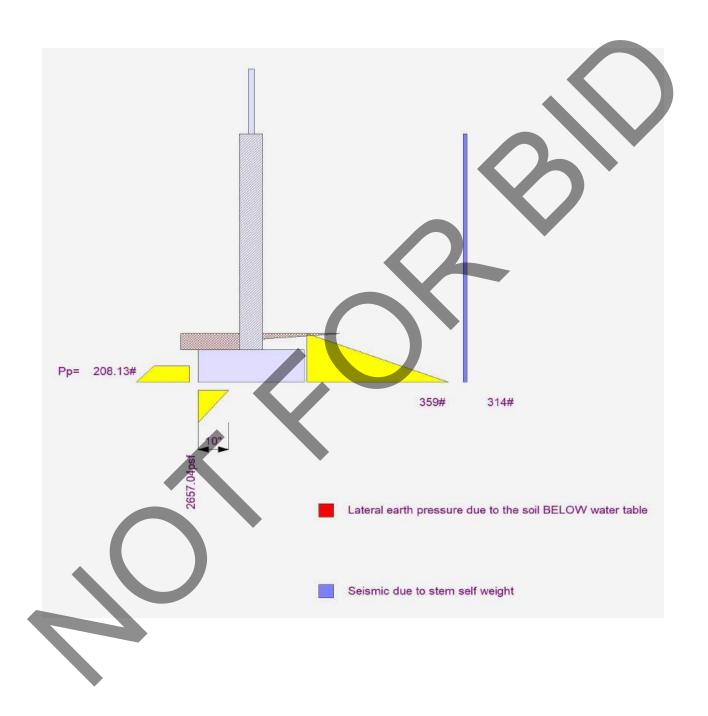
DESCRIPTION: Free Standing CMU Wall, Seismic Check



Innovative Structural Engineering, Inc. (IS

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DESCRIPTION: Free Standing CMU Wall, Seismic Check



LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
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DESCRIPTION: Free Standing CMU Wall, Wind Check

Code Reference.

Calculations per IBC 2018 1807.3, CBC 2019, SDPWS 2015

Criteria

Retained Height	=	0.50 ft
Wall height above soil	=	8.17 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water table above		
bottom of footing	=	0.0 ft

Surcharge Loads

Surcharge Over Heel = 0.0 psf Used To Resist Sliding & Overturning Surcharge Over Toe = 0.0 psf Used for Sliding & Overturning

Axial Load Applied to Stem

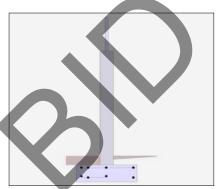
Axial Dead Load	=	0.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	6.0 in

Soil Data

Allow Soil Bearing Equivalent Fluid Pressure		2,660.0 psf
Active Heel Pressure	=	40.0 psf/ft
	=	
Passive Pressure	=	333.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in

Lateral Load Applied to Stem

Lateral Load Height to Top Height to Bottom	= =	0.0 #/ft 0.00 ft 0.00 ft	
Load Type		Vind (W)	
	(\$	Service Level)
Wind on Exposed Ste (Strength Level)	m =	34.4 psf	



Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

Project File: 8400.32 - Site Structures.ec6
(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Free Standing CMU Wall, Wind Check

Design Summary			Stem Construction		2nd	Bottom		
Wall Stability Ratios			Design Height Above Ftg		6.67	Stem OK 0.00		
Overturning	=	1.77 OK	Wall Material Above "Ht"		Fence	Masonry	20	0.0
Sliding	=	3.11 OK	Design Method	=		ASD	SD SD	SD
9			Thickness Rebar Size	=		8.00 # 5		
Global Stability	=	3.27	Rebar Spacing	=		16.00		
			Rebar Placed at	=		Center		
Total Bearing Loadresultant ecc.	=	1,157 lbs 10.16 in	Design Data			Center		
Eccentricity outside			fb/FB + fa/Fa	=		0.597		
Soil Pressure @ Toe	=	1,162 psf OK	Total Force @ Section					
Soil Pressure @ Heel	=	0 psf OK	Service Level	lbs=	41.3	173.6		
Allowable	=	2,660 psf	Strength Level	lbs=			•	
Soil Pressure Less	Than	Allowable	MomentActual	100 –				
ACI Factored @ Toe	=	1,627 psf	Service Level	ft-# =	41.3	774.0		
ACI Factored @ Heel	=	0 psf	Strength Level	ft-# =				
Footing Shear @ Toe	=	10.0 psi OK	MomentAllowable	ft-# =		1,294.8		
Footing Shear @ Hee	=	2.5 psi OK	ShearActual	11-# =		1,294.0 *		
Allowable	=	75.0 psi				4.0		
			Service Level	psi =		1.9		
Sliding Calcs			Strength Level	psi =				
Lateral Sliding Force	=	213.6 lbs	ShearAllowable	=		45.5		
less 100% Passive Force	e -	208.1 lbs	Anet (Masonry)	in2 =		91.50		
less 100% Friction Force	; ≡ -	455.4 lbs	Wall Weight	psf =		84.0		
Added Force Req'd	=	0.0 lbs OK	Rebar Depth 'd'	in=		3.81		
for 1.5 Stability	=	0.0 lbs OK						
			Masonry Data					
Vertical component of active			f'm	psi =		1,500		
NOT considered in the calcu	ulation	of soil bearing	Fs	psi =		20,000		
			Solid Grouting	=		Yes		
Load Factors			Modular Ratio 'n'	=		21.48		
Building Code Dead Load		1.200	Equiv. Solid Thick.	=		7.63		
Live Load		1.600	Masonry Block Type	=				
Earth, H		1.600	Masonry Design Method	=	ASD			
Wind. W		1.600	Concrete Data	no:				
- 1		1.000	f'c	psi =				
Seismic, E		1.000	Fy	psi =				

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: Free Standing CMU Wall, Wind Check

Footing Data

Toe Width	=	1.17 ft
Heel Width	=	1.83
Total Footing Width	= _	3.00
Footing Thickness	=	12.00 in

f'c = 2,500 psi Fy = 60,000 psi Footing Concrete Density = 150.00 pcf Min. As % = 0.0018 Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		<u>Toe</u>	<u>Heel</u>	
Factored Pressure	=	1,627	0	pst
Mu': Upward	=	888	0	ft-#
Mu': Downward	=	215	215	ft-#
Mu: Design	=	672	215	ft-#
φ Mn	=	11,610	13,005	ft-#
Actual 1-Way Shear	=	10.00	2.46	psi
Allow 1-Way Shear	=	75.00	75.00	psi
Toe Reinforcing	=	# 5 @ 12.00 in		
Heel Reinforcing	=	# 5 @ 12.00 in		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu		=	0.00 ft-lk	os
Footing Allow. Torsio	n, q	7n =	0.00 ft-lk	os

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@

46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area per foot 0.78 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars: If two layers of horizontal bars:

#4@ 9.26 in #4@ 18.52 in #5@ 14.35 in #5@ 28.70 in #6@ 20.37 in #6@ 40.74 in

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

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Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: Free Standing CMU Wall, Wind Check

Summary of Overturning & Resisting Forces & Moments

	OV Force	ERTURNING. Distance	 Moment	RESISTING Force Distance Moment
Item	lbs	ft	ft-#	lbs ft ft-#
HL Act Pres (ab water tbl) HL Act Pres (be water tbl) Hydrostatic Force	45.0	0.50	22.5	Soil Over HL (ab. water tbl) 64.2 2.42 155.1 Soil Over HL (bel. water tbl) 2.42 155.1 Water Table
Buoyant Force = Surcharge over Heel = Surcharge Over Toe = Adjacent Footing Load =				Sloped Soil Over Hee = Surcharge Over Heel = Adjacent Footing Load = Axial Dead Load on Stem=
Added Lateral Load = Load @ Stem Above Soil = =	168.6	5.59	941.8	* Axial Live Load on Stem = Soil Over Toe = 64.2 0.58 37.4 Surcharge Over Toe = Stem Weight(s) = 560.3 1.50 840.4
Total =	213.6	O.T.M. =	964.3	Earth @ Stem Transitions = Footing Weight = 450.0 1.50 675.0 Key Weight =
Resisting/Overturning Ra Vertical Loads used for So			1.77 3 lbs	Vert. Component Total = 1,138.6 lbs R.M.= 1,707.9 * Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

Soil Spring Reaction Modulus 200.0 pci Horizontal Defl @ Top of Wall (approximate only) 0.117 in

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS

(c) ENERCALC, LLC 1982-2024

Project File: 8400.32 - Site Structures.ec6

DESCRIPTION: Free Standing CMU Wall, Wind Check

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom

Stem Design Height: 0.00 ft above top of footing Calculated Rebar Stress, fs = 11955.43 psi

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) = Development length for #5 bar specified in this stem design segment =

Hooked embedment length into footing for #5 bar specified in this stem design segment =

As Provided =

As Required =

25.00 in 14.94 in

6.00 in 0.2325 in2/ft 0.1370 in2/ft



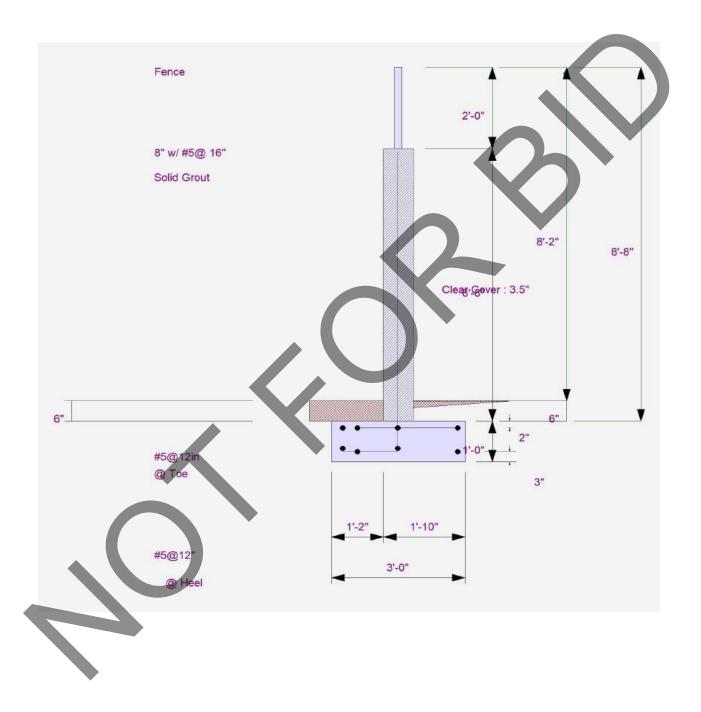
Project File: 8400.32 - Site Structures.ec6

LIC#: KW-06014215, Build:20.24.10.03

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(c) ENERCALC, LLC 1982-2024

DESCRIPTION: Free Standing CMU Wall, Wind Check

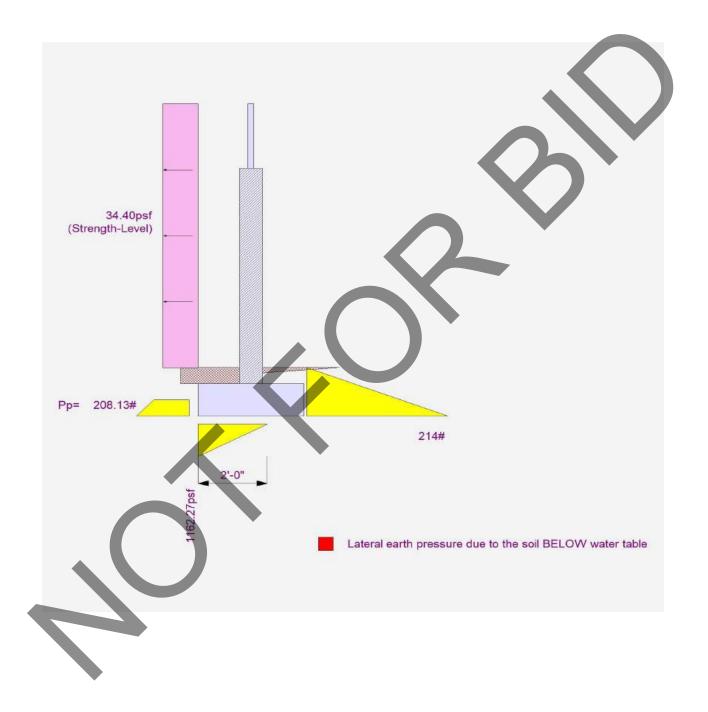


LIC#: KW-06014215, Build:20.24.10.03

Innovative Structural Engineering, Inc. (IS

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DESCRIPTION: Free Standing CMU Wall, Wind Check



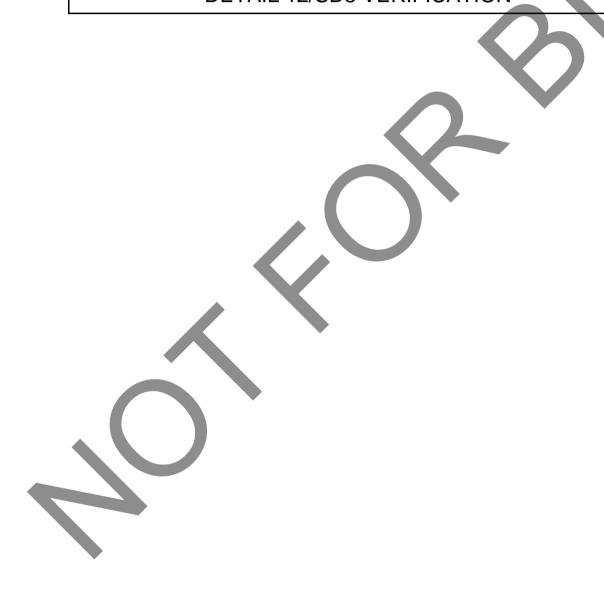


PLAN CHECK CALCULATIONS





DETAIL 12/SD3 VERIFICATION





Detail 12/SD3

Roof Joist Reaction from Forte = 550.00 lbs

LUS Hanger Capacity = 1335.00 lbs OK

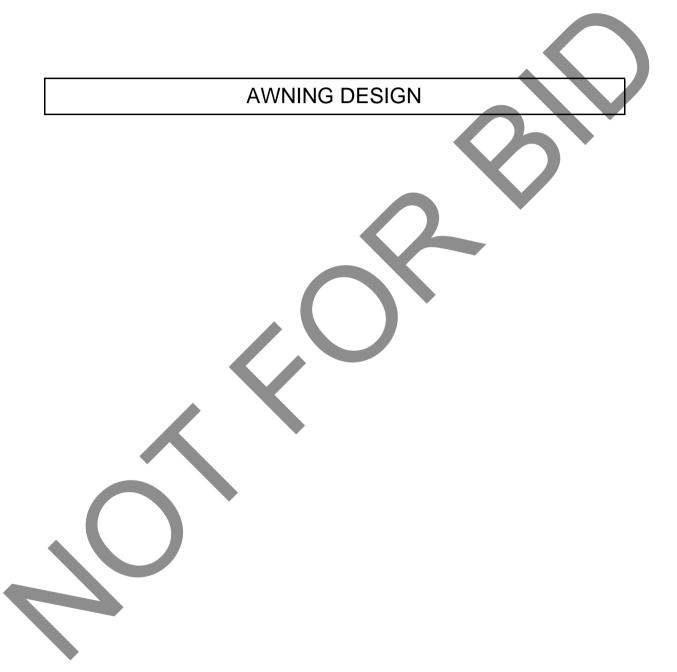
(2) Rows 1/4" DIA x 4 1/2" SDS Screws:

Shear Capacity (2 SDS)= 700.00

lbs

OK







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Sheet:	Seismic ELF Analysis
Date:	
Project ID:	
Version:	2022 CBC / ASCE 7-16

30.11 Attached Canopies on Buildings with h<=60ft

P = qh (GCp)

hc = 9 ft mean canopy height he = 14.33 ft mean eave height

hc/he = 0.63

GCpn -0.9 Net GCp Figure 30.11-1B

qh = 0.00256KzKztKdKeV2

Kz = 0.85 Kzt = 1 Kd = 0.85 Ke = 1 V = 125 mph

qh = 29 psf

P = qh (GCpn)

P = gh(GCpn) = -26 psf

Awning Connection to Wall:

Tensile Strength of (1) 1/2" A307 Bolt = 33.8ksi × 0.196 in^2 = 6.62 kip Shear Strength of (1) 1/2" A307 Bolt = 20.3ksi × 0.196 in^2 = 3.98 kip

Detail 4 Fitness Center Connection:

D Reaction = 7 lb 1.2D+1.6Lr+0.5W= 154 lbs Governs Lr Reaction= 65 lb 1.2D+1W+0.5Lr = 125 lbs

W Reaction= 84 lb < Shear Strength of Bolt, OK

Bolt 2' spacing = 2 bolts supporting beam load, therefore OK

Detail 8 Fitness Center Connection:

D Reaction = 20 lb 1.2D+1.6Lr+0.5W= 411 lbs Governs

Lr Reaction= 170 lb 1.2D+1W+0.5Lr = 339 lbs W Reaction= 230 lb << Shear Strength of Bolt, OK

Bolt 2' spacing = 2 bolts supporting beam load, therefore OK

Governing moment demand at end from enercalc: 411 lb-ft

4" T-C distance between bolts, Tension =M/d = 1233 lb << Bolt Tensile Strength, OK

Combined shear and tensile stress not investigated due to <30% required stress for both shear and tension per AISC J3.7

Project File: Awning.ec6 **Steel Beam**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Front Entrance Awning Edge Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, SDPWS 2021

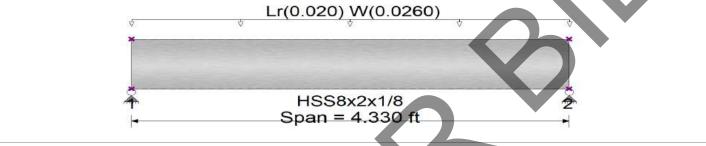
Load Combination Set: ASCE 7-16

Material Properties

Analysis Method Load Resistance Factor Design Beam Bracing: Completely Unbraced

Bending Axis: Major Axis Bending

46.0 ksi Fy: Steel Yield: 29,000.0 ksi E: Modulus:



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 1.0 ft

DESIGN SUMMARY

		Design OK
= 0.007 : 1	Maximum Shear Stress Ratio =	0.003 : 1
HSS8x2x1/8	Section used for this span	HSS8x2x1/8
0.128 k-ft	Vu : Applied	0.1186 k
17.630 k-ft	Vn * Phi : Allowable	41.285 k
+1.20D+1.60Lr+0.50W	Load Combination Location of maximum on span	+1.20D+1.60Lr+0.50W 0.000 ft
Span # 1	Span # where maximum occurs	Span # 1
	0 <360 n/a	
	HSS8x2x1/8 0.128 k-ft 17.630 k-ft +1.20D+1.60Lr+0.50W Span # 1	HSS8x2x1/8 0.128 k-ft 17.630 k-ft +1.20D+1.60Lr+0.50W Span # 1 O in Ratio = O 4360 Section used for this span Vu : Applied Vn * Phi : Allowable Load Combination Location of maximum on span Span # where maximum occurs

Span: 1: +D+0.750Lr+0.450W Max Downward Total Deflection 0.001 in Ratio = 85413 >= 180

Max Upward Total Deflection 0 in Ratio = <180 n/a

Maximum Forces & Stranger for Los

Maximum Forces &	Stress	es for Load	d Comi	binations									
Load Combination		Max Stress	Ratios		Sun	nmary of Mor	nent Val	lues			Summar	of She	ar Values
Segment Length	Span #	M	V m	ax Mu + max	Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+1.40D													
Dsgn. L = 4.33 ft	1	0.002	0.001	0.03		0.03	19.59	17.63	1.14	1.00	0.02	45.87	41.29
+1.20D+0.50Lr													
Dsgn. $L = 4.33 \text{ ft}$	1	0.003	0.001	0.05		0.05	19.59	17.63	1.14	1.00	0.04	45.87	41.29
+1.20D													
Dsgn. $L = 4.33 \text{ ft}$	1	0.001	0.001	0.02		0.02	19.59	17.63	1.14	1.00	0.02	45.87	41.29
+1.20D+1.60Lr													
Dsgn. L = 4.33 ft	1	0.006	0.002	0.10		0.10	19.59	17.63	1.14	1.00	0.09	45.87	41.29
+1.20D+1.60Lr+0.50W													
Dsgn. L = 4.33 ft	1	0.007	0.003	0.13		0.13	19.59	17.63	1.14	1.00	0.12	45.87	41.29
+1.20D+1.60Lr-0.50W		0.004	0.000	0.07		0.07	40.50	47.00		4.00	0.00	45.07	44.00
Dsgn. L = 4.33 ft	1	0.004	0.002	0.07		0.07	19.59	17.63	1.14	1.00	0.06	45.87	41.29
+1.20D+0.50W	1	0.003	0.001	0.05		0.05	19.59	17.63	1 1 1	1 00	0.05	45.87	41.29
Dsgn. L = 4.33 ft +1.20D-0.50W	ı	0.003	0.001	0.05		0.05	19.59	17.03	1.14	1.00	0.05	45.67	41.29
Dsgn. L = 4.33 ft	1	0.000	0.000		-0.01	0.01	19.59	17.63	1 1 1	1 00	0.01	45.87	41.29
+1.20D+0.50Lr+W	'	0.000	0.000		-0.01	0.01	19.59	17.03	1.14	1.00	0.01	45.67	41.29
Dsgn. L = 4.33 ft	1	0.006	0.002	0.11		0.11	19.59	17.63	1 14	1.00	0.10	45.87	41.29
+1.20D+0.50Lr-W		0.000	0.002	0.11		0.11	10.00	17.00		1.00	0.10	40.07	71.20
Dsgn. L = 4.33 ft	1	0.001	0.000		-0.01	0.01	19.59	17.63	1.14	1.00	0.01	45.87	41.29
+1.20D+W	•	0.00	0.000		0.0.	0.0.					0.0.	.0.0.	0
Dsgn. L = 4.33 ft	1	0.005	0.002	0.08		0.08	19.59	17.63	1.14	1.00	0.08	45.87	41.29
+1.20D-W													
Dsgn. L = 4.33 ft	1	0.002	0.001		-0.04	0.04	19.59	17.63	1.14	1.00	0.04	45.87	41.29
-													

Project Title: Engineer: Project ID: Project Descr:

Steel Beam Project File: Awning.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Front Entrance Awning Edge Beam

Load Combination		Max Stres	s Ratios		Su	mmary of Mo	ment Va	lues			Summar	y of She	ar Values
Segment Length	Span #	М	V max	Mu+	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+0.90D+W													
Dsgn. $L = 4.33 \text{ ft}$	1	0.004	0.002	0.08	3	0.08	19.59	17.63	1.14	1.00	0.07	45.87	41.2
+0.90D-W													
Dsgn. $L = 4.33 \text{ ft}$	1	0.002	0.001		-0.04	0.04	19.59	17.63	1.14	1.00	0.04	45.87	41.2
+0.90D													
Dsgn. $L = 4.33 \text{ ft}$	1	0.001	0.000	0.02	2	0.02	19.59	17.63	1.14	1.00	0.02	45.87	41.2
Overall Maximum D	eflectio	ns											
Load Combination		Span Ma	ax. "-" Defl	Locatio	on in Span	Load Com	bination			Max.	"+" Defl L	ocation	in Span
+D+0.750Lr+0.450W		1	0.0006		2.177				4		0.0000		0.000
Vertical Reactions					Suppo	rt notation : F	ar left is	#*	7	Values	in KIPS		
Load Combination			Support	1 Sup	port 2								
Max Upward from all L	oad Cond	ditions	0.07	5	0.075	0.084							
Max Upward from Loa		ations	0.07	5	0.075	0.084							
Max Upward from Loa	d Cases		0.05	6	0.056	0.084							
Max Downward from a	all Load Co	onditions (Re	sit			0.084							
Max Downward from L	oad Com	binations (Re	esi:			0.084							
Max Downward from L	oad Case	es (Resisting	Uţ			0.084							
D Only			0.01	8	0.018	0.084							
+D+Lr			0.06	1	0.061	0.084							
+D+0.750Lr			0.05	0	0.050	0.084							
+D+0.60W			0.05	1	0.051	0.084							
+D+0.750Lr+0.450W			0.07	5	0.075	0.084							
+D+0.450W			0.04	3	0.043	0.084							
+0.60D+0.60W			0.04	4	0.044	0.084							
+0.60D			0.01	1	0.011	0.084							
Lr Only			0.04	3	0.043	0.084							
W Only			0.05	6	0.056	0.084							

Project File: Awning.ec6 **Steel Beam**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Typical Awning Beam

CODE REFERENCES

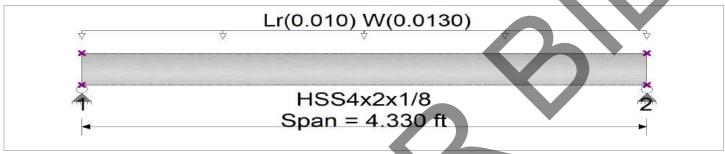
Calculations per AISC 360-16, IBC 2021, SDPWS 2021

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method Load Resistance Factor Design Fy: Steel Yield: Beam Bracing: Completely Unbraced E: Modulus:

Bending Axis: Major Axis Bending



Applied Loads

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

46.0 ksi

29,000.0 ksi

Beam self weight calculated and added to loading

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 0.50 ft

DESIGN SUMMARY

Design OK Maximum Bending Stress Ratio = 0.012:1 Maximum Shear Stress Ratio = **0.003**:1 HSS4x2x1/8 Section used for this span Section used for this span HSS4x2x1/8 Mu: Applied 0.066 k-ft Vu : Applied 0.06105 k Mn * Phi : Allowable 5.727 k-ft Vn * Phi : Allowable 21.046 k +1.20D+1.60Lr+0.50W Load Combination **Load Combination** +1.20D+1.60Lr+0.50W 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 0.001 in Ratio = 38,659Span: 1: W Only >=360

Max Upward Transient Deflection 0 in Ratio = <360 0

Max Downward Total Deflection 0.002 in Ratio = 27766>=180 Span: 1: +D+0.750Lr+0.450W

Max Upward Total Deflection 0 in Ratio = <180

Maximum Forces &	Stress	es for Loa	d Comb	inations									
Load Combination		Max Stress	s Ratios		Sum	mary of Mor	nent Val	ues			Summar	y of Shea	ar Values
Segment Length	Span #	M	V ma	x Mu + max M	1u - 1	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+1.40D													
Dsgn. L = 4.33 ft	1	0.003	0.001	0.02		0.02	6.36	5.73	1.14	1.00	0.01	23.38	21.05
+1.20D+0.50Lr													
Dsgn. L = 4.33 ft	1	0.004	0.001	0.03		0.03	6.36	5.73	1.14	1.00	0.02	23.38	21.05
+1.20D													
Dsgn. L = 4.33 ft	1	0.002	0.001	0.01		0.01	6.36	5.73	1.14	1.00	0.01	23.38	21.05
+1.20D+1.60Lr													- · · · -
Dsgn. L = 4.33 ft	1	0.009	0.002	0.05		0.05	6.36	5.73	1.14	1.00	0.05	23.38	21.05
+1.20D+1.60Lr+0.50W	4	0.040	0.000	0.07		0.07	0.00	F 70		4.00	0.00	00.00	04.05
Dsgn. L = 4.33 ft	1	0.012	0.003	0.07		0.07	6.36	5.73	1.14	1.00	0.06	23.38	21.05
+1.20D+1.60Lr-0.50W Dsgn. L = 4.33 ft	1	0.006	0.002	0.04		0.04	6.36	E 72	1 1 1	1.00	0.03	23.38	21.05
+1.20D+0.50W	'	0.006	0.002	0.04		0.04	0.30	5.73	1.14	1.00	0.03	23.30	21.05
Dsgn. L = 4.33 ft	1	0.005	0.001	0.03		0.03	6.36	5 73	1 1/	1.00	0.03	23.38	21.05
+1.20D-0.50W	'	0.003	0.001	0.03		0.03	0.50	3.73	1.14	1.00	0.03	25.50	21.05
Dsgn. L = 4.33 ft	1	0.000	0.000	-	-0.00	0.00	6.36	5.73	1 14	1.00	0.00	23.38	21.05
+1.20D+0.50Lr+W		0.000	0.000		0.00	0.00	0.00	0.10		1.00	0.00	20.00	21.00
Dsgn. L = 4.33 ft	1	0.010	0.002	0.06		0.06	6.36	5.73	1.14	1.00	0.05	23.38	21.05
+1.20D+0.50Lr-W													
Dsgn. L = 4.33 ft	1	0.001	0.000	-	0.01	0.01	6.36	5.73	1.14	1.00	0.00	23.38	21.05
+1.20D+W													
Dsgn. $L = 4.33 \text{ ft}$	1	0.008	0.002	0.04		0.04	6.36	5.73	1.14	1.00	0.04	23.38	21.05
+1.20D-W													
Dsgn. L = 4.33 ft	1	0.003	0.001	-	0.02	0.02	6.36	5.73	1.14	1.00	0.02	23.38	21.05

Steel Beam Project File: Awning.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Typical Awning Beam

Load Combination		Max Stres	s Ratios		Sur	mmary of Mor	ment Va	lues			Summa	ry of She	ar Values
Segment Length	Span #	M	V max	Mu + ı	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+0.90D+W													
Dsgn. L = 4.33 ft +0.90D-W	1	0.007	0.002	0.04		0.04	6.36	5.73	1.14	1.00	0.04	23.38	21.0
Dsgn. $L = 4.33 \text{ ft}$	1	0.004	0.001		-0.02	0.02	6.36	5 72	1 1/	1.00	0.02	23.38	21.0
+0.90D	'	0.004	0.001		-0.02	0.02	0.30	5.75	1.14	1.00	0.02	23.30	21.0
Dsgn. L = 4.33 ft	1	0.002	0.000	0.01		0.01	6.36	5.73	1.14	1.00	0.01	23.38	21.0
Overall Maximum D	eflectio	ns											
Load Combination		Span Ma	ax. "-" Defl	Locatio	n in Span	Load Com	bination			Max.	"+" Defl I	Location	in Span
+D+0.750Lr+0.450W		1	0.0019		2.177						0.0000		0.000
Vertical Reactions					Suppoi	rt notation : Fa	ar left is	#		Values	in KIPS		
Load Combination			Support	1 Supp	ort 2								
Max Upward from all	_oad Cond	ditions	0.03	9 (0.039	0.084				7			
Max Upward from Loa	ad Combin	ations	0.03	9 (0.039	0.084							
Max Upward from Loa	d Cases		0.02	8 (0.028	0.084							
Max Downward from a	all Load C	onditions (Re	sit		(0.084							
Max Downward from I	_oad Com	binations (Re	esi:		(0.084							
Max Downward from I	_oad Case	es (Resisting	Uţ		(0.084							
D Only		_	0.01	0 (0.010	0.084							
+D+Lr			0.03	2 (0.032	0.084							
+D+0.750Lr			0.02	7 (0.027	0.084							
+D+0.60W			0.02	7 (0.027	0.084							
+D+0.750Lr+0.450W			0.03	9 (0.039	0.084							
+D+0.450W			0.02	3 (0.023	0.084							
+0.60D+0.60W			0.02	3 (0.023	0.084							
+0.60D			0.00	6	0.006	0.084							
Lr Only			0.02	2 (0.022	0.084							
W Only			0.02		0.028	0.084							

Project File: Awning.ec6 **Steel Beam**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Front Entrance Awning Cantilever Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, SDPWS 2021

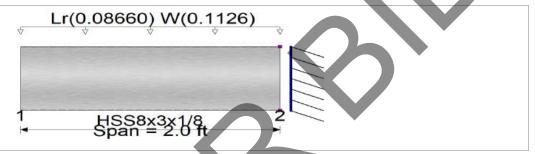
Load Combination Set: ASCE 7-16

Material Properties

Analysis Method Load Resistance Factor Design Beam Bracing: Completely Unbraced

Bending Axis: Major Axis Bending

46.0 ksi Fy: Steel Yield: E: Modulus: 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 4.330 ft

DESIGN SUMMARY

ESIGN SUMMARY			Design OK
Maximum Bending Stress Ratio	= 0.020:1	Maximum Shear Stress Ratio =	0.010 : 1
Section used for this span	HSS8x3x1/8	Section used for this span	HSS8x3x1/8
Mu : Applied	0.411 k-ft	Vu : Applied	0.4113 k
Mn * Phi : Allowable	20.800 k-ft	Vn * Phi : Allowable	41.285 k
Load Combination	+1.20D+1.60Lr+0.50W	Load Combination	+1.20D+1.60Lr+0.50W
		Location of maximum on span	2.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0 in Ratio =	0 <360 n/a	
Max Upward Transient Deflection	0 in Ratio =	0 <360 n/a	
Max Downward Total Deflection	0.001 in Ratio = 62	260 >=180 Span: 1 : +D+0.750Lr+0.4	50W
Max Upward Total Deflection	0 in Ratio =	0 <180 n/a	

Maximum Forces & Stresses for Load Combinations

Load Combination	Stress	Max Stress	$\overline{}$	ibinatio		nmary of Mo	mont \/a	duoc		Su.	ımmar	v of Sho	ar Values
	-					•							
Segment Length	Span #	M	V m	nax Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb R	m Vul	Max	Vnx	Phi*Vnx
+1.40D													_
Dsgn. L = 2.00 ft	1	0.001	0.001		-0.03	0.03	23.11	1 20.80	1.00 1.	00	0.03	45.87	41.29
+1.20D+0.50Lr													
Dsgn. $L = 2.00 \text{ ft}$	1	0.005	0.003		-0.11	0.11	23.11	1 20.80	1.00 1.	00	0.11	45.87	41.29
+1.20D													
Dsgn. $L = 2.00 \text{ ft}$	1	0.001	0.001		-0.02	0.02	23.11	1 20.80	1.00 1.	00	0.02	45.87	41.29
+1.20D+1.60Lr													
Dsgn. $L = 2.00 \text{ ft}$	1	0.014	0.007		-0.30	0.30	23.11	1 20.80	1.00 1.	00	0.30	45.87	41.29
+1.20D+1.60Lr+0.50W													
Dsgn. $L = 2.00 \text{ ft}$	1	0.020	0.010		-0.41	0.41	23.11	1 20.80	1.00 1.	00	0.41	45.87	41.29
+1.20D+1.60Lr-0.50W	_												
Dsgn. L = 2.00 ft	1	0.009	0.005		-0.19	0.19	23.11	1 20.80	1.00 1.	00	0.19	45.87	41.29
+1.20D+0.50W													
Dsgn. L = 2.00 ft	1	0.006	0.003		-0.13	0.13	23.11	1 20.80	1.00 1.	00	0.13	45.87	41.29
+1.20D-0.50W					_								
Dsgn. L = 2.00 ft	1	0.004	0.002	0.09	9	0.09	23.11	1 20.80	1.00 1.	00	0.09	45.87	41.29
+1.20D+0.50Lr+W													
Dsgn. L = 2.00 ft	1	0.016	0.008		-0.33	0.33	23.11	1 20.80	1.00 1.	00	0.33	45.87	41.29
+1.20D+0.50Lr-W		0.000	0.000	0.44	•	0.40	00.4				0.40	45.07	44.00
Dsgn. L = 2.00 ft	1	0.006	0.003	0.12	2	0.12	23.11	1 20.80	1.00 1.	00	0.12	45.87	41.29
+1.20D+W		0.040	0.000		0.05	0.05	00.4					45.07	44.00
Dsgn. L = 2.00 ft	1	0.012	0.006		-0.25	0.25	23.11	1 20.80	1.00 1.	00	0.25	45.87	41.29
+1.20D-W		0.040	0.005	0.0	•	0.00	00.4				0.00	45.07	44.00
Dsgn. $L = 2.00 \text{ ft}$	1	0.010	0.005	0.20	U	0.20	23.11	ı 20.80	1.00 1.	UU	0.20	45.87	41.29

Steel Beam Project File: Awning.ec6

Innovative Structural Engineering, Inc. (IS LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Front Entrance Awning Cantilever Beam

Load Combination		Max Str	ess R	atios		Sui	mmary of Mo	oment Va	lues			Summa	ry of She	ar Values
Segment Length	Span #	М	V	max	(Mu+	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+0.90D+W														
Dsgn. L = 2.00 ft +0.90D-W	1	0.012	2 (0.006		-0.24	0.24	23.11	20.80	1.00	1.00	0.24	45.87	41.29
Dsgn. L = 2.00 ft +0.90D	1	0.01	0 (0.005	0.2	1	0.21	23.11	20.80	1.00	0 1.00	0.21	45.87	41.2
Dsgn. L = 2.00 ft	1	0.00	1 (0.000		-0.02	0.02	23.11	20.80	1.00	0 1.00	0.02	45.87	41.29
Overall Maximum	Deflection	ons												
Load Combination		Span	Max.	"-" Defl	Location	on in Span	Load Cor	nbination			Max.	"+" Defl	ocation	in Span
+D+0.750Lr+0.450W	1	1		0.0008		0.000						0.0000		0.000
Vertical Reactions						Suppo	rt notation : I	Far left is	#		Values	in KIPS		
Load Combination			,	Support	1 Sup	port 2								
Max Upward from all	Load Cond	ditions				0.249	0.084				7			
Max Upward from Lo	ad Combir	nations				0.249	0.084							
Max Upward from Lo	ad Cases					0.225	0.084							
Max Downward from	all Load C	onditions (Resis				0.084							
Max Downward from	Load Com	ibinations (Resi				0.084							
Max Downward from	Load Case	es (Resistii	ng Up				0.084							
D Only							0.084							
+D+Lr						-	0.084							
+D+0.750Lr						-	0.084							
+D+0.60W							0.084							
+D+0.750Lr+0.450W	1					-	0.084							
+D+0.450W							0.084							
+0.60D+0.60W							0.084							
+0.60D							0.084							
Lr Only				4			0.084							
W Only						0.225	0.084							

Project File: Awning.ec6 **Steel Beam**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Fitness Center Awning Transverse Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, SDPWS 2021

Load Combination Set: ASCE 7-16

Material Properties

Analysis Method Load Resistance Factor Design 46.0 ksi Fy: Steel Yield: Beam Bracing: Completely Unbraced E: Modulus: 29,000.0 ksi

Bending Axis: Major Axis Bending

Lr(0.08660) W(0.11260.08660) W(0.1126



Applied Loads

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

Design OK

Beam self weight calculated and added to loading Load for Span Number 1

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 4.330 ft

Load for Span Number 2

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 4.330 ft

DESIGN SUMMARY

DESIGN SUMMAKT			Design On
Maximum Bending Stress Ratio =	0.005 : 1	Maximum Shear Stress Ratio =	0.006 : 1
Section used for this span	H\$\$8x3x1/8	Section used for this span	HSS8x3x1/8
Mu : Applied	0.103 k-ft	Vu : Applied	0.2571 k
Mn * Phi : Allowable	20.800 k-ft	Vn * Phi : Allowable	41.285 k
Load Combination	+1.20D+1.60Lr+0.50W	Load Combination Location of maximum on span	+1.20D+1.60Lr+0.50W 1.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0 in Ratio =	0 <360 n/a	
Max Upward Transient Deflection	0 in Ratio =	0 <360 n/a	
Max Downward Total Deflection	0.000 in Ratio = 4977	702 >=180 Span: 2 : +D+0.750Lr+0.4	450W
Max Upward Total Deflection	0 in Ratio =	0 <180 n/a	

waximum Forces	x Stresse												
Load Combination		Max Stres	s Ratios	·	Sur	nmary of Mo	ment Va	lues			Summar	y of She	ar Values
Segment Length	Span #	M	V r	max Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+1.40D													
Dsgn. L = 1.00 ft	1	0.000	0.000)	-0.01	0.01	23.11	20.80	1.00	1.00	0.02	45.87	41.29
Dsgn. $L = 2.00 \text{ ft}$	2	0.000	0.000	0.00	-0.01	0.01	23.11	20.80	2.08	1.00	0.02	45.87	41.29
+1.20D+0.50Lr													
Dsgn. L = 1.00 ft	1	0.001	0.002	2	-0.03	0.03	23.11	20.80	1.00	1.00	0.07	45.87	41.29
Dsgn. L = 2.00 ft	2	0.001	0.002	2 0.02	-0.03	0.03	23.11	20.80	2.08	1.00	0.07	45.87	41.29
+1.20D													
Dsgn. $L = 1.00 \text{ ft}$	1	0.000	0.000)	-0.01	0.01	23.11	20.80	1.00	1.00	0.01	45.87	41.29
Dsgn. $L = 2.00 \text{ ft}$	2	0.000	0.000	0.00	-0.01	0.01	23.11	20.80	2.08	1.00	0.01	45.87	41.29
+1.20D+1.60Lr													
Dsgn. L = 1.00 ft	1	0.004	0.005	5	-0.07	0.07	23.11	20.80	1.00	1.00	0.19	45.87	41.29
Dsgn. $L = 2.00 \text{ ft}$	2	0.004	0.005	5 0.04	-0.07	0.07	23.11	20.80	2.08	1.00	0.19	45.87	41.29
+1.20D+1.60Lr+0.50W													
Dsgn. $L = 1.00 \text{ ft}$	1	0.005	0.006	6	-0.10	0.10	23.11	20.80	1.00	1.00	0.26	45.87	41.29
Dsgn. $L = 2.00 \text{ ft}$	2	0.005	0.006	0.06	-0.10	0.10	23.11	20.80	2.08	1.00	0.26	45.87	41.29
+1.20D+1.60Lr-0.50W													
Dsgn. L = 1.00 ft	1	0.002	0.003	3	-0.05	0.05	23.11	20.80	1.00	1.00	0.12	45.87	41.29
Dsgn. $L = 2.00 \text{ ft}$	2	0.002	0.003	3 0.03	-0.05	0.05	23.11	20.80	2.08	1.00	0.12	45.87	41.29
+1.20D+0.50W													
Dsgn. L = 1.00 ft	1	0.002	0.002	2	-0.03	0.03	23.11	20.80	1.00	1.00	0.08	45.87	41.29
Dsgn. L = 2.00 ft	2	0.002	0.002	0.02	-0.03	0.03	23.11	20.80	2.08	1.00	0.08	45.87	41.29

Steel Beam Project File: Awning.ec6

Innovative Structural Engineering, Inc. (IS LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Fitness Center Awning Transverse Beam

Maximum Forces & Stresses for Load Combinations

Load Combina	ation		Max Stres	s Ratios		Sur	nmary of Mo	ment Va	lues			Summary	Summary of Shear Values			
Segment	Length	Span #	М	V ma	ax Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx		
+1.20D-0.50W	1															
Dsgn. L =	1.00 ft	1	0.001	0.001	0.02		0.02	23.11	20.80	1.00	1.00	0.06	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.001	0.001	0.02	-0.01	0.02	23.11	20.80	2.08	1.00	0.06	45.87	41.29		
+1.20D+0.50L	r+W															
Dsgn. L =	1.00 ft	1	0.004	0.005		-0.08	0.08	23.11	20.80	1.00	1.00	0.21	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.004	0.005	0.05	-0.08	0.08	23.11	20.80	2.08	1.00	0.21	45.87	41.29		
+1.20D+0.50L	r-W															
Dsgn. L =	1.00 ft	1	0.001	0.002	0.03		0.03	23.11	20.80	1.00	1.00	0.07	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.001	0.002	0.03	-0.02	0.03	23.11	20.80	2.08	1.00	0.07	45.87	41.29		
+1.20D+W																
Dsgn. L =	1.00 ft	1	0.003	0.004		-0.06	0.06	23.11	20.80	1.00	1.00	0.15	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.003	0.004	0.03	-0.06	0.06	23.11	20.80	2.08	1.00	0.15	45.87	41.29		
+1.20D-W																
Dsgn. L =	1.00 ft	1	0.002	0.003	0.05		0.05	23.11	20.80	1.00	1.00	0.13	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.002	0.003	0.05	-0.03	0.05	23.11	20.80	2.08	1.00	0.13	45.87	41.29		
+0.90D+W																
Dsgn. L =	1.00 ft	1	0.003	0.004		-0.06	0.06	23.11	20.80	1.00	1.00	0.15	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.003	0.004	0.03	-0.06	0.06	23.11	20.80	2.08	1.00	0.15	45.87	41.29		
+0.90D-W							_									
Dsgn. L =	1.00 ft	1	0.003	0.003	0.05		0.05	23.11	20.80	1.00	1.00	0.13	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.003	0.003	0.05	-0.03	0.05	23.11	20.80	2.08	1.00	0.13	45.87	41.29		
+0.90D																
Dsgn. L =	1.00 ft	1	0.000	0.000		-0.00	0.00	23.11	20.80	1.00	1.00	0.01	45.87	41.29		
Dsgn. L =	2.00 ft	2	0.000	0.000	0.00	-0.00	0.00	23.11	20.80	2.08	1.00	0.01	45.87	41.29		
Overall Max	kimum	Deflectio	ns													
Load Combir	nation		Span Ma	ax. "-" Def	Location	n in Span	Load Com	hbination			Max	"+" Defl Lo	ocation i	n Span		

Load Combination	Span	Max. "-" Defl Loca	tion in Span Load Combination	Max. "+" Defl	Location in Span
+D+0.750Lr+0.450W	1	0.0000	0.000	0.0000	0.000
+D+0.750Lr+0.450W	2	0.0000	1.160	0.0000	0.000

Vertical Reactions		Support notation : Far left is #	Values in KIPS
--------------------	--	----------------------------------	----------------

Project File: Awning.ec6 **Steel Beam**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Fitness Center Awning Edge Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, SDPWS 2021

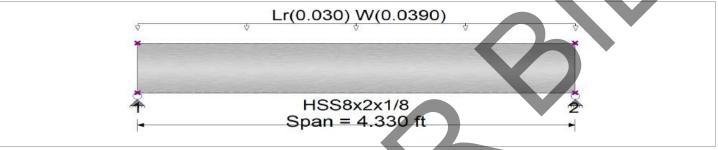
Load Combination Set: ASCE 7-16

Material Properties

Analysis Method Load Resistance Factor Design Beam Bracing: Completely Unbraced

Bending Axis: Major Axis Bending

46.0 ksi Fy: Steel Yield: E: Modulus: 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load: Lr = 0.020, W = 0.0260 ksf, Tributary Width = 1.50 ft

DESIGN SUMMARY

Design OK Maximum Bending Stress Ratio = 0.010:1 Maximum Shear Stress Ratio = **0.004**:1 HSS8x2x1/8 Section used for this span Section used for this span HSS8x2x1/8 0.181 k-ft Mu: Applied Vu : Applied 0.1673 k Mn * Phi : Allowable 17.630 k-ft Vn * Phi : Allowable 41.285 k +1.20D+1.60Lr+0.50W +1.20D+1.60Lr+0.50W Load Combination **Load Combination** 0.000 ft Location of maximum on span Span # where maximum occurs Span # 1 Span # where maximum occurs Span # 1

Maximum Deflection

Max Downward Transient Deflection 0 in Ratio = n/a 0 <360 Max Upward Transient Deflection 0 in Ratio = 0 <360 n/a

Max Downward Total Deflection 0.001 in Ratio = >=180 Span: 1: +D+0.750Lr+0.450W 61761

Max Upward Total Deflection 0 in Ratio = <180

Maximum Forces & Stresses for Load Combinations

waximum Forces &	Stress	$\overline{}$	$\overline{}$	binations								
Load Combination		Max Stress	s Ratios		Summary of I	Moment Va	alues			Summar	y of She	ar Values
Segment Length	Span #	M	V m	ax Mu + max M	u - Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+1.40D												
Dsgn. L = 4.33 ft	1	0.002	0.001	0.03	0.03	19.59	9 17.63	1.14	1.00	0.02	45.87	41.29
+1.20D+0.50Lr												
Dsgn. $L = 4.33 \text{ ft}$	1	0.003	0.001	0.06	0.06	19.59	9 17.63	1.14	1.00	0.05	45.87	41.29
+1.20D												
Dsgn. L = 4.33 ft	1	0.001	0.001	0.02	0.02	19.59	9 17.63	1.14	1.00	0.02	45.87	41.29
+1.20D+1.60Lr												
Dsgn. L = 4.33 ft	1	0.008	0.003	0.14	0.14	19.59	9 17.63	1.14	1.00	0.13	45.87	41.29
+1.20D+1.60Lr+0.50W	4	0.040	0.004	0.40	0.44	40.50	47.00		4 00	0.47	45.07	44.00
Dsgn. L = 4.33 ft	1	0.010	0.004	0.18	0.18	19.59	9 17.63	1.14	1.00	0.17	45.87	41.29
+1.20D+1.60Lr-0.50W Dsgn. L = 4.33 ft	1	0.005	0.002	0.09	0.09	19.59	9 17.63	1 1 1	1.00	0.08	45.87	41.29
+1.20D+0.50W	'	0.005	0.002	0.09	0.08	19.5	17.03	1.14	1.00	0.06	45.67	41.29
Dsgn. L = 4.33 ft	1	0.004	0.002	0.07	0.07	19.59	9 17.63	1 14	1 00	0.06	45.87	41.29
+1.20D-0.50W	•	0.004	0.002	0.07	0.01	10.00	17.00	1	1.00	0.00	10.07	71.20
Dsgn. L = 4.33 ft	1	0.001	0.001	-	0.02 0.02	19.59	9 17.63	1.14	1.00	0.02	45.87	41.29
+1.20D+0.50Lr+W												
Dsgn. L = 4.33 ft	1	0.008	0.003	0.15	0.15	19.59	9 17.63	1.14	1.00	0.14	45.87	41.29
+1.20D+0.50Lr-W												
Dsgn. $L = 4.33 \text{ ft}$	1	0.002	0.001	-	0.03 0.03	19.59	9 17.63	1.14	1.00	0.03	45.87	41.29
+1.20D+W												
Dsgn. $L = 4.33$ ft	1	0.006	0.003	0.11	0.1	19.59	9 17.63	1.14	1.00	0.11	45.87	41.29
+1.20D-W												
Dsgn. $L = 4.33 \text{ ft}$	1	0.004	0.002	=	0.07 0.07	19.59	9 17.63	1.14	1.00	0.06	45.87	41.29

Steel Beam Project File: Awning.ec6

LIC#: KW-06014215, Build:20.24.10.03 Innovative Structural Engineering, Inc. (IS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: Fitness Center Awning Edge Beam

Load Combination		Max Stres	s Ratios		Su	mmary of Mo	ment Va	lues			Summar	y of Shea	ar Values
Segment Length	Span #	М	V ma	ax Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
+0.90D+W													
Dsgn. $L = 4.33$ ft	1	0.006	0.002	0.1	1	0.11	19.59	17.63	1.14	1.00	0.10	45.87	41.2
+0.90D-W													
Dsgn. $L = 4.33$ ft	1	0.004	0.002		-0.07	0.07	19.59	17.63	1.14	1.00	0.07	45.87	41.2
+0.90D													
Dsgn. $L = 4.33 \text{ ft}$	1	0.001	0.000	0.02	2	0.02	19.59	17.63	1.14	1.00	0.02	45.87	41.2
Overall Maximum D	Deflectio	ns											
Load Combination		Span M	ax. "-" Def	Location	on in Span	Load Com	bination			Max.	"+" Defl L	ocation i	n Span
+D+0.750Lr+0.450W		1	0.0008	3	2.177						0.0000		0.000
Vertical Reactions					Suppo	rt notation : F	ar left is	#.		Values	in KIPS		
Load Combination			Suppo	t 1 Sup	port 2						<u>'</u>		
Max Upward from all I	Load Cond	ditions	0.1	04	0.104	0.084				_			
Max Upward from Loa			0.1	04	0.104	0.084							
Max Upward from Loa	ad Cases		0.0)84	0.084	0.084							
Max Downward from a	all Load C	onditions (Re	esis			0.084							
Max Downward from I	Load Com	binations (Re	esi:			0.084							
Max Downward from I	Load Case	es (Resisting	Uķ			0.084							
D Only			0.0)18	0.018	0.084							
+D+Lr			0.0	083	0.083	0.084							
+D+0.750Lr			0.0)66	0.066	0.084							
+D+0.60W			0.0	068	0.068	0.084							
+D+0.750Lr+0.450W			0.1	04	0.104	0.084							
+D+0.450W			0.0)56	0.056	0.084							
+0.60D+0.60W			0.0	061	0.061	0.084							
+0.60D			0.0)11	0.011	0.084							
Lr Only			0.0)65	0.065	0.084							
W Only			0.0	084	0.084	0.084							

Project File: Awning.ec6 **Steel Column**

LIC#: KW-06014215, Build:20.24.10.03 (c) ENERCALC, LLC 1982-2025 Innovative Structural Engineering, Inc. (IS

DESCRIPTION: Fitness Center Awning Brace

Code References

Calculations per AISC 360-16, IBC 2021, SDPWS 2021

Load Combinations Used: ASCE 7-16

General Information

Steel Section Name: HSS2x2x1/8 Overall Column Height 2.0 ft Analysis Method: Load Resistance Factor Top & Bottom Fixity Top & Bottom Pinned

Steel Stress Grade

Fy: Steel Yield 46.0 ksi Unbraced Length for buckling ABOUT X-X Axis = 2.0 ft, K = 1.0 E: Elastic Bending Modulus 29,000.0 ksi Unbraced Length for buckling ABOUT Y-Y Axis = 2.0 ft, K = 1.0

Brace condition:

Applied Loads

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

Column self weight included: 6.10 lbs * Dead Load Factor

AXIAL LOADS . . .

Transverse Beam Reaction: Axial Load at 2.0 ft, D = 0.020, LR = 0.20, W = 0.2530 k

DESIGN SUMMARY

Bending & Shear Check Results					
PASS Max. Axial+Bending Stress Ratio =	0.01469	: 1	Maximum Load Reactions		
Load Combination	+1.20D+1.60Lr+0.50W		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			Top along Y-Y	0.0 k	
Pu	0.4778	k	Bottom along Y-Y	0.0 k	
0.9 * Pn	32.525	k			
Mu-x	0.0	k-ft	Maximum Load Deflections		
0.9 * Mn-x :	2.015	k-ft	Along Y-Y 0.0 in at for load combination:	0.0ft above	base
Mu-y	0.0	k-ft	Tor load combination.		
0.9 * Mn-y :	2.015	k-ft	Along X-X 0.0 in at	0.0ft above	base
			for load combination:		
PASS Maximum Shear Stress Ration	0.0	: 1			
Load Combination	0.0				
Location of max.above base At maximum location values are	0.0	ft			
Vu : Applied	0.0				
Vn * Phi : Allowable	0.0	K			

Load Combination Results

Max	kimum Axial +	Bending	Stress Ratios					Maximum	Shear R	<u>latios</u>
Load Combination	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx I	KyLy/Ry	Stress Ratio	Status	Location
+1.40D	0.001	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+0.50Lr	0.004	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D	0.001	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+1.60Lr	0.011	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+1.60Lr+0.50W	0.015	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+1.60Lr-0.50W	0.007	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+0.50W	0.005	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D-0.50W	0.003	PASS	2.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+0.50Lr+W	0.012	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+0.50Lr-W	0.003	PASS	2.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D+W	0.009	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+1.20D-W	0.006	PASS	2.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+0.90D+W	0.009	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+0.90D-W	0.007	PASS	2.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
+0.90D	0.001	PASS	0.00 ft	1.00	1.00	31.54	31.54	0.000	PASS	0.00 ft
Maximum Reactions							Note	e: Only non-zer	ro reactio	ns are listed.

Maximum Reactions

	Axial Reaction	X-X Axis F	Reaction	k	Y-Y Axis Reaction	Mx - End M	Moments		
Load Combination	@ Base	@ Base	@ Top		@ Base @ Top	@ Base	@ Top	@ Base	@ Top

D Only 0.026

Steel ColumnProject File: Awning.ec6LIC#: KW-06014215, Build:20.24.10.03Innovative Structural Engineering, Inc. (IS(c) ENERCALC, LLC 1982-2025

DESCRIPTION: Fitness Center Awning Brace

Maximum Reactions

Note: Only non-zero reactions are listed.

	Axial Reaction	X-X Axis Reaction	k	Y-Y Axis Reaction	Mx - End Moments k-ft My - End Moments
Load Combination	@ Base	@ Base @ Top		@ Base @ Top	@ Base @ Top @ Base @ Top
+D+Lr	0.226				
+D+0.750Lr	0.176				
+D+0.60W	0.178				
+D+0.750Lr+0.450W	0.290				
+D+0.450W	0.140				
+0.60D+0.60W	0.167				
+0.60D	0.016				
Lr Only	0.200				
W Only	0.253				

Extreme Reactions

	A	Axial Reaction	X-X Axis	Reaction	k	Y-Y Axis Reaction	Mx - End Moments k-ft	My - End I	Moments
Item	Extreme Value	@ Base	@ Base	@ Top		@ Base @ Top	@ Base @ Top	@ Base	@ Top
Axial @ Base	Maximum	0.290							
II	Minimum	0.016							
Reaction, X-X Axis Base	e Maximum	0.026							
"	Minimum	0.026							
Reaction, Y-Y Axis Base	e Maximum	0.026							
"	Minimum	0.026							
Reaction, X-X Axis Top	Maximum	0.026							
"	Minimum	0.026							
Reaction, Y-Y Axis Top	Maximum	0.026							
"	Minimum	0.026							
Moment, X-X Axis Base	Maximum	0.026							
"	Minimum	0.026							
Moment, Y-Y Axis Base	Maximum	0.026							
"	Minimum	0.026							
Moment, X-X Axis Top	Maximum	0.026							
"	Minimum	0.026							
Moment, Y-Y Axis Top	Maximum	0.026							
"	Minimum	0.026							

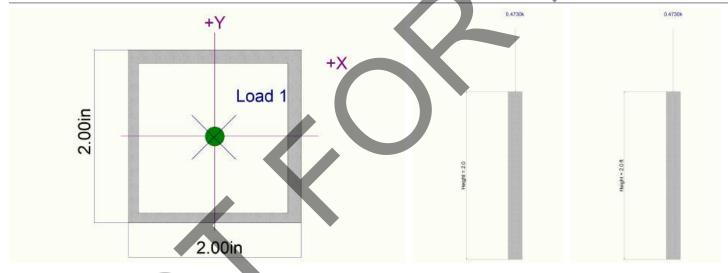
Maximum Deflections for Load Combinations

Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
0.0000 in	0.000 ft	0.000 in	0.000 ft
	0.0000 in 0.0000 in 0.0000 in 0.0000 in 0.0000 in 0.0000 in 0.0000 in 0.0000 in 0.0000 in	0.0000 in	0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in 0.0000 in 0.000 ft 0.000 in

Steel Section Properties : HSS2x2x1/8 Steel Section Properties : HSS2x2x1/8

1						Pro	oject File: Awning.ec6
uild:20.24	1.10.03	Innov	ative Structu	ural Engineering, Inc. (IS		(c) El	NERCALC, LLC 1982-2025
Fitne	ess Center Awni	ng Brace					
=	2.000 in	l xx	=	0.49 in^4	J	=	0.796 in^4
=	0.116 in	S xx	=	0.49 in^3			
=	2.000 in	R xx	=	0.761 in			
=	0.125 in	Zx	=	0.584 in^3			
=	0.840 in^2	l yy	=	0.486 in^4	С	=	0.817 in^3
=	3.050 plf	S yy	=	0.486 in^3			
	·	R yy	=	0.761 in			
=	0.000 in						
	Fitne = = = = = = = = = = = = = = = = = = =	wild:20.24.10.03 Fitness Center Awni	Fitness Center Awning Brace = 2.000 in	Fitness Center Awning Brace = 2.000 in	Innovative Structural Engineering, Inc. (IS Fitness Center Awning Brace	Innovative Structural Engineering, Inc. (IS Fitness Center Awning Brace	Innovative Structural Engineering, Inc. (IS Cc) Engineering Cc) Engineering Cc)

Sketches





LIGHT POLE FOOTING





27369 Via Industria Temecula, CA 92590 (951) 600-0032 Sht: E

Date: 3/4/2025

#: 7980.005

Δ: --

Design of Non-Building Structures per ASCE 7-16 Isolated Pole Footing

		isolated Fole Footing	
Seismic Design o	f N	on-Building Structures per ASCE 7-16 1	5.4
		SBC Fire Station 227	
Site Class		D-Default	ASCE 7-16, Sec. 11.4
	=	2.506 g	Per ASCE 7 Hazards Repo
	=	1.002 g	Per ASCE 7 Hazards Repo
Site Coefficient, F _a		1.20	Table 11.4
Site Coefficient, F _v		1.70	Table 11.4
$S_{DS} = 2/3 F_a * S_s$	=	1.67	ASCE 7 -16, EQ 11.4
Seismic Design Category		D	1613.5.6(1) &(
Risk Category		II	Table 1.5
$S_{D1} = 2/3 \text{ Fv*S}_1$		1.62	ASCE 7-16, EQ 11.4
Importance Factor, I _e		1.00	ASCE 7-16, Table 1.5
Height of Pole, z		22.50 ft	
Additional height from base of footing		2.50 ft	
Weight of Structure, W _p		275 lbs	Assume
	=	2.00	Table 15.4
	=	2.00 Deflection Amplification Fa	
Long Period Trans , T_L	Ī	8.00 sec	Per ASCE 7 Hazards Repo
c_t	E	0.02	Table 12.8-
X X	=	0.75	Table 12.8-
Approximate fundamental period $T = C_{\epsilon} (h_n)^x$	7	0.21 sec	12.8-
Determine Se	ism	Base Shear - ASCE 7-16 Section 15.4.1	
$C_s = S_{DS} / (R/I_e)$	_	0.84 Seismic Response Coeffific	ont /12.9.1
C _s shall not be less than:	_	0.84 Seismic Response Coeffific	ent (12.8- 2
			//
$C_{s \text{ (min)}} = 0.044S_{DS}I_{e}$		0.0735	(12.8-5
$C_{s \text{ (min)}} = 0.044 S_{DS} I_{e}$			cified in eq. 12.8-5 (15.4-2)
f $S_1 \ge 0.6g$ the minimum specified value in equation	12.	8-6 shall be replaced with eq 15.4-2	
$C_{s \text{ max}} = .5S_1 / (R/I_e)$	=	0.251	(12.8-0
$C_{s max} = .8S_1 / (R/I_e)$	=	0.4008	(15.4-7
The Value of Coneed not exceed the following:			
	_	3 92 for T < T.	(12.8.3
The Value of C_s need not exceed the following: $C_{s\prime}$ Max.	=	3.92 for T≤ T _L	(12.8-3
C _s , Max.			(12.8-5
C _s , Max.	=	0.84	
C _s , Max.	=		
C _s , Max.	=	0.84	
C_{s} , Max. $C_{s used}$ Seismic Base Shear, $V = C_{s W}$	= =	0.84 W	(12.8-:
C_{sused} Seismic Base Shear, V = C_{sW} Design Weight of Light Pole	= = =	0.84 W 275 lbs	(12.8-3 (12.8-3 15.4.
C_s , Max. C_s used Seismic Base Shear, $V = C_s$ W Design Weight of Light Pole Base Shear at bottom of pole, V	= = = =	0.84 W 275 lbs 0.230 kips	(12.8-



27369 Via Industria Temecula, CA 92590 (951) 600-0032 Sht: E

Date: 3/4/2025

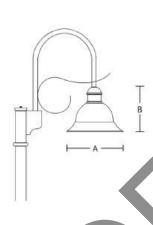
#: 7980.005

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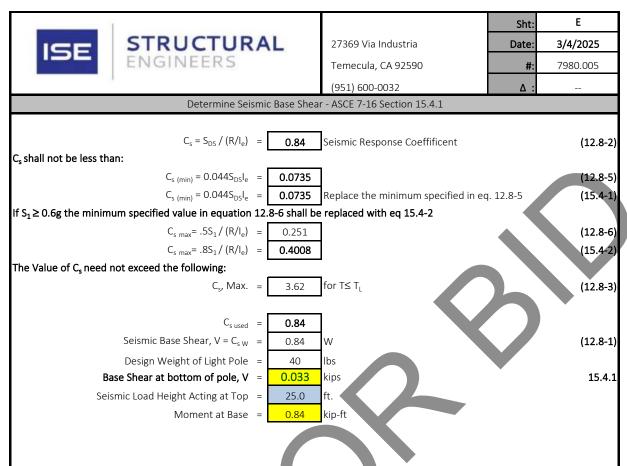
Design of Non-Building Structures per ASCE 7-16 Isolated Pole Footing

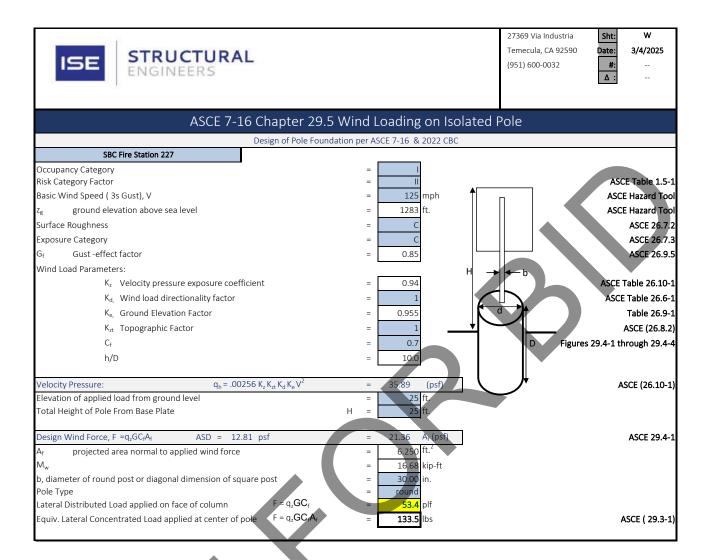
Seismic Design of Non-Building Structures per ASCE 7-16 15.4

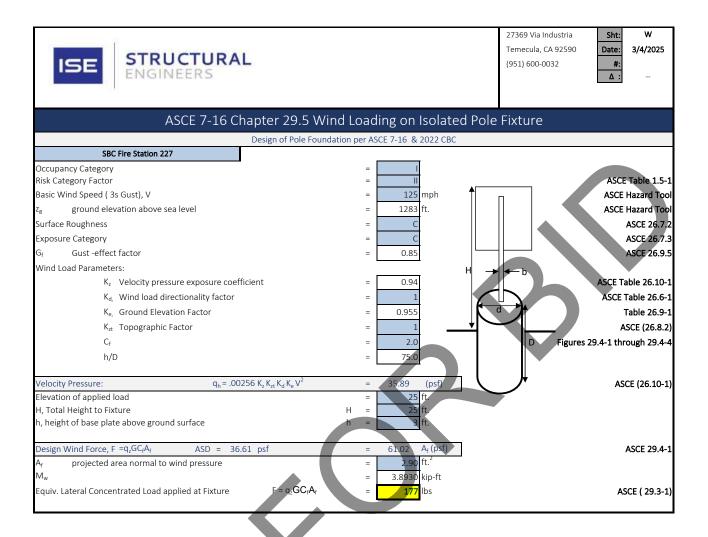
SBC Fire Station 227

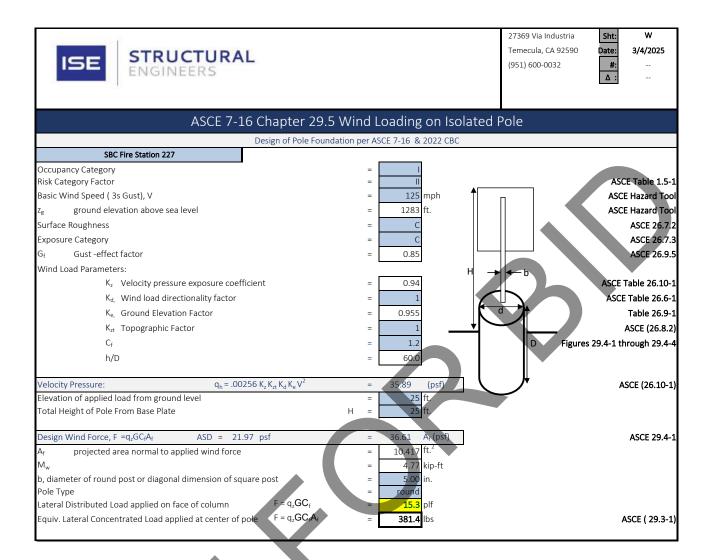


Design Parameters for Light Fixture										
Site Class =	D	ASCE 7-16, Sec. 11.4.2								
S _s =	2.51	g Per ASCE 7 Hazards Report								
$S_1 =$	1.00	g Per ASCE 7 Hazards Report								
Site Coefficient, $F_a =$	1.20	Table 11.4-1								
Site Coefficient, F _v =	1.70	Table 11.4-2								
$S_{DS} = 2/3 F_a * S_s =$	1.67	ASCE 7-16, EQ 11.4-3								
Seismic Design Category =	D	1613.5.6(1) &(2)								
Risk Category =	II	Table 1.5-1								
$S_{D1} = 2/3 \text{ Fv*} S_1 =$	1.62	ASCE 7-16, EQ 11.4-4								
Importance Factor, I _e =	1.00	ASCE 7-16, Table 1.5-2								
Height of Fixture, z =	25.00	ft								
Additional height from base of footing =	2.50	ft								
Weight Single of Fixture =	40.0	lbs Assumed								
Total Weight of Fixture, $W_p =$	40.0	lbs								
Head Type =	Single									
R =	2.00	Table 15.4-2								
C _d =	2.00	Deflection Amplification Factor Table 15.4-2								
Long Period Trans , T _L =	8.00	sec Per ASCE 7 Hazards Report								
$C_t =$	0.02	Table 12.8-2								
X =	0.75	Table 12.8-2								
Approximate fundamental period $T = C_t (h_n)^x =$	0.22	sec 12.8-7								











27369 Via Industria Temecula, CA 92590 (951)600-0032, (951)600-0036 Fax

Sht:	Rebar D= 30"
Date:	3/4/2025
#:	7980.005
Δ:	-

<u>Cast In Place</u> - Drilled Pier Reinforcement in Seismic Design Category D, E & F Per <u>CBC 1810.1 through 1810.4</u>

Pier Information:										
Diameter (D) =	30	in								
Depth (H) =	4.25	ft								
f' _c =	3,000	psi								
$f_y =$	60,000	psi								
$A_g =$	706.86	in2								
Edge Rebar Cover =	3	in								
$A_{ch} =$	452.39	in2								

	Longitudir	nal B	(Cast in Place)					
•	Longitudinal Bar =	8	#	6				
	$r_{long} =$	0.0050		> 0.005	longitudinal reinforcement ratio			
Alt:	Longitudinal Bar =	10	#	6				
	$r_{long} =$	C	.006	2	> 0.005	longitudi	nal reinforcement ratio	

	Remainder Tra	nsver						
-	Transverse Rebar =	#	4				_	(#3 if D<= 20" or #4)
	Spacing, s =		6	in	<	9.00	in	Min (12", D/2, 12d _{b long})

Project Title: Engineer: Project ID:

Distributed Load

Project Descr: Light Pole Footings

Distributed Load

Soil Surface

Pole Footing Embedded in Soil

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No lateral restraint

DESCRIPTION: 25' Tall Light Pole Foundation Footing

Code References

Calculations per IBC 2021 1807.3, SDPWS 2021

Load Combinations Used: ASCE 7-16

General Information

 Allow Passive
 250.0 pcf

 Max Passive
 2,500.0 psf

Controlling Values

Governing Load CombinatieD+0.60W

 Lateral Load
 0.770 k

 Moment
 10.428 k-ft

NO Ground Surface Restraint

Pressures at 1/3 Depth

Actual **465.984** psf Allowable **467.809** psf

Minimum Required Depth 5.625 ft

Footing Base Area 4.909 ft^2 Maximum Soil Pressure 0.08056 ksf

Applied Loads

Lateral Concentrated	Load (k)	Latera	l Distributed	Loads (k		Vertical Load (k)
D : Dead Load	k				k/ft	0.3150 k
Lr : Roof Live	k		•		k/ft	k
L : Live	k				k/ft	k
S : Snow	k				k/ft	k
W : Wind	0.1770 k	0.05340	0.01530		k/ft	k
E : Earthquake	0.0330 k			0.230	k/ft	k
H : Lateral Earth	k				k/ft	k
Load distance above		TOP of Load above	ground surface)		
ground surface	22.50 ft	22.50	2.50	22.50	ft	
		BOTTOM of Load at	ove ground su	ırface		
		2.50		21.50	ft	

Load Combination Results

	Forces @	Ground Surface	Required	Pressure at 1/3 Depth		Soil Increase
Load Combination	Loads - (k)	Moments - (ft-k)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor
D Only	0.000	0.000	0.13	0.0	0.0	1.000
+D+0.60W	0.770	10.428	5.63	466.0	467.8	1.000
+D-0.60W	0.770	10.428	5.63	466.0	467.8	1.000
+D+0.450W	0.577	7.821	5.13	419.5	421.1	1.000
+D-0.450W	0.577	7.821	5.13	419.5	421.1	1.000
+0.60D+0.60W	0.770	10.428	5.63	466.0	467.8	1.000
+0.60D-0.60W	0.770	10.428	5.63	466.0	467.8	1.000
+1.255D+0.70E	0.184	4.062	3.88	320.6	322.8	1.000
+1.255D-0.70E	0.184	4.062	3.88	320.6	322.8	1.000

Project Title:
Engineer:
Project ID:
Project Descr: Light Pole Footings

#: KW-06014215, Build:20.24.10.03	ole Footing Embedded	in Soil			P	roject File: light	poles.ec6
+1.192D+0.5250E	C# : KW-06014215, Build:20.24.10.03	Innovative		, Inc. (IS	((c) ENERCALC, LI	_C 1982-202
+1.192D-0.5250E 0.138 3.046 3.63 290.1 291.9 1.000 +0.3446D+0.70E 0.184 4.062 3.88 320.6 322.8 1.000	DESCRIPTION: 25' Tall Light	Pole Foundation Foo	ting				
+0.3446D+0.70E 0.184 4.062 3.88 320.6 322.8 1.000	+1.192D+0.5250E	0.138	3.046	3.63	290.1	291.9	1.000
	+1.192D-0.5250E	0.138	3.046	3.63	290.1	291.9	1.000
+0.3446D-0.70E 0.184 4.062 3.88 320.6 322.8 1.000	+0.3446D+0.70E	0.184	4.062	3.88	320.6	322.8	1.000
	+0.3446D-0.70E	0.184	4.062	3.88	320.6	322.8	1.000
				2			
			•				