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714-844-2140
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Ben@accandengineering.com
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STRUCTURAL CALCULATION REPORT

CITY OF ORANGE

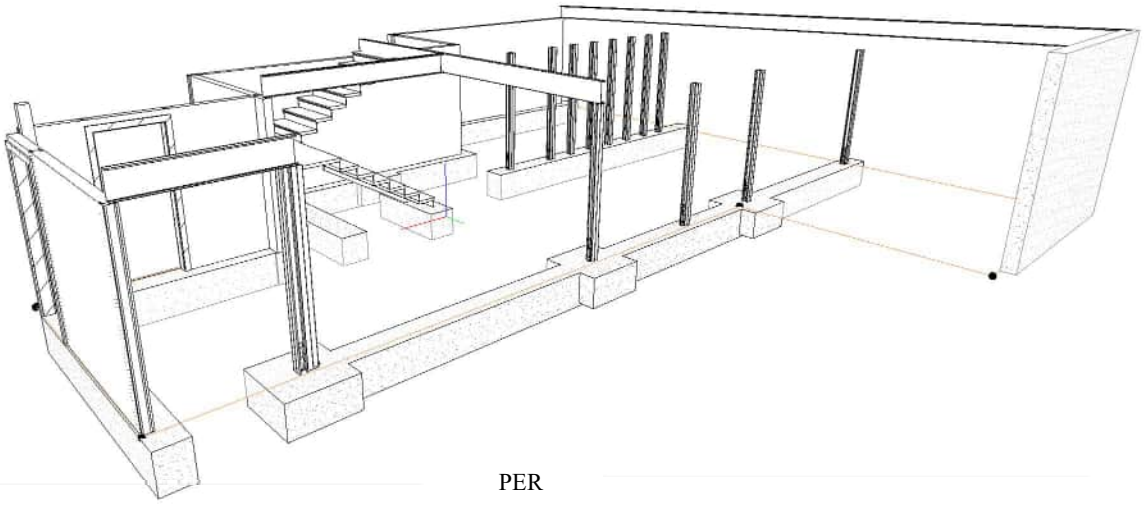
STRUCTURAL ANALYSIS

FOR PROJECT

HORIZONS OFFICE EXPANSION T.I

PROJECT ADDRESS

432 W MEATS AVE. ORANGE, CA 92865



PER

ASCE 7-22

THE EXISTING BUILDING IS TYPE (SPECIAL REINFORCED CONCRETE SHEAR WALLS IN BOTH DIRECTIONS)

THE PROPOSED SEISMIC RESISTANCE SYSTEM USED IS (COLD FORMED STEEL WALLS SHEATHED WITH WOOD STRUCTURAL PANELS)

THE EXISITING BUILDING TO BE ANALYZED BY CHECKING THE EXISTING REINFORCED CONCRETE SHEAR WALLS AGAINST ADDED WEIGHT & REINFORCE PROPOSED STRUCTURE RESISTING SYSTEM, BOTH EXISTING AND NEW SYSTEM SHALL RESIST THE SEISMIC FORCES AND/OR ANY OTHER LATERAL FORCES PER ASCE-7-22.

AFFILIATIONS

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS
CONTRACTORS STATE LICENSE BOARD
SEI STRUCTURAL ENGINEERING INSTITUTE
AWS American Welding Society

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

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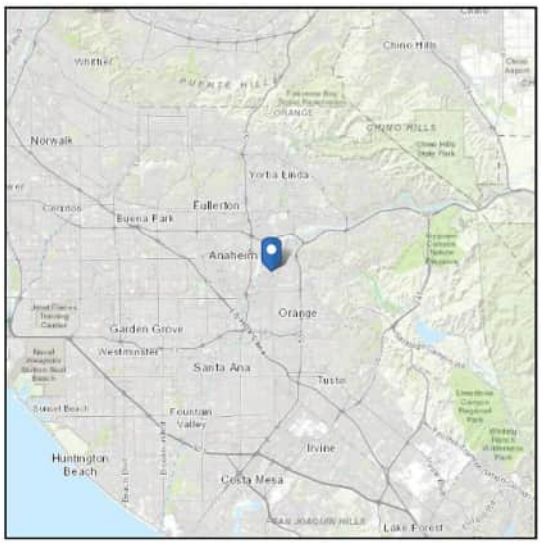
ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

ASCE Hazards Report

Address:
432 W Meats Ave
Orange, California
92865

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: Default

Latitude: 33.822758
Longitude: -117.858182
Elevation: 192.72996362798855 ft (NAVD 88)



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REVIEW BY: MOSTAFA BAYOUMI, P.E.

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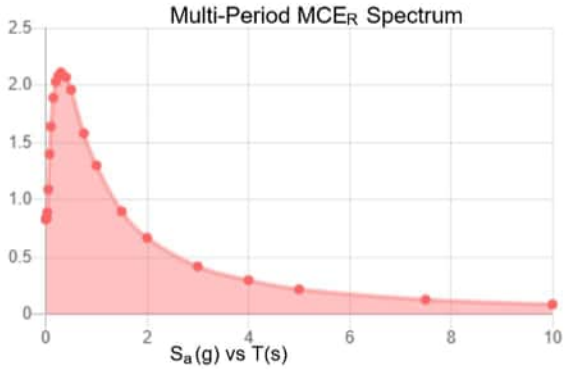
Seismic

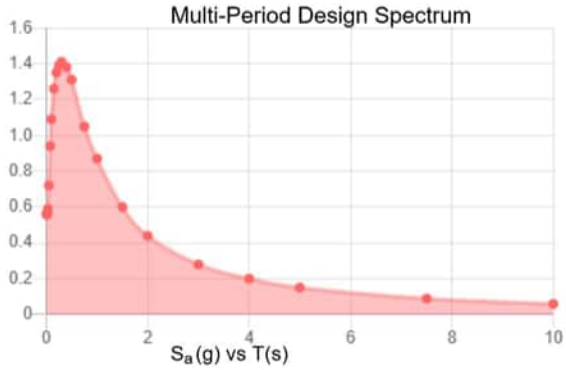
Site Soil Class: Default

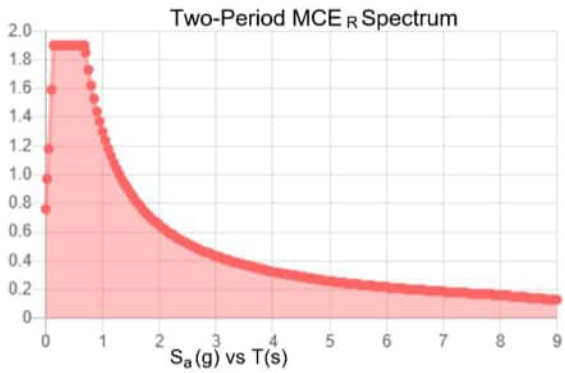
Results:

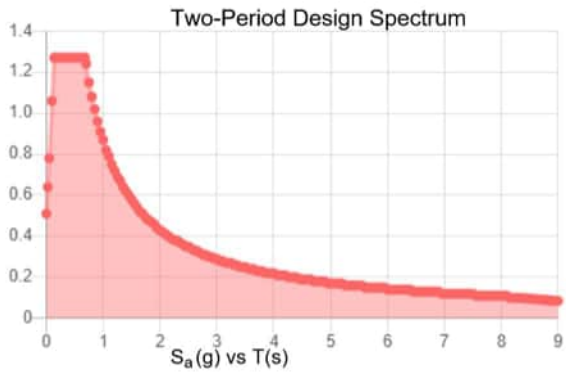
PGA_M :	0.73	T_L :	8
S_{MS} :	1.9	S_S :	1.67
S_{M1} :	1.3	S_1 :	0.57
S_{DS} :	1.27	V_{S30} :	260
S_{D1} :	0.87		

Seismic Design Category: D









MCER Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

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BUILDING LOADS CALCULATIONS

DEAD LOAD			LIVE LOAD		
LEVEL	SOURCE	LOAD (P.S.F)	LEVEL	SOURCE	LOAD (P.S.F)
ROOF	PLYWOOD MATERIALS WEIGHT	2.5 P.S.F	ROOF	LIVE LOAD	20 P.S.F
ROOF	INSULATION MATERIALS WEIGHT	1.5 P.S.F	FLOOR	LIVE LOAD	40 P.S.F
			ROOF	DESIGN LIVE LOAD	40x
ROOF	GYPSUM BOARD MATERIALS WEIGHT	2.7 P.S.F			
ROOF	FLOORING MATERIALS WEIGHT	7 P.S.F			
ROOF	FRAMING MATERIALS WEIGHT	4.5 P.S.F			
ROOF	MISC.LEVEL	1.8 P.S.F			
TOTAL	DEAD LOAD	20 P.S.F			
ROOF	DESIGN DEAD LOAD	20x			

SEISMIC LOAD CALCULATION:

TOTAL DESIGN AREA WEIGHT= TOTAL D.L PER SQ.FT x TOTAL AREA

AREA = 1090 SQ.FT

TOTAL DESIGN AREA WEIGHT= 20x1090 = 21800 LBS.

TOTAL DESIGN WALL WEIGHT = (TOTAL WALL LEGNTH x WALL WEIGHT PER SQ.FT X AVERAGE WALL HEIGHT / 2)

WALL LEGNTH = 225 LINEAR FEET

WALL HEIGHT = 8 FT

WEIGHT PER SQ.FT = 15 P.S.F

TOTAL DESIGN WALL WEIGHT = (225X15X8) / 2 = 13.5 $X10^4$

TOTAL DEAD LOAD CONTRIBUTING TO SEISMIC FORCE = TOTAL DESIGN AREA WEIGHT + TOTAL DESIGN WALL WEIGHT

TOTAL DEAD LOAD CAUSING SEIMSIC LOAD = 35.3 KIP.

SEISMIC DESIGN DEADLOAD TO BE USED TO CALCULATE SEISMIC BASE SHEAR = 35.3KIP

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SEISMIC DESIGN CRITERIA & PARAMETERS PER ASCE 7-22		
Site Classification= (Default)	D	ASCE 7-22 Section 11.4.2
Risk Category=	II	ASCE 7-22 Table 1.5-1
Seismic Design Category=	SDC	ASCE 7-22 Section 11.6
Importance Factor= I=	1	ASCE 7-22 Section 11.5 Table 1.5-2
Response Modification Factor R=	5	ASCE 7-22 Table 12.2-1 (Existing building system)
System Overstrength Factor Ω_o=	1.25	ASCE 7-22 Table 12.2-1
Deflection Amplification Factor C_d=	1.25	ASCE 7-22 Table 12.2-1
Rho Factor (ρ) ρ=	1.3	ASCE 7-22 Section 12.3.4.2 Reliability Redundancy Factor
Approximate Fundamental Period T =	0.4	ASCE 7-22 Section 12.8-2
Long Period T_L=	8	ASCE 7-22 Figure 22-14 to 22-17 ASCE 7 Hazard Report
Spectral Response Short Period S_S=	1.67	ASCE 7-22 Chapter 22 ASCE 7 Hazard Report
Spectral Response Long Period S_1=	0.57	ASCE 7-22 Chapter 22 ASCE 7 Hazard Report
Short Period Site Coefficient F_a=	1. 1	ASCE 7-22 Section 11.4.4 Site Coefficients MCER
Long Period Site Coefficient F_V=	2.5	ASCE 7-22 Section 11.4.4 Site Coefficients MCER
Spectral Response Accelerations Short S_{MS}=F_aS_s=	1.65	ASCE 7-22 Section 11.4.4 Site Coefficients MCE_R
Spectral Response Accelerations Long S_{M1}=F_VS_1=	1.33	ASCE 7-22 Section 11.4.4 Site Coefficients MCER
Spectral Response Short Period S_{DS}=	1.27	ASCE 7-22 Section 11.4.5 Design Spectral Acceleration.
Spectral Response Long Period S_{D1}=	0.87	ASCE 7-16 Section 11.4.5 Design Spectral Acceleration
$T_s = (S_{D1} / S_{DS})$ T_S=	0.685	ASCE 7-22 Section 11.4.6 .095<1.5xT_S=0.830*
Coefficient as determined from table 12.8-2 C_t =	0.02	ASCE 7-22 table 12.8-2
Structural Height as defined in section 11.2 h_n =	8	ASCE 7-22 table 12.8-2
Coefficient as determined from table 12.8-2 x =	0.75	ASCE 7-22 Section 12.8-2
Approximate Fundamental Period $T_a = (Ct * h_n^x)$ =	0.095	ASCE 7-22 Section 12.8-8
Seismic Response Coefficient CS =	**0.25**	ASCE 7-22 Eq. 12.8-2 Seismic Response Coefficient
Maximum Seismic Response Coefficient C_{Smax} =	1.93	ASCE 7-22 Eq. 12.8-3 Maximum
Minimum Seismic Response Coefficient	0.5588	ASCE 7-22 Eq. 12.8-5 or 12.8-6 Minimum
*Site specific ground motion analysis is not required per ASCE 7-22 Section 11.4.8 Exception 2 Seismic Design Category specified from Table 11.4-2		

- $S_{DS} = 1.27$
- $S_{D1} = 0.57$
- $I = 1$
- $R = 5$
- $T_L = 8$ (which is the long period transition period; this value is used to check if T is less than T_L, which would validate the use of S_{DS} over S_{D1})

The approximate fundamental period T_a can also be calculated using the formula provided, which is a function of the building height h_n:

$$T_a = C_t \times h_n^x$$

- $C_t = 0.05$
- $x = 0.75$

$$C_s = \frac{S_{DS} \times I}{R} \text{ or } C_s = \frac{S_{D1} \times I}{R \times T}$$ ilding)

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
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951-903-2284
714-844-2140
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Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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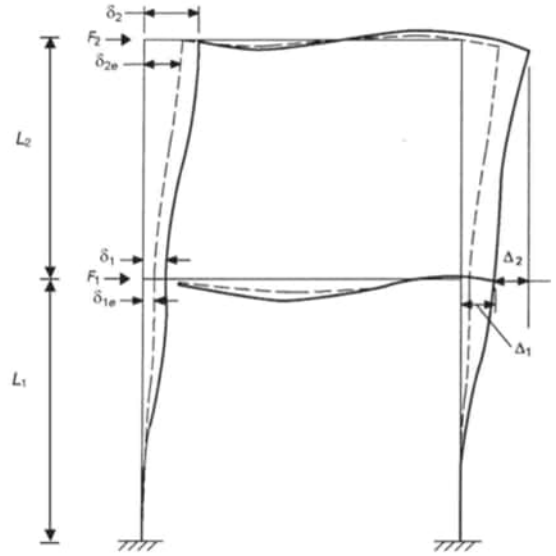
The approximate fundamental period T_a for the building is 0.4 seconds.

Given that T_a is less than T_L, we use the design spectral response acceleration at



Note: Δ_i = story drift; Δ_i / L_i = story drift ratio; δ_x = total displacement; i = level under consideration.

Story Level 1: F_1 = strength-level design earthquake force; δ_{1e} = elastic displacement computed under strength-level design earthquake forces; $\delta_1 = C_d\delta_{1e}/I_E$ = amplified displacement; $\Delta_1 = \delta_1 \le \Delta_a$ (Table 12.12-1).

Story Level 2: F_2 = strength-level design earthquake force; δ_{2e} = elastic displacement computed under strength-level design earthquake forces; $\delta_2 = C_d\delta_{2e}/I_E$ = amplified displacement; $\Delta_2 = C_d(\delta_{2e} - \delta_{1e})/I_E \le \Delta_a$ (Table 12.12-1).

12.8.3 Vertical Distribution of Seismic Forces The lateral seismic force, F_x (kip or kN), induced at any level shall be determined from the following equations:

$$F_x = C_{vx}V \qquad (12.8\text{-}12)$$

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} \qquad (12.8\text{-}13)$$

Fx = V = Total Base Shear

$C_s = 0.254$
$W = 35.3\,\text{kips}$

the base shear V is calculated as follows:

$V = 0.254 \times 35.3$ = 8.23 P.S.F

Result

$V \approx 8.9512\,\text{kips}$

Therefore, the calculated base shear V for the single level structure is approximately 8.95 kips. This value will be utilized to design the seismic force-resisting elements to ensure that the structure can adequately resist the expected lateral seismic forces.

ıild

Seismic Force Considerations

The second story's contribution to the overall seismic response of the building is isolated to the lateral forces that it imparts to the structure's seismic force-resisting system. As this upper story does not support any gravity loads and is independent of the primary load-bearing system of the building, its design is governed solely by the need to resist the horizontal seismic forces.

For the purpose of this analysis, the forces of interest are:

- F_2: the strength-level design earthquake force applied to the second story level.

According to the ASCE 7-22 standards, the second story level seismic force (F_2) is calculated without consideration for story drift (Δ), as there is no vertical load contribution from the second story. The elastic displacement (δ_{2e}) used in the calculation of the seismic force at the second story level is based on the amplified displacement computed under strength-level earthquake forces (δ_2).

Given that the existing building's primary structural system independently supports all imposed vertical loads, the seismic design for the second story can be approached by considering the following:

- The seismic force at the second story level is computed as a portion of the base shear (V) associated with the seismic response of the entire structure.
- The amplified displacement for the second story (δ_2) is derived from the elastic displacements (δ_{2e}) and is calculated based on the prescribed response modification coefficient and the deflection amplification factor, which are given in the ASCE 7-22.

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951-903-2284
714-844-2140
www.accandengineering.com
Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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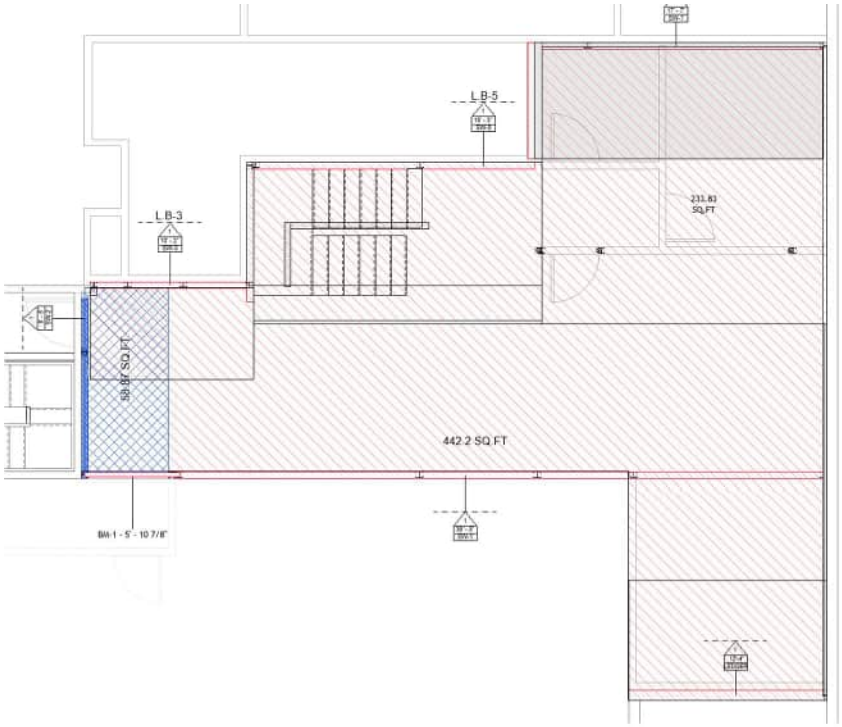
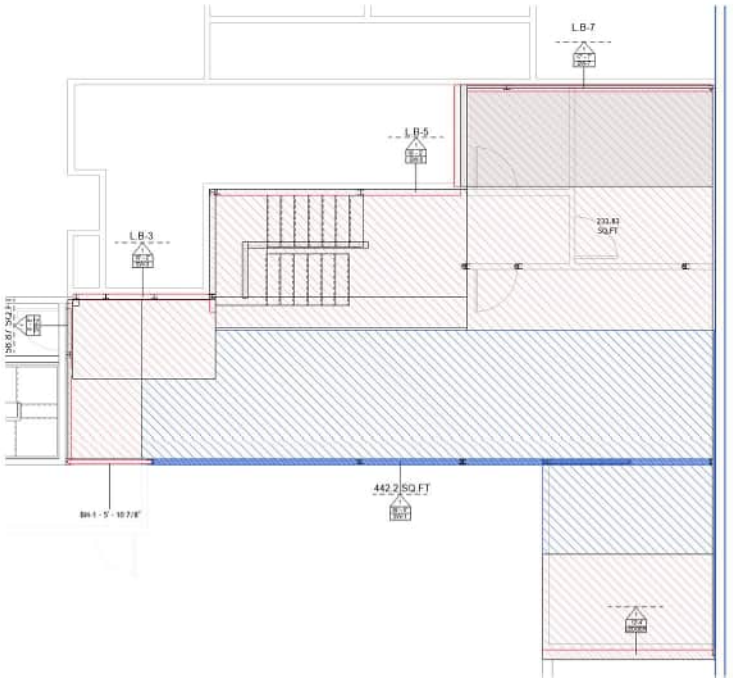
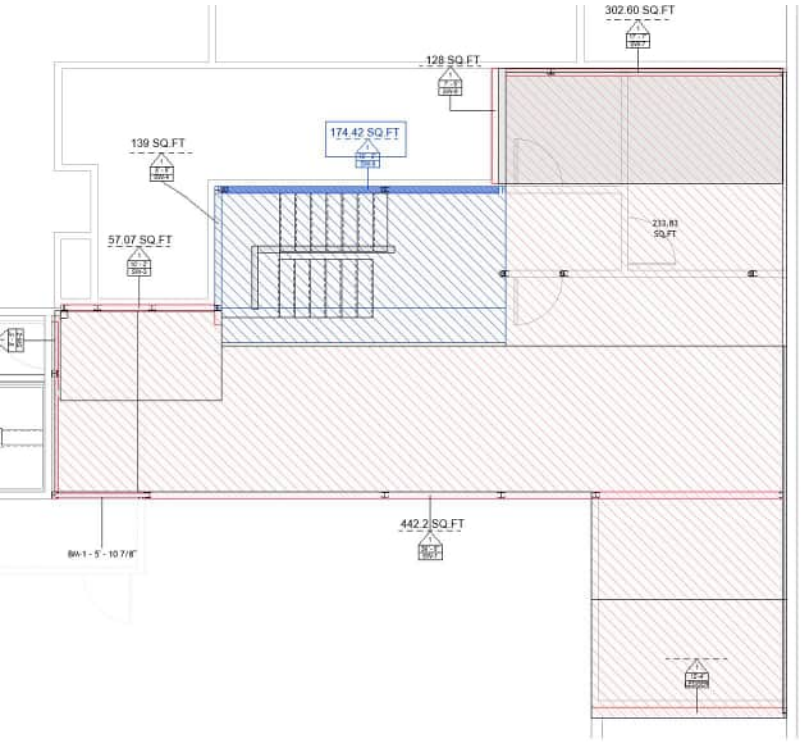
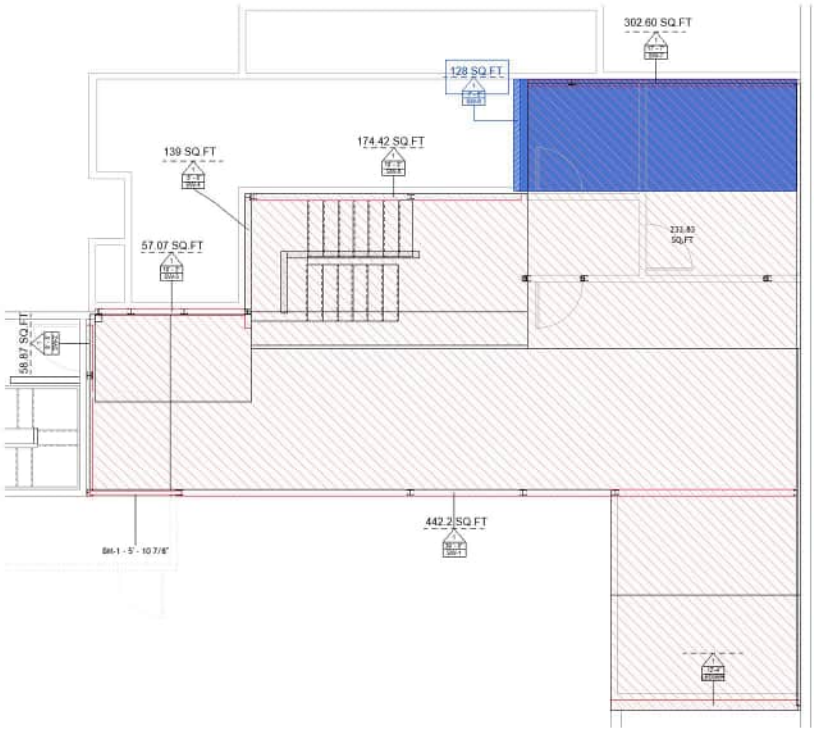
SHEAR WALL LATERAL DISTRIBUTION (MEMBERS TRIBUTARY AREAS)









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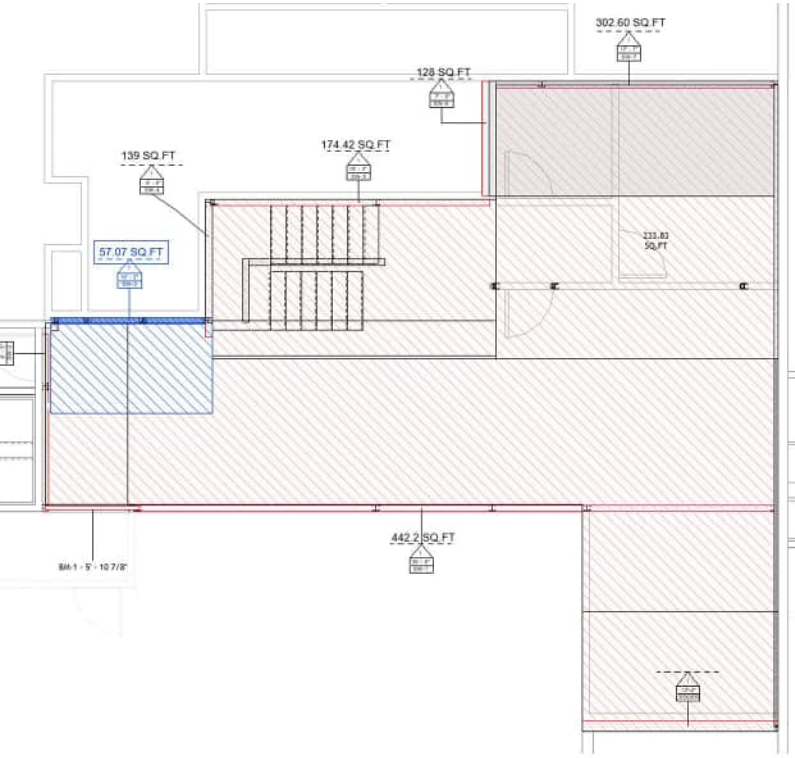

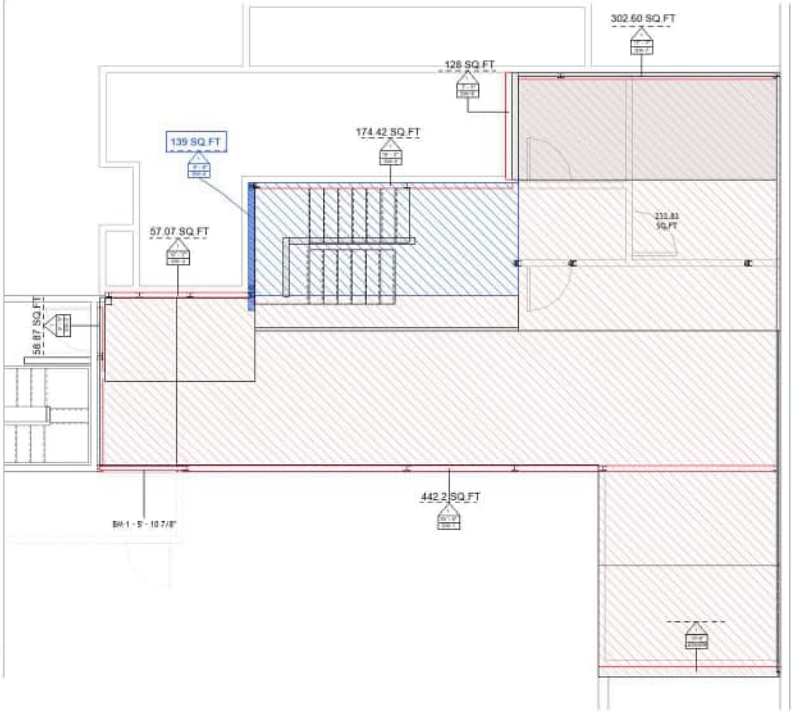

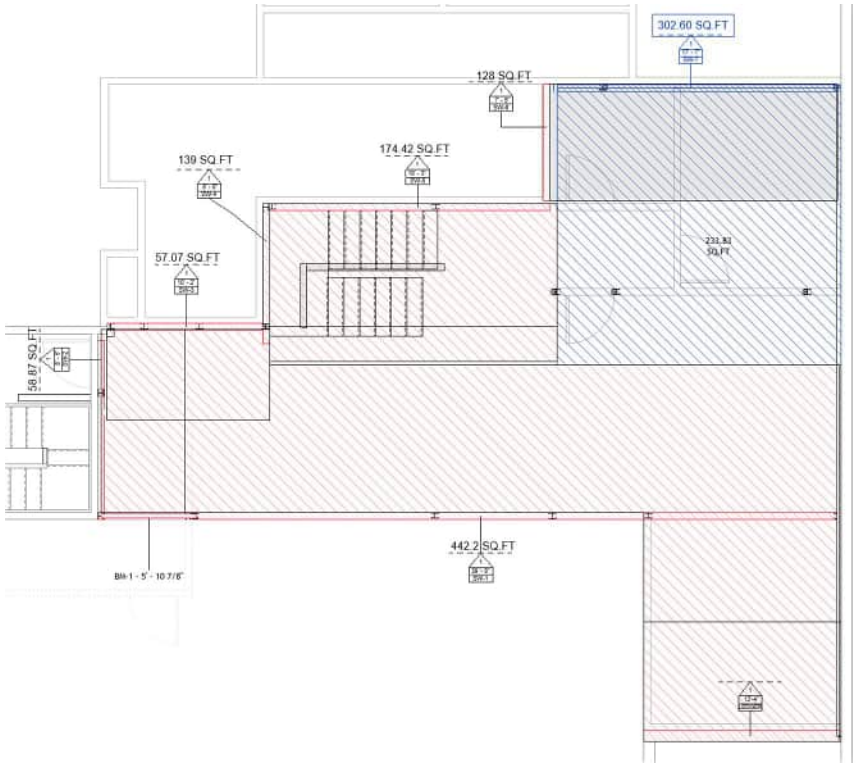

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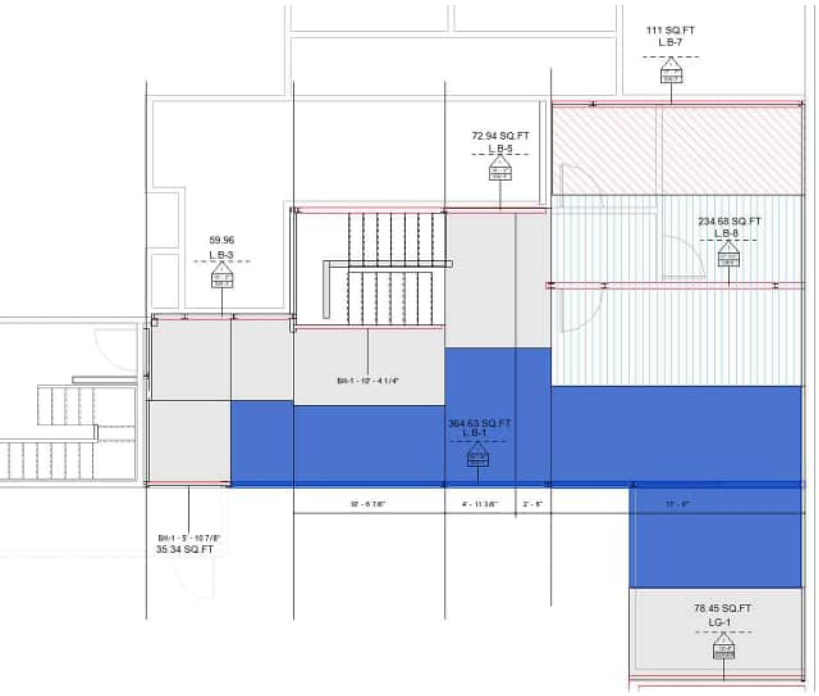
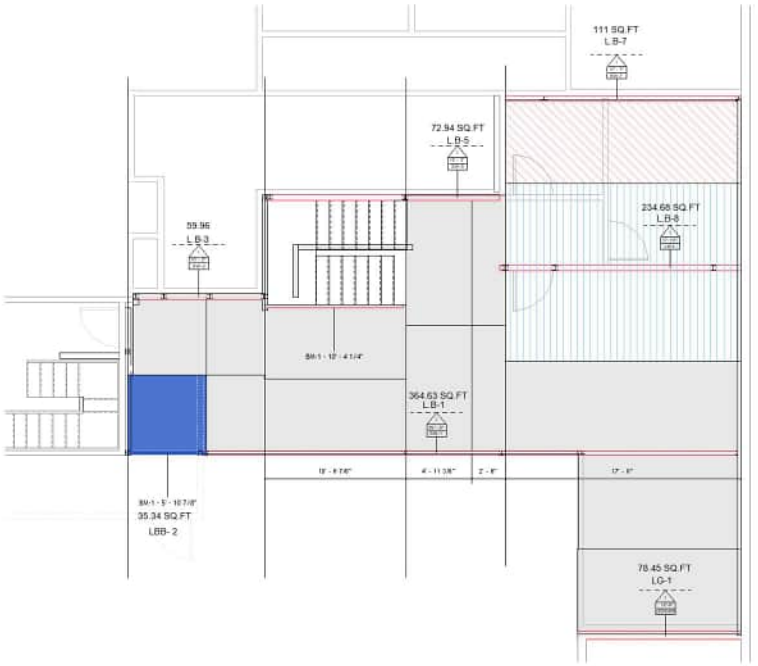
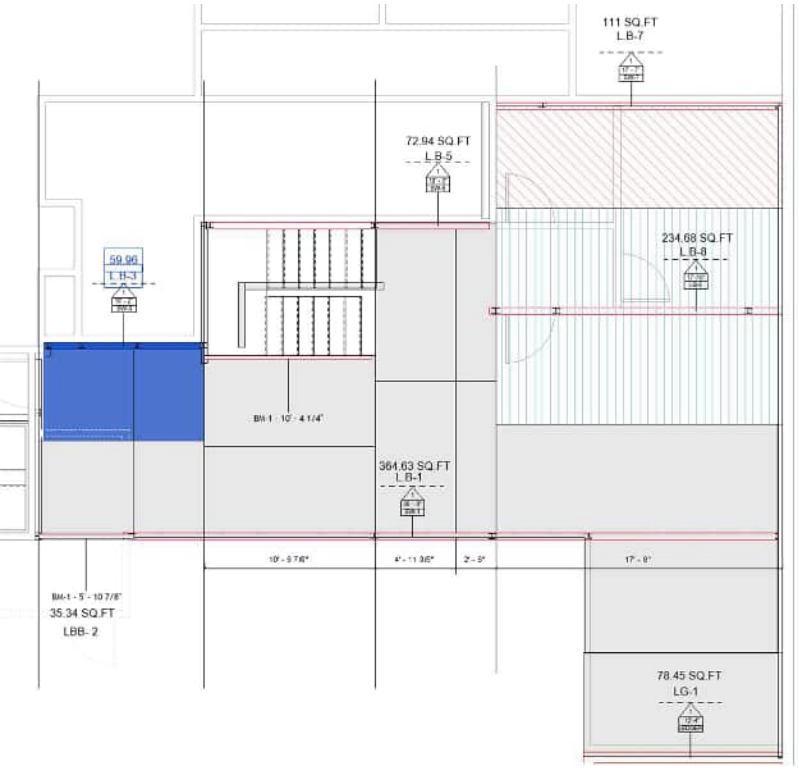
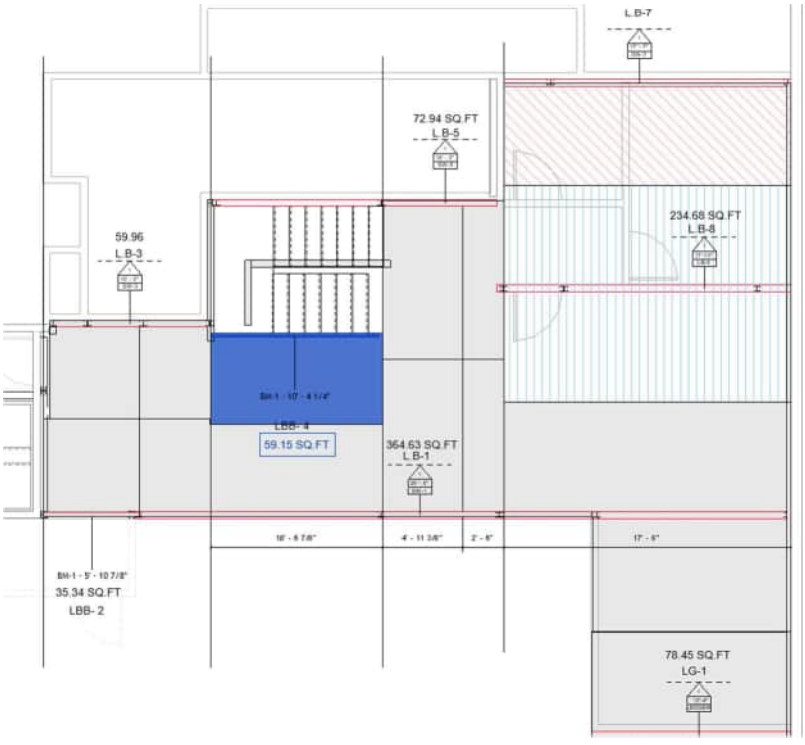
DIAPHRAM LOADS AXIAL DISTRIBUTION TO FOUNDATION (MEMBERS TRIBUTARY AREAS)









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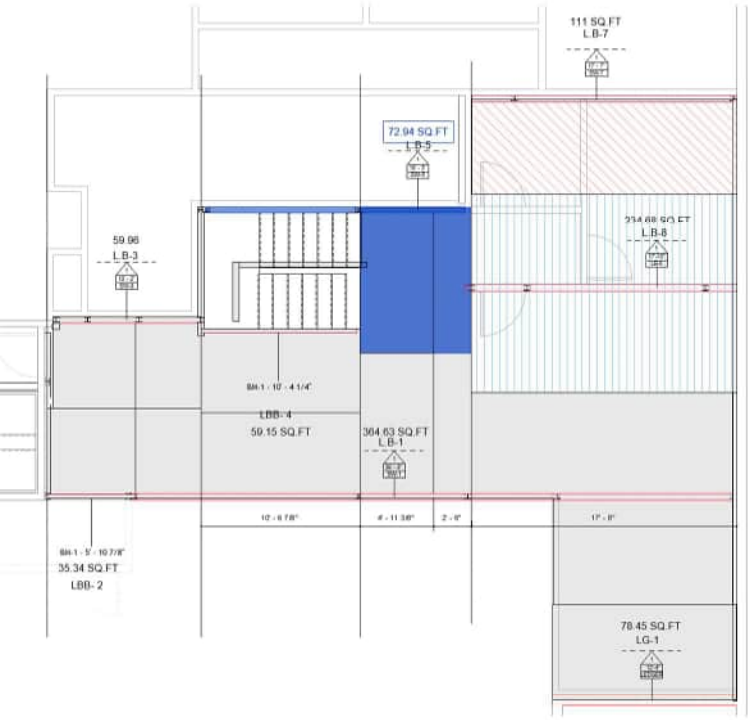

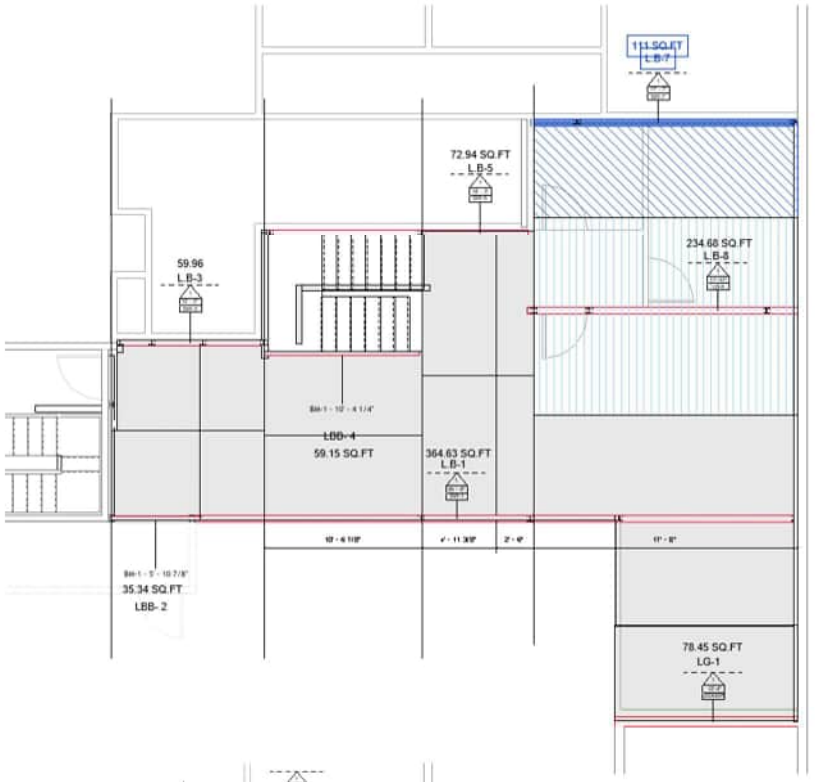

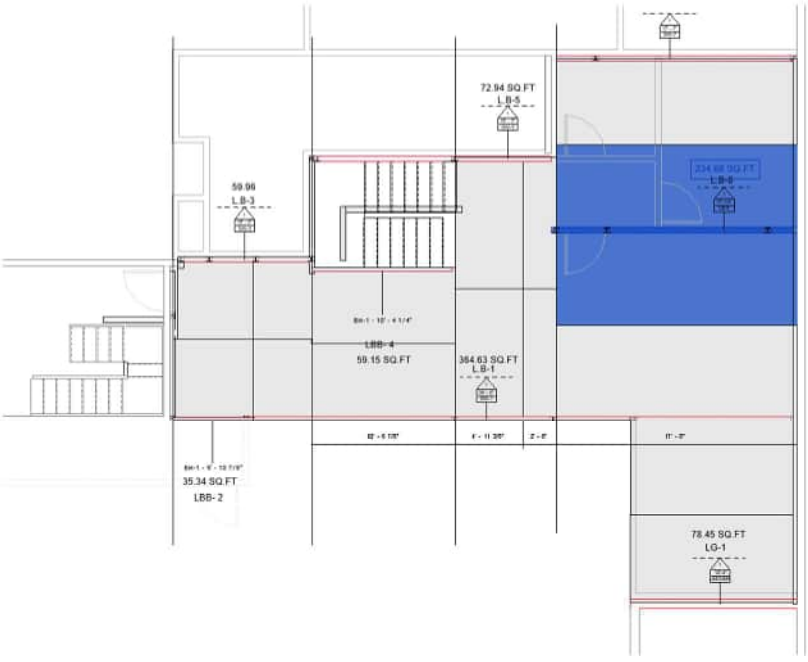

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Design | Engineering | Construction
951-903-2284 www.accandengineering.com
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LATERAL

WALL NAME	WALL LEGNTH IN FEET	WALL LEGNTH IN INCHES	TRIBUTARY AREA SQ.FT	DESIGN LOAD P.S.F	TOTAL LOAD LBS	CAPACITY LBS	DESIGN RESULT
SW-1	39.7	476.0	442.2	8.5	3,758.7	21,199.8	O.K
SW-2	8.4	101.0	58.9	8.5	500.4	4,494.5	O.K
SW-3	10.2	122.0	57.1	8.5	485.1	5,429.0	O.K
SW-4	8.7	104.0	139.0	8.5	1,181.5	4,628.0	O.K
SW-5	18.3	219.0	174.4	8.5	1,482.6	9,745.5	O.K
SW-6	7.4	89.0	128.0	8.5	1,088.0	3,960.5	O.K
SW-7	17.6	211.0	302.6	8.5	2,572.1	9,389.5	O.K

TOTAL LATERAL LOAD SYSTEM ABLE TO RESIST	58,846.8
TOTAL LATERAL LOAD	11,068.4
TOTAL LATERAL LOAD RESISTED BY LFRS	11,068.4

GRAVITY

MEMBER NAME	WALL LEGNTH IN FEET	WALL LEGNTH INCHES	TRIBUTARY AREA SQ.FT	DESIGN LOAD P.S.F	TOTAL LOAD LBS	NO#STUDS 16" O.C	AXIAL LOAD PER STUD LBS
				60.0	38,077.8	29.7	1,280.1
				60.0	25.0	4.4	5.6
LB-1	39.7	475.9	634.6	60.0	3,597.6	7.6	471.8
LBB-2	5.9	71.0	35.3	60.0	3,549.0	7.8	457.9
LB-3	10.2	122.0	60.0	60.0	4,376.4	13.7	319.7
LBB-4	10.3	124.0	59.2	60.0	6,660.0	13.2	505.0
LB-5	18.3	219.0	72.9	60.0	14,080.8	13.4	1,052.8
LB-7	17.6	211.0	111.0				
LB-8	17.8	214.0	234.7	TOTAL	70,366.6	89.8	783.5

$P = F_y \times A_e$

Yield strength (Fy): 50 ksi (given for both with and without cold work)

Effective area (Ae): 0.463 in^2 (given for the effective section considering knockouts)

P=50 ksi×0.463 in^2

P=50 ksi×0.463 in2=23.15 kips P=23.15 kips

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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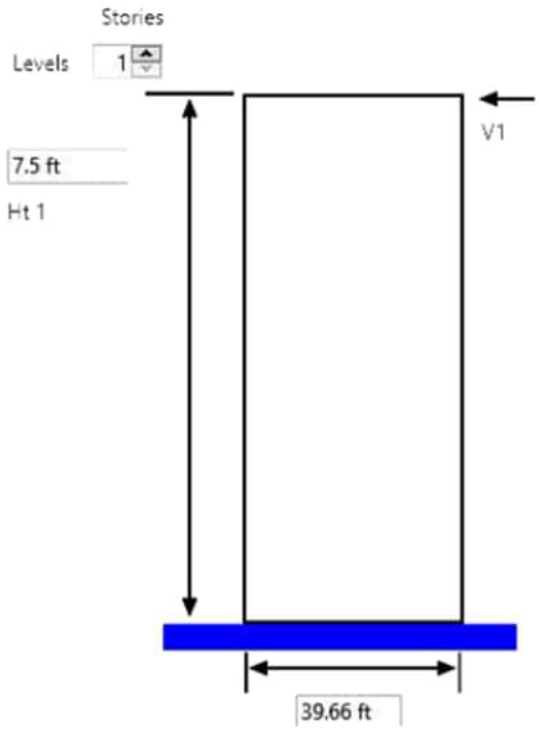
Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-1 & LB-1
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Cold Formed Steel

LFRS Shear-wall & Bearing-wall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	3758.7	0.19

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	1280	0	0	0	0

PER CHORD (STUD)

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	3758.7	94.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

Level	Wind Modifiers	Seismic Modifiers

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-1 & LB-1
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.177

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = $(1.2+0.2S_{ds})D + \Omega_o Qe + L + 0.2S$ Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	1792	1536	1536	1536	2247	2750

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0.233	0.2	0.2	0.2	0.292	0.358

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-1 & LB-1
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Factored Net Uplift (lb)
(Negative values represent uplift, Positive values indicate no net uplift)

Shear Forces (lb)

Level	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	1152	441	-62	1	3759	4698

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0	0.006

Displacement

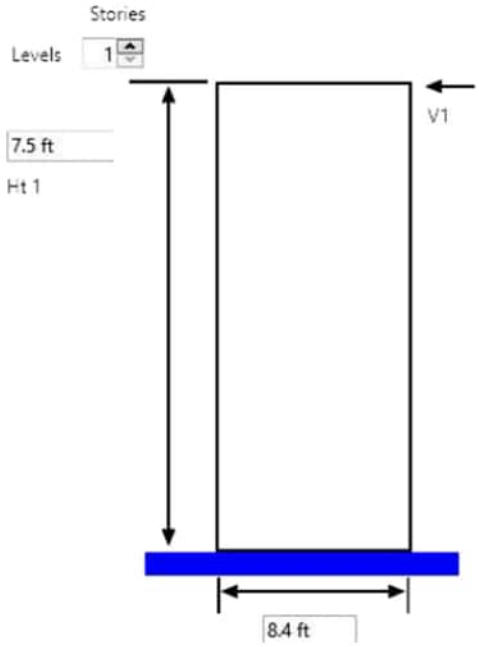
Level	Floor-Floor Relative Displacement (in)			Drift %		
	Wind	Seismic	Seismic, Cd	Wind	Seismic	Seismic, Cd
1	0	0.01	0.01	0	0.01	0.01

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-2
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	0.89

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	2365	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	59.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

Level	Wind Modifiers	Seismic Modifiers

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
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1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.112

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω₀Qe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	3784	2365	4730	2812	2923

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0.492	0.308	0.615	0.366	0.38

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Factored Net Uplift (lb)
(Negative values represent uplift, Positive values indicate no net uplift)

Level	LC5	LC7	LCO7
1	-1	-447	-558

Shear Forces (lb)

Wind	Seismic	Seismic w/Overstrength
1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.047	0.059

Displacement

Level	Floor-Floor Relative Displacement (in) Wind	Seismic	Seismic, Cd	Drift % Wind	Seismic	Seismic, Cd
1	0	0.02	0.02	0	0.02	0.02

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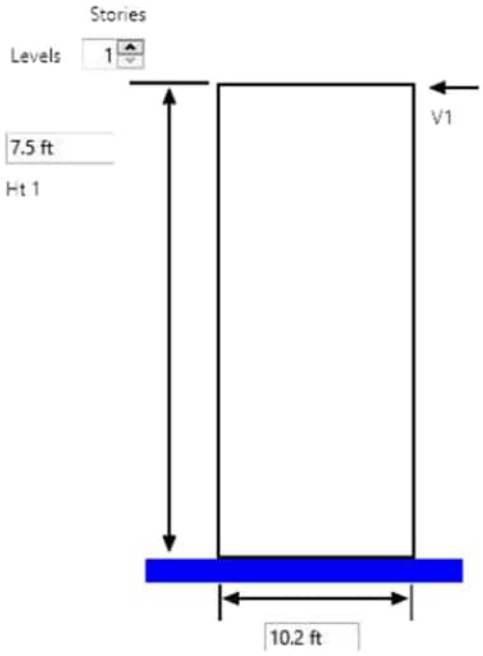
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-3 & LB-3
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	0.74

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	0	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	49.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

Level	Wind Modifiers	Seismic Modifiers

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DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.092

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω₀Qe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	1	368	460

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0	0	0	0.048	0.06

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Factored Net Uplift (lb)
(Negative values represent uplift, Positive values indicate no net uplift)

Shear Forces (lb)

Level	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	-1	-368	-460	1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.039	0.048

Displacement

Level	Floor-Floor Relative Displacement (in)			Drift %		
	Wind	Seismic	Seismic, Cd	Wind	Seismic	Seismic, Cd
1	0	0.01	0.01	0	0.01	0.01

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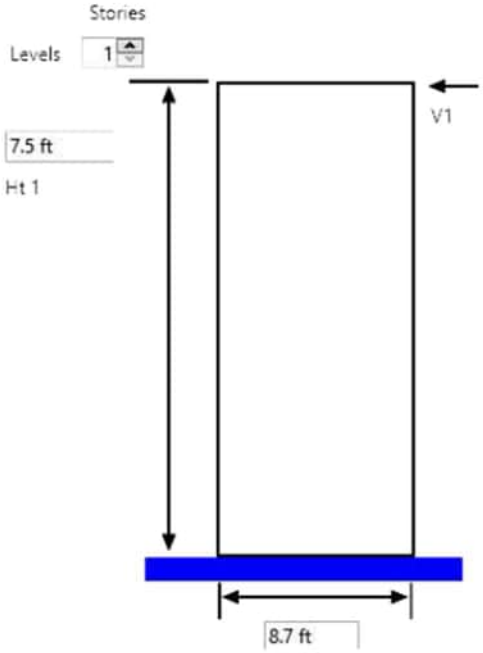
951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-4
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	1181.54	0.86

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	1112	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	1181.54	135.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

	Wind	Seismic
Level	Modifiers	Modifiers

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DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.254

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω_oQe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	1779	1112	2224	2131	2385

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0.231	0.145	0.289	0.277	0.31

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.254

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω_oQe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	1779	1112	2224	2131	2385

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0.231	0.145	0.289	0.277	0.31

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Level	Factored Net Uplift (lb) (Negative values represent uplift, Positive values indicate no net uplift)			Shear Forces (lb)		
	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	-1	-1019	-1273	1	1182	1477

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.107	0.133

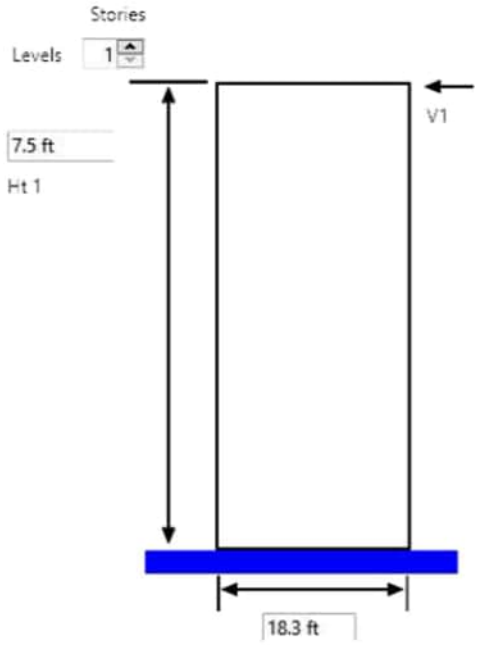
Displacement

Level	Floor-Floor Relative Displacement (in)			Drift %		
	Wind	Seismic	Seismic, Cd	Wind	Seismic	Seismic, Cd
1	0	0.04	0.05	0	0.04	0.06

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	0.41

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	0	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	27.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

Level	Wind Modifiers	Seismic Modifiers

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DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.051

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = $(1.2+0.2S_{ds})D + \Omega_o Q_e + L + 0.2S$ Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	205	256

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0	0	0	0.027	0.033

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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1130 N Kraemer Blvd #I, Anaheim, CA 92806
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LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Factored Net Uplift (lb)
(Negative values represent uplift, Positive values indicate no net uplift)

Shear Forces (lb)

Level	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	0	-205	-256	1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.021	0.027

Displacement

Level	Floor-Floor Relative Displacement (in) Wind	Seismic	Seismic, Cd	Drift % Wind	Seismic	Seismic, Cd
1	0	0	0	0	0	0.01

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REVIEW BY: MOSTAFA BAYOUMI, P.E.

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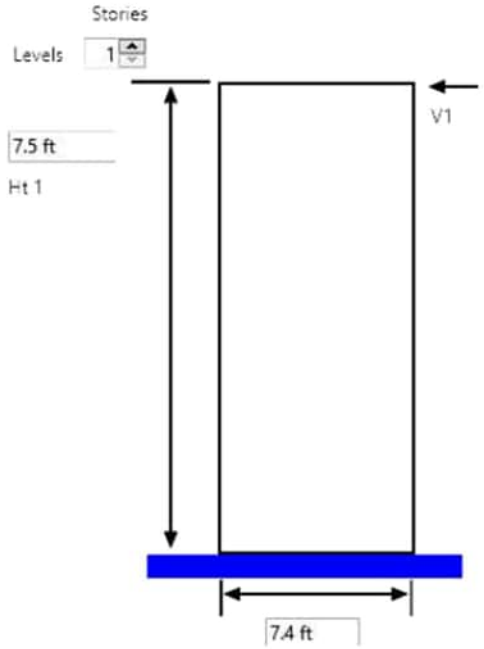
951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-6
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	1.01

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	0	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	67.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

	Wind	Seismic
Level	Modifiers	Modifiers

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
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714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-6
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.127

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω₀Qe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	1	1	507	634

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0	0	0	0.066	0.082

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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REVIEW BY: MOSTAFA BAYOUMI, P.E.

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951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-6
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Level	Factored Net Uplift (lb) (Negative values represent uplift, Positive values indicate no net uplift)			Shear Forces (lb)		
	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	-1	-507	-634	1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.053	0.066

Displacement

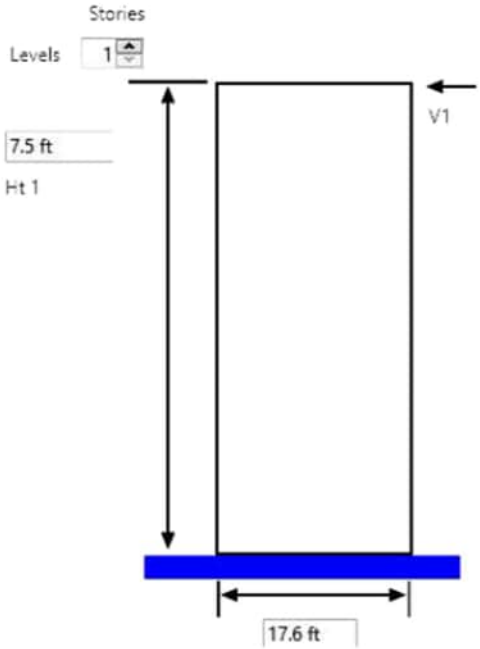
Level	Floor-Floor Relative Displacement (in)			Drift %		
	Wind	Seismic	Seismic, Cd	Wind	Seismic	Seismic, Cd
1	0	0.02	0.02	0	0.02	0.03

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-7 & LB-7
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	0.43

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	0	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	28.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 8	6/12	54	24	1

Shear Strength Modification Factors

	Wind	Seismic
Level	Modifiers	Modifiers

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-7 & LB-7
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report

1 None None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.053

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S200-54	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + ΩₒQe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	213	267

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	1945	7689	0	0	0	0	0.028	0.035

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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REVIEW BY: MOSTAFA BAYOUMI, P.E.

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714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: SW-7 & LB-7
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Level	Factored Net Uplift (lb) (Negative values represent uplift, Positive values indicate no net uplift) LC5	LC7	LCO7	Shear Forces (lb) Wind	Seismic	Seismic w/Overstrength
1	0	-213	-267	1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.022	0.028

Displacement

Level	Floor-Floor Relative Displacement (in) Wind	Seismic	Seismic, Cd	Drift % Wind	Seismic	Seismic, Cd
1	0	0	0.01	0	0	0.01

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
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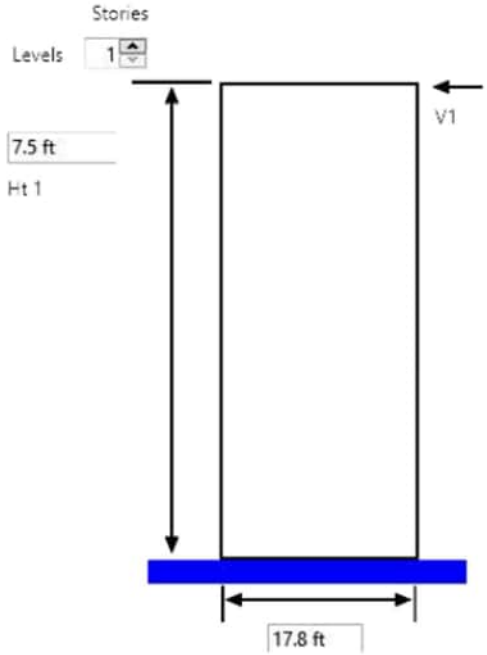
951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: LB-8
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

LFRS Shearwall Summary Report



Load Inputs (All Loads are Unfactored LRFD Forces)

Top of Level Shear (lb)

Level	Wind	Seismic	Aspect Ratio
1	1	500.4	0.42

Seismic Design Parameters:

Seismic Design Category = C S_{DS} = 1.27 Ie = 1

Level	Overstrength Factor, Ω_0	Defl Amplification Factor, Cd
1	1.25	1.25

Additional Applied Chord Axial Loads (lb) - Unfactored

Level	D	L	Lr	S	W
1	0	0	0	0	0

Additional Applied Chord Moments (ft-lb) - Unfactored

Level	D	L	Lr	S	W	E
1	0	0	0	0	0	0

Total and Unit Shear Forces

	Wind Shear Forces		Seismic Shear Forces	
Level	Vu, Total (lb)	vu, per ft (lb/ft)	Vu, Total (lb)	vu, per ft (lb/ft)
1	1	0.	500.4	28.

Shear Wall Sheathing and Fastener Selection

Level	Sheathing	Fastener Size	Edge/Field Fastener Spac (in)	Framing Thickness (mils)	Max Framing Spac (in)	One or Two Sides
1	15/32" Structural 1 Sheathing (4-ply)	No. 10	6/12	68	24	1

Shear Strength Modification Factors

	Wind	Seismic
Level	Modifiers	Modifiers

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

LFRS Shearwall Summary Report

1	None	None

Available Shear Strength and Shear Ratios

	Wind			Seismic		
Level	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn	Aspect Ratio Factor	Available Shear Strength, ϕvn (lb/ft)	Shear Ratio vu/ϕvn
1	1	692	0	1	534	0.053

Chords

				Bracing (in)					
Level	Section	Fy (ksi)	Configuration	Flexural	Axial KyLy	Axial KtLt	Flex Kϕ (lb-in/in)	Axial Kϕ (lb-in/in)	Bracing, Lm (in)
1	400S250-68	50	Single	60	60	60	0	0	None

Load Combinations IBC 2018 LRFD

LC1 = 1.4D
LC2 = 1.2D + 1.6L + 0.5(Lr or S)
LC3 = 1.2D + 1.6(Lr or S) + (L or 0.5W)
LC4 = 1.2D + 1.0W + L + 0.5(Lr or S)
LC6 = 1.2D + 1.0E + L + 0.2S
LCO6 = (1.2+0.2Sds)D + Ω_oQe + L + 0.2S Note: LCO6 based on the lower of Overstrength or Expected Strength

Factored Chord Compression, Pu (lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	211	264

Factored Chord Strong-Axis Bending, Mux (ft-lb)

Level	LC1	LC2	LC3	LC4	LC6	LCO6
1	0	0	0	0	0	0

	Minimum	Minimum	Interactions					
Level	ϕMnx (ft-lb)	ϕPn (lb)	LC1	LC2	LC3	LC4	LC6	LCO6
1	2838	11882	0	0	0	0	0.018	0.022

Ties and Holdowns

Level	Holdown	Quantity	Config	Exposed Rod Length (in)	Holdown Capacity Φ Tn (lb/Each)	Holdown Disp at Φ Tn (in)	Holdown height (in)	Rod Dia. (in)
1	HTT4-33	2	Base	4	4770	0.187	12.375	0.625

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1130 N Kraemer Blvd #I, Anaheim, CA 92806
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Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: LB-8
Code: 2012 NASPEC [AISI S100-2012]
AISI S400-15/S1-16 AISI S240-15

Date: 04/02/2024
Cold Formed Steel

LFRS Shearwall Summary Report

Level	Holdown Offset from End of Shear Wall (in)
1	0.0

Load Combinations (IBC 2018 LRFD)

LC5 = 0.9D + 1.0W
LC7 = (0.9-0.2Sds)D + 1.0E
LCO7 = (0.9-0.2Sds)D + Ω_oQe Note: LCO7 based on the lower of Overstrength or Expected Strength

Factored Net Uplift (lb)
(Negative values represent uplift, Positive values indicate no net uplift)

Shear Forces (lb)

Level	LC5	LC7	LCO7	Wind	Seismic	Seismic w/Overstrength
1	0	-211	-264	1	500	626

Ratio (Factored Net Uplift)/(Holdown Capacity)

Level	LC5	LC7	LCO7
1	0	0.022	0.028

Displacement

Level	Floor-Floor Relative Displacement (in)			Drift %		
	Wind	Seismic	Seismic, Cd	Wind	Seismic	Seismic, Cd
1	0	0	0	0	0	0

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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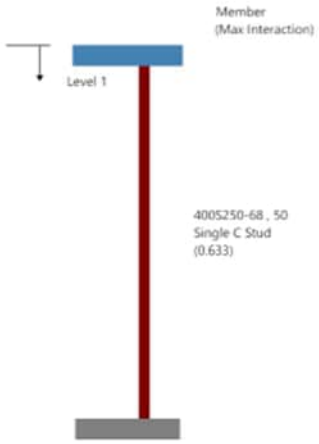
Project Name: HORIZONS CONSTRUCTION STRUCT ANALYSIS
Model: LB-1
Code: 2012 NASPEC [AISI S100-2012]

Date: 04/02/2024
Cold Formed Steel



Stacked Wall Summary Report

Interior Model Inputs

Level	Wall Height (ft)	Stud Spacing (in)	Supported Member Tributary Length (ft) Side A	Side B	Gravity Load Ecc. (Ea Side) (in)
1	7.5	16	7.99	4.32	None

		Side A		Side B				
Level	Wall D (psf)	Roof or Floor D (psf)	Floor or Roof L or Lr (psf)	Roof or Floor D (psf)	Floor or Roof L or Lr (psf)	Lateral Live Load (psf)	Seismic Coefficient Eh/D	Seismic Coefficient Ev/D
1	12	80	80	80	80	5	0.3	0.14

Live Load Reduction

	Case AB		Case A		Case B	
Level	AT (ft^2)	Reduction Factor	AT (ft^2)	Reduction Factor	AT (ft^2)	Reduction Factor

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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1	16.41	1.000	10.65	1.000	5.76	1.000

Load Combinations

LC Number	D	L	Max Roof (Lr or S)	S	MWFRS Windward (W)	MWFRS Leeward (W)	C&C Windward (W)	C&C Leeward (W)	Roof Uplift (W)	Seismic (Eh or Ev)
1	1	1	0	0	0	0	0	0	0	0
2	1	0	1	0	0	0	0	0	0	0
3	1	0.75	0.75	0	0	0	0	0	0	0
4	1	0.75	0.75	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	1
8	1	0.75	0	0.75	0	0	0	0	0	0.75
9	0.6	0	0	0	0	0	0	0	1	0
10	0.6	0	0	0	0	0	0	0	1	0

Member Selection

Level	Section	Fy (ksi)	Configuration	Ma-Fy (ft-lb)	Ma-Dist (ft-lb)	Ma-Brc (ft-lb)	Axial Pa (lb)	Axial Pa-Dist (lb)
1	400S250-68	50	Single	1933	2064	1675	4358	14859

	Bending and Axial Interactions				Shear and Web Crippling					
Level	Control LC	M(LC) (ft-lb)	P(LC) (lb)	Max Int'xn	Rmax (lb)	Control LC	Va (lb)	Rmax/Va	Pa (lb)	Stiffener Req'd
1	1-AB	47	2626	0.633	32	8-A	4871	0.007	953	No

Deflection

Level	D(Unif) (in)	L/	Control LC	D(Total) (in)	L/	Control LC
1	0.011	L/8084	8	0.011	L/8084	8-A

Notes:

Case AB is for Live Load Side A and Side B at all levels.
Case A is for Live Load on Side A at given level and Side A & Side B for all levels above.
Case B is for Live Load on Side B at given level, and Side A & Side B at all levels above.

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REVIEW BY: MOSTAFA BAYOUMI, P.E.

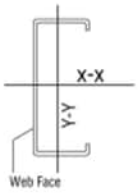
Project Name: 1. Floor Joists_Short Spans
Model: Floor Joists_Short Spans
Code: 2012 NASPEC [AISI S100-2012]

Page 1 of 1

Section Designation : 1200S162-68 (50 ksi) Single C Stud

INPUT PROPERTIES :

Web Height =	12.0000 in	Steel Thickness =	0.0713 in
Top Flange =	1.6250 in	Inside Corner Radius =	0.1070 in
Bottom Flange =	1.6250 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	0.5000 in	Fy With Cold-Work, Fya =	50.0000 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.6178 in
Moment of Inertia for Deflection (Ixx)	18.3901 in^4
Section Modulus (Sxx)	2.6451 in^3
Allowable Bending Moment (Ma)	6599.49 ft-lb
Allowable Distortional Buckling Moment (Mda) at Kϕ = 0	5511.50 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.0000 in
Moment of Inertia (Ixxg)	19.5178 in^4
Section modules (Sxxg)	3.2530 in^3
Cross Sectional Area (Ag)	1.1208 in^2
Radius of Gyration (Rxg)	4.1730 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	19.4978 in^4
Section Modules (Sxx-net)	3.2496 in^3
Cross Sectional Area (Anet)	1.0139 in^2

Section Properties, Weak Axis

Gross Neutral Axis (Xcg) From Web Face	0.2689 in
Gross Moment of Inertia (Iyy)	0.2553 in^4
Radius of Gyration (Ry)	0.4773 in

Other Section Property Data

Member Weight per Foot of Length	3.8140 lb/ft
Allowable Shear Force In Web (Unpunched)	2770.75 lb
Allowable Shear Force In Web (Punched)	2770.75 lb
Pao for use in Interaction Equation C5-2	12150 lb

Torsional Properties

Dist. from Shear Center to Neutral Axis (Xo)	-0.7185 in
St. Venant torsion Constant (J x 1000)	1.8993 in^4
Warping Constant (Cw)	7.7388 in^6
Radii of Gyration (Ro)	4.2612 in^6
Torsional Flexural Constant (Beta)	0.9716

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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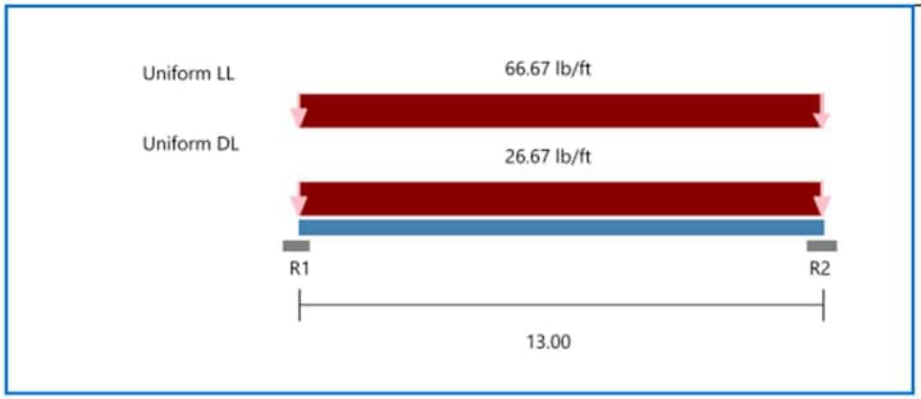
Project Name: 1. Floor Joists_Short Spans
Model: Floor Joists_Short Spans
Code: 2012 NASPEC [AISI S100-2012]



Section : 1200S162-68 (50 ksi) @ 16 in" o.c. Single C Stud (punched)
Maxo = 6599.5 ft-lb **Va** = 2770.7 lb **I** = 18.390 in^4

Deflection Limits: Total Load - 240 Live Load - 360

Load Comb:
1. DL + LL All spans
2. DL + LL Even spans
3. DL + LL Odd spans
4. LL All spans
5. LL Even spans
6. LL Odd spans

Joist Flexural and Deflection

	Mmax (ft-lb)	K-phi (lb-in/in)	Lm (in)	Ma-dist (ft-lb)	Mmax/ Ma min	Load Comb.	TL Defl	Load Comb.	LL Defl	Load Comb.
Span	1972	0.0	156.0	5511.5	0.358	1	L/1411	1	L/1975	4

Joist Bending and Web Crippling

Support	Load (lb)	Load Comb.	Bearing (in)	Pa (lb)	Pn (lb)	Max Intr.	Load Comb.	Stiffeners Required
R1	606.7	1	1.00	828.0	1449.1	0.38	1	NO
R2	606.7	1	1.00	828.0	1449.1	0.38	1	NO

Joist Bending and Shear

Support	Vmax (lb)	Load Comb.	Va Factor	V/Va	M/Ma	Intr. Unstiffened	Load Comb.	Intr. Stiffened	Load Comb.
R1	606.7	1	1.000	0.22	0.00	0.22	1	N/A	N/A
R2	606.7	1	1.000	0.22	0.00	0.22	1	N/A	N/A

Joist Reaction and Connections

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	606.7	SSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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Project Name: 1. Floor Joists_Short Spans
Model: Floor Joists_Short Spans
Code: 2012 NASPEC [AISI S100-2012]

R2	0.0	606.7	MSSC6.25 Max (7#10) & (6) #10 to Carrying (18/33) (Side Attached)	44.44 %	84.26 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

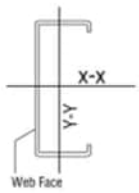
FLOOR JOISTS (LONG SPAN)

Project Name: 2. Floor Joists_Long Spans
Model: Floor Joist –Long Span
Code: 2012 NASPEC [AISI S100-2012]

Section Designation : 1200S200-97 (50 ksi) Single C Stud

INPUT PROPERTIES :

Web Height =	12.0000 in	Steel Thickness =	0.1017 in
Top Flange =	2.0000 in	Inside Corner Radius =	0.1526 in
Bottom Flange =	2.0000 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	0.6250 in	Fy With Cold-Work, Fya =	50.0000 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.2605 in
Moment of Inertia for Deflection (Ixx)	30.1748 in^4
Section Modulus (Sxx)	4.6597 in^3
Allowable Bending Moment (Ma)	11626.12 ft-lb
Allowable Distortional Buckling Moment (Mda) at Kϕ = 0	10572.09 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.0000 in
Moment of Inertia (Ixxg)	30.4168 in^4
Section modules (Sxxg)	5.0695 in^3
Cross Sectional Area (Ag)	1.6774 in^2
Radius of Gyration (Rxg)	4.2583 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	30.3882 in^4
Section Modules (Sxx-net)	5.0647 in^3
Cross Sectional Area (Anet)	1.5249 in^2

Section Properties, Weak Axis

Gross Neutral Axis (Xcg) From Web Face	0.3814 in
Gross Moment of Inertia (Iyy)	0.6347 in^4
Radius of Gyration (Ry)	0.6151 in

Other Section Property Data

Member Weight per Foot of Length	5.7080 lb/ft
Allowable Shear Force In Web (Unpunched)	8147.00 lb
Allowable Shear Force In Web (Punched)	7411.12 lb
Pao for use in Interaction Equation C5-2	22242 lb

Torsional Properties

Dist. from Shear Center to Neutral Axis (Xo)	-0.9867 in
St. Venant torsion Constant (J x 1000)	5.7832 in^4
Warping Constant (Cw)	19.1497 in^6
Radii of Gyration (Ro)	4.4142 in^6
Torsional Flexural Constant (Beta)	0.9500

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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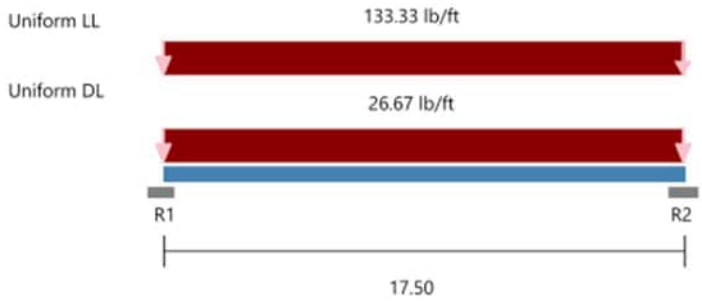
Project Name: 2. Floor Joists_Long Spans
Model: Floor Joist –Long Span
Code: 2012 NASPEC [AISI S100-2012]



Section : 1200S200-97 (50 ksi) @ 16 in" o.c. Single C Stud (punched)
Maxo = 11626.1 ft-lb **Va** = 8147.0 lb **I** = 30.175 in^4

Deflection Limits: Total Load - 240 Live Load - 360

Load Comb:
1. DL + LL All spans
2. DL + LL Even spans
3. DL + LL Odd spans
4. LL All spans
5. LL Even spans
6. LL Odd spans

Joist Flexural and Deflection

	Mmax (ft-lb)	K-phi (lb-in/in)	Lm (in)	Ma-dist (ft-lb)	Mmax/ Ma min	Load Comb.	TL Defl	Load Comb.	LL Defl	Load Comb.
Span	6125	0.0	210.0	10572.1	0.579	1	L/554	1	L/664	4

Joist Bending and Web Crippling

Support	Load (lb)	Load Comb.	Bearing (in)	Pa (lb)	Pn (lb)	Max Intr.	Load Comb.	Stiffeners Required
R1	1400.0	1	1.00	1617.5	2830.6	0.45	1	NO
R2	1400.0	1	1.00	1617.5	2830.6	0.45	1	NO

Joist Bending and Shear

Support	Vmax (lb)	Load Comb.	Va Factor	V/Va	M/Ma	Intr. Unstiffened	Load Comb.	Intr. Stiffened	Load Comb.
R1	1400.0	1	1.000	0.17	0.00	0.17	1	N/A	N/A
R2	1400.0	1	1.000	0.17	0.00	0.17	1	N/A	N/A

Joist Reaction and Connections

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	1400.0	SSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %

951-903-2284
714-844-2140
www.accandengineering.com
Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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Project Name: 2. Floor Joists_Long Spans
Model: Floor Joist –Long Span
Code: 2012 NASPEC [AISI S100-2012]

R2	0.0	1400.0	SSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

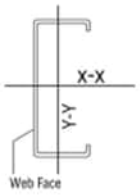
FLOOR JOISTS (SHORT SPAN AT LOBBY)

Project Name: 3. Floor Joists_Lobby_Short Span
Model: Floor Joist –Lobby_Short Span
Code: 2012 NASPEC [AISI S100-2012]

Section Designation : 1200S200-97 (50 ksi) Single C Stud

INPUT PROPERTIES :

Web Height =	12.0000 in	Steel Thickness =	0.1017 in
Top Flange =	2.0000 in	Inside Corner Radius =	0.1526 in
Bottom Flange =	2.0000 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	0.6250 in	Fy With Cold-Work, Fya =	50.0000 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.2605 in
Moment of Inertia for Deflection (Ixx)	30.1748 in^4
Section Modulus (Sxx)	4.6597 in^3
Allowable Bending Moment (Ma)	11626.12 ft-lb
Allowable Distortional Buckling Moment (Mda) at Kϕ = 0	10572.09 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.0000 in
Moment of Inertia (Ixxg)	30.4168 in^4
Section modules (Sxxg)	5.0695 in^3
Cross Sectional Area (Ag)	1.6774 in^2
Radius of Gyration (Rxg)	4.2583 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	30.3882 in^4
Section Modules (Sxx-net)	5.0647 in^3
Cross Sectional Area (Anet)	1.5249 in^2

Section Properties, Weak Axis

Gross Neutral Axis (Xcg) From Web Face	0.3814 in
Gross Moment of Inertia (Iyy)	0.6347 in^4
Radius of Gyration (Ry)	0.6151 in

Other Section Property Data

Member Weight per Foot of Length	5.7080 lb/ft
Allowable Shear Force In Web (Unpunched)	8147.00 lb
Allowable Shear Force In Web (Punched)	7411.12 lb
Pao for use in Interaction Equation C5-2	22242 lb

Torsional Properties

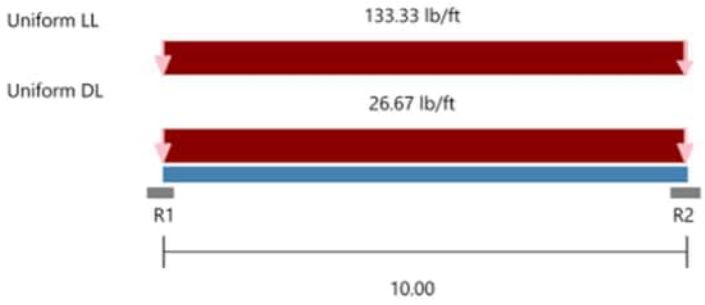
Dist. from Shear Center to Neutral Axis (Xo)	-0.9867 in
St. Venant torsion Constant (J x 1000)	5.7832 in^4
Warping Constant (Cw)	19.1497 in^6
Radii of Gyration (Ro)	4.4142 in^6
Torsional Flexural Constant (Beta)	0.9500

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: 3. Floor Joists_Lobby_Short Span
Model: Floor Joist –Lobby_Short Span
Code: 2012 NASPEC [AISI S100-2012]



Section : 1200S200-97 (50 ksi) @ 16 in" o.c. Single C Stud (punched)
Maxo = 11626.1 ft-lb **Va** = 8147.0 lb **I** = 30.175 in^4

Deflection Limits: Total Load - 240 Live Load - 360

Load Comb:
1. DL + LL All spans
2. DL + LL Even spans
3. DL + LL Odd spans
4. LL All spans
5. LL Even spans
6. LL Odd spans

Joist Flexural and Deflection

	Mmax (ft-lb)	K-phi (lb-in/in)	Lm (in)	Ma-dist (ft-lb)	Mmax/ Ma min	Load Comb.	TL Defl	Load Comb.	LL Defl	Load Comb.
Span	2000	0.0	120.0	10572.1	0.189	1	L/2967	1	L/3561	4

Joist Bending and Web Crippling

Support	Load (lb)	Load Comb.	Bearing (in)	Pa (lb)	Pn (lb)	Max Intr.	Load Comb.	Stiffeners Required
R1	800.0	1	1.00	1617.5	2830.6	0.26	1	NO
R2	800.0	1	1.00	1617.5	2830.6	0.26	1	NO

Joist Bending and Shear

Support	Vmax (lb)	Load Comb.	Va Factor	V/Va	M/Ma	Intr. Unstiffened	Load Comb.	Intr. Stiffened	Load Comb.
R1	800.0	1	1.000	0.10	0.00	0.10	1	N/A	N/A
R2	800.0	1	1.000	0.10	0.00	0.10	1	N/A	N/A

Joist Reaction and Connections

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	800.0	SSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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Project Name: 3. Floor Joists_Lobby_Short Span
Model: Floor Joist –Lobby_Short Span
Code: 2012 NASPEC [AISI S100-2012]

R2	0.0	800.0	MSSC6.25 Max (7#10) & (6) #10 to Carrying (16/50) (Side Attached)	58.61 %	58.61 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

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951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
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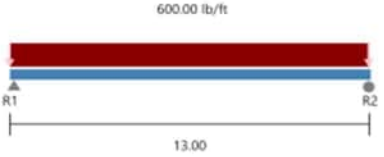
BEAM - 1

Project Name: 4. BM#1
Model: BM#1
Code: 2012 NASPEC [AISI S100-2012]

Date: 08/07/2022

Section: (2) 1200S300-118 (50 ksi) Boxed C Stud (punched)
Maxo = 40610.8 ft-lb **Va =** 29971.1 lb **I =** 89.45 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations



Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	Full, N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	3900.0	1.00	4707.9	0.0	0.43	NO
R2	3900.0	1.00	4707.9	0.0	0.43	NO

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	3900.0	22073.4	18%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	12675.0	40610.8	31%	
	Moment Stability, ft-lbs	12675.0	40610.8	31%	
	Shear/Moment	0.31	1.00	31%	Shear 0.0, Moment 12675.0
	Axial/Moment	0.31	1.00	31%	Axial 0.0(c), Moment 12675.0
	Deflection Span, in	0.146	--meets L/1068--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	3900.0	MSSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %
R2	0.0	3900.0	S/B (3)#14 Joist & (8)#10 top,(4)#14 face to 12ga header	65.33 %	65.33 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

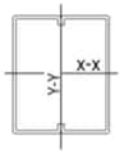
BEAM - 2

Project Name: 5. BM#2
Model: BM#2
Code: 2012 NASPEC [AISI S100-2012]

Section Designation : (2) 1200S350-118 (50 ksi) Boxed C Stud

INPUT PROPERTIES :

Web Height =	12.0000 in	Steel Thickness =	0.1242 in
Top Flange =	3.5000 in	Inside Corner Radius =	0.1863 in
Bottom Flange =	3.5000 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	1.0000 in	Fy With Cold-Work, Fya =	55.4133 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.1145 in
Moment of Inertia for Deflection (Ixx)	103.9850 in^4
Section Modulus (Sxx)	16.5192 in^3
Allowable Bending Moment (Ma)	45677.78 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	6.0000 in
Moment of Inertia (Ixxg)	103.9850 in^4
Section modules (Sxxg)	17.3308 in^3
Cross Sectional Area (Ag)	2.4935 in^2
Radius of Gyration (Rxg)	4.5663 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	103.9500 in^4
Section Modules (Sxx-net)	17.3250 in^3
Cross Sectional Area (Anet)	2.1209 in^2

Section Properties, Weak Axis

Gross Moment of Inertia (Iyy)	40.9538 in^4
Radius of Gyration (Ry)	2.8657 in

Other Section Property Data

Member Weight per Foot of Length	16.9699 lb/ft
Allowable Shear Force In Web (Unpunched)	29971.08 lb
Allowable Shear Force In Web (Punched)	22073.44 lb
Pao for use in Interaction Equation C5-2	78947 lb

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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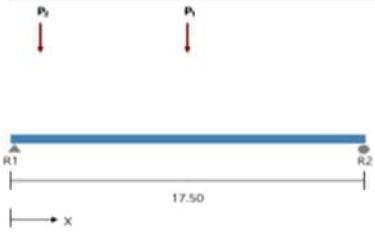
Project Name: 5. BM#2
Model: BM#2
Code: 2012 NASPEC [AISI S100-2012]



Section: (2) 1200S350-118 (50 ksi) Boxed C Stud (punched)
Maxo = 45677.8 ft-lb **Va =** 29971.1 lb **I =** 103.98 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	Mid-Pt, N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	3870.0	1.00	4321.1	0.0	0.47	NO
R2	2130.0	1.00	4707.9	0.0	0.24	NO
P1	3900.0	3.50	15500.2	18637.5	0.38	NO
P2	2100.0	6.00	5912.0	5813.9	0.26	NO

Point Loads	P1	P2
Load(lb)	3900.00	2100.00
X-Dist.(ft)	8.75	1.50

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	3870.0	22073.4	18%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	18637.5	45677.8	41%	
	Moment Stability, ft-lbs	18637.5	45677.8	41%	
	Shear/Moment	0.42	1.00	42%	Shear 2130.0, Moment 18637.5
	Axial/Moment	0.41	1.00	41%	Axial 0.0(c), Moment 18637.5
	Deflection Span, in	0.279	--meets L/753--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	3870.0	MSSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %
R2	0.0	2130.0	MSSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

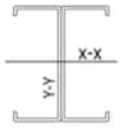
COLOUMN DESIGN

Project Name: 6. Column
Model: Column
Code: 2012 NASPEC [AISI S100-2012]

Section Designation : **(2) 400S250-68 (50 ksi) Back-To-Back C Stud**

INPUT PROPERTIES :

Web Height =	4.0000 in	Steel Thickness =	0.0713 in
Top Flange =	2.5000 in	Inside Corner Radius =	0.1070 in
Bottom Flange =	2.5000 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	0.6250 in	Fy With Cold-Work, Fya =	50.0000 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	2.1710 in
Moment of Inertia for Deflection (Ixx)	3.7287 in^4
Section Modulus (Sxx)	1.5494 in^3
Allowable Bending Moment (Ma)	3865.75 ft-lb
Allowable Distortional Buckling Moment (Mda) at Kϕ = 0	4127.12 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	2.0000 in
Moment of Inertia (Ixxg)	3.7287 in^4
Section modules (Sxxg)	1.8643 in^3
Cross Sectional Area (Ag)	1.3861 in^2
Radius of Gyration (Rxg)	1.6402 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	3.7086 in^4
Section Modules (Sxx-net)	1.8543 in^3
Cross Sectional Area (Anet)	1.1722 in^2

Section Properties, Weak Axis

Gross Moment of Inertia (Iyy)	2.3360 in^4
Radius of Gyration (Ry)	1.2982 in

Other Section Property Data

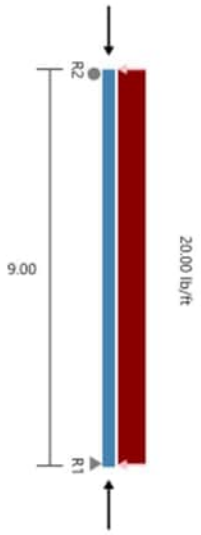
Member Weight per Foot of Length	9.4330 lb/ft
Allowable Shear Force In Web (Unpunched)	9741.81 lb
Allowable Shear Force In Web (Punched)	2711.75 lb
Pao for use in Interaction Equation C5-2	25747 lb

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: 6. Column
Model: Column
Code: 2012 NASPEC [AISI S100-2012]



Section: (2) 400S250-68 (50 ksi) Back-To-Back C Stud (punched)
Maxo = 3865.7 ft-lb **Va =** 9741.8 lb **I =** 3.73 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	None, None	None, 108.0"	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R2	90.0	--Slip Track Design, Ref Connectors--				NO
R1	90.0	--Stud/Track Design, Ref Connectors--				NO

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	3870.0(c)	18528.3(c)	21%	KΦ=0.00 lb-in/in Max KL/r = 84
	Max. Shear, lbs	90.0	2711.8	3%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	202.5	3865.7	5%	MaFy (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	202.5	3609.9	6%	
	Shear/Moment	0.05	1.00	5%	Shear 0.0, Moment 202.5
	Axial/Moment	0.27	1.00	27%	Axial 3870.0(c), Moment 202.5
	Deflection Span, in	0.027	--meets L/4024--		
	L/6 interconnection spacing (S100 D1.1), in	18			See S100 D1.1 for add'nl Req'mts

Simpson Strong-Tie® Connectors

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie® Connector	Connector Interaction	Anchor Interaction
R2	90	0	400SLT250-33 (33) & (1) .157" SST PDPA/PDPAT-62KP to steel (3/16" to 1/2" thickness)	60.00 %	55.00 %
R1	90	3870	400T125-33 (33) & (1) .157" SST PDPA/PDPAT-62KP to steel (3/16" to 1/2" thickness)	13.08 %	40.87 %

* Reference catalog for connector and anchor requirement notes as well as screw placements requirement

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

BEARING WALLS

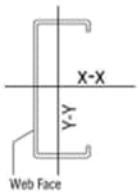
Project Name: 7. Bearing Walls
Model: Bearing Walls
Code: 2012 NASPEC [AISI S100-2012]

Date: 08/07/2022

Section Designation : 400S200-54 (33 ksi) Single C Stud

INPUT PROPERTIES :

Web Height =	4.0000 in	Steel Thickness =	0.0566 in
Top Flange =	2.0000 in	Inside Corner Radius =	0.0849 in
Bottom Flange =	2.0000 in	Yield Stress, Fy =	33.0000 ksi
Stiffening Lip =	0.6250 in	Fy With Cold-Work, Fya =	33.0000 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	2.0312 in
Moment of Inertia for Deflection (Ixx)	1.2920 in^4
Section Modulus (Sxx)	0.6226 in^3
Allowable Bending Moment (Ma)	1025.26 ft-lb
Allowable Distortional Buckling Moment (Mda) at Kϕ = 0	1063.78 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	2.0000 in
Moment of Inertia (Ixxg)	1.2920 in^4
Section modules (Sxxg)	0.6460 in^3
Cross Sectional Area (Ag)	0.4997 in^2
Radius of Gyration (Rxg)	1.6079 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	1.2761 in^4
Section Modules (Sxx-net)	0.6380 in^3
Cross Sectional Area (Anet)	0.4148 in^2

Section Properties, Weak Axis

Gross Neutral Axis (Xcg) From Web Face	0.6973 in
Gross Moment of Inertia (Iyy)	0.2872 in^4
Radius of Gyration (Ry)	0.7580 in

Other Section Property Data

Member Weight per Foot of Length	1.7005 lb/ft
Allowable Shear Force In Web (Unpunched)	2603.48 lb
Allowable Shear Force In Web (Punched)	944.23 lb
Pao for use in Interaction Equation C5-2	7036 lb

Torsional Properties

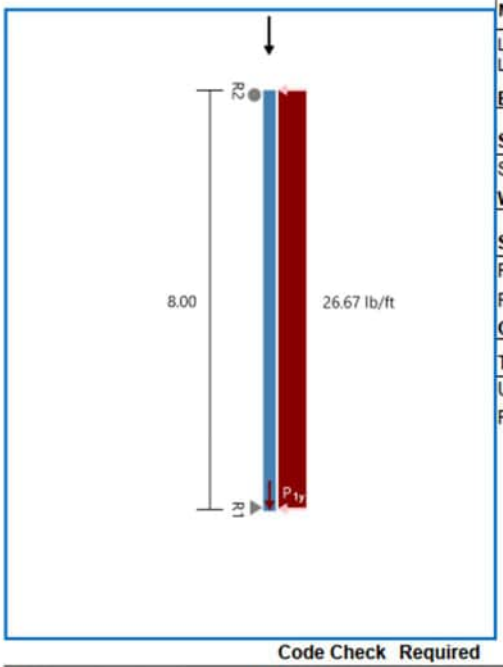
Dist. from Shear Center to Neutral Axis (Xo)	-1.6617 in
St. Venant torsion Constant (J x 1000)	0.5336 in^4
Warping Constant (Cw)	1.0829 in^6
Radii of Gyration (Ro)	2.4334 in^6
Torsional Flexural Constant (Beta)	0.5337

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

Project Name: 7. Bearing Walls
Model: Bearing Walls
Code: 2012 NASPEC [AISI S100-2012]



Section : 400S200-54 (33 ksi) @ 16" o.c. Single C Stud (punched)
Maxo = 1025.3 ft-lb **Va =** 2603.5 lb **I =** 1.29 in^4

Loads have not been modified for strength checks
Loads have been multiplied by 0.70 for deflection calculations

Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	None, None	None, 96.0"	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R2	106.7	--Slip Track Design, Ref Connectors--				NO
R1	106.7	--Stud/Track Design, Ref Connectors--				NO

Gravity Load

Type	Load (lb)
Uniform	20.00plf
P1y	1440.00lb @ 0.00ft

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	1600.0(c)	2534.3(c)	63%	KΦ=0.00 lb-in/in Max KL/r = 127
	Max. Shear, lbs	106.7	944.2	11%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	213.3	1025.3	21%	MaFy (control),KΦ=0.00 lb-in/in
	Moment Stability, ft-lbs	213.3	834.8	26%	
	Shear/Moment	0.21	1.00	21%	Shear 0.0, Moment 213.3
	Axial/Moment	0.63	1.00	63%	Axial 1600.0(c), Moment 0.0
	Deflection Span, in	0.045	--meets L/2127--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R2	106.7	0.0	400T250-54 (50) & (1) .157" SST PDPA/PDPAT-62KP to steel (3/16" to 1/2" thickness)	44.48 %	46.53 %
R1	106.7	1600.0	400T150-54 (50) & (1) .157" SST PDPA/PDPAT-62KP to steel (3/16" to 1/2" thickness)	15.37 %	26.02 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

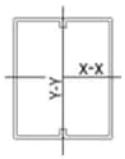
HEADER DESIGN

Project Name: 8. Header
Model: Header
Code: 2012 NASPEC [AISI S100-2012]

Section Designation : (2) 600S200-68 (50 ksi) Boxed C Stud

INPUT PROPERTIES :

Web Height =	6.0000 in	Steel Thickness =	0.0713 in
Top Flange =	2.0000 in	Inside Corner Radius =	0.1070 in
Bottom Flange =	2.0000 in	Yield Stress, Fy =	50.0000 ksi
Stiffening Lip =	0.6250 in	Fy With Cold-Work, Fya =	55.4372 ksi
Punchout Width =	1.5000 in	Punchout Length =	4.0000 in



OUTPUT PROPERTIES :

Effective Section Properties, Strong Axis

Neutral Axis from Top Fiber (Ycg)	3.0469 in
Moment of Inertia for Deflection (Ixx)	8.2010 in^4
Section Modulus (Sxx)	2.6334 in^3
Allowable Bending Moment (Ma)	7284.82 ft-lb

Gross Section Properties of Full Section, Strong Axis

Neutral Axis from Top Fiber (Ycg)	3.0000 in
Moment of Inertia (Ixxg)	8.2010 in^4
Section modules (Sxxg)	2.7337 in^3
Cross Sectional Area (Ag)	0.7643 in^2
Radius of Gyration (Rxg)	2.3162 in

Net Section Properties of the Punched Section, Strong Axis

Moment of Inertia (Ixx-net)	8.1810 in^4
Section Modules (Sxx-net)	2.7270 in^3
Cross Sectional Area (Anet)	0.5504 in^2

Section Properties, Weak Axis

Gross Moment of Inertia (Iyy)	3.9139 in^4
Radius of Gyration (Ry)	1.6001 in

Other Section Property Data

Member Weight per Foot of Length	5.2017 lb/ft
Allowable Shear Force In Web (Unpunched)	10700.57 lb
Allowable Shear Force In Web (Punched)	5757.86 lb
Pao for use in Interaction Equation C5-2	26715 lb

Location (1) and (6) are tip of compression and tension lip respectively
Location (2) and (5) are flange/lip corner of compression and tension side respectively
Location (3) and (4) are flange/web corner of compression and tension side respectively

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

951-903-2284 www.accandengineering.com
714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

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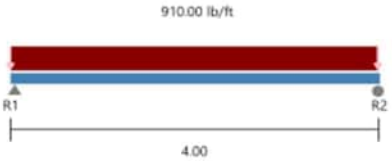
Project Name: 8. Header
Model: Header
Code: 2012 NASPEC [AISI S100-2012]

Section: (2) 600S200-68 (50 ksi) Boxed C Stud (punched)
Maxo = 7284.8 ft-lb **Va =** 10700.6 lb **I =** 8.20 in^4

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations



Bridging Connectors - Design Method =AISI S100

Span	Axial KyLy, KtLt	Flexual, Distortional	Connector	Stress Ratio
Span	NA	Full, N/A	N/A	-

Web Crippling

Support	Load (lb)	Bearing (in)	Pa (lb)	M (ft-lbs)	Max Int.	Stiffener?
R1	1820.0	1.00	1828.8	0.0	0.52	NO
R2	1820.0	1.00	1828.8	0.0	0.52	NO

	Code Check	Required	Allowed	Interaction	Notes
Span	Max. Axial, lbs	0.0(t)	-	0%	KΦ=0.00 lb-in/in Max KL/r = N/A
	Max. Shear, lbs	1820.0	5757.9	32%	Shear (Punched)
	Max. Moment (MaFy, Ma-dist), ft-lbs	1820.0	7284.8	25%	
	Moment Stability, ft-lbs	1820.0	7284.8	25%	
	Shear/Moment	0.32	1.00	32%	Shear 1820.0, Moment 0.0
	Axial/Moment	0.25	1.00	25%	Axial 0.0(c), Moment 1820.0
	Deflection Span, in	0.022	--meets L/2215--		

Support	Rx(lb)	Ry(lb)	Simpson Strong-Tie Connector	Connector Interaction	Anchor Interaction
R1	0.0	1820.0	MSSC4.25 (4#10) & (3) #10 to A36 steel (Joist Bearing on Support)	0.00 %	0.00 %
R2	0.0	1820.0	S/B (3)#14 Joist & (8)#10 top,(4)#14 face to 12ga header	30.49 %	30.49 %

* Reference catalog for connector and anchor requirement notes as well as screw placement requirements

DESIGN BY: BEN HAMED, AM.ASCE.,AIA.
REVIEW BY: MOSTAFA BAYOUMI, P.E.

ACC & ENGINEERING
Design | Engineering | Construction

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714-844-2140 Ben@accandengineering.com
1130 N Kraemer Blvd #I, Anaheim, CA 92806
DIR | PW-LR-1000801097 BPELSG | 39074 CSLB | 1073807

CONCRETE PAD

General Footing

DESCRIPTION: Concrete Pad

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2018

General Information

Material Properties

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

Analysis Settings

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

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	1.50 ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

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

Dimensions

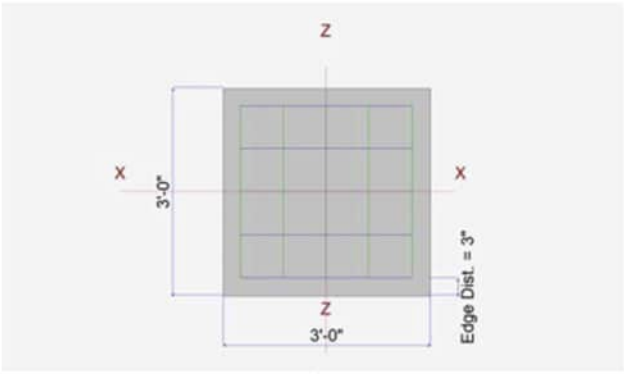
Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	18.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	0.0 in
pz : parallel to Z-Z Axis	=	0.0 in
Height	=	0.0 in

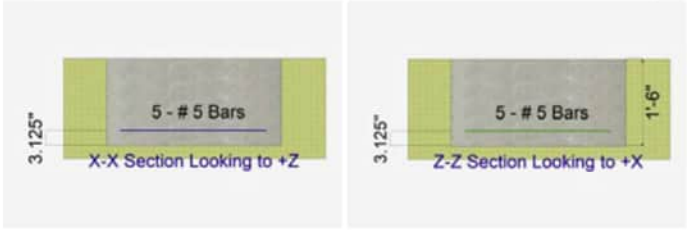
Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.125 in



Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	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	H
P : Column Load	=	0.7740	0.0	3.096	0.0	0.0	0.0	0.0 k
OB : Overburden	=	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ksf
M-xx	=	0.0	0.0	0.0	0.0	0.0	0.0	0.0 k-ft
M-zz	=	0.0	0.0	0.0	0.0	0.0	0.0	0.0 k-ft
V-x	=	0.0	0.0	0.0	0.0	0.0	0.0	0.0 k
V-z	=	0.0	0.0	0.0	0.0	0.0	0.0	0.0 k

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General Footing

DESCRIPTION: Concrete Pad

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4317	Soil Bearing	0.6475 ksf	1.50 ksf	+D+L 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	0.02217	Z Flexure (+X)	0.7353 k-ft/ft	33.171 k-ft/ft	+1.20D+1.60L
PASS	0.02217	Z Flexure (-X)	0.7353 k-ft/ft	33.171 k-ft/ft	+1.20D+1.60L
PASS	0.02217	X Flexure (+Z)	0.7353 k-ft/ft	33.171 k-ft/ft	+1.20D+1.60L
PASS	0.02217	X Flexure (-Z)	0.7353 k-ft/ft	33.171 k-ft/ft	+1.20D+1.60L
PASS	0.01318	1-way Shear (+X)	0.9886 psi	75.0 psi	+1.20D+1.60L
PASS	0.01318	1-way Shear (-X)	0.9886 psi	75.0 psi	+1.20D+1.60L
PASS	0.01318	1-way Shear (+Z)	0.9886 psi	75.0 psi	+1.20D+1.60L
PASS	0.01318	1-way Shear (-Z)	0.9886 psi	75.0 psi	+1.20D+1.60L
PASS	0.03649	2-way Punching	5.474 psi	150.0 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	1.50	n/a	0.0	0.3035	0.3035	n/a	n/a	0.202
X-X, +D+L	1.50	n/a	0.0	0.6475	0.6475	n/a	n/a	0.432
X-X, +D+0.750L	1.50	n/a	0.0	0.5615	0.5615	n/a	n/a	0.374
X-X, +0.60D	1.50	n/a	0.0	0.1821	0.1821	n/a	n/a	0.121
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.3035	0.3035	0.202
Z-Z, +D+L	1.50	0.0	n/a	n/a	n/a	0.6475	0.6475	0.432
Z-Z, +D+0.750L	1.50	0.0	n/a	n/a	n/a	0.5615	0.5615	0.374
Z-Z, +0.60D	1.50	0.0	n/a	n/a	n/a	0.1821	0.1821	0.121

Overturning Stability

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

All units k

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.1355	+Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.40D	0.1355	-Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D+1.60L	0.7353	+Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D+1.60L	0.7353	-Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D+0.50L	0.3096	+Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D+0.50L	0.3096	-Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D	0.1161	+Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +1.20D	0.1161	-Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +0.90D	0.08708	+Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
X-X, +0.90D	0.08708	-Z	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.40D	0.1355	-X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.40D	0.1355	+X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.20D+1.60L	0.7353	-X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.20D+1.60L	0.7353	+X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.20D+0.50L	0.3096	-X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.20D+0.50L	0.3096	+X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +1.20D	0.1161	-X	Bottom	0.3888	AsMin	0.5167	33.171	OK

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General Footing

ES ENGINEERING SOLUTIONS LLC

DESCRIPTION: Concrete Pad

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D	0.1161	+X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +0.90D	0.08708	-X	Bottom	0.3888	AsMin	0.5167	33.171	OK
Z-Z, +0.90D	0.08708	+X	Bottom	0.3888	AsMin	0.5167	33.171	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.18 psi	0.18 psi	0.18 psi	0.18 psi	0.18 psi	75.00 psi	0.00	OK
+1.20D+1.60L	0.99 psi	0.99 psi	0.99 psi	0.99 psi	0.99 psi	75.00 psi	0.01	OK
+1.20D+0.50L	0.42 psi	0.42 psi	0.42 psi	0.42 psi	0.42 psi	75.00 psi	0.01	OK
+1.20D	0.16 psi	0.16 psi	0.16 psi	0.16 psi	0.16 psi	75.00 psi	0.00	OK
+0.90D	0.12 psi	0.12 psi	0.12 psi	0.12 psi	0.12 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	1.01 psi	150.00 psi	0.006722	OK
+1.20D+1.60L	5.47 psi	150.00 psi	0.03649	OK
+1.20D+0.50L	2.31 psi	150.00 psi	0.01537	OK
+1.20D	0.86 psi	150.00 psi	0.005762	OK
+0.90D	0.65 psi	150.00 psi	0.004322	OK

OUT OF PLANE ANCHORAGE

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Structural Hand Calculation Sheet

Design Engineer : Ben

Project: Horizons T.I

Wall Anchorage For out of plane Force

- wall weight = 100 p.s.f
- Tributary x wall weight
  = 10 x 100 = 1000 lb/ft

(Per ASCE 12.11-2)

$W_p = 0.4\, S_{DS}\, k_a\, I\, w_p$

* S_{DS} = 1.178 * L_y = 11.25
* $k_a = 1 + \frac{L_y}{100} = 1.113$
* $I = 1$

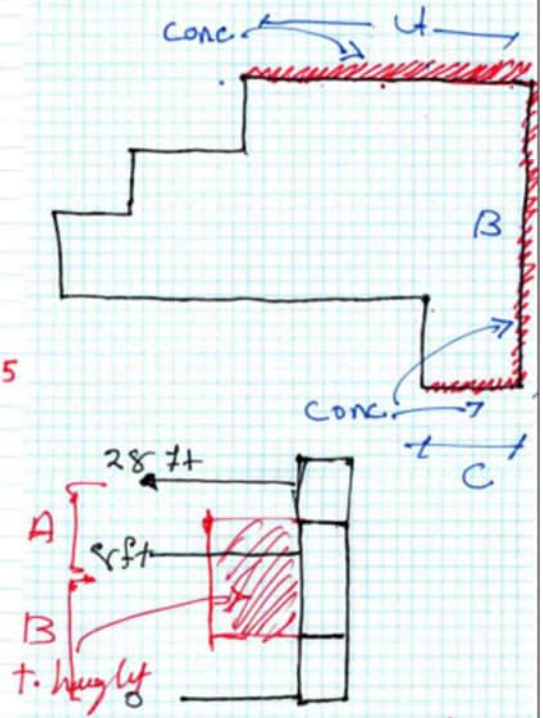
$\therefore W_p = 524.2$ lb/ft

HTT4 hold down capacity
= 4395 lbs (per data sheet)

$\therefore$ 4395 lb/ft / 524.2 lb/ft = 8.39'

$\therefore$ Max Anchor spacing is 8 feet

#



= A 1/2 + 1/2 B = 10 feet

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DATA SHEET REFERENCED ABOVE IN HAND CALCULATIONS.

Model	Dimensions (in.)			Fasteners		Stud Member Thickness mil (ga.)	ASD (lb.)		LRFD (lb.)		Nominal Tension Load[4] (lb.)	Code Ref.
	W	H	℄	Anchor Bolt Diameter[1] (in.)	Stud Fasteners[5]		Tension Load	Deflection at ASD Load[3]	Tension Load	Deflection at LRFD Load[3]		
DTT1Z	1½	7⅛	¾	⅜	(6) #10	33 (20)	905	0.156	1,270	0.250	3,485	IBC, FL, LA
S/LTT20	2	20	1½	½	(8) #10	33 (20)	1,200	0.125	1,890	0.250	4,625	
S/DTT2Z	1⅜	6¹⁵⁄₁₆	¹³⁄₁₆	½	(8) #14	33 (20)	1,570	0.138	2,200	0.250	4,265	
						43 (18)	1,685	0.151	2,355	0.250	5,570	
						2–33 (2–20)	1,735	0.153	2,430	0.250	5,735	
HTT4	2½	12⅜	1⅜	⅝	(18) #10	33 (20)	3,180	0.104	4,770	0.187	8,215	
						2–33 (2–20)	4,395	0.125	6,675	0.250	11,835	
HTT5	2½	16	1⅜	⅝	(26) #10	43 (18)	4,240	0.125	6,505	0.250	11,585	
						2–43 (2–18)	4,670	0.125	6,970	0.250	12,195	
						1–54 (1–16)	4,150	0.125	6,425	0.250	12,365	

END OF REPORT

REGARDS

DESIGN BY : BEN, HAMED, AM.ASCE,AIA
REVIEW STAMP BY : M.BAYOUMI, P.E.,ASCE.