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STRUCTURAL CALCULATION REPORT

CITY OF PLACENTIA

STRUCTURAL ANALYSIS

FOR PROJECT

(E) RESIDENTIAL TYPE (VB) CONSTRUCTION WALL REMOVAL

PROJECT ADDRESS

1914 Brookhaven Ave, Placentia, CA 92870

PER

ASCE 7-22 MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES
(E) LOAD BEARING WALL REMOVAL & INSTALLATION OF NEW STEEL SUPPORT BEAM.

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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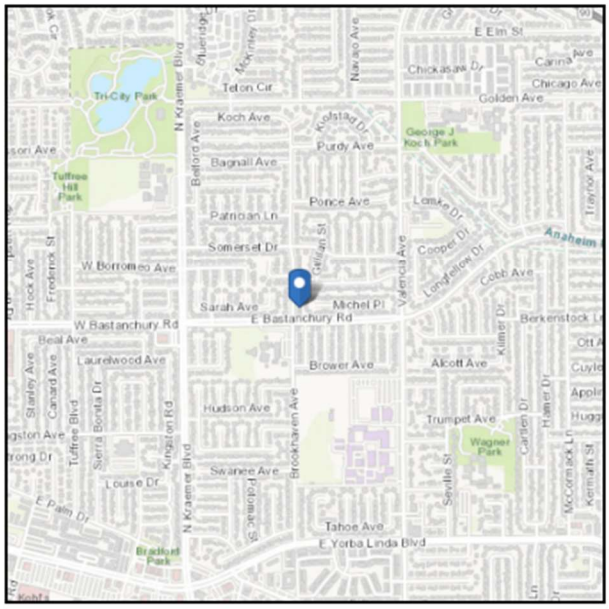
ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

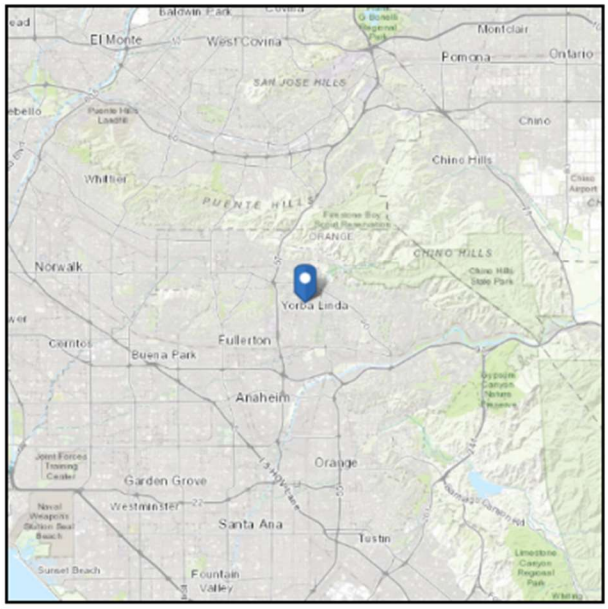
ASCE Hazards Report

Address:
1914 Brookhaven Ave
Placentia, California
92870

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

Latitude: 33.896943
Longitude: -117.859032
Elevation: 335.79396899343817 ft (NAVD 88)





Wind

Results:

Wind Speed	95 Vmph
10-year MRI	66 Vmph
25-year MRI	72 Vmph
50-year MRI	76 Vmph
100-year MRI	81 Vmph
300-year MRI	89 Vmph
700-year MRI	95 Vmph
1,700-year MRI	102 Vmph
3,000-year MRI	106 Vmph
10,000-year MRI	115 Vmph
100,000-year MRI	133 Vmph
1,000,000-year MRI	151 Vmph

Data Source: ASCE/SEI 7-22, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue May 28 2024

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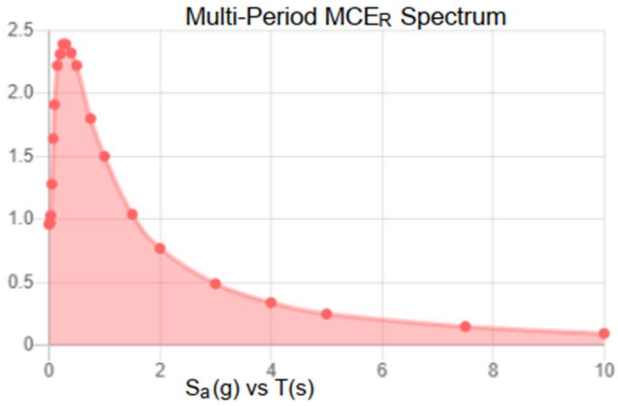
Seismic

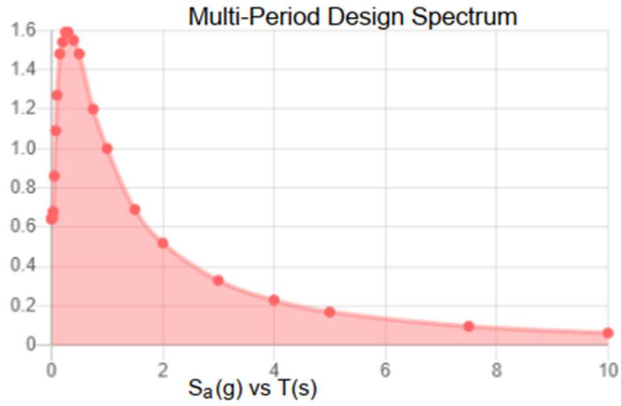
Site Soil Class: Default

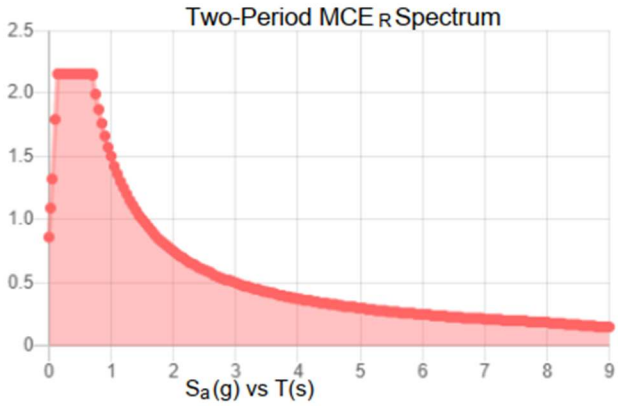
Results:

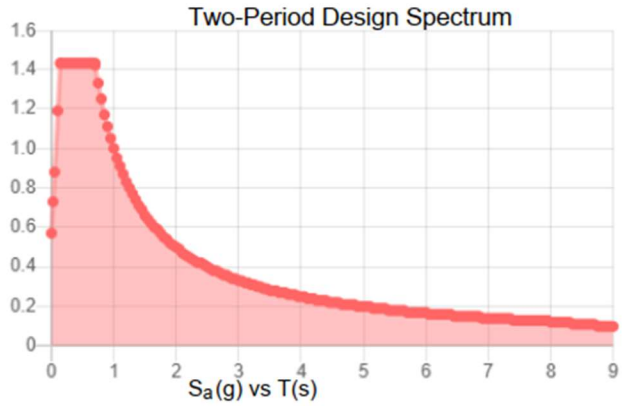
PGA_M :	0.86	T_L :	8
S_{MS} :	2.15	S_S :	2.01
S_{M1} :	1.5	S_1 :	0.7
S_{DS} :	1.43	V_{S30} :	260
S_{D1} :	1		

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 LOAD CALCULATION (ROOF)		
LOAD TPYE	DEAD LOAD	
LOAD LEVEL	ROOF	
LEVEL AREA (SQ.FT)	1,460.0	
LOUD SOURCE	LOAD **(P.S.F)**	TOTAL LOAD (LBS)
ROOFING MATERIALS (SHINGLES)	2.5	3,650.0
SHEATHING	1.8	
RAFTER AND TRUSSES	4.0	
INSULATION	1.0	
UNDERLAYMENT	0.5	
CEILING FINISHES	2.2	
MICELLANEOUS LOAD		
STRUCTURAL MEMBERS	2.0	
TOTAL DEAD LOAD (15 MIN)	15.0	3,650.0
ATTIC DEAD LOAD (IF EXIST)	15.0	
DESIGN LOAD :	30.0	

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BUILDING LOAD CALCULATION (FLOOR)		
LOAD TPYE	DEAD LOAD	
LOAD LEVEL	1ST FLOOR	
LEVEL AREA (SQ.FT)	1,460.0	
LOUD SOURCE	LOAD **(P.S.F)**	TOTAL LOAD (LBS)
CONCRETE SLAB	12.5	18,250.0
FLOOR FINISH (CARPET)	1.0	1,460.0
FLOOR FINISH (TILE)	7.0	10,220.0
HARWOOKD FLOORING	3.5	5,110.0
SUBFLOOR (PLYWOOD)	2.2	3,212.0
JOISTS & BEAMS	2.0	2,920.0
UTILITIES & DUCT WORK	2.1	3,066.0
GYPSUM BOARD	2.2	3,212.0
TOTAL DEAD LOAD	20.0	47,450.0
DESIGN LOAD :	20.0	

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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=		D	ASCE 7-22 Section 11.6
Importance Factor=	I=	1	ASCE 7-22 Section 11.5 Table 1.5-2
Response Modification Factor	R=	6.5	ASCE 7-22 Table 12.2-1 (light frame wood shear walls)
System Overstrength Factor	Ω_o=	3	ASCE 7-22 Table 12.2-1
Deflection Amplification Factor	C_d=	4	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=	2.01	ASCE 7-22 Chapter 22 ASCE 7 Hazard Report
Spectral Response Long Period	S_1=	0.7	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}=FaS_s=	2.15	ASCE 7-22 Section 11.4.4 Site Coefficients MCE_R
Spectral Response Accelerations Long	S_{M1}=FvS_1=	1.5	ASCE 7-22 Section 11.4.4 Site Coefficients MCER
Spectral Response Short Period	**S_{DS}=**	**1.43**	ASCE 7-22 Section 11.4.5 Design Spectral Acceleration.
Spectral Response Long Period	S_{D1}=	1	ASCE 7-16 Section 11.4.5 Design Spectral Acceleration
$T_s = (S_{D1} / S_{DS})$	T_S=	0.76	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 =	14.5	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	$T_a = (Ct * h_n^x)$ =	0.148	ASCE 7-22 Section 12.8-8
Seismic Response Coefficient	**CS =**	**0.17875**	ASCE 7-22 Eq. 12.8-2 Seismic Response Coefficient
Maximum Seismic Response Coefficient	C_{Smax} =	0.17875	ASCE 7-22 Eq. 12.8-3 Maximum
Minimum Seismic Response Coefficient		.00793	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			

- Minimum C_s:

$$C_s \geq \frac{0.044 \times S_{DS} \times I}{R}$$

$$C_s \geq \frac{0.044 \times 1.43 \times 1.0}{8} = 0.00793$$

- Maximum C_s:

$$C_s \leq \frac{S_{DS}}{R}$$

$$C_s \leq \frac{1.43}{8} = 0.17875$$

$$C_s = \frac{S_{DS}}{R/I}$$

Substituting the values:

$$C_s = \frac{1.43}{8/1.0} = 0.17875$$

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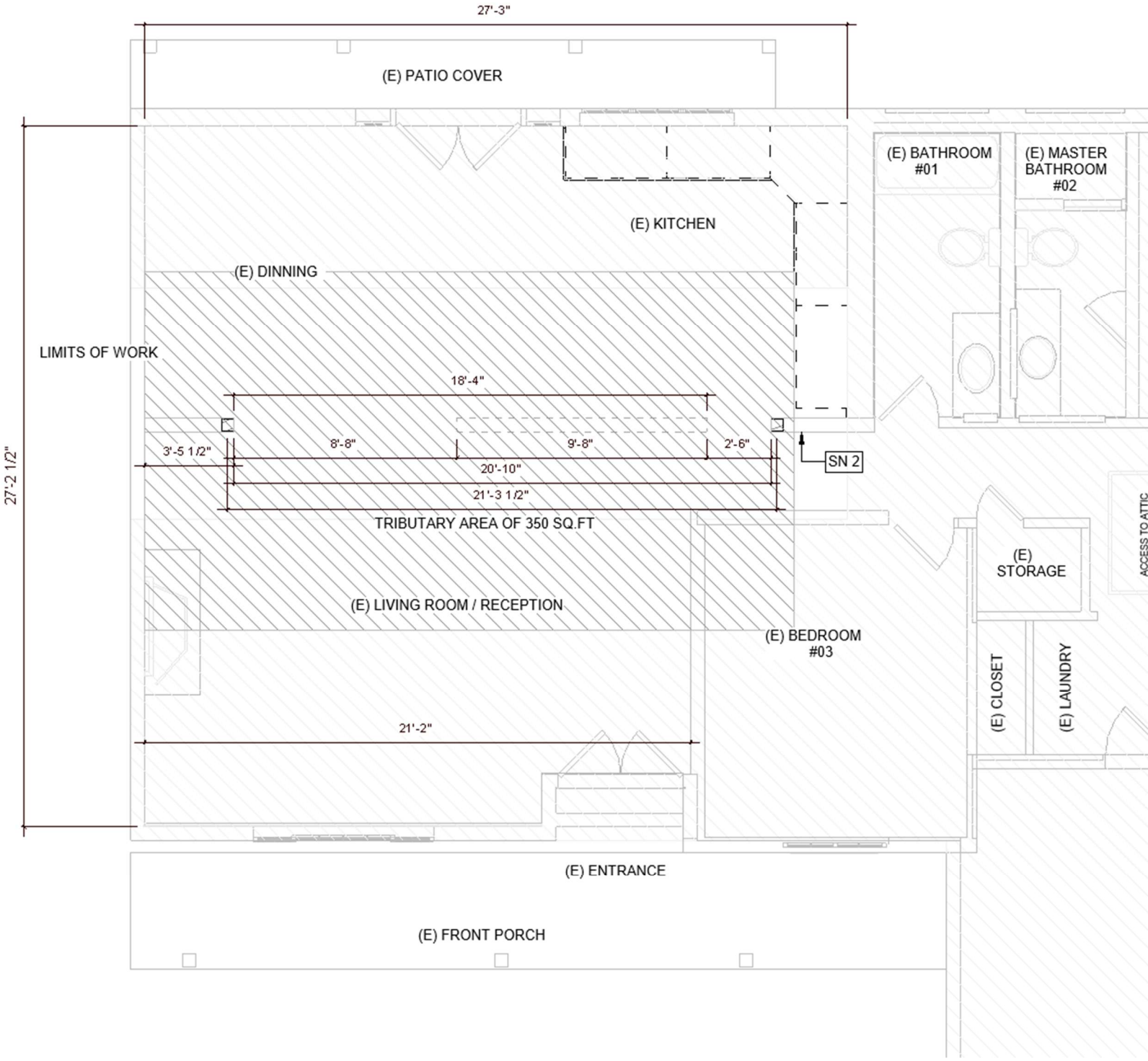
MEMBERS TRIBUTARY AREAS & LOAD CALCULATION



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MEMBER LOAD CALCULATION			
MEMBER TAG	BM-1		
MATERIALS	STEEL		
TRIBUTARY AREA (SQ.FT)	350.0		
LEGNTH	21.3		
LOUD SOURCE	LOAD **(P.S.F)**	TOTAL LOAD **(LBS)**	LOAD P.L.F **(LB/F)**
DEAD LOAD (FLOOR)	0.0	0.0	0.0
DEAD LOAD (ROOF)	30.0	10,500.0	494.1
LIVE LOAD (ROOF)	15.0	5,250.0	247.1
LIVE LOAD (ATTIC)		0.0	0.0
LIVE LOAD (FLOOR)		0.0	0.0
SEISMIC LOAD		0.0	0.0
WIND LOAD		0.0	0.0
SNOW LOAD		0.0	0.0
TOTAL LOAD	45.0 P.S.F	15,750.0 LBS	741.2 LBS PER LINEAR FOOT
DESIGN LOAD (K/L.F)	0.7	LOAD PER SUPPORT	7,875.0

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Steel Beam

Project File: KEVIN CHANG PLACENTIA.ec6

LIC# : KW-06018864, Build:20.24.01.31 ACC & Engineering (c) ENERCALC INC 1983-2023

DESCRIPTION: BM-1 LOAD CHECK

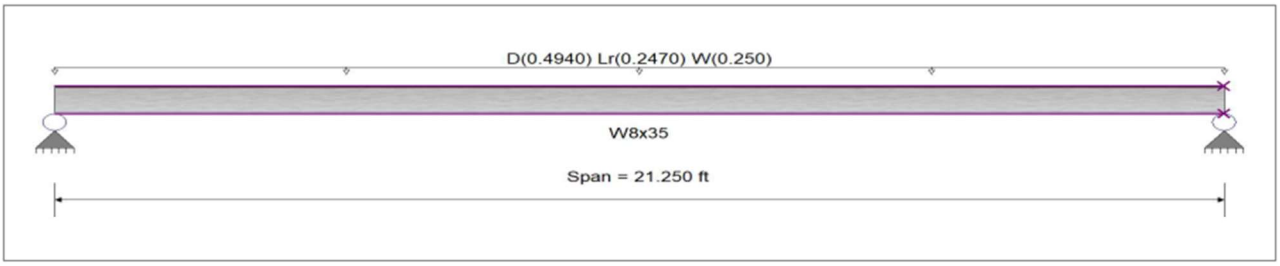
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :Load Resistance Factor Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.4940, Lr = 0.2470, W = 0.250 k/ft, Tributary Width = 1.0 ft, (UNIFORM DL & Lr @T.A OF 350 SQ.FT D=45 P.S.F)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.501 : 1	Maximum Shear Stress Ratio =	0.163 : 1
Section used for this span	W8x35	Section used for this span	W8x35
Mu : Applied	65.194 k-ft	Vu : Applied	12.272 k
Mn * Phi : Allowable	130.125 k-ft	Vn * Phi : Allowable	75.516 k
Load Combination	+1.20D+1.60Lr+0.50W	Load Combination	+1.20D+1.60Lr+0.50W
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.313 in	Ratio =	815	>=360.	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360.0	n/a
Max Downward Total Deflection	1.035 in	Ratio =	246	>=240.	Span: 1 : +D+0.750Lr+0.450W
Max Upward Total Deflection	0 in	Ratio =	0	<240.0	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values max Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	Summary of Shear Values VuMax	Vnx	Phi*Vnx
+1.40D													
Dsgn. L = 21.25 ft	1	0.321	0.104	41.80		41.80	144.58	130.13	1.00	1.00	7.87	75.52	75.52
+1.20D+0.50Lr													
Dsgn. L = 21.25 ft	1	0.329	0.107	42.80		42.80	144.58	130.13	1.00	1.00	8.06	75.52	75.52
+1.20D													
Dsgn. L = 21.25 ft	1	0.275	0.089	35.83		35.83	144.58	130.13	1.00	1.00	6.74	75.52	75.52
+1.20D+1.60Lr													
Dsgn. L = 21.25 ft	1	0.447	0.145	58.14		58.14	144.58	130.13	1.00	1.00	10.94	75.52	75.52
+1.20D+1.60Lr+0.50W													
Dsgn. L = 21.25 ft	1	0.501	0.163	65.19		65.19	144.58	130.13	1.00	1.00	12.27	75.52	75.52
+1.20D+0.50W													
Dsgn. L = 21.25 ft	1	0.330	0.107	42.89		42.89	144.58	130.13	1.00	1.00	8.07	75.52	75.52
+1.20D+0.50Lr+W													
Dsgn. L = 21.25 ft	1	0.437	0.142	56.91		56.91	144.58	130.13	1.00	1.00	10.71	75.52	75.52
+1.20D+W													
Dsgn. L = 21.25 ft	1	0.384	0.124	49.94		49.94	144.58	130.13	1.00	1.00	9.40	75.52	75.52
+0.90D+W													
Dsgn. L = 21.25 ft	1	0.315	0.102	40.98		40.98	144.58	130.13	1.00	1.00	7.71	75.52	75.52
+0.90D													
Dsgn. L = 21.25 ft	1	0.207	0.067	26.87		26.87	144.58	130.13	1.00	1.00	5.06	75.52	75.52

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Steel Beam

Project File: KEVIN CHANG PLACENTIA.ec6

LIC# : KW-06018864, Build:20.24.01.31 ACC & Engineering

DESCRIPTION: BM-1 LOAD CHECK

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750Lr+0.450W	1	1.0346	10.686		0.0000	0.000

Vertical Reactions

Support notation : Far left is #' Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	8.784	8.784
Max Upward from Load Combinations	8.784	8.784
Max Upward from Load Cases	5.621	5.621
D Only	5.621	5.621
+D+Lr	8.245	8.245
+D+0.750Lr	7.589	7.589
+D+0.60W	7.214	7.214
+D+0.750Lr+0.450W	8.784	8.784
+D+0.450W	6.816	6.816
+0.60D+0.60W	4.966	4.966
+0.60D	3.372	3.372
Lr Only	2.624	2.624
W Only	2.656	2.656

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Wood Column

Project File: KEVIN CHANG PLACENTIA.ec6

DESCRIPTION: 6X6 WOOD POST LAOD CHECK

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Load Resistance Factor Design		
End Fixities	Top Fixed, Bottom Fixed		
Overall Column Height	8 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.2		
Fb +	900.0 psi	Fv	180.0 psi
Fb -	900.0 psi	Ft	575.0 psi
Fc - Prll	1,350.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,600.0	1,600.0	1,600.0 ksi
Minimum	580.0	580.0	

Wood Section Name	**6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**5.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.0
Area	30.250 in^2	Cf or Cv for Compressio	1.0
Ix	76.255 in^4	Cf or Cv for Tension	1.0
Iy	76.255 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Fact	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
Fully braced against buckling ABOUT X-X Axis
Fully braced against buckling ABOUT Y-Y Axis

Applied Loads

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

Column self weight included : 52.450 lbs * Dead Load Factor
AXIAL LOADS . . .
BEAM REACTIONS: Axial Load at 8.0 ft, D = 7.70, Lr = 7.70 k
BENDING LOADS . . .
CONSERVATIVE: Lat. Uniform Load creating My-y, E = 0.20 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.5240 : 1**
Load Combination +1.20D+E
Governing NDS Forumla Comp + Myy, NDS Eq. 3.9-3
Location of max.above base 0.0 ft
At maximum location values are .
Applied Axial 9.303 k
Applied Mx 0.0 k-ft
Applied My -1.067 k-ft
Fc : Allowable 2,916.0 psi

PASS Maximum Shear Stress Ratio = **0.06802 : 1**
Load Combination +0.90D+E
Location of max.above base 0.0 ft
Applied Design Shear 59.504 psi
Allowable Shear 388.80 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.80 k	Bottom along X-X	0.80 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base
for load combination : n/a
Along X-X 0.03022 in at 4.027 ft above base
for load combination : E Only

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension
LRFD - Format Conversion factor	2.541	2.400	2.700
LRFD - Resistance factor	0.850	0.900	0.800

Load Combination Results

Load Combination	Lambda	C_P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
+1.40D	1.000	1.000	0.1230	PASS	0.0 ft	0.0	PASS	0.0 ft
+1.20D+0.50Lr	1.000	1.000	0.1491	PASS	0.0 ft	0.0	PASS	0.0 ft
+1.20D	1.000	1.000	0.1055	PASS	0.0 ft	0.0	PASS	0.0 ft
+1.20D+1.60Lr	1.000	1.000	0.2451	PASS	0.0 ft	0.0	PASS	0.0 ft
+1.20D+E	1.000	1.000	0.5240	PASS	0.0 ft	0.06802	PASS	0.0 ft
+0.90D	1.000	1.000	0.07910	PASS	0.0 ft	0.0	PASS	0.0 ft
+0.90D+E	1.000	1.000	0.5192	PASS	0.0 ft	0.06802	PASS	0.0 ft

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Wood Column

Project File: KEVIN CHANG PLACENTIA.ec6

LIC# : KW-06018864, Build:20.24.01.31 ACC & Engineering

DESCRIPTION: 6X6 WOOD POST LAOD CHECK

Maximum Reactions

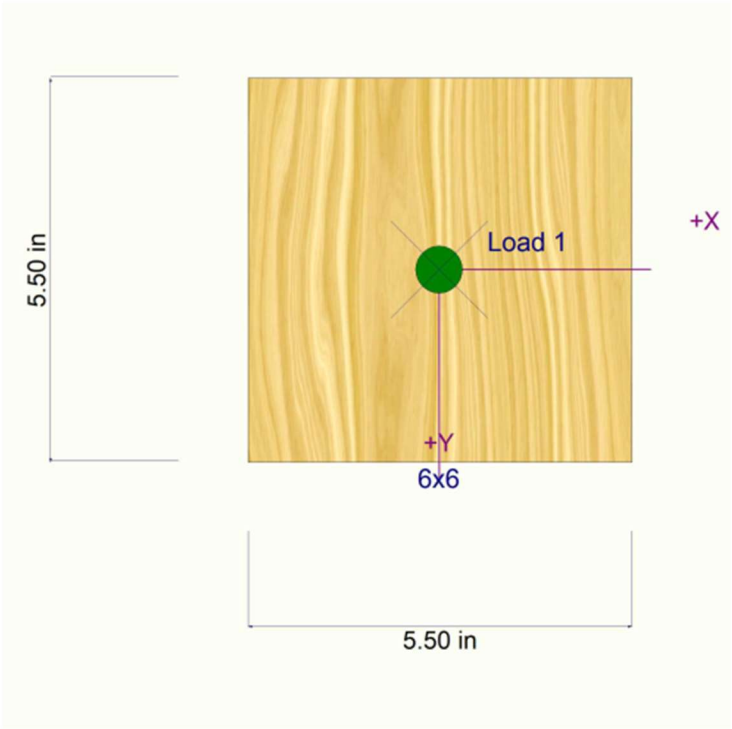
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	k-ft @ Top	Mx - End Moments @ Base	@ Top
D Only						7.752				
+D+Lr						15.452				
+D+0.750Lr						13.527				
+D+0.70E	0.560	0.560				7.752	0.747	-0.747		
+D+0.5250E	0.420	0.420				7.752	0.560	-0.560		
+0.60D						4.651				
+0.60D+0.70E	0.560	0.560				4.651	0.747	-0.747		
Lr Only						7.700				
E Only	0.800	0.800					1.067	-1.067		

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.70E	0.0212 in	4.027ft	0.000 in	0.000 ft
+D+0.5250E	0.0159 in	4.027ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D+0.70E	0.0212 in	4.027ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
E Only	0.0302 in	4.027ft	0.000 in	0.000 ft

Sketches



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General Footing

Project File: KEVIN CHANG PLACENTIA.ec6

LIC# : KW-06018864, Build:20.24.01.31 ACC & Engineering (c) ENERCALC INC 1983-2023

DESCRIPTION: FOUNDATION LOAD CHECK

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	2,850.0 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	:	Yes

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)	=	100.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	2.0 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

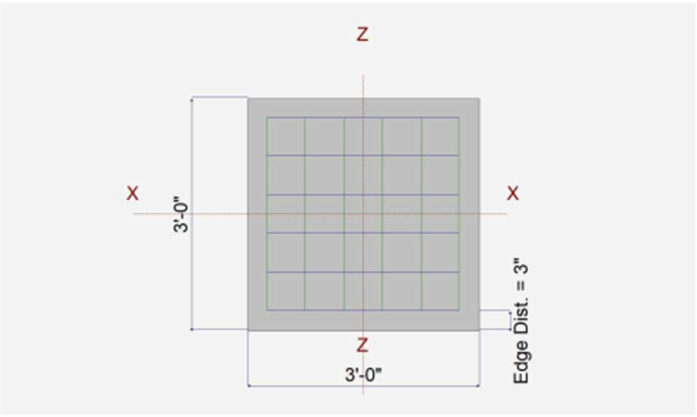
Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	24.0 in

Pedestal dimensions...

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

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.50 in



Reinforcing

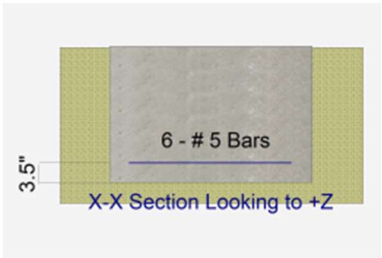
Bars parallel to X-X Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	5

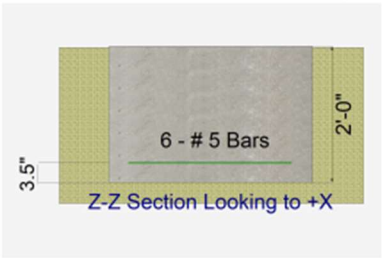
Bandwidth Distribution Check (ACI 15.4.4.2)

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	=	3.950	6.80						k
OB : Overburden	=		0.0						ksf
M-xx	=						0.0		k-ft
M-zz	=						0.0		k-ft
V-x	=						0.0		k
V-z	=						0.0		k

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DESCRIPTION: FOUNDATION LOAD CHECK

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9893	Soil Bearing	1.484 ksf	1.50 ksf	+D+Lr about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.03540	Z Flexure (+X)	1.953 k-ft/ft	55.160 k-ft/ft	+1.20D+1.60Lr
PASS	0.03540	Z Flexure (-X)	1.953 k-ft/ft	55.160 k-ft/ft	+1.20D+1.60Lr
PASS	0.03540	X Flexure (+Z)	1.953 k-ft/ft	55.160 k-ft/ft	+1.20D+1.60Lr
PASS	0.03540	X Flexure (-Z)	1.953 k-ft/ft	55.160 k-ft/ft	+1.20D+1.60Lr
PASS	n/a	1-way Shear (+X)	0.0 psi	75.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	2-way Punching	6.378 psi	75.0 psi	+1.20D+1.60Lr

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	0.7289	0.7289	n/a	n/a	0.486
X-X, +D+Lr	1.50	n/a	0.0	1.484	1.484	n/a	n/a	0.989
X-X, +D+0.750Lr	1.50	n/a	0.0	1.296	1.296	n/a	n/a	0.864
X-X, +0.60D	1.50	n/a	0.0	0.4373	0.4373	n/a	n/a	0.292
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.7289	0.7289	0.486
Z-Z, +D+Lr	1.50	0.0	n/a	n/a	n/a	1.484	1.484	0.989
Z-Z, +D+0.750Lr	1.50	0.0	n/a	n/a	n/a	1.296	1.296	0.864
Z-Z, +0.60D	1.50	0.0	n/a	n/a	n/a	0.4373	0.4373	0.292

Overturning Stability

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

Sliding Stability

All units k

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	0.6913	+Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.40D	0.6913	-Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D+0.50Lr	1.018	+Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D+0.50Lr	1.018	-Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D	0.5925	+Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D	0.5925	-Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D+1.60Lr	1.953	+Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +1.20D+1.60Lr	1.953	-Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +0.90D	0.4444	+Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
X-X, +0.90D	0.4444	-Z	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.40D	0.6913	-X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.40D	0.6913	+X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.20D+0.50Lr	1.018	-X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.20D+0.50Lr	1.018	+X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.20D	0.5925	-X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.20D	0.5925	+X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +1.20D+1.60Lr	1.953	-X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK

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DESCRIPTION: FOUNDATION LOAD CHECK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+1.60Lr	1.953	+X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +0.90D	0.4444	-X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK
Z-Z, +0.90D	0.4444	+X	Bottom	0.5184	ACI 7.6.1.1	0.620	55.160	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60Lr	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60Lr	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 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	2.26 psi	150.00 psi	0.01505	OK
+1.20D+0.50Lr	3.32 psi	150.00 psi	0.02216	OK
+1.20D	1.94 psi	150.00 psi	0.0129	OK
+1.20D+1.60Lr	6.38 psi	150.00 psi	0.04252	OK
+0.90D	1.45 psi	150.00 psi	0.009677	OK

END OF REPORT

REGARDS,

ACC & Engineering Structural Desing Department

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Review & Stamp by : M.BAYOUMI, P.E., ASCE. Civil Engineer Of Record