



STRUCTURAL CALCULATIONS

PROJECT:

Chick-fil-A - Lee's Summit, MO

BPA Project Number: **240741**

Submittal: **Permit**

Date: **November 19, 2024**

by: Britt, Peters and Associates, Inc.
101 Falls Park Drive, Suite 601, Greenville, SC
29601
(864) 271-8869
www.brittpeters.com





ENVIRONMENTAL LOADING

ASCE Hazards Report

Address:

No Address at This Location

Standard:

ASCE/SEI 7-16

Risk Category: II**Soil Class:**

C - Very Dense
Soil and Soft Rock

Latitude:

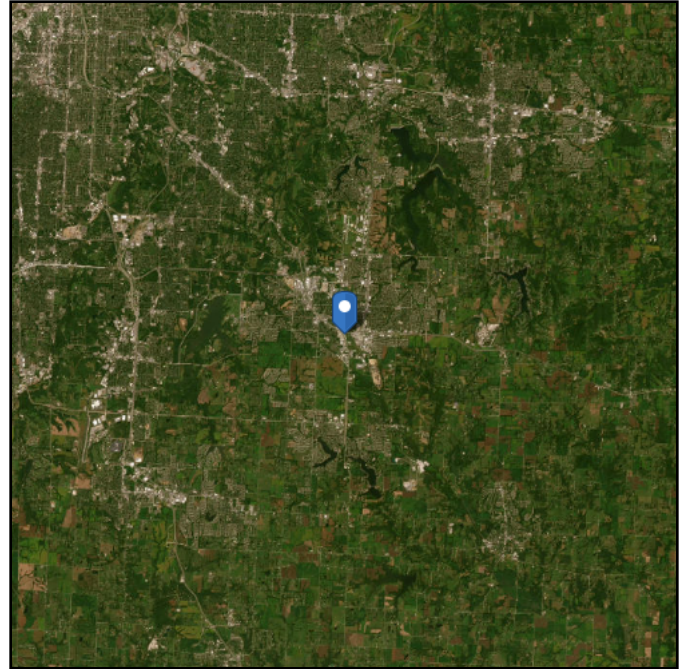
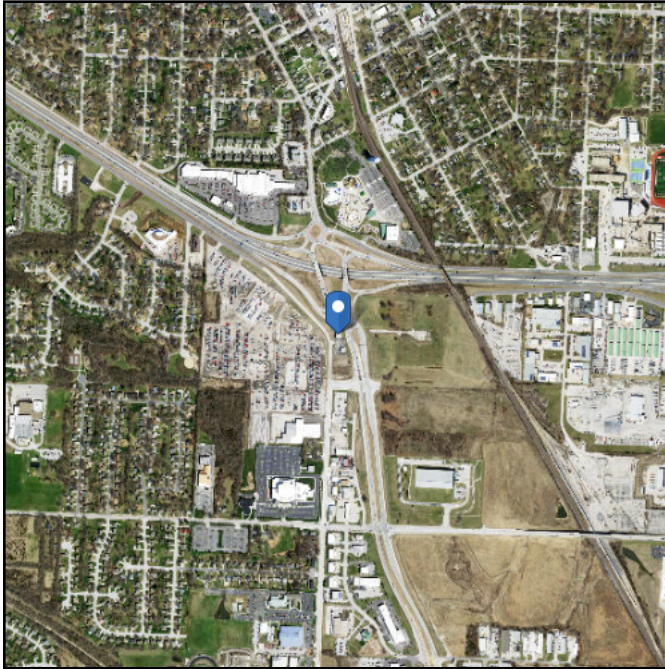
38.901445

Longitude:

-94.376918

Elevation:

1044.7591079664112 ft
(NAVD 88)



Wind

Results:

Wind Speed	109 Vmph
10-year MRI	76 Vmph
25-year MRI	83 Vmph
50-year MRI	88 Vmph
100-year MRI	94 Vmph

Data Source:

ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed:

Wed Nov 13 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.



ASCE 7-16 Wind

Version: V5

Subject: CFA in Lee's Summit, MO
Project No.: 24XXXX
By: JSS
Date: 10/22/2024
101 Falls Park Drive, Suite 601, Greenville, SC 29601

Parameters:

Risk Category (I, II, III, IV):	II
Mean Recurrence Interval (MRI):	700 yrs
Basic Wind Speed, V:	109 mph
Exposure Category:	C
Wind directionality factor, K_d :	0.85
Ground elevation factor, K_e :	1.00
Velocity pressure exposure coeff., K_z :	0.86
Topographic factor, K_{zt} :	1.00
Gust Factor, G (x-dir wind):	0.85
Gust Factor, G (y-dir wind):	0.85
Internal pressure coefficient, $+GC_{pi}$:	0.18

Building Properties:

Mean Roof Height, h:	16.3 ft
h override:	
Eave Height, h_e :	15.8 ft
Ridge Height, h_r :	16.8 ft
Parapet Height:	6.5 ft
Parapet around roof perimeter?	YES
Roof Type: (Flat, Mono, Hip, Gable?)	Flat
Ridge Line is Parallel to X or Y?	X
Roof Slope, degrees:	2.18 degrees
slope override:	
Length X-direction, L_1 :	124.0 ft
Length Y-direction, L_2 :	48.3 ft

Calculated Gust Effect Factors:

Damping ratio, b:	0.010
LFRS:	Shear Walls or Braced Frames
T =	
T_{used} =	0.22 sec

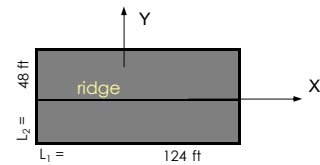
Applied Technology Council Wind Speed Website:

[ASCE 7 Hazard Tool Online](#)

Google Maps:

<https://maps.google.com/>

Building Footprint Schematic



?Verify you want to have a parapet with a sloped roof?

Velocity pressure, q_n : 22.3 psf
Internal Pressure: +/-4.02 psf

Enter the building's period here, or leave blank for spreadsheet to determine.

BRITT, PETERS & ASSOCIATES, INC.
CONSULTING ENGINEERS
101 Falls Park Drive, Suite 601, Greenville, SC 29601

	roof	wall
pww	-0.13	15
plw	-0.22	-5

Subject: CFA in Lee's Summit
Project No.: 24XXXX
By: JSS
Date: 10/22/2024

ASCE 7-16 Main Wind Force Resisting System Loads - Directional Procedure

Cantilevered Parapet for X-dir Wind?		YES		This assumes the input widths extend to the ridge line. Typically, L1 or L2 should be set to "0" to denote no width at the ridge in the direction parallel to the ridge.				X-Direction Wind												
Flat	Has Parapet?	YES						L/B (L1/L2)	Leeward Cp	External wall pressure		Total pressure (psf)	Story Force (k)	Story Torsion (k-ft)	Story Shear (k)	Story OTM Moment (k-ft)				
Parallel										p _{ww} (psf)	p _{lw} (psf)									
		z (ft)	K _z	q _z (psf)	L ₁ (ft)	L ₂ (ft)	L ₁ (ft)	L ₂ (ft)												
Top of Parapet		22.79	0.93	24			124	48		-1.00	35.9	-24.0	59.9							
Ridge		17	0.86	22			124	48			15.2	-5.2	20.3	1	7	1	0			
Eave Height		16	0.86	22			124	48	2.57	-0.27	15.1	-5.2	20.2	32	234	33	526			
Story 0		0	0.85	22			124	48	2.57	-0.27	14.9	-5.2	20.1	3	24	36	526			

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	roof	wall
pww	-0.13	15
plw	-0.27	-9

Subject: CFA in Lee's Summit
Proj. No.: 24XXXX
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ASCE 7-16 Main Wind Force Resisting System Loads - Directional Procedure

Cantilevered Parapet for Y-dir Wind?		YES									
Flat											
Perpendicular		Y-Direction Wind									
	L/B (L ₂ /L ₁)	Leeward C _p	External wall pressure		Total pressure (psf)	Story Force (k)	Story Torsion (k-ft)	Story Shear (k)	Story OTM Moment (k-ft)		
			p _{ww} (psf)	P _{lw} (psf)							
Top of Parapet		-1.00	35.9	-24.0	59.9						
Ridge			-0.1	-0.3	8	1	7	1	0		
Top of Roof		0.39	-0.50	15.1	-9.5	25	87	1622	88	1,395	
Story 0		0.39	-0.50	14.9	-9.5	24	13	237	101	1,395	

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ASCE 7-16 Main Wind Force Resisting System Loads - Directional Procedure

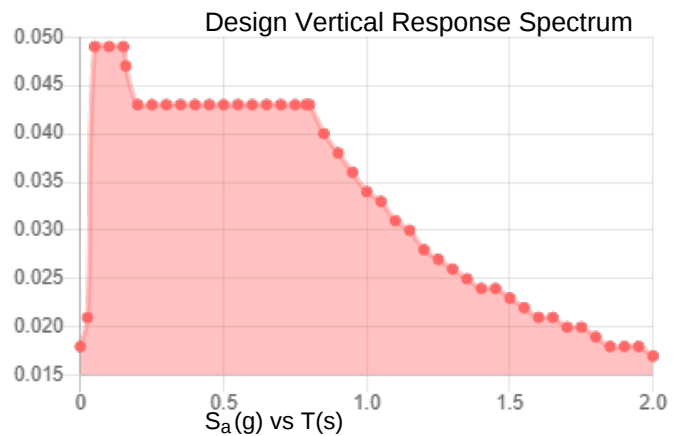
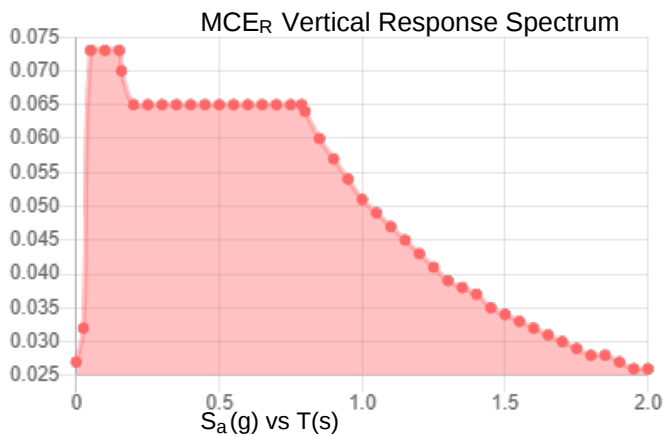
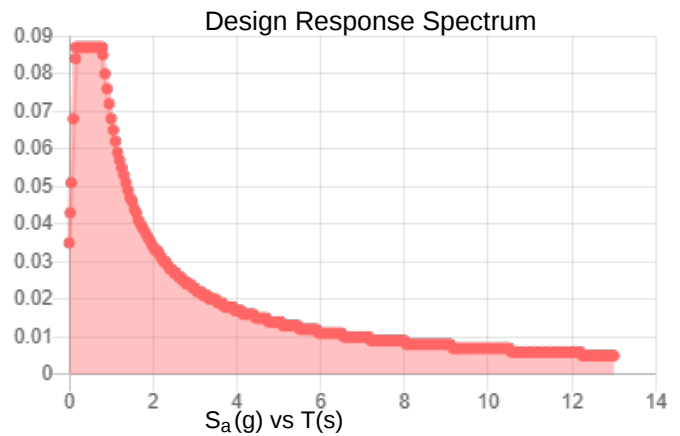
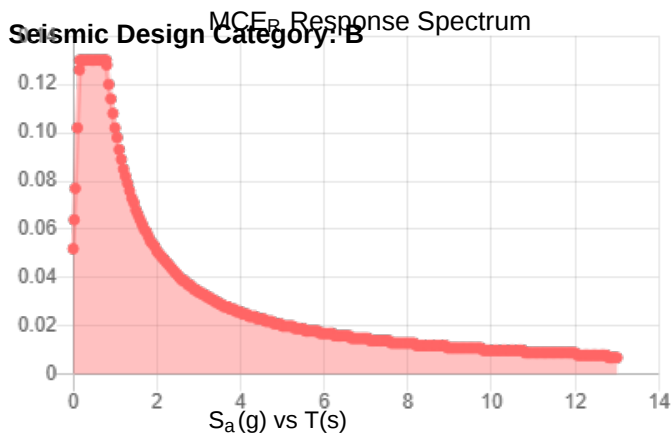
Wall pressure							
X-Direction Wind				Y-Direction Wind			
+GCpi		-GCpi		+GCpi		-GCpi	
pww (psf)	plw (psf)	pww (psf)	plw (psf)	pww (psf)	plw (psf)	pww (psf)	plw (psf)
11.1	-9.2	19.1	-1.1	11.1	-13.5	19.1	-5.5
10.9	-9.2	18.9	-1.1	10.9	-13.5	18.9	-5.5

Ultimate Design Wind Pressure (psf):								
			Effective Wind Area (sq ft)					
Walls:			10	20	50	100	200	500
Interior	Zone 4	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-26.1	-25.1	-23.6	-22.6	-21.5	-21.8
Edge	Zone 5	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-32.2	-30.0	-27.2	-25.1	-22.9	-23.4
Roof:			10	20	50	100	200	500
Interior	Zone 1	+	16.0	16.0	16.0	16.0	16.0	16.0
		-	-42.0	-39.2	-35.6	-32.8	-30.0	-30.7
Interior	Zone 1'	+	16.0	16.0	16.0	16.0	16.0	16.0
		-	-24.1	-24.1	-24.1	-24.1	-20.8	-21.6
Edge	Zone 2	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-55.4	-51.8	-47.1	-43.6	-40.0	-40.9
Corner	Zone 3	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-55.4	-51.8	-47.1	-43.6	-40.0	-40.9
Overhang:			10	20	50	100	200	500
Edge	Zone 2	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-51.4	-46.6	-40.3	-35.6	-30.8	-32.0
Corner	Zone 3	+	24.1	23.0	21.6	20.6	19.5	19.8
		-	-71.5	-63.1	-52.2	-43.9	-35.5	-37.6
Parapet:			10	20	50	100	200	500
Edge	Zone 2	+	76.7	71.7	65.2	60.2	55.2	56.4
		-	-45.3	-43.0	-40.0	-37.7	-35.4	-35.9
Corner	Zone 3	+	76.7	71.7	65.2	60.2	55.2	56.4
		-	-51.8	-48.3	-43.8	-40.3	-36.9	-37.7

Site Soil Class: C - Very Dense Soil and Soft Rock

Results:

S_S :	0.1	S_{D1} :	0.068
S_1 :	0.068	T_L :	12
F_a :	1.3	PGA :	0.047
F_v :	1.5	PGA _M :	0.061
S_{MS} :	0.13	F_{PGA} :	1.3
S_{M1} :	0.102	I_e :	1
S_{DS} :	0.087	C_v :	0.7



Data Accessed: Wed Nov 13 2024

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

 BRITT, PETERS ASSOCIATES CONSULTING ENGINEERS	ASCE 7-16 Seismic		Version: V4
	Subject:	CFA Oldham Village	
	Project No.:	240741	
	By:	JSS	
	Date:	10/22/2024	
		101 Falls Park Drive, Suite 601, Greenville, SC 29601	

USGS Data		Redundancy Factor	1	
$T_L =$	8	$C_s = S_{DS}/(R/I) =$	0.01	(Eq. 12.8-2)
$S_s =$	0.100	$C_t =$	0.02	
$S_1 =$	0.068	$x =$	0.75	
Site Class =	C	$T_a = C_t(h_n)^x =$	0.16	sec
$F_a =$	1.30	$T_{calc} =$		sec
$F_v =$	1.50	$T =$	0.16	sec
$S_{MS} = F_a S_s =$	0.130	$C_{u,max} = S_{D1}/((R/I)T) =$	0.06	
$S_{M1} = F_v S_1 =$	0.102	$C_{u,max} = S_{D1} T_d / ((R/I) T^2) =$	N/A, $T < T_L$	
$S_{D5} = 2/3 * S_{MS} =$	0.087	$C_{u,min} = 0.044 S_{D5} > 0.01 =$	0.01	
$S_{D1} = 2/3 * S_{M1} =$	0.068	$C_{u,min} = 0.55 I / (R/I) =$	N/A, $S I < 0.6$	
Risk Category:	II	$C_s =$	0.013	
Importance Factor =	I	$V_{seismic} = C_s W =$	4.79	kips
Irregularity?	NO	$T_s =$	0.78	sec
Seismic Design Category	Table 11.6-1 Table 11.6-2			
	SDC = A			
	SDC = B			
	YES	Is the 1-s period mapped spectral response acceleration parameter S_1 less than 0.75?		
	YES	Is the approximate fundamental period of the structure, T_a , less than $0.8T_L$ in each of the two orthogonal directions?		
	YES	Is the fundamental period of the structure used to calculate story drift less than T_L in each of the two orthogonal directions?		
	YES	Is Eq. 12.8-2 used to determine the seismic response coefficient, C_s ?		
User Verify!	NO	Are the diaphragms rigid? Or if the diaphragms are flexible, is the distance between vertical elements of the seismic force-resisting system not greater than 40 ft?		
	Controlling SDC =	B		User Verify!

Structural System Category:	BEARING WALL SYSTEMS				
Specific Structural System:	Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance or steel sheets				
Response Modification Coefficient, $R =$	6.50	STRUCTURAL SYSTEM LIMITATIONS INCLUDING			
System Over-Strength Factor =	3.00	STRUCTURAL HEIGHT, h_c (ft.)			
Deflection Amplification Factor, $C_d =$	4.00	B			
Analysis Procedure:	Equivalent lateral-force procedure	NL			

k =	1.00						
A	B	C	D=C*B*k	E=D/SUM(D)	F=E*V	G=(F) _k *(G) _{k+1}	H=(J) _k *[(B) _k -(B) _{k+1}]+(H) _{k+1}

Vertical Distribution Factor, C_{vx}									
Level (x)	Height from base to level x h_x (ft)	Effective Seismic Weight assigned to level x w_x (kips)	$w_x h_x^k$	$\sum_{i=1}^n \frac{w_i x h_i^k}{\sum_{i=1}^n w_i h_i^k}$	Lateral Seismic Story Force, F_x (kips)	Lateral Seismic Story Shear, V_x (kips)	Lateral Seismic Story Overturning Moment at Level, M_x (kip-ft)	Diaphragm Design Force, F_{px} (kips)	Diaphragm Design Force, Max of F_x and F_{px} (kips)
Roof	16.5	359	5930	1.00	4.8	4.8		6.2	6.2
0	0	0	0	0.00	0.0	4.8	79	0.0	0.0
0	0	0	0	0.00	0.0	4.79	79	0.0	0.0
0	0	0	0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
			0	0.00	0.0	4.8	79	0.0	0.0
SUM	16.5	359	5930	1	5		712		

SEISMIC WEIGHT CALCULATIONS

Component Weights (PSF)

Roof	20 psf	Total Roof:	359 Kips
Floor	25 psf	Total Floor	0 Kips
		Total Floor	0 Kips
Brick + Wall Wt.	50 psf	Total Floor	0 Kips
Wood Studs	12 psf	Total Floor	0 Kips
Windows/Doors	10 psf	TOTAL SEISMIC WEIGHT:	359 Kips

Building Dimensions

X= 124 ft
Y= 48.3 ft

Subject:	CFA Oldham Village
Project No.:	240741
By:	JSS
Date:	10/22/2024

Level	Floor Height (ft)	Floor Area (ft ²)	NORTH Wall Area (ft ²)			SOUTH Wall Area (ft ²)			EAST Wall Area (ft ²)			WEST Wall Area (ft ²)			Component Weights (Kips)				Building Weights
			Brick + Wall Wt.	Wood Studs	Windows/ Doors	Brick + Wall Wt.	Wood Studs	Windows/ Doors	Brick + Wall Wt.	Wood Studs	Windows/ Doors	Brick + Wall Wt.	Wood Studs	Windows/ Doors	Brick + Wall Wt.	Wood Studs	Windows/ Doors	Floor	
Roof	6.5	5350	1817	0	0	1817	0	0	708	0	0	708	0	0	252.4	0.0	0.0	107.0	359.4 Kips
0	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0 Kips
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0 Kips
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0 Kips
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0 Kips
22.8																			Building Seismic Wt.: 359.4 Kips

Mech Weights		
RTU-1	0.000	Kips
RTU-2	0.000	Kips
CHILL-1	0.000	Kips
CHILL-2	0.000	Kips
EF-1	0.000	Kips
Mech Seismic Wt.	0.00	Kips

Results:

Ground Snow Load, p_g : 20 lb/ft²

Mapped Elevation: 1044.8 ft

Data Source: ASCE/SEI 7-16, Table 7.2-8

Date Accessed: Wed Nov 13 2024

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported 'elevation' and 'mapped elevation' differ significantly from each other.

Rain

Results:

15-minute Precipitation Intensity: 7.49 in./h

60-minute Precipitation Intensity: 3.51 in./h

Data Source: NOAA National Weather Service, Precipitation Frequency Data Server, Atlas 14 (<https://www.nws.noaa.gov/oh/hdsc/>)

Date Accessed: Wed Nov 13 2024



Version: V4

Project Name: **CFA in Lee's Summit, MO**
Project #: **240741**
Date: **10/22/2024**

Location **Lee's Summit, MO**

Roof Information

Type = **Monoslope**
Slope = **2.33**
Slippery Surface? (Y/N) **N**
Roof projection or Roof Parapet? (Y/N) **Y**
W = **45.3** ft
Height of element above ground surface = **16.3** ft

Design Snow Load

Basic Ground Snow Load, p_g = **20** psf (Figure 7.2-1)
 C_e = **1** (Table 7.3-1)
 C_t = **1** (Table 7.3-2)
 I_s = **1** (Table 1.5-1)
 h_g = **1.2** ft

Flat Roof Snow Load

Flat Roof p_f = **14.0** psf (Eq. 7.3-1)
Minimum or p_m = **20.0** psf (Section 7.3.4) **Applicable**

Rain-on-Snow Surcharge = **5.0** psf (Section 7.10)
Design p_f = **20.0** psf

Sloped Roof Snow Load

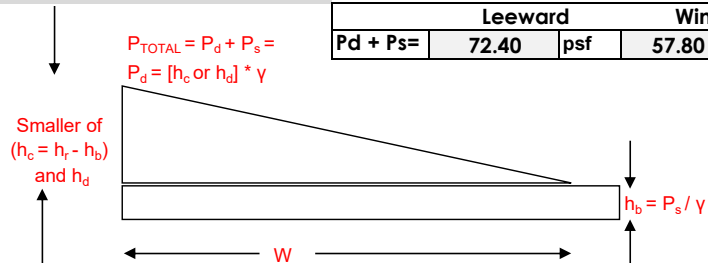
C_s = **1.00** (Sections 7.4.1 - 7.4.3)
Sloped p_s = **14.00** psf (Eq. 7.4-1)

Snow Drift

L_u = **124** ft
 h_r = **6.5** ft
 h_b = **0.84** ft
 h_c = **5.66** ft
 γ = **16.60** pcf (Eq. 7.7-1)
 h_c/h_b = **6.71** **>0.2 Drift Loads Must be Considered**

	Leeward		Windward
h_d	3.52 ft		2.64 ft
w	14.07 ft		10.55 ft
P_d	58.40 psf		43.80 psf

	Leeward		Windward
$P_d + P_s$	72.40 psf		57.80 psf



Results:

Flood Zone Categorization: X (unshaded)

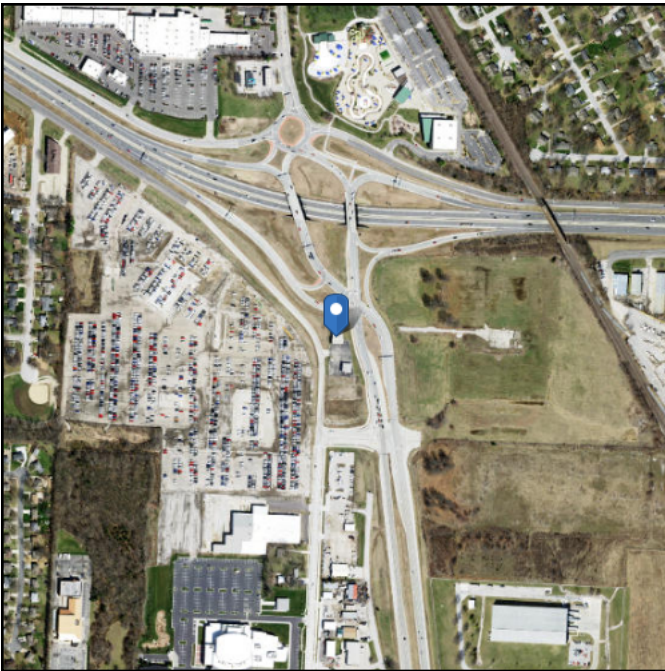
Base Flood Elevation:

Data Source: FEMA National Flood Hazard Layer - Effective Flood Hazard Layer for US, where modernized (<https://msc.fema.gov/portal/search>)

Date Accessed: Wed Nov 13 2024

FIRM Panel: If available, download FIRM panel [here](#)

Insurance Study Note: Download FEMA Flood Insurance Study for this area [here](#)



The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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SHEAR WALL DESIGN & ANALYSIS

Shear Wall Design & Analysis

Project:	CFA - Lee's Summit, MO
Project #:	240741
Sheet Description:	Load Data



Description of load entered:

Loads From:	ASCE 7-10
Wind Factor =	0.6
Seismic Factor =	0.7

NOTE: FOR STEEL STUD SHEAR WALLS **R = 3**
OTHERWISE MUST USE AISI S400 AND SPREADSHEET IS
NOT CORRECT

NOTE: FOR STEEL STUD SHEAR WALLS MAX RATIO IS 4/1

Wall Forces

Input Strength Level Loads														
Story Force					Service Level Loads					Story Shear (Factored)				
Floor	Wind X	Wind Y	EQ X	EQ Y	Wind X	Wind Y	EQ X	EQ Y		Wind X	Wind Y	EQ X	EQ Y	
5	0	0	0	0	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
4	0	0	0	0	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
3	0	0	0	0	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
2	0	0	0	0	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
1	33	88	5.9	5.9	19.80	52.80	4.13	4.13		19.80	52.80	4.13	4.13	
Base Shear	33	88	5.9	5.9	19.8	52.8	4.13	4.13						

Diaphragm Forces

Story Force				
Floor	Wind X	Wind Y	EQ X	EQ Y
5	0	0	0	0
4	0	0	0	0
3	0	0	0	0
2	0	0	0	0
1	33	88	5.9	5.9

Input Story Forces beginning from bottom.
E.g. Floor above Podium will be Floor 1

Project:	CFA - Lee's Summit, MO
Project #:	240741
Sheet Description:	1st Story Loads

1st

Load Data:

Story Data

Story Height	16.25 ft
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[illegible][illegible][illegible]

Shear Analysis and Design													
Seismic Shear Analysis			Seismic Shear Design			Wind Shear Analysis			Wind Shear Design			Controlling Shear Design	
F (kip)	F Override (kip)	Shear (plf)	Shear for edge spacing design (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	F (kip)	F Override (kip)	Shear (plf)	Shear for edge spacing design (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	Spacing Requirements (in)	(BS) Spacing Requirements (in)
0.96		63	63	6	6	4.60		301	301	6	6	6.00	6.00
1.11		63	63	6	6	5.30		301	301	6	6	6.00	6.00
2.07		91	91	6	6	9.90		437	437	4	6	4.00	6.00
0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Shear Analysis and Design													
Seismic Shear Analysis			Seismic Shear Design			Wind Shear Analysis			Wind Shear Design			Controlling Shear Design	
F (kip)	F Override (kip)	Shear (plf)	Shear for edge spacing design (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	F (kip)	F Override (kip)	Shear (plf)	Shear for edge spacing design (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	Spacing Requirements (in)	(BS) Spacing Requirements (in)
0.49		22	22	6	6	6.30		278	278	6	6	6.00	6.00
2.07		116	116	6	6	26.40		1481	1481	BS	3	BS	3.00
0.84		64	64	6	6	10.70		823	823	2	4	2.00	4.00
0.74		64	64	6	6	9.40		823	823	2	4	2.00	4.00

Note: + = Compression, - = Tension

Tension and Compression Analysis of Boundary Conditions

	<u>Dead Load</u>	<u>Overturning Moment</u>	<u>Resisting Moment</u>	<u>Net Moment</u>	<u>Tension & Compression @ SW Ends</u>		<u>N/A</u>							
<u>Shear Wall Label</u>	<u>Roof Trib (ft)</u>	<u>Dead Load (kip)</u>	<u>Seismic (ft- kip)</u>	<u>Wind (ft- kip)</u>	<u>Dead (kip)</u>	<u>(ft- Seismic (ft- kip)</u>	<u>Wind (ft- kip)</u>	<u>Seismic (kip)</u>	<u>Wind (kip)</u>	<u>C (Kip)</u>	<u>Controlling Tension (lbf)</u>	<u>Holddown</u>	<u>Holddown Capacity (lbf)</u>	<u>Minimum Wood Member Thickness (in)</u>
North-1	19.6	8.96	15.60	74.78	41.06	25.46	-33.72	1.67	-2.21	N/A	-2208.21	HDU2-SDS2.5	3075.00	3"
North-2	19.6	10.32	17.96	86.09	54.42	36.47	-31.67	2.07	-1.80	N/A	-1801.42	DTT2Z	2145.00	3"
South-1	19.6	13.30	33.56	160.88	90.42	56.87	-70.45	2.51	-3.11	N/A	-3109.09	HDU4-SDS2.5	4565.00	3"
0	0	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!	#DIV/0!	N/A	#DIV/0!	#N/A	#N/A	#N/A
0	0	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!	#DIV/0!	N/A	#DIV/0!	#N/A	#N/A	#N/A
0	0	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!	#DIV/0!	N/A	#DIV/0!	#N/A	#N/A	#N/A

Note: + = Compression, - = Tension

Tension and Compression Analysis of Boundary Conditions

	<u>Dead Load</u>	<u>Overturning Moment</u>	<u>Resisting Moment</u>	<u>Net Moment</u>	<u>Tension & Compression</u>		<u>N/A</u>							
<u>Shear Wall Label</u>	<u>Roof Trib (ft)</u>	<u>Dead Load (kip)</u>	<u>Seismic (ft- kip)</u>	<u>Wind (ft- kip)</u>	<u>Dead (kip)</u>	<u>(ft- Seismic (ft- kip)</u>	<u>Wind (ft- kip)</u>	<u>Seismic (kip)</u>	<u>Wind (kip)</u>	<u>C (Kip)</u>	<u>Controlling Tension (lbf)</u>	<u>Holddown</u>	<u>Holddown Capacity (lbf)</u>	<u>Minimum Wood Member Thickness (in)</u>
West	0	4.42	8.01	102.40	30.06	22.06	-72.33	0.97	-3.19	N/A	-3190.57	HDU4-SDS2.5	4565.00	3"
Interior	2.67	4.43	33.56	429.00	23.69	-9.87	-405.31	-0.55	-22.73	N/A	-22731.88	#N/A	#N/A	#N/A
East North	0	2.54	13.60	173.87	9.89	-3.71	-163.98	-0.29	-12.61	N/A	-12613.99	HDU14-SDS2.5	14445.00	6x6 Post
East South	0	2.23	11.95	152.74	7.63	-4.32	-145.11	-0.38	-12.71	N/A	-12706.42	HDU14-SDS2.5	14445.00	6x6 Post

Summary											Foundation Design - If Applicable					Foundation Design (LRFD)				
Controlling Shear Design							Wind		Seismic		Moment (ft-kip)					Moment (ft-kip)				
Shear Wall Label	Wind (kip)	Seismic (kip)	Wind (plf)	Seismic (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	Compression (kip)	Tension (kip)	Compression (kip)	Tension (kip)	Shear Wall Label	Length (ft)	P (kip)	Seismic	Wind	Shear Wall Label	Length (ft)	P (kip)	Seismic	Wind
North-1	4.6	1.0	301	63	6	6	4.90	-2.21	1.02	0.00	North-1	15.27	8.96	11.70	74.78	North-1	19.29	8.96	16.71246	124.6353
North-2	5.3	1.1	301	63	6	6	4.90	-1.80	1.02	0.00	North-2	17.58	10.32	13.47	86.09	North-2	17.58	10.32	19.24067	143.4897
South-1	9.9	2.1	437	91	4	6	7.10	-3.11	1.48	0.00	South-1	22.66	13.30	25.17	160.88	South-1	22.66	13.30	35.95313	268.125
0	0.0	0.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0
0	0.0	0.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0
0	0.0	0.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0
Summary											Foundation Design - If Applicable					Foundation Design - LRFD				
Controlling Shear Design							Wind		Seismic		Moment (ft-kip)					Moment (ft-kip)				
Shear Wall Label	Wind (kip)	Seismic (kip)	Wind (plf)	Seismic (plf)	Spacing Requirements (in)	(BS) Spacing Requirements (in)	Compression (kip)	Tension (kip)	Compression (kip)	Tension (kip)	Shear Wall Label	Length (ft)	P (kip)	Seismic	Wind	Shear Wall Label	Length (ft)	P (kip)	Seismic	Wind
West	6.3	0.5	278	22	6	6	4.52	-3.19	0.35	0.00	West	22.67	4.42	6.01	102.40	West 1	22.67	4.42	8.581404	170.6584
Interior	26.4	2.1	1481	116	BS	3	24.06	-22.73	1.88	-0.55	Interior	17.83	4.43	25.17	429.00	East 1	17.83	4.43	35.95313	715
East North	10.7	0.8	823	64	2	4	13.37	-12.61	1.05	-0.29	East North	13.00	2.54	10.20	173.87	East 2	13.00	2.54	14.57135	289.7805
East South	9.4	0.7	823	64	2	4	13.37	-12.71	1.05	-0.38	East South	11.42	2.23	8.96	152.74	East 3	11.42	2.23	12.80037	254.561



GRAVITY FRAMING

Location: North 1

q' _a =	1.5	ksf
Allowable increase	1	
input L =	15.27	ft
input B =	2	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.7	ksf
q' _{max} =	1.29	ksf

Dead load factor for footin and soil wt.= 0.6

Edge "E", Interior "I", or Corner "C" E

Suggested L = ft

Suggested B = ft

	Dim	Area
SQ =	873.00	762129.00
Rect B =	2.00	30.54
Rect L =	15.27	

Applied Loads		ular Footing Check For /						
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft)
3	-8.97	75.01		20.3	75.01	0	3.703	0.000
4	-8.97	-75.01		20.3	-75.01	0	3.703	0.000
5				11.3	0	0	0.000	0.000
6				11.3	0	0	0.000	0.000

OR	q' _{equiv}	
1	1.3	OK
1	1.3	OK
	0.4	OK
	0.4	OK

This spreadsheet uses a plastic analysis methodology for soil bearing pressure. Designs generated will be less conservative than other design programs such as Eneccalc and Tedds. Ref pg 117 of "A:\02_STRUCTURAL\00_STRUCTURAL DESIGN\300_Material & Subject Specific\31-Earthwork\001_Codes & References\FHWA-SA-02-054 - Shallow Fnds.pdf"

Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui	d Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: North 2

q' _a =	1.5	ksf
Allowable increase	1	
input L =	17.58	ft
input B =	2	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.7	ksf
q' _{max} =	1.14	ksf

Dead load factor for footin and soil wt.= 0.6

Edge "E", Interior "I", or Corner "C" E

Suggested L = ft

Suggested B = ft

	Dim	Area
SQ =	922.50	851006.25
Rect B =	2.00	35.16
Rect L =	17.58	

*Notes:
>adding more weight
when close to boarder of
the footing working can
help by flatting out the
overturning of the footing
and allowing for more
bearing area (this occurs
with the bearing area
does not extend very far
from the end of the

Applied Loads		ular Footing Check For /						
P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft)	OR q'equiv
3	-10.33	86.36	22.9	86.36	0	3.770	0.000	1 1.1
4	-10.33	-86.36	22.9	-86.36	0	3.770	0.000	1 1.1
5			12.6	0	0	0.000	0.000	0.4
6			12.6	0	0	0.000	0.000	0.4

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F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui	d Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: South 1

q' _a =	1.5	ksf
Allowable increase	1	
input L =	22.66	ft
input B =	2	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.7	ksf
q' _{max} =	1.26	ksf

Dead load factor for footin and soil wt.= 0.6

Edge "E", Interior "I", or Corner "C" E

Suggested L = ft

Suggested B = ft

	Dim	Area
SQ =	1022.50	#####
Rect B =	2.00	45.32
Rect L =	22.66	

*Notes:
>adding more weight
when close to boarder of
the footing working can
help by flatting out the
overturning of the footing
and allowing for more
bearing area (this occurs
with the bearing area
does not extend very far
from the end of the

Applied Loads		ular Footing Check For /						
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft) OR q'equiv
3	-13.32	161.37		28.7	161.37	0	5.616	1 1.3 OK
4	-13.32	-161.37		28.7	-161.37	0	5.616	1 1.3 OK
5				15.4	0	0	0.000	0.3 OK
6				15.4	0	0	0.000	0.3 OK

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Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui'd	Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: West

q' _a =	3	ksf
Allowable increase	1	
input L =	22.67	ft
input B =	2	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	3.2	ksf
q' _{max} =	0.80	ksf

Dead load factor for footin and soil wt.= 0.6
Edge "E", Interior "I", or Corner "C" E

Suggested L = ft
Suggested B = ft

	Dim	Area
SQ =	749.00	561001.00
Rect B =	2.00	45.34
Rect L =	22.67	

*Notes:
>adding more weight when close to boarder of the footing working can help by flatting out the overturning of the footing and allowing for more bearing area (this occurs with the bearing area does not extend very far from the end of the

Applied Loads		ular Footing Check For /							
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft)	OR q'equiv
3	-4.42	102.4		19.8	102.4	0	5.161	0.000	1 0.8 OK
4	-4.42	102.4		19.8	102.4	0	5.161	0.000	1 0.8 OK
5				15.4	0	0	0.000	0.000	1 0.3 OK
6				15.4	0	0	0.000	0.000	1 0.3 OK

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Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui	d Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: Interior

q' _a =	3	ksf
Allowable increase	1	
input L =	40	ft
input B =	2	ft
x offset =	0	ft
y offset =	11	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	3.3	ksf
q' _{max} =	1.24	ksf

Dead load factor for footin and soil wt. = 0.6
Edge "E", Interior "I", or Corner "C" I

Suggested L = ft
Suggested B = ft

	Dim	Area
SQ =	1130.50	#####
Rect B =	2.00	80
Rect L =	40.00	

*Notes:
>adding more weight when close to boarder of the footing working can help by flatting out the overturning of the footing and allowing for more bearing area (this occurs with the bearing area does not extend very far from the end of the

Applied Loads		ular Footing Check For /						
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft) OR q'equiv
3	-4.43	429		40.2	477.73	0	11.874	1 1.2 OK
4	-4.43	-429		40.2	-380.27	0	9.452	1 1.0 OK
5				35.8	0	0	0.000	0.4 OK
6				35.8	0	0	0.000	0.4 OK

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Insert Section Cut Forces directly from ETABS starting in cell AL16

Note these are reactions and will have reversed signs from what is used in the applied loads section.

F3 - is axial force

M1 - is moment about the X axis (Mx')

M2 - is moment about the Y axis (My')

ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui'd	Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: East 1&2 Comb.

q' _a =	3	ksf
Allowable increase	1	
input L =	40	ft
input B =	2	ft
x offset =	0	ft
y offset =	5.22	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	3.2	ksf
q' _{max} =	0.91	ksf

Dead load factor for footin and soil wt.= 0.6
Edge "E", Interior "I", or Corner "C" E

Suggested L = ft
Suggested B = ft

	Dim	Area
SQ =	956.50	914692.25
Rect B =	2.00	80
Rect L =	40.00	

Applied Loads		ular Footing Check For /						
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft) OR q'equiv
3	-4.76	326.6		29.9	351.4472	0	11.769	0.000 1 0.9 OK
4	-4.76	-326.6		29.9	-301.753	0	10.105	0.000 0.8 OK
5				25.1	0	0	0.000	0.000 0.3 OK
6				25.1	0	0	0.000	0.000 0.3 OK

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Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui	d Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: SF-1

q' _a =	1.5	ksf
Allowable increase	1	
input L =	22.67	ft
input B =	2	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	12	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.6	ksf
q' _{max} =	1.07	ksf

Dead load factor for footin and soil wt. = 0.6
Edge "E", Interior "I", or Corner "C" E

Suggested L = ft
Suggested B = ft

	Dim	Area
SQ =	900.50	810900.25
Rect B =	2.00	45.34
Rect L =	22.67	

*Notes:
>adding more weight
when close to boarder of
the footing working can
help by flatting out the
overturning of the footing
and allowing for more
bearing area (this occurs
with the bearing area
does not extend very far
from the end of the

Applied Loads		ular Footing Check For /						
	P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft) OR q'equiv
3	-13.32	136.92		24.7	136.92	0	5.552	1 1.1 OK
4	-13.32	-136.92		24.7	-136.92	0	5.552	1 1.1 OK
5				11.3	0	0	0.000	0.3 OK
6				11.3	0	0	0.000	0.3 OK

This spreadsheet uses a plastic analysis methodology for soil bearing pressure. Designs generated will be less conservative than other design programs such as Eneccalc and Tedds. Ref pg 117 of "A:\02_STRUCTURAL\00_STRUCTURAL DESIGN\300_Material & Subject Specific\31-Earthwork\001_Codes & References\FHWA-SA-02-054 - Shallow Fnds.pdf"

Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui	d Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				

Location: SF-1.5

q' _a =	1.5	ksf
Allowable increase	1	
input L =	19.25	ft
input B =	1.5	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	12	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.7	ksf
q' _{max} =	1.11	ksf

Dead load factor for footin and soil wt.= 0.6
Edge "E", Interior "I", or Corner "C" E

Suggested L = ft
Suggested B = ft

	Dim	Area
SQ =	799.00	638401.00
Rect B =	1.50	28.875
Rect L =	19.25	

*Notes:
>adding more weight
when close to boarder of
the footing working can
help by flatting out the
overturning of the footing
and allowing for more
bearing area (this occurs
with the bearing area
does not extend very far
from the end of the

Applied Loads		Mx'(kft)		My'(kft)		P+Footing		Mx(kft)		My(kft)		eL(ft)		eB(ft)		OR		ular Footing Check For /	
P(k)		Mx'(kft)		My'(kft)		P+Footing		Mx(kft)		My(kft)		eL(ft)		eB(ft)		OR		q'equiv	
3	-11.33	-71.64				20.4		-71.64		0		3.515		0.000		1		1.1	
4		0				9.1		0		0		0.000		0.000				0.3	
5		0				9.1		0		0		0.000		0.000				0.3	
6		0				9.1		0		0		0.000		0.000				0.3	

This spreadsheet uses a plastic analysis methodology for soil bearing pressure. Designs generated will be less conservative than other design programs such as Eneccalc and Tedds. Ref pg 117 of "A:\02_STRUCTURAL\00_STRUCTURAL DESIGN\300_Material & Subject Specific\31-Earthwork\001_Codes & References\FHWA-SA-02-054 - Shallow Fnds.pdf"

Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis											
Section Cui	d	Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
			kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
					1.1						
					0.5	2.8					
					1		0				
					0	0	0				

Location: SF-3.5

q' _a =	1.5	ksf
Allowable increase	1	
input L =	29	ft
input B =	3.5	ft
x offset =	0	ft
y offset =	0	ft
footing thickness	24	in
Depth of Top of Footing	0	ft
Soil Density	120	psf
Slab Thickness	4	in
Slab Extension	6.62	ft
Soil Friction Angle	45	degrees
L (y)		
B (x)		

q _{eff} =	1.7	ksf
q' _{max} =	1.42	ksf

Dead load factor for footin and soil wt.= 0.6
Edge "E", Interior "I", or Corner "C" E

Suggested L = ft
Suggested B = ft

Dim	Area
SQ =	1369.50 #####
Rect B =	3.50 101.5
Rect L =	29.00

*Notes:
>adding more weight
when close to boarder of
the footing working can
help by flatting out the
overturning of the footing
and allowing for more
bearing area (this occurs
with the bearing area
does not extend very far
from the end of the

Applied Loads		ular Footing Check For /						
P(k)	Mx'(kft)	My'(kft)	P+Footing	Mx(kft)	My(kft)	eL(ft)	eB(ft)	OR q'equiv
3	-6.13	-371.64	33.3	-371.64	0	11.148	0.000	1 1.4 OK
4	-6.13	371.64	33.3	371.64	0	11.148	0.000	1 1.4 OK
5			27.2	0	0	0.000	0.000	0.3 OK
6			27.2	0	0	0.000	0.000	0.3 OK

This spreadsheet uses a plastic analysis methodology for soil bearing pressure. Designs generated will be less conservative than other design programs such as Eneccalc and Tedds. Ref pg 117 of "A:\02_STRUCTURAL\00_STRUCTURAL DESIGN\300_Material & Subject Specific\31-Earthwork\001_Codes & References\FHWA-SA-02-054 - Shallow Fnds.pdf"

Insert Section Cut Forces directly from ETABS starting in cell AL16
Note these are reactions and will have reversed signs from what is used in the applied loads section.
F3 - is axial force
M1 - is moment about the X axis (Mx')
M2 - is moment about the Y axis (My')
ensure the 1 and 2 axes in ETABS relates to the global X and Y direction. If this is not the case, take care to define the section cut axis to coorelate with the spreadsheet input.

TABLE: Section Cut Forces - Analysis										
Section Cui'd	Case/Cor	F1	F2	F3	M1	M2	M3	X	Y	Z
		kip	kip	kip	kip-ft	kip-ft	kip-ft	ft	ft	ft
				1.1						
				0.5	2.8					
				1		0				
				0	0	0				



Anchor Designer™
Software
Version 3.2.2309.2

Company:		Date:	2/17/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1. Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-19
Units: Imperial units

Anchor Information:

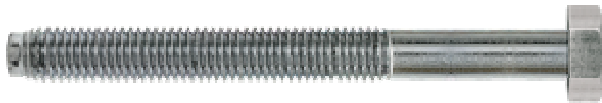
Anchor type: Cast-in-place
Material: F1554 Grade 36
Diameter (inch): 1.000
Effective Embedment depth, h_{ef} (inch): 18.000
Anchor category: -
Anchor ductility: Yes
 h_{min} (inch): 19.75
 C_{min} (inch): 6.00
 S_{min} (inch): 6.00

Base Material

Concrete: Normal-weight
Concrete thickness, h (inch): 36.00
State: Cracked
Compressive strength, f'_c (psi): 3000
 $\Psi_{c,v}$: 1.0
Reinforcement condition: Supplementary reinforcement not present
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

Recommended Anchor

Anchor Name: Heavy Hex Bolt - 1"Ø Heavy Hex Bolt, F1554 Gr. 36





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

Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination: not set

Seismic design: No

Anchors subjected to sustained tension: Not applicable

Apply entire shear load at front row: Yes

Anchors only resisting wind and/or seismic loads: No

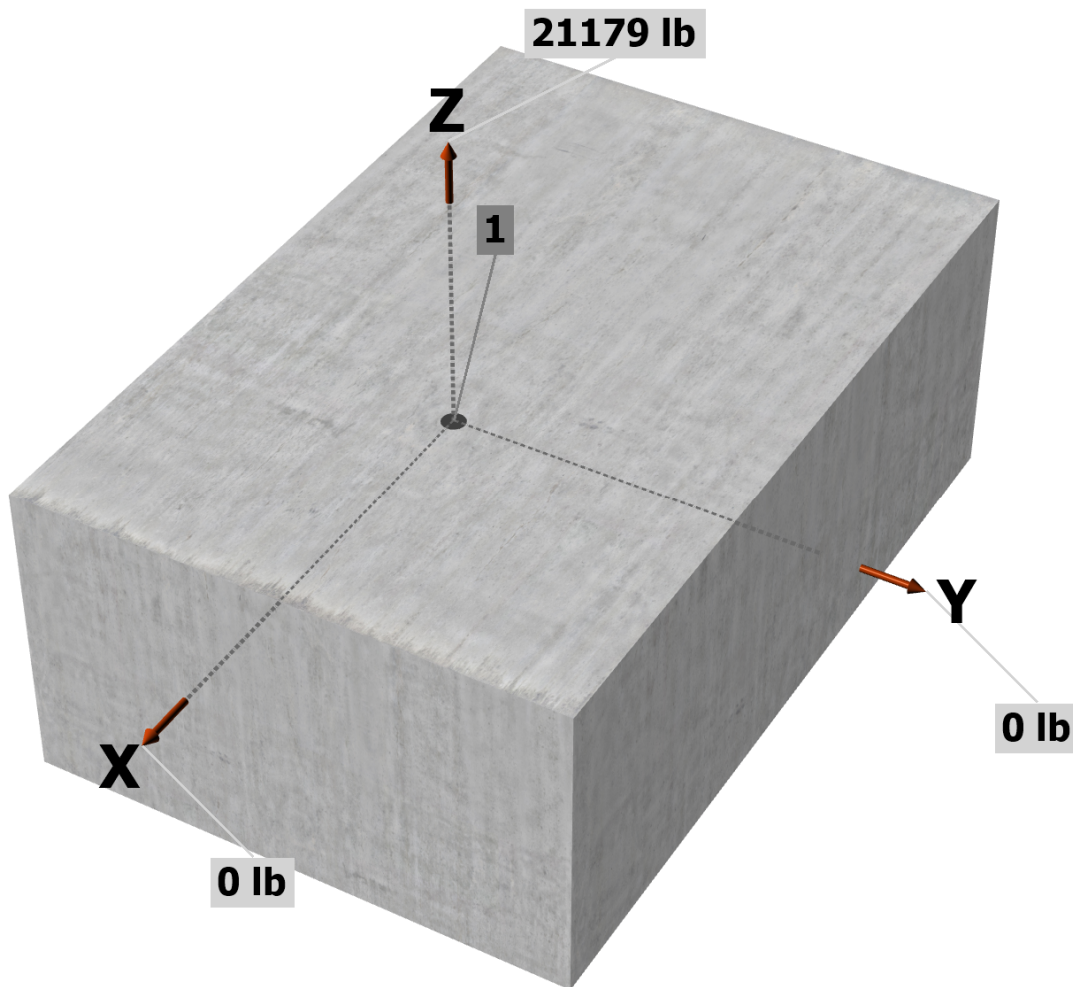
Strength level loads:

N_{ua} [lb]: 21179

V_{uax} [lb]: 0

V_{uay} [lb]: 0

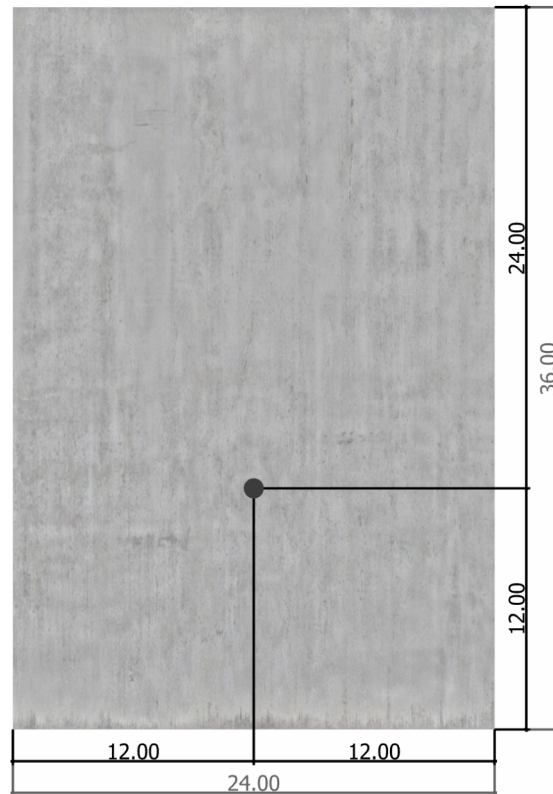
<Figure 1>





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Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	21179.0	0.0	0.0	0.0
Sum	21179.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00

Maximum concrete compression stress (psi): 0

Resultant tension force (lb): 0

Resultant compression force (lb): 0

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

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

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
35150	0.75	26363

6. Pullout Strength of Anchor in Tension (Sec. 17.6.3)

$\phi N_{pn} = \phi \psi_{c,P} N_p = \phi \psi_{c,P} 8 A_{brg} f'_c$ (Sec. 17.5.1.2, Eq. 17.6.3.1 & 17.6.3.2.2a)

$\psi_{c,P}$	A_{brg} (in ²)	f'_c (psi)	ϕ	ϕN_{pn} (lb)
1.0	1.50	3000	0.70	25217



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Engineer:		Page:	5/5
Project:			
Address:			
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E-mail:			

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	21179	26363	0.80	Pass
Pullout	21179	25217	0.84	Pass (Governs)

1"Ø Heavy Hex Bolt, F1554 Gr. 36 with hef = 18.000 inch meets the selected design criteria.

12. Warnings

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.5.2.1 for conditions where calculations of the concrete breakout strength may not be required.
- Designer must exercise own judgement to determine if this design is suitable.



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Company:		Date:	2/15/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1. Project information

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

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-19
Units: Imperial units

Anchor Information:

Anchor type: Cast-in-place
Material: F1554 Grade 36
Diameter (inch): 1.000
Effective Embedment depth, h_{ef} (inch): 18.000
Anchor category: -
Anchor ductility: Yes
 h_{min} (inch): 19.75
 C_{min} (inch): 6.00
 S_{min} (inch): 6.00

Base Material

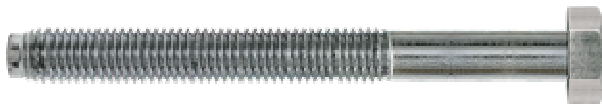
Concrete: Normal-weight
Concrete thickness, h (inch): 48.00
State: Cracked
Compressive strength, f'_c (psi): 3000
 $\Psi_{c,v}$: 1.0
Reinforcement condition: Supplementary reinforcement not present
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

Base Plate

Length x Width x Thickness (inch): 5.50 x 15.00 x 0.25

Recommended Anchor

Anchor Name: Heavy Hex Bolt - 1"Ø Heavy Hex Bolt, F1554 Gr. 36





Company:		Date:	2/15/2023
Engineer:		Page:	2/5
Project:			
Address:			
Phone:			
E-mail:			

Load and Geometry

Load factor source: ACI 318 Section 5.3

Load combination: not set

Seismic design: No

Anchors subjected to sustained tension: Not applicable

Apply entire shear load at front row: No

Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 37887

V_{uax} [lb]: 0

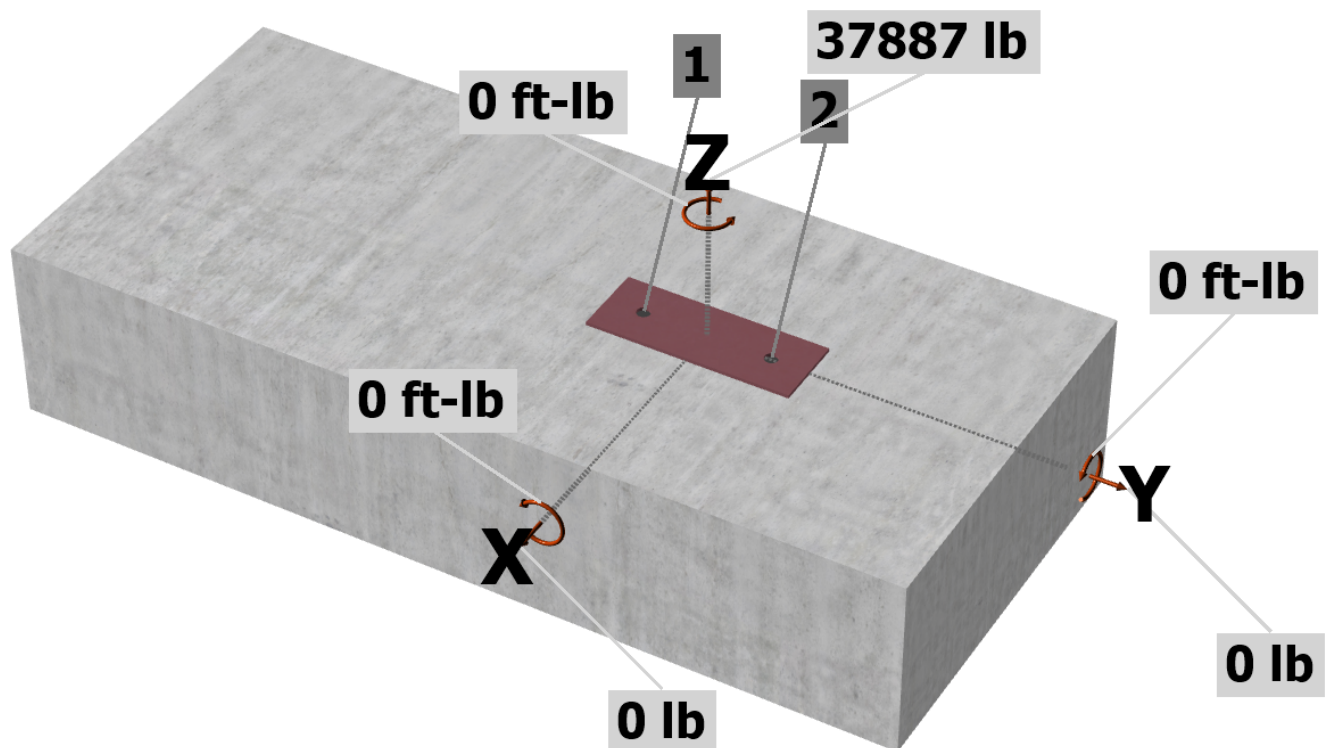
V_{uay} [lb]: 0

M_{ux} [ft-lb]: 0

M_{uy} [ft-lb]: 0

M_{uz} [ft-lb]: 0

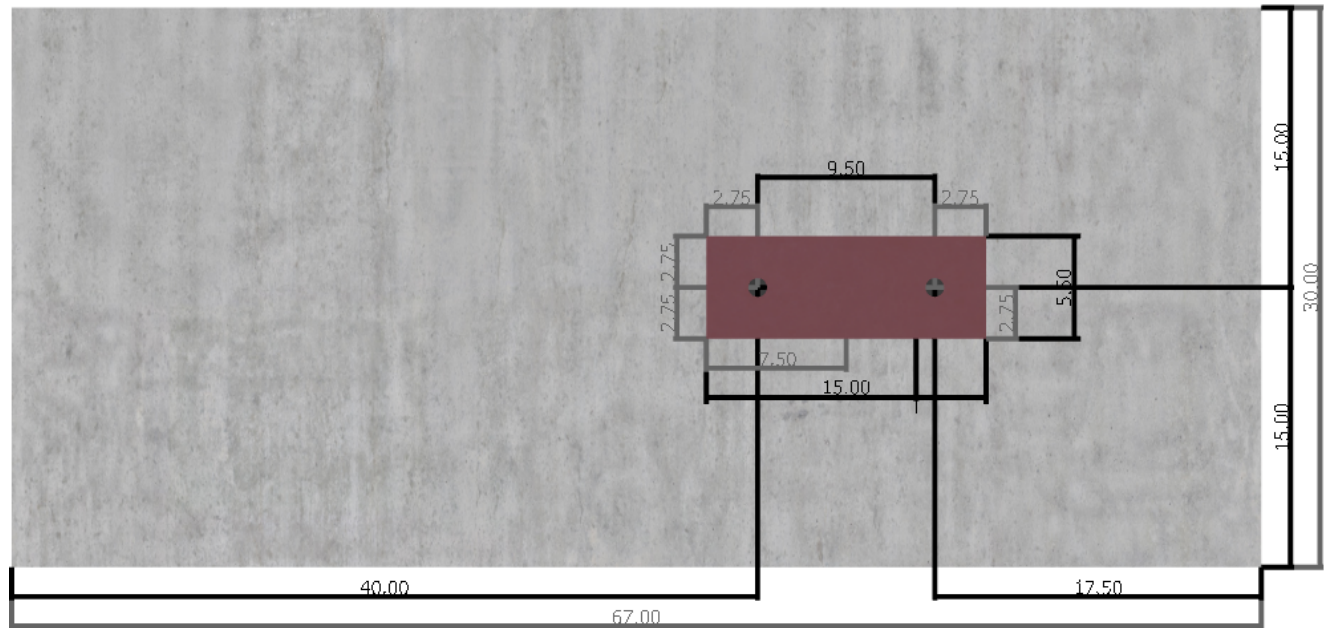
<Figure 1>





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<Figure 2>





Company:		Date:	2/15/2023
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Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	18943.5	0.0	0.0	0.0
2	18943.5	0.0	0.0	0.0
Sum	37887.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00

Maximum concrete compression stress (psi): 0

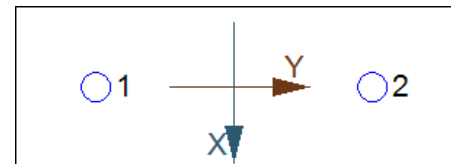
Resultant tension force (lb): 0

Resultant compression force (lb): 0

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

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

<Figure 3>



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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
35150	0.75	26363

6. Pullout Strength of Anchor in Tension (Sec. 17.6.3)

$\phi N_{pn} = \phi \psi_{c,p} N_p = \phi \psi_{c,p} 8 A_{brg} f'_c$ (Sec. 17.5.1.2, Eq. 17.6.3.1 & 17.6.3.2.2a)

$\psi_{c,p}$	A_{brg} (in ²)	f'_c (psi)	ϕ	ϕN_{pn} (lb)
1.0	1.50	3000	0.70	25217



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Engineer:		Page:	5/5
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Address:			
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E-mail:			

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	18944	26363	0.72	Pass
Pullout	18944	25217	0.75	Pass (Governs)

1"Ø Heavy Hex Bolt, F1554 Gr. 36 with hef = 18.000 inch meets the selected design criteria.

12. Warnings

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.5.2.1 for conditions where calculations of the concrete breakout strength may not be required.
- Designer must exercise own judgement to determine if this design is suitable.

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: SF-1

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	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :	=	Yes

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
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

Reference Depth below Surface	=	ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

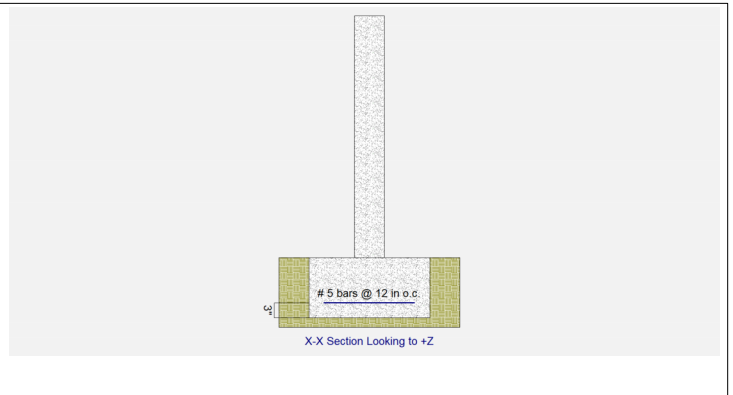
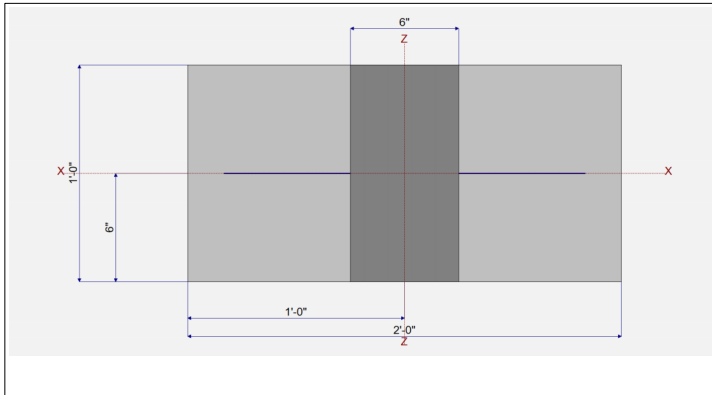
Adjusted Allowable Bearing Pressure

= 1.50 ksf

Dimensions

Reinforcing

Footing Width	=	2.0 ft	Footing Thickness	=	12.0 in	Bars along X-X Axis	=	
Wall Thickness	=	6.0 in	Rebar Centerline to Edge of Concrete...	=		Bar spacing	=	12.00
Wall center offset from center of footing	=	0 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	=	# 5



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	0.6730	0.6730	0.6260			k
OB : Overburden	=	0.110					ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=						in above top of footing

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 240622.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: SF-1

DESIGN SUMMARY

Design OK

Factor of Safety		Item	Applied	Capacity	Governing Load Combination
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	Uplift	0.0 k	0.0 k	No Uplift
Utilization Ratio		Item	Applied	Capacity	Governing Load Combination
PASS	0.6003	Soil Bearing	0.9005 ksf	1.50 ksf	+D+Lr
PASS	0.02511	Z Flexure (+X)	0.3047 k-ft	12.131 k-ft	+1.20D+1.60Lr
PASS	0.009473	Z Flexure (-X)	0.1149 k-ft	12.131 k-ft	+0.90D
PASS	n/a	1-way Shear (+X)	0.0 psi	82.158 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
, D Only	1.50 ksf	0.0 in	0.5640 ksf	0.5640 ksf	0.376
, +D+Lr	1.50 ksf	0.0 in	0.9005 ksf	0.9005 ksf	0.600
, +D+S	1.50 ksf	0.0 in	0.8770 ksf	0.8770 ksf	0.585
, +D+0.750Lr	1.50 ksf	0.0 in	0.8164 ksf	0.8164 ksf	0.544
, +D+0.750S	1.50 ksf	0.0 in	0.7988 ksf	0.7988 ksf	0.533
, +0.60D	1.50 ksf	0.0 in	0.3384 ksf	0.3384 ksf	0.226

Units : k-ft

Overturning Stability

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

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D	0.1788	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.40D	0.1788	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.2005	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.2005	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.1972	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.1972	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.3047	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.3047	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.2941	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.2941	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.2148	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.2148	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.1149	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.1149	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

Units : k

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50Lr	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50S	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60Lr	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60S	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.70S	0 psi	0 psi	0 psi	82.158 psi	0	OK
+0.90D	0 psi	0 psi	0 psi	82.158 psi	0	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 8 ft

CODE REFERENCES

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

Load Combination Set : IBC 2021

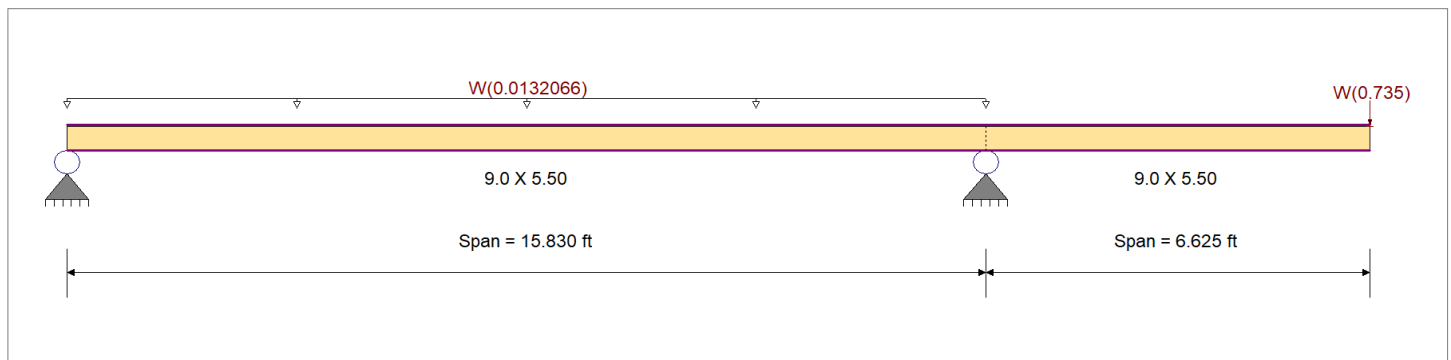
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination : IBC 2021

Wood Species : RedBuilt
 Wood Grade : RedLam LVL Beam/Joist

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

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



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 0.6670 ft, (Wind on Wall)

Load for Span Number 2

Point Load : W = 0.7350 k @ 6.625 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio		=	0.150 : 1	Maximum Shear Stress Ratio		=	0.029 : 1
Section used for this span			9.0 X 5.50	Section used for this span			9.0 X 5.50
fb: Actual		=	772.66 psi	fv: Actual		=	13.36 psi
F'b		=	5,159.38 psi	F'v		=	456.00 psi
Load Combination			+0.60W	Load Combination			+0.60W
Location of maximum on span		=	15.830ft	Location of maximum on span		=	15.830 ft
Span # where maximum occurs		=	Span # 1	Span # where maximum occurs		=	Span # 1
Maximum Deflection							
Max Downward Transient Deflection		0 in	Ratio =	0	<240	n/a	
Max Upward Transient Deflection		0 in	Ratio =	0	<240	n/a	
Max Downward Total Deflection		0.659 in	Ratio =	240	>=240	Span: 2 : +0.420W	
Max Upward Total Deflection		-0.199 in	Ratio =	956	>=240	Span: 1 : +0.420W	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios											Moment Values			Shear Values		
Segment	Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
+0.60W	Length = 15.830 ft	1			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 6.625 ft	2			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			2,902.1	0.00	0.0	256.5
						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.150	0.029	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.92	772.7	5,159.4	0.44	13.4	456.0
	Length = 6.625 ft	2	0.150	0.029	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.92	772.7	5,159.4	0.44	13.4	456.0
+0.450W						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.112	0.022	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.19	579.5	5,159.4	0.33	10.0	456.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: SF-1.5

DESIGN SUMMARY

Design OK

Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	No Uplift
Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5143	Soil Bearing	0.7714 ksf	+D+Lr
PASS	0.03715	Z Flexure (+X)	0.4507 k-ft	+1.20D+1.60Lr
PASS	0.01455	Z Flexure (-X)	0.1765 k-ft	+0.90D
PASS	0.02540	1-way Shear (+X)	2.086 psi	+1.20D+1.60Lr
PASS	0.02540	1-way Shear (-X)	2.086 psi	+1.20D+1.60Lr

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
, D Only	1.50 ksf	0.0 in	0.5022 ksf	0.5022 ksf	0.335
, +D+Lr	1.50 ksf	0.0 in	0.7714 ksf	0.7714 ksf	0.514
, +D+S	1.50 ksf	0.0 in	0.7530 ksf	0.7530 ksf	0.502
, +D+0.750Lr	1.50 ksf	0.0 in	0.7041 ksf	0.7041 ksf	0.469
, +D+0.750S	1.50 ksf	0.0 in	0.6903 ksf	0.6903 ksf	0.460
, +0.60D	1.50 ksf	0.0 in	0.3013 ksf	0.3013 ksf	0.201

Units : k-ft

Overturning Stability

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

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D	0.2745	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.40D	0.2745	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.3026	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.3026	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.298	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.298	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.4507	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.4507	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.436	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.436	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.3231	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.3231	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.1765	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.1765	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

Units : k

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	1.271 psi	1.271 psi	1.271 psi	82.158 psi	0.01547	OK
+1.20D+0.50Lr	1.401 psi	1.401 psi	1.401 psi	82.158 psi	0.01705	OK
+1.20D+0.50S	1.38 psi	1.38 psi	1.38 psi	82.158 psi	0.01679	OK
+1.20D+1.60Lr	2.086 psi	2.086 psi	2.086 psi	82.158 psi	0.0254	OK
+1.20D+1.60S	2.018 psi	2.018 psi	2.018 psi	82.158 psi	0.02457	OK
+1.20D+0.70S	1.496 psi	1.496 psi	1.496 psi	82.158 psi	0.01821	OK
+0.90D	0.8171 psi	0.8171 psi	0.8171 psi	82.158 psi	0.009945	OK

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: SF-3

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	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :	=	Yes

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
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

Reference Depth below Surface	=	ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

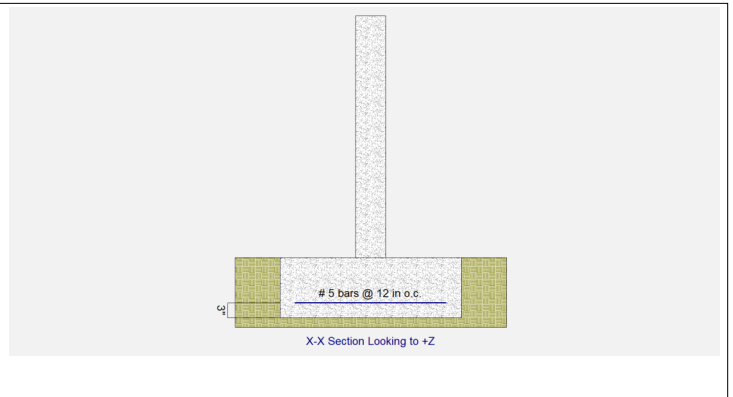
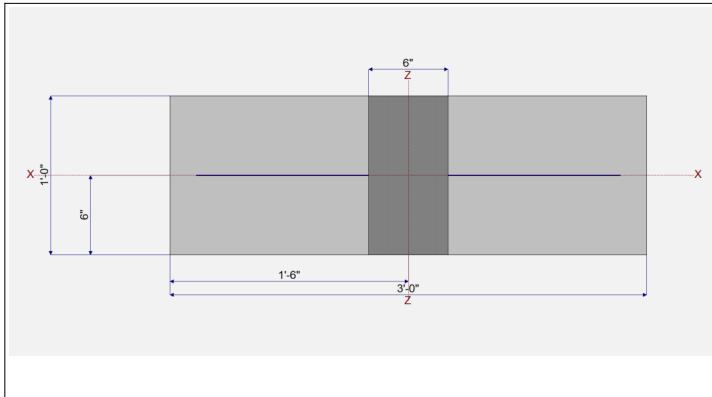
Adjusted Allowable Bearing Pressure

= 1.50 ksf

Dimensions

Reinforcing

Footing Width	=	3.0 ft	Footing Thickness	=	12.0 in	Bars along X-X Axis	=	
Wall Thickness	=	6.0 in	Rebar Centerline to Edge of Concrete...	=		Bar spacing	=	12.00
Wall center offset from center of footing	=	0 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	=	# 5



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	0.6730	0.6730	0.626			k
OB : Overburden	=	0.110					ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=						in above top of footing

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: SF-3

DESIGN SUMMARY

Design OK

Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	No Uplift
Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4569	Soil Bearing	0.6853 ksf	+D+Lr
PASS	0.05024	Z Flexure (+X)	0.6095 k-ft	+1.20D+1.60Lr
PASS	0.02034	Z Flexure (-X)	0.2468 k-ft	+0.90D
PASS	0.04220	1-way Shear (+X)	3.467 psi	+1.20D+1.60Lr
PASS	0.04220	1-way Shear (-X)	3.467 psi	+1.20D+1.60Lr

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
, D Only	1.50 ksf	0.0 in	0.4610 ksf	0.4610 ksf	0.307
, +D+Lr	1.50 ksf	0.0 in	0.6853 ksf	0.6853 ksf	0.457
, +D+S	1.50 ksf	0.0 in	0.6697 ksf	0.6697 ksf	0.446
, +D+0.750Lr	1.50 ksf	0.0 in	0.6293 ksf	0.6293 ksf	0.420
, +D+0.750S	1.50 ksf	0.0 in	0.6175 ksf	0.6175 ksf	0.412
, +0.60D	1.50 ksf	0.0 in	0.2766 ksf	0.2766 ksf	0.184

Units : k-ft

Overturning Stability

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

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D	0.3839	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.40D	0.3839	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.4167	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50Lr	0.4167	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.4106	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.50S	0.4106	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.6095	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60Lr	0.6095	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.5899	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+1.60S	0.5899	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.4432	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +1.20D+0.70S	0.4432	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.2468	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
, +0.90D	0.2468	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

Units : k

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	2.184 psi	2.184 psi	2.184 psi	82.158 psi	0.02658	OK
+1.20D+0.50Lr	2.371 psi	2.371 psi	2.371 psi	82.158 psi	0.02885	OK
+1.20D+0.50S	2.336 psi	2.336 psi	2.336 psi	82.158 psi	0.02843	OK
+1.20D+1.60Lr	3.467 psi	3.467 psi	3.467 psi	82.158 psi	0.0422	OK
+1.20D+1.60S	3.356 psi	3.356 psi	3.356 psi	82.158 psi	0.04085	OK
+1.20D+0.70S	2.521 psi	2.521 psi	2.521 psi	82.158 psi	0.03069	OK
+0.90D	1.404 psi	1.404 psi	1.404 psi	82.158 psi	0.01709	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Pole Footing Embedded in Soil

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing

Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Pole Footing Shape Circular
 Pole Footing Diameter 36.0 in
 Calculate Min. Depth for Allowable Pressures
 Lateral Restraint at Ground Surface
 Allow Passive 100.0 pcf
 Max Passive 3,000.0 psf

Controlling Values

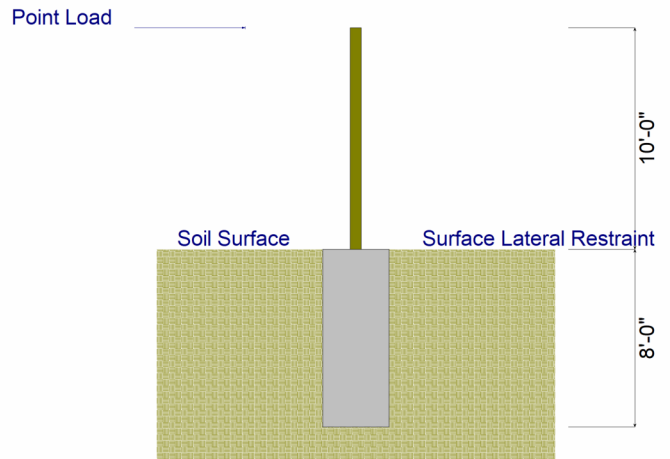
Governing Load Combination $D+0.750Lr+0.450W$
 Lateral Load 0.3825 k
 Moment 34.50 k-ft

Restraint @ Ground Surface

Pressure at Depth
 Actual **763.67** psf
 Allowable **800.0** psf
 Surface Retraint Force 9,546.56 lbs

Minimum Required Depth 8.0 ft

Footing Base Area 7.069 ft²
 Maximum Soil Pressure 0.04244 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k)		Applied Moment (kft)	Vertical Load (k)
D : Dead Load	k		k/ft	9.0 k-ft	-2.250 k
Lr : Roof Live	k		k/ft	20.50 k-ft	-4.250 k
L : Live	k		k/ft	k-ft	k
S : Snow	k		k/ft	k-ft	k
W : Wind	0.850 k		k/ft	14.0 k-ft	2.750 k
E : Earthquake	0.90 k		k/ft	3.50 k-ft	k
H : Lateral Earth	k		k/ft	k-ft	k
Load distance above ground surface	10.0 ft	TOP of Load above ground surface	ft		
		BOTTOM of Load above ground surface	ft		

Load Combination Results

Load Combination	Forces @ Ground Surface		Required Depth - (ft)	Pressure at Depth		Soil Increase Factor
	Loads - (k)	Moments - (ft-k)		Actual - (psf)	Allow - (psf)	
D Only	0.000	9.000	5.13	485.4	512.5	1.000
+D+Lr	0.000	29.500	7.50	743.0	750.0	1.000
+D+0.750Lr	0.000	24.375	7.13	680.2	712.5	1.000
+D+0.60W	0.510	22.500	6.88	674.4	687.5	1.000
+D+0.70E	0.630	17.750	6.38	618.7	637.5	1.000
+D+0.750Lr+0.450W	0.383	34.500	8.00	763.7	800.0	1.000
+D+0.450W	0.383	19.125	6.50	641.3	650.0	1.000
+D+0.5250E	0.473	15.563	6.13	587.7	612.5	1.000
+0.60D+0.60W	0.510	18.900	6.50	633.7	650.0	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30 BRITT PETERS & ASSOCIATES INC. (c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing

+0.60D+0.70E	0.630	14.150	5.88	580.8	587.5	1.000
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Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Footing

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	=	3.0 ksi
f _y : Rebar Yield	=	60.0 ksi
E _c : Concrete Elastic Modulus	=	3,320.56 ksi
Concrete Density	=	150.0 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	=	1.50 : 1
Min. Sliding Safety Factor	=	1.50 : 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	=	100.0 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	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

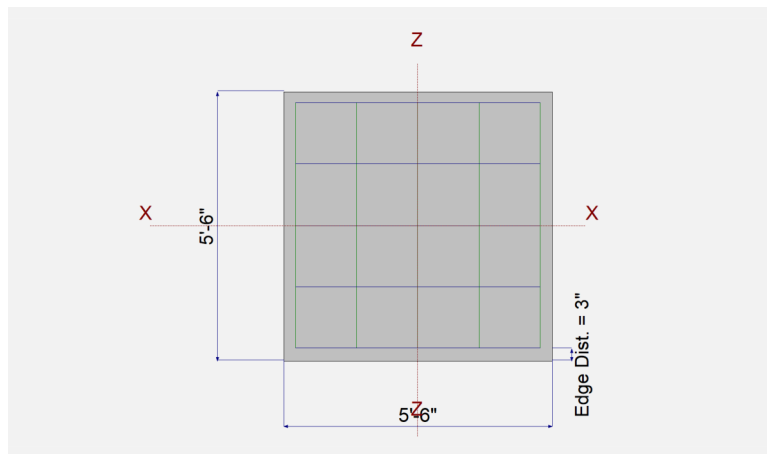
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	5.50 ft
Length parallel to Z-Z Axis	=	5.50 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

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



Reinforcing

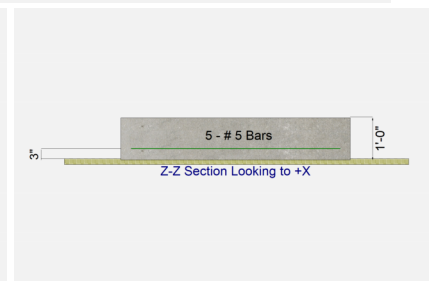
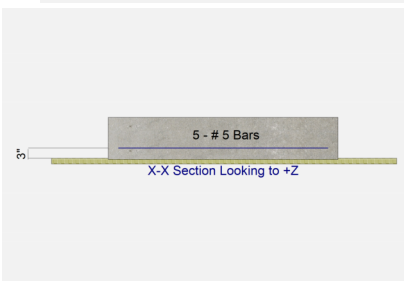
Bars parallel to X-X Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bars parallel to Z-Z Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

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



Applied Loads

	D	L _r	L	S	W	E	H
P : Column Load	=	20.616		14.491			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8740	Soil Bearing	1.311 ksf	1.50 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.5415	Z Flexure (+X)	5.991 k-ft/ft	11.063 k-ft/ft	+1.20D+1.60S
PASS	0.5415	Z Flexure (-X)	5.991 k-ft/ft	11.063 k-ft/ft	+1.20D+1.60S
PASS	0.5415	X Flexure (+Z)	5.991 k-ft/ft	11.063 k-ft/ft	+1.20D+1.60S
PASS	0.5415	X Flexure (-Z)	5.991 k-ft/ft	11.063 k-ft/ft	+1.20D+1.60S
PASS	0.3535	1-way Shear (+X)	29.045 psi	82.158 psi	+1.20D+1.60S
PASS	0.3535	1-way Shear (-X)	29.045 psi	82.158 psi	+1.20D+1.60S
PASS	0.3535	1-way Shear (+Z)	29.045 psi	82.158 psi	+1.20D+1.60S
PASS	0.3535	1-way Shear (-Z)	29.045 psi	82.158 psi	+1.20D+1.60S
PASS	0.8825	2-way Punching	145.017 psi	164.317 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
			(in)			Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.50	n/a	0.0	0.8315	0.8315	n/a	n/a	n/a	n/a	0.554
X-X, +D+S	1.50	n/a	0.0	1.311	1.311	n/a	n/a	n/a	n/a	0.874
X-X, +D+0.750S	1.50	n/a	0.0	1.191	1.191	n/a	n/a	n/a	n/a	0.794
X-X, +0.60D	1.50	n/a	0.0	0.4989	0.4989	n/a	n/a	n/a	n/a	0.333
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.8315	0.8315	0.8315	0.8315	0.554
Z-Z, +D+S	1.50	0.0	n/a	n/a	n/a	1.311	1.311	1.311	1.311	0.874
Z-Z, +D+0.750S	1.50	0.0	n/a	n/a	n/a	1.191	1.191	1.191	1.191	0.794
Z-Z, +0.60D	1.50	0.0	n/a	n/a	n/a	0.4989	0.4989	0.4989	0.4989	0.333

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	3.608	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.40D	3.608	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D	3.092	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D	3.092	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+0.50S	3.998	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+0.50S	3.998	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+1.60S	5.991	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+1.60S	5.991	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+0.70S	4.360	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +1.20D+0.70S	4.360	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +0.90D	2.319	+Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
X-X, +0.90D	2.319	-Z	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.40D	3.608	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.40D	3.608	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D	3.092	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D	3.092	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D+0.50S	3.998	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Footing

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+0.50S	3.998	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D+1.60S	5.991	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D+1.60S	5.991	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D+0.70S	4.360	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +1.20D+0.70S	4.360	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +0.90D	2.319	-X	Bottom	0.2592	AsMin	0.2818	11.063	OK
Z-Z, +0.90D	2.319	+X	Bottom	0.2592	AsMin	0.2818	11.063	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	17.49 psi	17.49 psi	17.49 psi	17.49 psi	17.49 psi	82.16 psi	0.21	OK
+1.20D	14.99 psi	14.99 psi	14.99 psi	14.99 psi	14.99 psi	82.16 psi	0.18	OK
+1.20D+0.50S	19.39 psi	19.39 psi	19.39 psi	19.39 psi	19.39 psi	82.16 psi	0.24	OK
+1.20D+1.60S	29.05 psi	29.05 psi	29.05 psi	29.05 psi	29.05 psi	82.16 psi	0.35	OK
+1.20D+0.70S	21.14 psi	21.14 psi	21.14 psi	21.14 psi	21.14 psi	82.16 psi	0.26	OK
+0.90D	11.25 psi	11.25 psi	11.25 psi	11.25 psi	11.25 psi	82.16 psi	0.14	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	87.34 psi	164.32psi	0.5315	OK
+1.20D	74.86 psi	164.32psi	0.4556	OK
+1.20D+0.50S	96.78 psi	164.32psi	0.589	OK
+1.20D+1.60S	145.02 psi	164.32psi	0.8825	OK
+1.20D+0.70S	105.55 psi	164.32psi	0.6424	OK
+0.90D	56.14 psi	164.32psi	0.3417	OK

All units k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Footing

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	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,320.56 ksi
Concrete Density	=	150.0 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	=	1.50 : 1
Min. Sliding Safety Factor	=	1.50 : 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	=	100.0 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	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

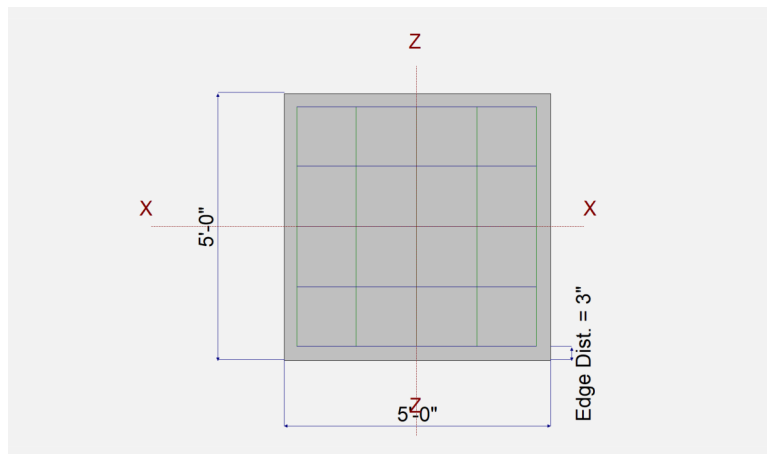
Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

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



Reinforcing

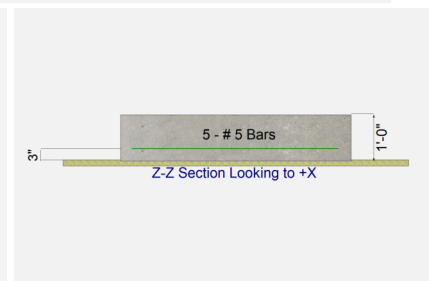
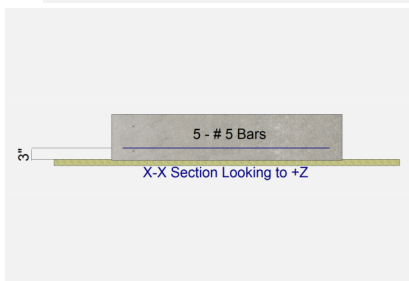
Bars parallel to X-X Axis	=	
Number of Bars	=	5
Reinforcing Bar Size	=	# 5

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	=	11.608		10.725			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6953	Soil Bearing	1.043 ksf	1.50 ksf	+D+S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.3204	Z Flexure (+X)	3.886 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60S
PASS	0.3204	Z Flexure (-X)	3.886 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60S
PASS	0.3204	X Flexure (+Z)	3.886 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60S
PASS	0.3204	X Flexure (-Z)	3.886 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60S
PASS	0.2453	1-way Shear (+X)	20.151 psi	82.158 psi	+1.20D+1.60S
PASS	0.2453	1-way Shear (-X)	20.151 psi	82.158 psi	+1.20D+1.60S
PASS	0.2453	1-way Shear (+Z)	20.151 psi	82.158 psi	+1.20D+1.60S
PASS	0.2453	1-way Shear (-Z)	20.151 psi	82.158 psi	+1.20D+1.60S
PASS	0.5708	2-way Punching	93.797 psi	164.317 psi	+1.20D+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.50	n/a	0.0			0.6143	0.6143	n/a	n/a	0.410
X-X, +D+S	1.50	n/a	0.0			1.043	1.043	n/a	n/a	0.695
X-X, +D+0.750S	1.50	n/a	0.0			0.9361	0.9361	n/a	n/a	0.624
X-X, +0.60D	1.50	n/a	0.0			0.3686	0.3686	n/a	n/a	0.246
Z-Z, D Only	1.50	0.0	n/a			n/a	n/a	0.6143	0.6143	0.410
Z-Z, +D+S	1.50	0.0	n/a			n/a	n/a	1.043	1.043	0.695
Z-Z, +D+0.750S	1.50	0.0	n/a			n/a	n/a	0.9361	0.9361	0.624
Z-Z, +0.60D	1.50	0.0	n/a			n/a	n/a	0.3686	0.3686	0.246

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	2.031	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.40D	2.031	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D	1.741	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D	1.741	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+0.50S	2.412	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+0.50S	2.412	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+1.60S	3.886	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+1.60S	3.886	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+0.70S	2.680	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +1.20D+0.70S	2.680	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +0.90D	1.306	+Z	Bottom	0.2592	AsMin	0.310	12.131	OK
X-X, +0.90D	1.306	-Z	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.40D	2.031	-X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.40D	2.031	+X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D	1.741	-X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D	1.741	+X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D+0.50S	2.412	-X	Bottom	0.2592	AsMin	0.310	12.131	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Footing

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+0.50S	2.412	+X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D+1.60S	3.886	-X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D+1.60S	3.886	+X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D+0.70S	2.680	-X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +1.20D+0.70S	2.680	+X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +0.90D	1.306	-X	Bottom	0.2592	AsMin	0.310	12.131	OK
Z-Z, +0.90D	1.306	+X	Bottom	0.2592	AsMin	0.310	12.131	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	10.53 psi	10.53 psi	10.53 psi	10.53 psi	10.53 psi	82.16 psi	0.13	OK
+1.20D	9.03 psi	9.03 psi	9.03 psi	9.03 psi	9.03 psi	82.16 psi	0.11	OK
+1.20D+0.50S	12.50 psi	12.50 psi	12.50 psi	12.50 psi	12.50 psi	82.16 psi	0.15	OK
+1.20D+1.60S	20.15 psi	20.15 psi	20.15 psi	20.15 psi	20.15 psi	82.16 psi	0.25	OK
+1.20D+0.70S	13.89 psi	13.89 psi	13.89 psi	13.89 psi	13.89 psi	82.16 psi	0.17	OK
+0.90D	6.77 psi	6.77 psi	6.77 psi	6.77 psi	6.77 psi	82.16 psi	0.08	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	49.03 psi	164.32psi	0.2984	OK
+1.20D	42.03 psi	164.32psi	0.2558	OK
+1.20D+0.50S	58.20 psi	164.32psi	0.3542	OK
+1.20D+1.60S	93.80 psi	164.32psi	0.5708	OK
+1.20D+0.70S	64.68 psi	164.32psi	0.3936	OK
+0.90D	31.52 psi	164.32psi	0.1918	OK

All units k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 240622.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Canopy Footing

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	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

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

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	100.0 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

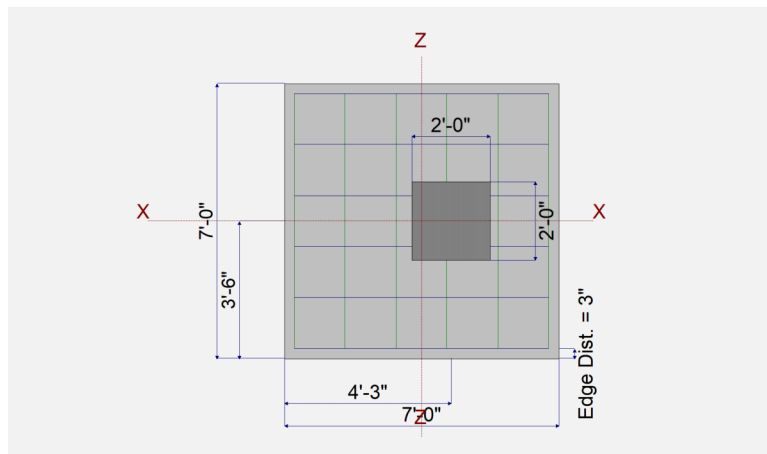
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

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

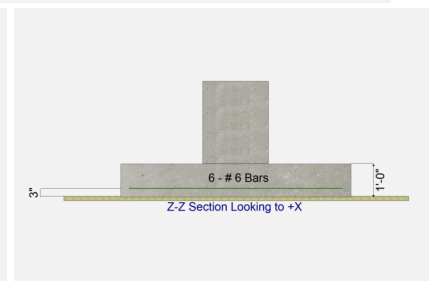
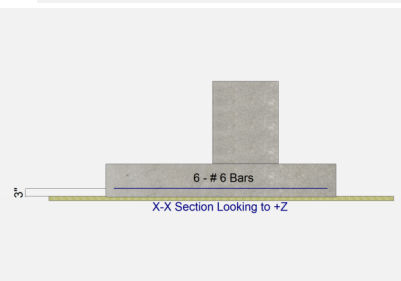
Dimensions

Width parallel to X-X Axis	=	7.0 ft
Length parallel to Z-Z Axis	=	7.0 ft
Footing Thickness	=	12.0 in
Load location offset from footing center...		
ex : Prll to X-X Axis	=	9 in
	=	in
Pedestal dimensions...		
px : parallel to X-X Axis	=	24.0 in
pz : parallel to Z-Z Axis	=	24.0 in
Height	=	30.0 in
Rebar Centerline to Edge of Concrete...		
at Bottom of footing	=	3.0 in



Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
Bars parallel to Z-Z Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 6
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	=	2.250	4.250		2.750		k
OB : Overburden	=						ksf
M-xx	=	9.0	20.50		14.0		k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Canopy Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6807	Soil Bearing	1.021 ksf	1.50 ksf	+D+0.750Lr+0.450W about X-X axis
PASS	1.572	Overturning - X-X	30.675 k-ft	48.230 k-ft	+D+0.750Lr+0.450W
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	0.03563	Z Flexure (+X)	0.5219 k-ft/ft	14.647 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.04450	Z Flexure (-X)	0.6518 k-ft/ft	14.647 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.2672	X Flexure (+Z)	3.913 k-ft/ft	14.647 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.03712	X Flexure (-Z)	0.5437 k-ft/ft	14.647 k-ft/ft	+1.20D+1.60Lr
PASS	0.03806	1-way Shear (+X)	3.127 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.03710	1-way Shear (-X)	3.048 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.2407	1-way Shear (+Z)	19.772 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.03432	1-way Shear (-Z)	2.819 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.06073	2-way Punching	9.978 psi	164.317 psi	+1.20D+1.60Lr+0.50W



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.50	n/a	11.545	0.03506	0.3468	n/a	n/a	0.231
X-X, +D+Lr	1.50	n/a	26.020	0.0	0.9645	n/a	n/a	0.643
X-X, +D+0.750Lr	1.50	n/a	23.321	0.0	0.7616	n/a	n/a	0.508
X-X, +D+0.60W	1.50	n/a	18.973	0.0	0.5429	n/a	n/a	0.362
X-X, +D+0.750Lr+0.450W	1.50	n/a	26.713	0.0	1.021	n/a	n/a	0.681
X-X, +D+0.450W	1.50	n/a	17.333	0.0	0.4880	n/a	n/a	0.325
X-X, +0.60D+0.60W	1.50	n/a	22.801	0.0	0.4292	n/a	n/a	0.286
X-X, +0.60D	1.50	n/a	11.545	0.02104	0.2081	n/a	n/a	0.139
Z-Z, D Only	1.50	2.165	n/a	n/a	n/a	0.1617	0.2201	0.147
Z-Z, +D+Lr	1.50	4.30	n/a	n/a	n/a	0.1932	0.3621	0.241
Z-Z, +D+0.750Lr	1.50	3.902	n/a	n/a	n/a	0.1853	0.3266	0.218
Z-Z, +D+0.60W	1.50	3.189	n/a	n/a	n/a	0.1739	0.2752	0.184
Z-Z, +D+0.750Lr+0.450W	1.50	4.360	n/a	n/a	n/a	0.1945	0.3679	0.245
Z-Z, +D+0.450W	1.50	2.963	n/a	n/a	n/a	0.1709	0.2615	0.174
Z-Z, +0.60D+0.60W	1.50	3.717	n/a	n/a	n/a	0.1093	0.1872	0.125
Z-Z, +0.60D	1.50	2.165	n/a	n/a	n/a	0.09702	0.1321	0.088

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	9.0 k-ft	32.743 k-ft	3.638	OK
X-X, +D+Lr	29.50 k-ft	47.618 k-ft	1.614	OK
X-X, +D+0.750Lr	24.375 k-ft	43.899 k-ft	1.801	OK
X-X, +D+0.60W	17.40 k-ft	38.518 k-ft	2.214	OK
X-X, +D+0.750Lr+0.450W	30.675 k-ft	48.230 k-ft	1.572	OK
X-X, +D+0.450W	15.30 k-ft	37.074 k-ft	2.423	OK
X-X, +0.60D+0.60W	13.80 k-ft	25.421 k-ft	1.842	OK
X-X, +0.60D	5.40 k-ft	19.646 k-ft	3.638	OK
Z-Z, D Only	None	34.430 k-ft	Infinity	OK
Z-Z, +D+Lr	None	52.493 k-ft	Infinity	OK
Z-Z, +D+0.750Lr	None	47.977 k-ft	Infinity	OK
Z-Z, +D+0.60W	None	41.443 k-ft	Infinity	OK
Z-Z, +D+0.750Lr+0.450W	None	53.236 k-ft	Infinity	OK
Z-Z, +D+0.450W	None	39.689 k-ft	Infinity	OK
Z-Z, +0.60D+0.60W	None	27.671 k-ft	Infinity	OK
Z-Z, +0.60D	None	20.658 k-ft	Infinity	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Canopy Footing

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
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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	0.7256	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.40D	0.3238	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50Lr	1.224	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50Lr	0.5046	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D	0.6219	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D	0.2776	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+1.60Lr	3.143	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+1.60Lr	0.5437	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+1.60Lr+0.50W	3.913	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+1.60Lr+0.50W	0.5437	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50W	1.014	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50W	0.460	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50Lr+W	2.317	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+0.50Lr+W	0.5437	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+W	1.479	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +1.20D+W	0.5360	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +0.90D+W	1.378	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +0.90D+W	0.4078	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
X-X, +0.90D	0.4664	+Z	Bottom	0.2592	AsMin	0.3771	14.647	OK
X-X, +0.90D	0.2082	-Z	Top	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.40D	0.1888	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.40D	0.1512	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50Lr	0.2892	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50Lr	0.2315	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D	0.1618	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D	0.1296	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+1.60Lr	0.5694	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+1.60Lr	0.4559	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+1.60Lr+0.50W	0.6518	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+1.60Lr+0.50W	0.5219	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50W	0.2442	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50W	0.1956	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50Lr+W	0.4540	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+0.50Lr+W	0.3635	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+W	0.3266	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +1.20D+W	0.2615	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +0.90D+W	0.2862	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +0.90D+W	0.2291	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +0.90D	0.1214	-X	Bottom	0.2592	AsMin	0.3771	14.647	OK
Z-Z, +0.90D	0.09718	+X	Bottom	0.2592	AsMin	0.3771	14.647	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.88 psi	0.91 psi	1.64 psi	3.72 psi	3.72 psi	82.16 psi	0.05	OK
+1.20D+0.50Lr	1.35 psi	1.39 psi	2.68 psi	6.27 psi	6.27 psi	82.16 psi	0.08	OK
+1.20D	0.76 psi	0.78 psi	1.40 psi	3.19 psi	3.19 psi	82.16 psi	0.04	OK
+1.20D+1.60Lr	2.66 psi	2.73 psi	2.82 psi	15.97 psi	15.97 psi	82.16 psi	0.19	OK
+1.20D+1.60Lr+0.50W	3.05 psi	3.13 psi	2.82 psi	19.77 psi	19.77 psi	82.16 psi	0.24	OK
+1.20D+0.50W	1.14 psi	1.17 psi	2.38 psi	5.20 psi	5.20 psi	82.16 psi	0.06	OK
+1.20D+0.50Lr+W	2.12 psi	2.18 psi	2.82 psi	11.82 psi	11.82 psi	82.16 psi	0.14	OK
+1.20D+W	1.53 psi	1.57 psi	2.82 psi	7.57 psi	7.57 psi	82.16 psi	0.09	OK
+0.90D+W	1.34 psi	1.37 psi	2.12 psi	7.04 psi	7.04 psi	82.16 psi	0.09	OK
+0.90D	0.57 psi	0.58 psi	1.05 psi	2.39 psi	2.39 psi	82.16 psi	0.03	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	2.24 psi	164.32psi	0.01362	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 240622.ec6

LIC# : KW-06014569, Build:20.23.08.30 BRITT PETERS & ASSOCIATES INC. (c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Canopy Footing

Two-Way "Punching" Shear				All units k
Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+0.50Lr	3.51 psi	164.32psi	0.02134	OK
+1.20D	1.92 psi	164.32psi	0.01167	OK
+1.20D+1.60Lr	8.38 psi	164.32psi	0.051	OK
+1.20D+1.60Lr+0.50W	9.98 psi	164.32psi	0.06073	OK
+1.20D+0.50W	2.92 psi	164.32psi	0.01776	OK
+1.20D+0.50Lr+W	6.32 psi	164.32psi	0.03848	OK
+1.20D+W	4.10 psi	164.32psi	0.02495	OK
+0.90D+W	3.79 psi	164.32psi	0.02307	OK
+0.90D	1.44 psi	164.32psi	0.008755	OK

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x8 Joist

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 8" Wide

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

Fb + 925 psi

Fb - 925 psi

Fc - Prll 1350 psi

Fc - Perp 565 psi

Fv 175 psi

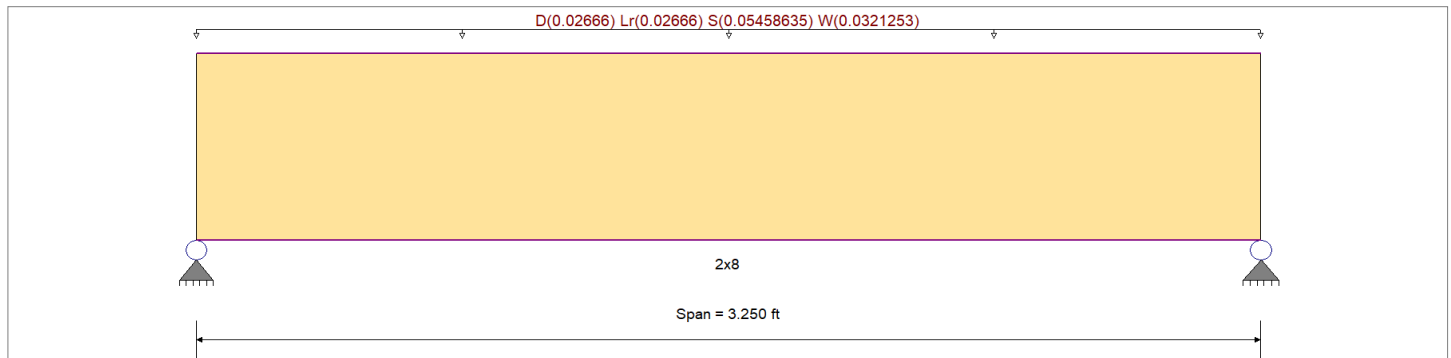
Ft 550 psi

E : Modulus of Elasticity

Ebend- xx 1400ksi

Eminbend - xx 510ksi

Density 34.33pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.04095, W = 0.02410 ksf, Tributary Width = 1.333 ft, (Roof)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.095 : 1	Maximum Shear Stress Ratio	=	0.059 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	101.09 psi	fv: Actual	=	11.93 psi
F'b	=	1,063.75 psi	F'v	=	201.25 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	1.625 ft	Location of maximum on span	=	2.657 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.002 in	Ratio = 18870 >=360	Span: 1 : S Only		
Max Upward Transient Deflection	0 in	Ratio = 0 <360	n/a		
Max Downward Total Deflection	0.003 in	Ratio = 12168 >=180	Span: 1 : +D+0.750S+0.450W		
Max Upward Total Deflection	0 in	Ratio = 0 <180	n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 3.250 ft	1	0.042	0.026	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.04	35.3	832.5	0.03	4.2	157.5
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1	0.058	0.036	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.07	67.4	1,156.3	0.06	8.0	218.8
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1	0.095	0.059	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.11	101.1	1,063.8	0.09	11.9	201.3
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1	0.051	0.032	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.07	59.4	1,156.3	0.05	7.0	218.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1	0.080	0.050	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.09	84.6	1,063.8	0.07	10.0	201.3

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: 2x8 Joist

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F _b	V	fv	F _v
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1		0.040	0.025	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.06	58.5	1,480.0	0.05	6.9	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1		0.052	0.032	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.08	76.8	1,480.0	0.07	9.1	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1		0.069	0.043	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.11	102.1	1,480.0	0.09	12.0	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1		0.030	0.019	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.05	44.4	1,480.0	0.04	5.2	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.250 ft	1		0.014	0.009	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.02	21.2	1,480.0	0.02	2.5	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.0032	1.637		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.138	0.138
Max Upward from Load Combinations	0.138	0.138
Max Upward from Load Cases	0.089	0.089
D Only	0.048	0.048
+D+Lr	0.091	0.091
+D+S	0.136	0.136
+D+0.750Lr	0.080	0.080
+D+0.750S	0.114	0.114
+D+0.60W	0.079	0.079
+D+0.750Lr+0.450W	0.104	0.104
+D+0.750S+0.450W	0.138	0.138
+0.60D+0.60W	0.060	0.060
+0.60D	0.029	0.029
Lr Only	0.043	0.043
S Only	0.089	0.089
W Only	0.052	0.052

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Steel Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Column Grid D-2

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
	@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
+D+0.750S	8.623										
+D+0.60W	7.498										
+D+0.750Lr+0.450W	10.123										
+D+0.750S+0.450W	10.198										
+0.60D+0.60W	5.339										
+0.60D	3.239										
Lr Only	4.200										
S Only	4.300										
W Only	3.500										

Extreme Reactions

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Axial @ Base	Maximum	10.198										
"	Minimum	3.239										
Reaction, X-X Axis Base	Maximum	5.398										
"	Minimum	5.398										
Reaction, Y-Y Axis Base	Maximum	5.398										
"	Minimum	5.398										
Reaction, X-X Axis Top	Maximum	5.398										
"	Minimum	5.398										
Reaction, Y-Y Axis Top	Maximum	5.398										
"	Minimum	5.398										
Moment, X-X Axis Base	Maximum	5.398										
"	Minimum	5.398										
Moment, Y-Y Axis Base	Maximum	5.398										
"	Minimum	5.398										
Moment, X-X Axis Top	Maximum	5.398										
"	Minimum	5.398										
Moment, Y-Y Axis Top	Maximum	5.398										
"	Minimum	5.398										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir		Distance	Max. Deflection in Y dir		Distance
D Only	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+Lr	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+S	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+0.750Lr	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+0.750S	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+0.60W	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+0.750Lr+0.450W	0.0000	in	0.000 ft	0.000	in	0.000 ft
+D+0.750S+0.450W	0.0000	in	0.000 ft	0.000	in	0.000 ft
+0.60D+0.60W	0.0000	in	0.000 ft	0.000	in	0.000 ft
+0.60D	0.0000	in	0.000 ft	0.000	in	0.000 ft
Lr Only	0.0000	in	0.000 ft	0.000	in	0.000 ft
S Only	0.0000	in	0.000 ft	0.000	in	0.000 ft
W Only	0.0000	in	0.000 ft	0.000	in	0.000 ft

Steel Section Properties : HSS5x5x3/16

Steel Section Properties : HSS5x5x3/16

Steel Column

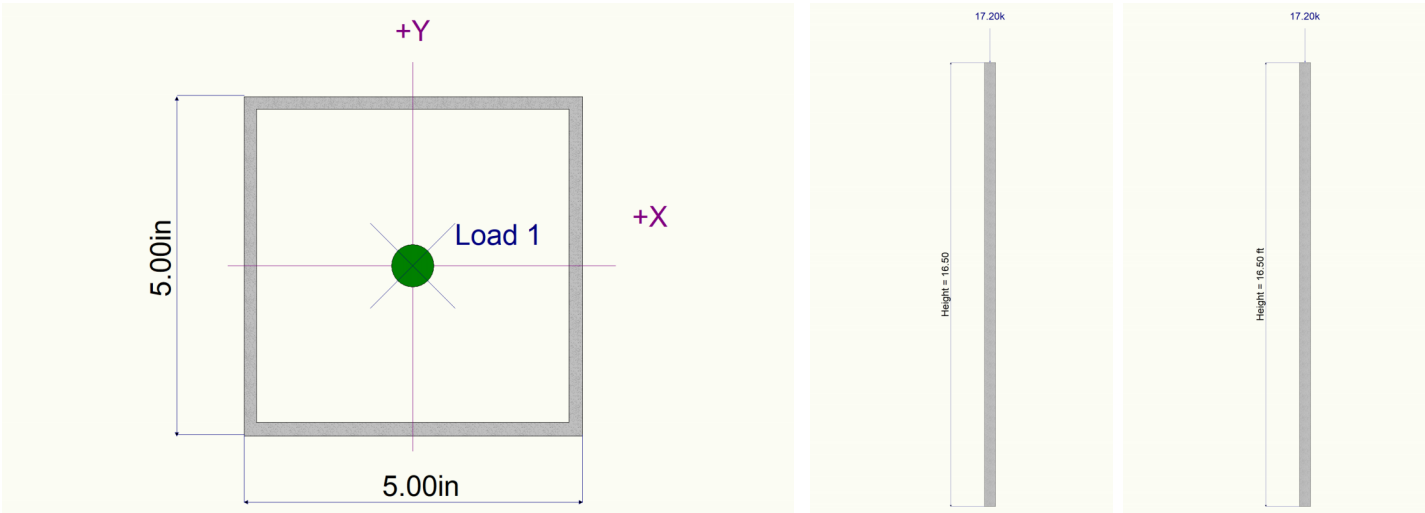
Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30 BRITT PETERS & ASSOCIATES INC. (c) ENERCALC INC 1983-2023

DESCRIPTION: Column Grid D-2

Depth	=	5.000 in	I xx	=	12.60 in^4	J	=	19.900 in^4
Design Thick	=	0.174 in	S xx	=	5.03 in^3			
Width	=	5.000 in	R xx	=	1.960 in			
Wall Thick	=	0.187 in	Zx	=	5.890 in^3			
Area	=	3.280 in^2	I yy	=	12.600 in^4	C	=	8.080 in^3
Weight	=	11.970 plf	S yy	=	5.030 in^3			
			R yy	=	1.960 in			
Ycg	=	0.000 in						

Sketches



Steel Base Plate

Project File: 240741.ec6
(c) ENERCALC INC 1983-2023

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

DESCRIPTION: 12x12x3/4 BP

Code Reference:

Calculations per AISC Design Guide # 1, IBC 2018, CBC 2019, ASCE 7-16, AISC 360-16
Load Combination Set : IBC 2021

General Information

Material Properties

AISC Design Method	Load Resistance Factor Design	ϕ_c : LRFD Resistance Factor	0.65
Steel Plate Fy	= 36 ksi		
Concrete Support f'c	= 3 ksi		
Assumed Bearing Area	Full Bearing	Nominal Bearing Fp per J8	2.550 ksi

Column & Plate

Column Properties

Steel Section	HSS5x5x3/16		
Depth	5 in	Area	3.28 in^2
Width	5 in	Ixx	12.6 in^4
Flange Thickness	0.174 in	Iyy	12.6 in^4
Web Thickness:	in		

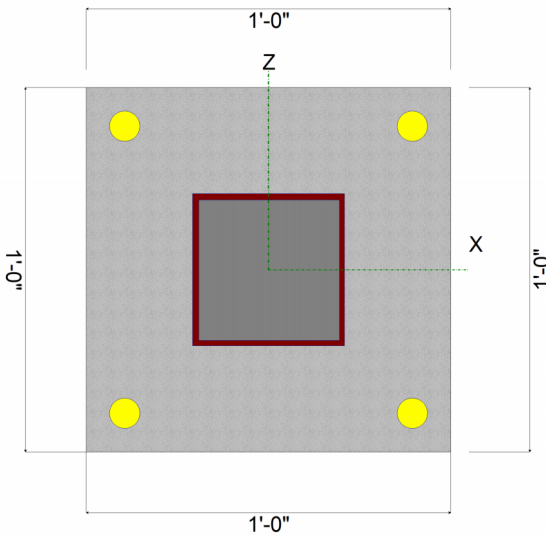
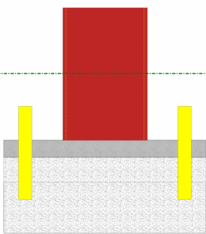
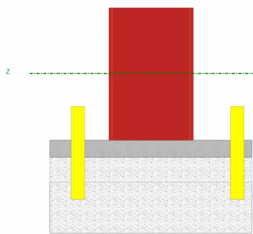
Plate Dimensions

N : Length	12 in
B : Width	12 in
Thickness	1 in

Support Dimensions

Width along "X"	12 in
Length along "Z"	12 in

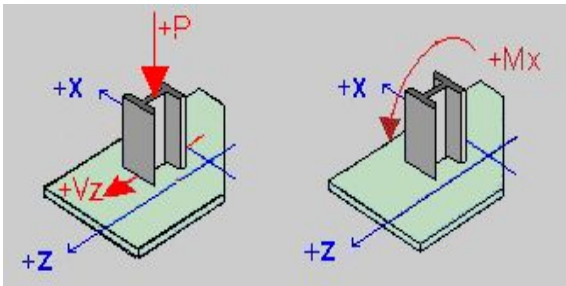
Column assumed welded to base plate



Applied Loads

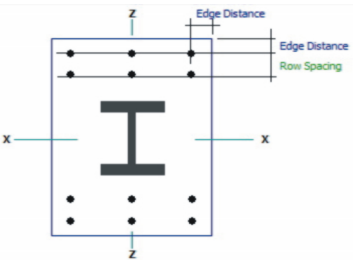
	P-Y	V-Z	M-X
D : Dead Load	5.20 k	k	k-ft
L : Live	k	k	k-ft
Lr : Roof Live	4.20 k	k	k-ft
S : Snow	4.30 k	k	k-ft
W : Wind	k	k	k-ft
E : Earthquake	k	k	k-ft
H : Lateral Earth	k	k	k-ft

" P " = Gravity load, "+" sign is downward
" M " = Moments create higher soil pressure at +Z edge
" V " = Shears push plate towards +Z edge



Anchor Bolts

Anchor Bolt or Rod Description 3/4	
Max of Tension or Pullout Capacity.....	29.80 k
Shear Capacity.....	17.90 k
Edge distance : bolt to plate.....	1.250 in
Number of Bolts in each Row.....	2.0
Number of Bolt Rows.....	1.0



Project Title:
Engineer:
Project ID:
Project Descr:

Steel Base Plate

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: 12x12x3/4 BP

GOVERNING DESIGN LOAD CASE SUMMARY

Plate Design Summary

Design Method **Load Resistance Factor Design**
Governing Load Combinat **+1.20D+1.60S**
Governing Load Case Typ **Axial Load Only**
Governing STRESS RATIO **0.07391**
Design Plate Size **1'-0" x 1'-0" x 1"**
Pu : Axial 0.000 k
Mu : Moment 0.000 k-ft

Mu : Max. Moment 0.599 k-in
fb : Max. Bending Stress 2.395 ksi
Fb : Allowable : 32.400 ksi
Fy * Phi
Bending Stress Ratio **0.074**
Bending Stress OK
fu : Max. Plate Bearing Stress 0.091 ksi
Fp : Allowable : 1.658 ksi
Bearing Stress Ratio **0.055**
Bearing Stress OK

Load Comb. : +1.40D

Axial Load Only, No Moment

Loading

Pu : Axial 7.280 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in^2
A2 : Support Area 144.000 in^2
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in^2
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.051 ksi
Stress Ratio 0.031

Plate Bending Stresses

Mmax = Fu * L^2 / 2 0.332 k-in on 1" strip
fb : Actual 1.329 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.041

Load Comb. : +1.20D+0.50Lr

Axial Load Only, No Moment

Loading

Pu : Axial 8.340 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in^2
A2 : Support Area 144.000 in^2
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in^2
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.058 ksi
Stress Ratio 0.035

Plate Bending Stresses

Mmax = Fu * L^2 / 2 0.381 k-in on 1" strip
fb : Actual 1.522 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.047

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Base Plate

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: 12x12x3/4 BP

Load Comb. : +1.20D+0.50S

Axial Load Only, No Moment

Loading

Pu : Axial 8.390 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in²
A2: Support Area 144.000 in²
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in²
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.058 ksi
Stress Ratio 0.035

Plate Bending Stresses

Mmax = Fu * L² / 2 0.383 k-in on 1" strip
fb : Actual 1.531 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.047

Load Comb. : +1.20D+1.60Lr

Axial Load Only, No Moment

Loading

Pu : Axial 12.960 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in²
A2: Support Area 144.000 in²
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in²
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.090 ksi
Stress Ratio 0.054

Plate Bending Stresses

Mmax = Fu * L² / 2 0.591 k-in on 1" strip
fb : Actual 2.365 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.073

Load Comb. : +1.20D+1.60S

Axial Load Only, No Moment

Loading

Pu : Axial 13.120 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in²
A2: Support Area 144.000 in²
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in²
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.091 ksi
Stress Ratio 0.055

Plate Bending Stresses

Mmax = Fu * L² / 2 0.599 k-in on 1" strip
fb : Actual 2.395 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.074

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Base Plate

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: 12x12x3/4 BP

Load Comb. : +1.20D+0.70S

Axial Load Only, No Moment

Loading

Pu : Axial 9.250 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in²
A2: Support Area 144.000 in²
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in²
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.064 ksi
Stress Ratio 0.039

Plate Bending Stresses

Mmax = Fu * L² / 2 0.422 k-in on 1" strip
fb : Actual 1.688 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.052

Load Comb. : +0.90D

Axial Load Only, No Moment

Loading

Pu : Axial 4.680 k
Design Plate Height 12.000 in
Design Plate Width 12.000 in
Will be different from entry if partial bearing used.
A1 : Plate Area 144.000 in²
A2: Support Area 144.000 in²
sqrt(A2/A1) 1.000

Distance for Moment Calculation

" m " 3.625 in
" n " 3.625 in
X 0.000 in²
Lambda 0.000
n' 0.000 in
n' * Lambda 0.000 in
L = max(m, n, n") 3.625 in

Bearing Stresses

Fp : Allowable 1.658 ksi
fu : Max. Bearing Pressure 0.033 ksi
Stress Ratio 0.020

Plate Bending Stresses

Mmax = Fu * L² / 2 0.214 k-in on 1" strip
fb : Actual 0.854 ksi
Fb : Allowable 32.400 ksi
Stress Ratio 0.026

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: West Foundation (171 k-ft)

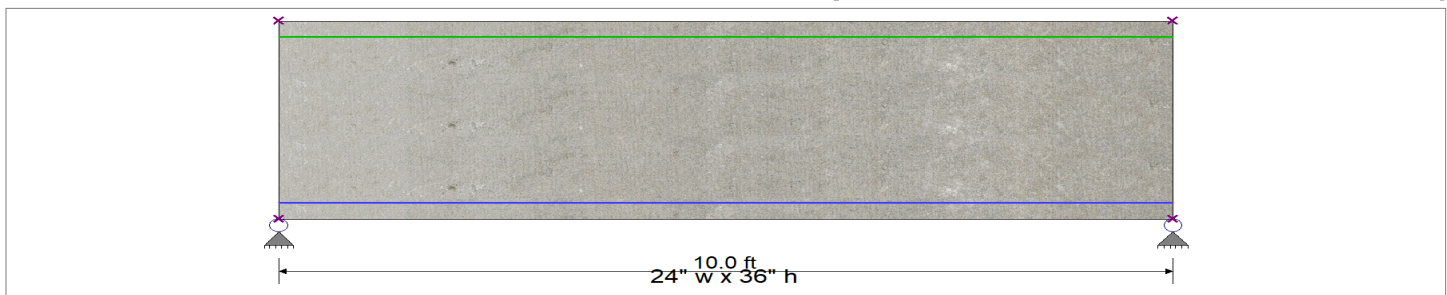
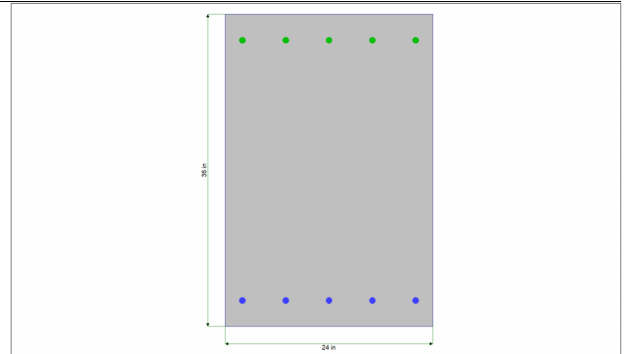
CODE REFERENCES

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

Load Combination Set : IBC 2021

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} \cdot 7.50$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	4
			Number of Resisting Legs Per Stirrup	=	2.0



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 36.0 in

Span #1 Reinforcing....

5-#6 at 3.0 in from Bottom, from 0.0 to 10.0 ft in this span

4-#6 at 3.0 in from Top, from 0.0 to 10.0 ft in this span

Beam self weight calculated and added to loads

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.048	: 1
Section used for this span		Typical Section	
Mu : Applied		15.225	k-ft
Mn * Phi : Allowable		316.713	k-ft
Location of maximum on span		5.009	ft
Span # where maximum occurs		Span # 1	

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0	<360.0	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	
Max Downward Total Deflection	0.000 in	Ratio =	0	<180.0	Span: 1 : D Only
Max Upward Total Deflection	0.000 in	Ratio =	0	<180.0	Span: 1 : D Only

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.350	4.350
Max Upward from Load Combinations	2.610	2.610
Max Upward from Load Cases	4.350	4.350
D Only	4.350	4.350
+0.60D	2.610	2.610

Shear Stirrup Requirements

Entire Beam Span Length : $V_u < \phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: West Foundation (171 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
+1.40D	1	0.00	33.00	6.09	6.09	0.00	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.11	33.00	5.96	5.96	0.66	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.22	33.00	5.82	5.82	1.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.33	33.00	5.69	5.69	1.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.44	33.00	5.56	5.56	2.55	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.55	33.00	5.42	5.42	3.15	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.66	33.00	5.29	5.29	3.73	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.77	33.00	5.16	5.16	4.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.87	33.00	5.03	5.03	4.86	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.98	33.00	4.89	4.89	5.40	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.09	33.00	4.76	4.76	5.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.20	33.00	4.63	4.63	6.44	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.31	33.00	4.49	4.49	6.94	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.42	33.00	4.36	4.36	7.42	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.53	33.00	4.23	4.23	7.89	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.64	33.00	4.09	4.09	8.35	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.75	33.00	3.96	3.96	8.79	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.86	33.00	3.83	3.83	9.21	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.97	33.00	3.69	3.69	9.62	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	2.08	33.00	3.56	3.56	10.02	0.98	65.85	Vu < Phi*Vc / 2	1st Reqd per	65.8	0.0
+1.40D	1	2.19	33.00	3.43	3.43	10.40	0.91	65.55	Vu < Phi*Vc / 2	1st Reqd per	65.6	0.0
+1.40D	1	2.30	33.00	3.29	3.29	10.77	0.84	65.29	Vu < Phi*Vc / 2	1st Reqd per	65.3	0.0
+1.40D	1	2.40	33.00	3.16	3.16	11.12	0.78	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.51	33.00	3.03	3.03	11.46	0.73	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.62	33.00	2.90	2.90	11.78	0.68	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.73	33.00	2.76	2.76	12.09	0.63	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.84	33.00	2.63	2.63	12.39	0.58	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.95	33.00	2.50	2.50	12.67	0.54	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.06	33.00	2.36	2.36	12.93	0.50	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.17	33.00	2.23	2.23	13.18	0.47	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.28	33.00	2.10	2.10	13.42	0.43	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.39	33.00	1.96	1.96	13.64	0.40	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.50	33.00	1.83	1.83	13.85	0.36	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.61	33.00	1.70	1.70	14.04	0.33	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.72	33.00	1.56	1.56	14.22	0.30	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.83	33.00	1.43	1.43	14.38	0.27	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.93	33.00	1.30	1.30	14.53	0.25	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.04	33.00	1.16	1.16	14.67	0.22	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.15	33.00	1.03	1.03	14.79	0.19	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.26	33.00	0.90	0.90	14.89	0.17	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.37	33.00	0.77	0.77	14.98	0.14	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.48	33.00	0.63	0.63	15.06	0.12	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.59	33.00	0.50	0.50	15.12	0.09	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.70	33.00	0.37	0.37	15.17	0.07	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.81	33.00	0.23	0.23	15.20	0.04	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.92	33.00	0.10	0.10	15.22	0.02	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.03	33.00	-0.03	0.03	15.22	0.01	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.14	33.00	-0.17	0.17	15.21	0.03	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.25	33.00	-0.30	0.30	15.19	0.05	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.36	33.00	-0.43	0.43	15.15	0.08	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.46	33.00	-0.57	0.57	15.09	0.10	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.57	33.00	-0.70	0.70	15.02	0.13	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.68	33.00	-0.83	0.83	14.94	0.15	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.79	33.00	-0.97	0.97	14.84	0.18	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.90	33.00	-1.10	1.10	14.73	0.21	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.01	33.00	-1.23	1.23	14.60	0.23	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.12	33.00	-1.36	1.36	14.46	0.26	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: West Foundation (171 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd'		Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
		(ft)	(in)	Actual	Design							
+1.40D	1	6.23	33.00	-1.50	1.50	14.30	0.29	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.34	33.00	-1.63	1.63	14.13	0.32	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.45	33.00	-1.76	1.76	13.95	0.35	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.56	33.00	-1.90	1.90	13.75	0.38	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.67	33.00	-2.03	2.03	13.53	0.41	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.78	33.00	-2.16	2.16	13.30	0.45	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.89	33.00	-2.30	2.30	13.06	0.48	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.99	33.00	-2.43	2.43	12.80	0.52	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.10	33.00	-2.56	2.56	12.53	0.56	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.21	33.00	-2.70	2.70	12.24	0.61	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.32	33.00	-2.83	2.83	11.94	0.65	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.43	33.00	-2.96	2.96	11.62	0.70	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.54	33.00	-3.09	3.09	11.29	0.75	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.65	33.00	-3.23	3.23	10.95	0.81	65.16	Vu < Phi*Vc / 2	65.2	0.0	0.0
+1.40D	1	7.76	33.00	-3.36	3.36	10.59	0.87	65.42	Vu < Phi*Vc / 2	65.4	0.0	0.0
+1.40D	1	7.87	33.00	-3.49	3.49	10.21	0.94	65.70	Vu < Phi*Vc / 2	65.7	0.0	0.0
+1.40D	1	7.98	33.00	-3.63	3.63	9.82	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.09	33.00	-3.76	3.76	9.42	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.20	33.00	-3.89	3.89	9.00	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.31	33.00	-4.03	4.03	8.57	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.42	33.00	-4.16	4.16	8.12	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.52	33.00	-4.29	4.29	7.66	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.63	33.00	-4.43	4.43	7.18	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.74	33.00	-4.56	4.56	6.69	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.85	33.00	-4.69	4.69	6.19	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.96	33.00	-4.83	4.83	5.67	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.07	33.00	-4.96	4.96	5.13	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.18	33.00	-5.09	5.09	4.58	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.29	33.00	-5.22	5.22	4.02	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.40	33.00	-5.36	5.36	3.44	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.51	33.00	-5.49	5.49	2.85	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.62	33.00	-5.62	5.62	2.24	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.73	33.00	-5.76	5.76	1.62	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.84	33.00	-5.89	5.89	0.98	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.95	33.00	-6.02	6.02	0.33	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
Span # 1		1	10.000	15.22	316.71	0.05
+1.40D						
Span # 1		1	10.000	15.22	316.71	0.05
+1.20D						
Span # 1		1	10.000	13.05	316.71	0.04
+0.90D						
Span # 1		1	10.000	9.79	316.71	0.03

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
D Only	1	0.0007	5.000		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Foundation (715 k-ft)

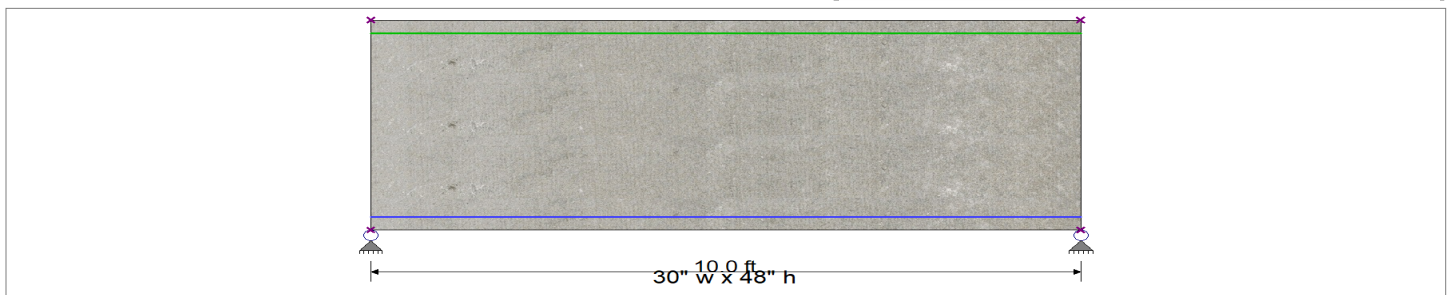
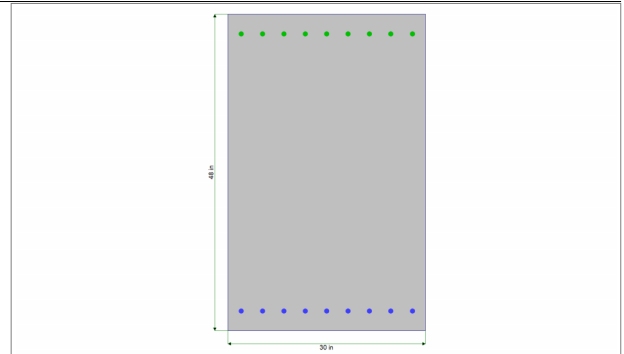
CODE REFERENCES

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

Load Combination Set : IBC 2021

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} \cdot 7.50$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	4
			Number of Resisting Legs Per Stirrup	=	2.0



Cross Section & Reinforcing Details

Rectangular Section, Width = 30.0 in, Height = 48.0 in

Span #1 Reinforcing...

9-#6 at 3.0 in from Bottom, from 0.0 to 10.0 ft in this span

9-#6 at 3.0 in from Top, from 0.0 to 10.0 ft in this span

Beam self weight calculated and added to loads

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.033 : 1
Section used for this span		Typical Section
Mu : Applied		25.375 k-ft
Mn * Phi : Allowable		774.10 k-ft
Location of maximum on span		4.991 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 < 360.0	
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360.0	
Max Downward Total Deflection	0.000 in	Ratio =	0 < 180.0	Span: 1 : D Only
Max Upward Total Deflection	0.000 in	Ratio =	0 < 180.0	Span: 1 : D Only

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.250	7.250
Max Upward from Load Combinations	4.350	4.350
Max Upward from Load Cases	7.250	7.250
D Only	7.250	7.250
+0.60D	4.350	4.350

Shear Stirrup Requirements

Entire Beam Span Length : $V_u < \phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Foundation (715 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)
				Actual	Design							Req'd
+1.40D	1	0.00	45.00	10.15	10.15	0.00	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.11	45.00	9.93	9.93	1.10	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.22	45.00	9.71	9.71	2.17	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.33	45.00	9.48	9.48	3.22	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.44	45.00	9.26	9.26	4.24	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.55	45.00	9.04	9.04	5.24	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.66	45.00	8.82	8.82	6.22	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.77	45.00	8.60	8.60	7.17	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.87	45.00	8.38	8.38	8.10	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	0.98	45.00	8.15	8.15	9.00	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.09	45.00	7.93	7.93	9.88	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.20	45.00	7.71	7.71	10.74	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.31	45.00	7.49	7.49	11.57	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.42	45.00	7.27	7.27	12.37	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.53	45.00	7.04	7.04	13.15	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.64	45.00	6.82	6.82	13.91	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.75	45.00	6.60	6.60	14.65	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.86	45.00	6.38	6.38	15.35	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	1.97	45.00	6.16	6.16	16.04	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	2.08	45.00	5.93	5.93	16.70	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	2.19	45.00	5.71	5.71	17.34	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	2.30	45.00	5.49	5.49	17.95	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	2.40	45.00	5.27	5.27	18.54	1.00	112.79	$V_u < \Phi^*V_c / 2$	112.8	112.8	0.0
+1.40D	1	2.51	45.00	5.05	5.05	19.10	0.99	112.73	$V_u < \Phi^*V_c / 2$	112.7	112.7	0.0
+1.40D	1	2.62	45.00	4.83	4.83	19.64	0.92	112.21	$V_u < \Phi^*V_c / 2$	112.2	112.2	0.0
+1.40D	1	2.73	45.00	4.60	4.60	20.16	0.86	111.73	$V_u < \Phi^*V_c / 2$	111.7	111.7	0.0
+1.40D	1	2.84	45.00	4.38	4.38	20.65	0.80	111.28	$V_u < \Phi^*V_c / 2$	111.3	111.3	0.0
+1.40D	1	2.95	45.00	4.16	4.16	21.11	0.74	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.06	45.00	3.94	3.94	21.56	0.69	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.17	45.00	3.72	3.72	21.97	0.63	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.28	45.00	3.49	3.49	22.37	0.59	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.39	45.00	3.27	3.27	22.74	0.54	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.50	45.00	3.05	3.05	23.08	0.50	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.61	45.00	2.83	2.83	23.40	0.45	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.72	45.00	2.61	2.61	23.70	0.41	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.83	45.00	2.38	2.38	23.97	0.37	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	3.93	45.00	2.16	2.16	24.22	0.33	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.04	45.00	1.94	1.94	24.45	0.30	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.15	45.00	1.72	1.72	24.65	0.26	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.26	45.00	1.50	1.50	24.82	0.23	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.37	45.00	1.28	1.28	24.97	0.19	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.48	45.00	1.05	1.05	25.10	0.16	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.59	45.00	0.83	0.83	25.20	0.12	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.70	45.00	0.61	0.61	25.28	0.09	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.81	45.00	0.39	0.39	25.34	0.06	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	4.92	45.00	0.17	0.17	25.37	0.02	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.03	45.00	-0.06	0.06	25.37	0.01	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.14	45.00	-0.28	0.28	25.36	0.04	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.25	45.00	-0.50	0.50	25.31	0.07	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.36	45.00	-0.72	0.72	25.25	0.11	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.46	45.00	-0.94	0.94	25.16	0.14	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.57	45.00	-1.16	1.16	25.04	0.17	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.68	45.00	-1.39	1.39	24.90	0.21	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.79	45.00	-1.61	1.61	24.74	0.24	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	5.90	45.00	-1.83	1.83	24.55	0.28	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	6.01	45.00	-2.05	2.05	24.34	0.32	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0
+1.40D	1	6.12	45.00	-2.27	2.27	24.10	0.35	110.91	$V_u < \Phi^*V_c / 2$	110.9	110.9	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Interior Foundation (715 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
+1.40D	1	6.23	45.00	-2.50	2.50	23.84	0.39	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.34	45.00	-2.72	2.72	23.56	0.43	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.45	45.00	-2.94	2.94	23.25	0.47	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.56	45.00	-3.16	3.16	22.91	0.52	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.67	45.00	-3.38	3.38	22.56	0.56	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.78	45.00	-3.61	3.61	22.17	0.61	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.89	45.00	-3.83	3.83	21.77	0.66	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	6.99	45.00	-4.05	4.05	21.34	0.71	110.91	Vu < Phi*Vc / 2	110.91	110.9	0.0
+1.40D	1	7.10	45.00	-4.27	4.27	20.88	0.77	111.06	Vu < Phi*Vc / 2	111.06	111.1	0.0
+1.40D	1	7.21	45.00	-4.49	4.49	20.40	0.83	111.50	Vu < Phi*Vc / 2	111.50	111.5	0.0
+1.40D	1	7.32	45.00	-4.71	4.71	19.90	0.89	111.96	Vu < Phi*Vc / 2	111.96	112.0	0.0
+1.40D	1	7.43	45.00	-4.94	4.94	19.37	0.96	112.46	Vu < Phi*Vc / 2	112.46	112.5	0.0
+1.40D	1	7.54	45.00	-5.16	5.16	18.82	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	7.65	45.00	-5.38	5.38	18.25	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	7.76	45.00	-5.60	5.60	17.65	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	7.87	45.00	-5.82	5.82	17.02	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	7.98	45.00	-6.05	6.05	16.37	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.09	45.00	-6.27	6.27	15.70	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.20	45.00	-6.49	6.49	15.00	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.31	45.00	-6.71	6.71	14.28	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.42	45.00	-6.93	6.93	13.54	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.52	45.00	-7.15	7.15	12.77	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.63	45.00	-7.38	7.38	11.97	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.74	45.00	-7.60	7.60	11.15	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.85	45.00	-7.82	7.82	10.31	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	8.96	45.00	-8.04	8.04	9.44	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.07	45.00	-8.26	8.26	8.55	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.18	45.00	-8.49	8.49	7.64	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.29	45.00	-8.71	8.71	6.70	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.40	45.00	-8.93	8.93	5.73	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.51	45.00	-9.15	9.15	4.75	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.62	45.00	-9.37	9.37	3.73	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.73	45.00	-9.60	9.60	2.70	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.84	45.00	-9.82	9.82	1.64	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0
+1.40D	1	9.95	45.00	-10.04	10.04	0.55	1.00	112.79	Vu < Phi*Vc / 2	112.79	112.8	0.0

Maximum Forces & Stresses for Load Combinations

Load Combination	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
Segment			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	10.000	25.37	774.10	0.03
+1.40D					
Span # 1	1	10.000	25.37	774.10	0.03
+1.20D					
Span # 1	1	10.000	21.75	774.10	0.03
+0.90D					
Span # 1	1	10.000	16.31	774.10	0.02

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
D Only	1	0.0004	5.000		0.0000	0.000

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: East Foundation (290 k-ft)

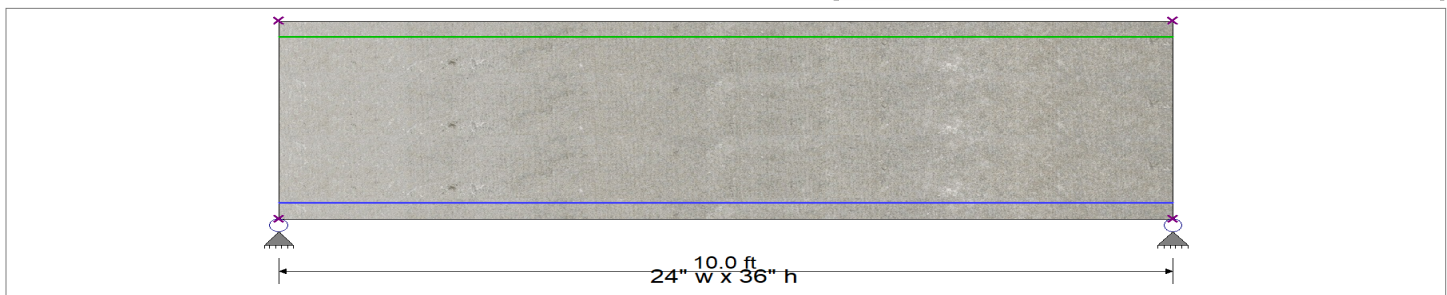
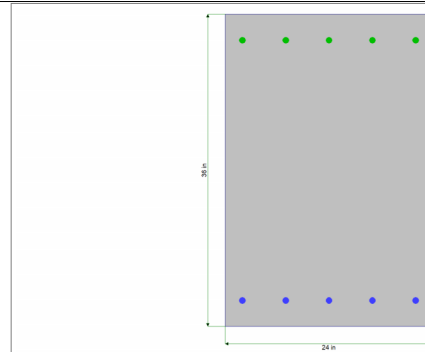
CODE REFERENCES

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

Load Combination Set : IBC 2021

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} \cdot 7.50$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	4
			Number of Resisting Legs Per Stirrup	=	2.0



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 36.0 in

Span #1 Reinforcing....

5-#6 at 3.0 in from Bottom, from 0.0 to 10.0 ft in this span

4-#6 at 3.0 in from Top, from 0.0 to 10.0 ft in this span

Beam self weight calculated and added to loads

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.048 : 1
Section used for this span	Typical Section
Mu : Applied	15.225 k-ft
Mn * Phi : Allowable	316.713 k-ft
Location of maximum on span	5.009 ft
Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 < 360.0	
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360.0	
Max Downward Total Deflection	0.000 in	Ratio =	0 < 180.0	Span: 1 : D Only
Max Upward Total Deflection	0.000 in	Ratio =	0 < 180.0	Span: 1 : D Only

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.350	4.350
Max Upward from Load Combinations	2.610	2.610
Max Upward from Load Cases	4.350	4.350
D Only	4.350	4.350
+0.60D	2.610	2.610

Shear Stirrup Requirements

Entire Beam Span Length : $V_u < \phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: East Foundation (290 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
+1.40D	1	0.00	33.00	6.09	6.09	0.00	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.11	33.00	5.96	5.96	0.66	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.22	33.00	5.82	5.82	1.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.33	33.00	5.69	5.69	1.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.44	33.00	5.56	5.56	2.55	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.55	33.00	5.42	5.42	3.15	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.66	33.00	5.29	5.29	3.73	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.77	33.00	5.16	5.16	4.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.87	33.00	5.03	5.03	4.86	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.98	33.00	4.89	4.89	5.40	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.09	33.00	4.76	4.76	5.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.20	33.00	4.63	4.63	6.44	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.31	33.00	4.49	4.49	6.94	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.42	33.00	4.36	4.36	7.42	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.53	33.00	4.23	4.23	7.89	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.64	33.00	4.09	4.09	8.35	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.75	33.00	3.96	3.96	8.79	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.86	33.00	3.83	3.83	9.21	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.97	33.00	3.69	3.69	9.62	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	2.08	33.00	3.56	3.56	10.02	0.98	65.85	Vu < Phi*Vc / 2	1st Reqd per	65.8	0.0
+1.40D	1	2.19	33.00	3.43	3.43	10.40	0.91	65.55	Vu < Phi*Vc / 2	1st Reqd per	65.6	0.0
+1.40D	1	2.30	33.00	3.29	3.29	10.77	0.84	65.29	Vu < Phi*Vc / 2	1st Reqd per	65.3	0.0
+1.40D	1	2.40	33.00	3.16	3.16	11.12	0.78	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.51	33.00	3.03	3.03	11.46	0.73	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.62	33.00	2.90	2.90	11.78	0.68	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.73	33.00	2.76	2.76	12.09	0.63	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.84	33.00	2.63	2.63	12.39	0.58	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.95	33.00	2.50	2.50	12.67	0.54	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.06	33.00	2.36	2.36	12.93	0.50	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.17	33.00	2.23	2.23	13.18	0.47	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.28	33.00	2.10	2.10	13.42	0.43	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.39	33.00	1.96	1.96	13.64	0.40	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.50	33.00	1.83	1.83	13.85	0.36	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.61	33.00	1.70	1.70	14.04	0.33	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.72	33.00	1.56	1.56	14.22	0.30	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.83	33.00	1.43	1.43	14.38	0.27	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.93	33.00	1.30	1.30	14.53	0.25	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.04	33.00	1.16	1.16	14.67	0.22	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.15	33.00	1.03	1.03	14.79	0.19	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.26	33.00	0.90	0.90	14.89	0.17	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.37	33.00	0.77	0.77	14.98	0.14	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.48	33.00	0.63	0.63	15.06	0.12	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.59	33.00	0.50	0.50	15.12	0.09	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.70	33.00	0.37	0.37	15.17	0.07	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.81	33.00	0.23	0.23	15.20	0.04	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.92	33.00	0.10	0.10	15.22	0.02	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.03	33.00	-0.03	0.03	15.22	0.01	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.14	33.00	-0.17	0.17	15.21	0.03	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.25	33.00	-0.30	0.30	15.19	0.05	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.36	33.00	-0.43	0.43	15.15	0.08	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.46	33.00	-0.57	0.57	15.09	0.10	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.57	33.00	-0.70	0.70	15.02	0.13	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.68	33.00	-0.83	0.83	14.94	0.15	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.79	33.00	-0.97	0.97	14.84	0.18	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.90	33.00	-1.10	1.10	14.73	0.21	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.01	33.00	-1.23	1.23	14.60	0.23	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.12	33.00	-1.36	1.36	14.46	0.26	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: East Foundation (290 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
+1.40D	1	6.23	33.00	-1.50	1.50	14.30	0.29	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.34	33.00	-1.63	1.63	14.13	0.32	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.45	33.00	-1.76	1.76	13.95	0.35	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.56	33.00	-1.90	1.90	13.75	0.38	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.67	33.00	-2.03	2.03	13.53	0.41	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.78	33.00	-2.16	2.16	13.30	0.45	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.89	33.00	-2.30	2.30	13.06	0.48	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	6.99	33.00	-2.43	2.43	12.80	0.52	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.10	33.00	-2.56	2.56	12.53	0.56	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.21	33.00	-2.70	2.70	12.24	0.61	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.32	33.00	-2.83	2.83	11.94	0.65	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.43	33.00	-2.96	2.96	11.62	0.70	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.54	33.00	-3.09	3.09	11.29	0.75	65.07	Vu < Phi*Vc / 2	65.1	0.0	0.0
+1.40D	1	7.65	33.00	-3.23	3.23	10.95	0.81	65.16	Vu < Phi*Vc / 2	65.2	0.0	0.0
+1.40D	1	7.76	33.00	-3.36	3.36	10.59	0.87	65.42	Vu < Phi*Vc / 2	65.4	0.0	0.0
+1.40D	1	7.87	33.00	-3.49	3.49	10.21	0.94	65.70	Vu < Phi*Vc / 2	65.7	0.0	0.0
+1.40D	1	7.98	33.00	-3.63	3.63	9.82	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.09	33.00	-3.76	3.76	9.42	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.20	33.00	-3.89	3.89	9.00	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.31	33.00	-4.03	4.03	8.57	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.42	33.00	-4.16	4.16	8.12	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.52	33.00	-4.29	4.29	7.66	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.63	33.00	-4.43	4.43	7.18	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.74	33.00	-4.56	4.56	6.69	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.85	33.00	-4.69	4.69	6.19	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	8.96	33.00	-4.83	4.83	5.67	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.07	33.00	-4.96	4.96	5.13	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.18	33.00	-5.09	5.09	4.58	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.29	33.00	-5.22	5.22	4.02	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.40	33.00	-5.36	5.36	3.44	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.51	33.00	-5.49	5.49	2.85	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.62	33.00	-5.62	5.62	2.24	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.73	33.00	-5.76	5.76	1.62	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.84	33.00	-5.89	5.89	0.98	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0
+1.40D	1	9.95	33.00	-6.02	6.02	0.33	1.00	65.94	Vu < Phi*Vc / 2	65.9	0.0	0.0

Maximum Forces & Stresses for Load Combinations

Load Combination	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
Segment			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	10.000	15.22	316.71	0.05
+1.40D					
Span # 1	1	10.000	15.22	316.71	0.05
+1.20D					
Span # 1	1	10.000	13.05	316.71	0.04
+0.90D					
Span # 1	1	10.000	9.79	316.71	0.03

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
D Only	1	0.0007	5.000		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: South Foundation (270 k-ft)

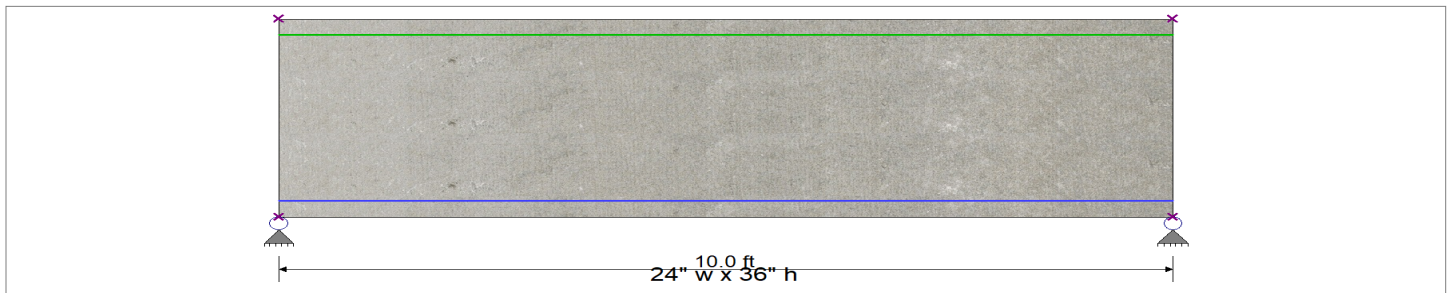
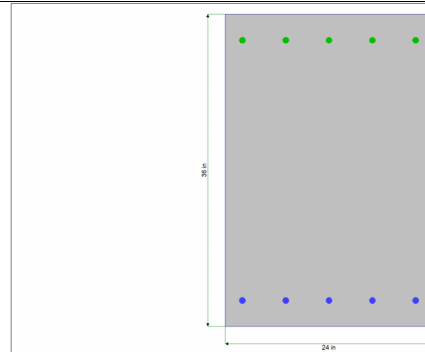
CODE REFERENCES

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

Load Combination Set : IBC 2021

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} \cdot 7.50$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	4
			Number of Resisting Legs Per Stirrup	=	2.0



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 36.0 in

Span #1 Reinforcing...

5-#6 at 3.0 in from Bottom, from 0.0 to 10.0 ft in this span

6-#6 at 3.0 in from Top, from 0.0 to 10.0 ft in this span

Beam self weight calculated and added to loads

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.048 : 1
Section used for this span	Typical Section
Mu : Applied	15.225 k-ft
Mn * Phi : Allowable	316.820 k-ft
Location of maximum on span	5.009 ft
Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 <360.0	
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0	
Max Downward Total Deflection	0.000 in	Ratio =	0 <180.0	Span: 1 : D Only
Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0	Span: 1 : D Only

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.350	4.350
Max Upward from Load Combinations	2.610	2.610
Max Upward from Load Cases	4.350	4.350
D Only	4.350	4.350
+0.60D	2.610	2.610

Shear Stirrup Requirements

Entire Beam Span Length : $V_u < \phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: South Foundation (270 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd' (ft)	(in)	Vu (k)	(k)	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
+1.40D	1	0.00	33.00	6.09	6.09	0.00	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.11	33.00	5.96	5.96	0.66	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.22	33.00	5.82	5.82	1.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.33	33.00	5.69	5.69	1.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.44	33.00	5.56	5.56	2.55	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.55	33.00	5.42	5.42	3.15	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.66	33.00	5.29	5.29	3.73	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.77	33.00	5.16	5.16	4.30	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.87	33.00	5.03	5.03	4.86	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	0.98	33.00	4.89	4.89	5.40	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.09	33.00	4.76	4.76	5.93	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.20	33.00	4.63	4.63	6.44	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.31	33.00	4.49	4.49	6.94	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.42	33.00	4.36	4.36	7.42	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.53	33.00	4.23	4.23	7.89	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.64	33.00	4.09	4.09	8.35	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.75	33.00	3.96	3.96	8.79	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.86	33.00	3.83	3.83	9.21	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	1.97	33.00	3.69	3.69	9.62	1.00	65.94	Vu < Phi*Vc / 2	1st Reqd per	65.9	0.0
+1.40D	1	2.08	33.00	3.56	3.56	10.02	0.98	65.85	Vu < Phi*Vc / 2	1st Reqd per	65.8	0.0
+1.40D	1	2.19	33.00	3.43	3.43	10.40	0.91	65.55	Vu < Phi*Vc / 2	1st Reqd per	65.6	0.0
+1.40D	1	2.30	33.00	3.29	3.29	10.77	0.84	65.29	Vu < Phi*Vc / 2	1st Reqd per	65.3	0.0
+1.40D	1	2.40	33.00	3.16	3.16	11.12	0.78	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.51	33.00	3.03	3.03	11.46	0.73	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.62	33.00	2.90	2.90	11.78	0.68	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.73	33.00	2.76	2.76	12.09	0.63	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.84	33.00	2.63	2.63	12.39	0.58	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	2.95	33.00	2.50	2.50	12.67	0.54	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.06	33.00	2.36	2.36	12.93	0.50	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.17	33.00	2.23	2.23	13.18	0.47	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.28	33.00	2.10	2.10	13.42	0.43	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.39	33.00	1.96	1.96	13.64	0.40	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.50	33.00	1.83	1.83	13.85	0.36	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.61	33.00	1.70	1.70	14.04	0.33	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.72	33.00	1.56	1.56	14.22	0.30	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.83	33.00	1.43	1.43	14.38	0.27	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	3.93	33.00	1.30	1.30	14.53	0.25	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.04	33.00	1.16	1.16	14.67	0.22	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.15	33.00	1.03	1.03	14.79	0.19	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.26	33.00	0.90	0.90	14.89	0.17	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.37	33.00	0.77	0.77	14.98	0.14	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.48	33.00	0.63	0.63	15.06	0.12	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.59	33.00	0.50	0.50	15.12	0.09	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.70	33.00	0.37	0.37	15.17	0.07	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.81	33.00	0.23	0.23	15.20	0.04	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	4.92	33.00	0.10	0.10	15.22	0.02	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.03	33.00	-0.03	0.03	15.22	0.01	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.14	33.00	-0.17	0.17	15.21	0.03	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.25	33.00	-0.30	0.30	15.19	0.05	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.36	33.00	-0.43	0.43	15.15	0.08	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.46	33.00	-0.57	0.57	15.09	0.10	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.57	33.00	-0.70	0.70	15.02	0.13	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.68	33.00	-0.83	0.83	14.94	0.15	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.79	33.00	-0.97	0.97	14.84	0.18	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	5.90	33.00	-1.10	1.10	14.73	0.21	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.01	33.00	-1.23	1.23	14.60	0.23	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0
+1.40D	1	6.12	33.00	-1.36	1.36	14.46	0.26	65.07	Vu < Phi*Vc / 2	1st Reqd per	65.1	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Concrete Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: South Foundation (270 k-ft)

Detailed Shear Information

Load Combination	Span Number	Distance 'd'		Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in) Req'd
		(ft)	(in)	Actual	Design							
+1.40D	1	6.23	33.00	-1.50	1.50	14.30	0.29	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.34	33.00	-1.63	1.63	14.13	0.32	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.45	33.00	-1.76	1.76	13.95	0.35	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.56	33.00	-1.90	1.90	13.75	0.38	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.67	33.00	-2.03	2.03	13.53	0.41	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.78	33.00	-2.16	2.16	13.30	0.45	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.89	33.00	-2.30	2.30	13.06	0.48	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	6.99	33.00	-2.43	2.43	12.80	0.52	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.10	33.00	-2.56	2.56	12.53	0.56	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.21	33.00	-2.70	2.70	12.24	0.61	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.32	33.00	-2.83	2.83	11.94	0.65	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.43	33.00	-2.96	2.96	11.62	0.70	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.54	33.00	-3.09	3.09	11.29	0.75	65.07	Vu < Phi*Vc / 2	65.1	65.1	0.0
+1.40D	1	7.65	33.00	-3.23	3.23	10.95	0.81	65.16	Vu < Phi*Vc / 2	65.2	65.2	0.0
+1.40D	1	7.76	33.00	-3.36	3.36	10.59	0.87	65.42	Vu < Phi*Vc / 2	65.4	65.4	0.0
+1.40D	1	7.87	33.00	-3.49	3.49	10.21	0.94	65.70	Vu < Phi*Vc / 2	65.7	65.7	0.0
+1.40D	1	7.98	33.00	-3.63	3.63	9.82	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.09	33.00	-3.76	3.76	9.42	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.20	33.00	-3.89	3.89	9.00	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.31	33.00	-4.03	4.03	8.57	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.42	33.00	-4.16	4.16	8.12	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.52	33.00	-4.29	4.29	7.66	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.63	33.00	-4.43	4.43	7.18	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.74	33.00	-4.56	4.56	6.69	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.85	33.00	-4.69	4.69	6.19	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	8.96	33.00	-4.83	4.83	5.67	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.07	33.00	-4.96	4.96	5.13	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.18	33.00	-5.09	5.09	4.58	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.29	33.00	-5.22	5.22	4.02	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.40	33.00	-5.36	5.36	3.44	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.51	33.00	-5.49	5.49	2.85	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.62	33.00	-5.62	5.62	2.24	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.73	33.00	-5.76	5.76	1.62	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.84	33.00	-5.89	5.89	0.98	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0
+1.40D	1	9.95	33.00	-6.02	6.02	0.33	1.00	65.94	Vu < Phi*Vc / 2	65.9	65.9	0.0

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
Span # 1		1	10.000	15.22	316.82	0.05
+1.40D						
Span # 1		1	10.000	15.22	316.82	0.05
+1.20D						
Span # 1		1	10.000	13.05	316.82	0.04
+0.90D						
Span # 1		1	10.000	9.79	316.82	0.03

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
D Only	1	0.0007	5.000		0.0000	0.000

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General Footing

Project File: 240741-CALC PACKAGE COPY.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: Exterior Canopy Footing

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	=	3.0 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	=	3.0 ksf
Soil Density	=	100.0 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	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

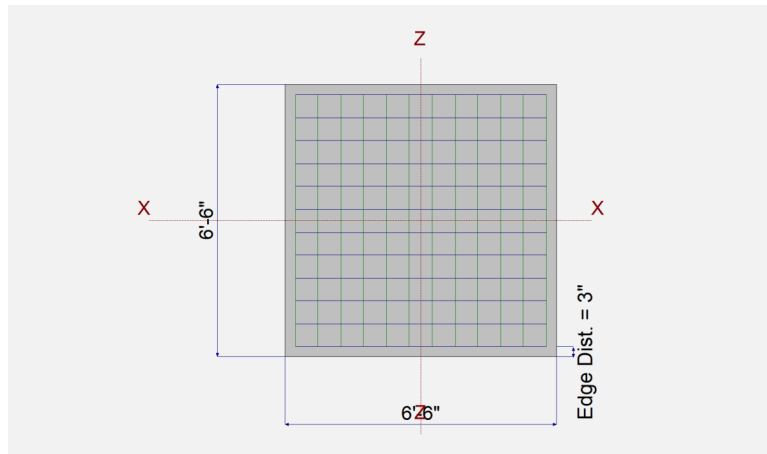
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	6.50 ft
Length parallel to Z-Z Axis	=	6.50 ft
Footing Thickness	=	36.0 in

Pedestal dimensions...

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



Reinforcing

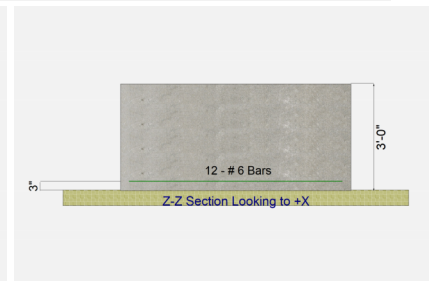
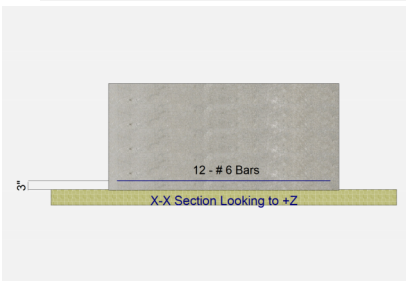
Bars parallel to X-X Axis	=	12
Number of Bars	=	# 6
Reinforcing Bar Size	=	# 6

Bars parallel to Z-Z Axis	=	12
Number of Bars	=	# 6
Reinforcing Bar Size	=	# 6

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	=	2.750		6.250	-4.50		k
OB : Overburden	=						ksf
M-xx	=	9.0	20.50		14.0		k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

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General Footing

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BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: Exterior Canopy Footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.3947	Soil Bearing	1.184 ksf	3.0 ksf	+D+0.750Lr+0.450W about X-X axis
PASS	1.825	Overturning - X-X	22.575 k-ft	41.201 k-ft	+0.60D+0.60W
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	4.695	Uplift	-2.70 k	12.677 k	+0.60D+0.60W
PASS	0.01412	Z Flexure (+X)	1.663 k-ft/ft	117.717 k-ft/ft	+1.20D+1.60S
PASS	0.01412	Z Flexure (-X)	1.663 k-ft/ft	117.717 k-ft/ft	+1.20D+1.60S
PASS	0.04270	X Flexure (+Z)	5.027 k-ft/ft	117.717 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.02342	X Flexure (-Z)	2.757 k-ft/ft	117.717 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.005031	1-way Shear (+X)	0.4134 psi	82.158 psi	+1.20D+1.60S
PASS	0.005031	1-way Shear (-X)	0.4134 psi	82.158 psi	+1.20D+1.60S
PASS	0.02447	1-way Shear (+Z)	2.010 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.008343	1-way Shear (-Z)	0.6855 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.01530	2-way Punching	2.515 psi	164.317 psi	+1.20D+1.60S



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Zecc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	5.112	0.3054	0.6948	n/a	n/a	0.232
X-X, +D+Lr	3.0	n/a	16.754	0.0	1.162	n/a	n/a	0.387
X-X, +D+S	3.0	n/a	3.945	0.4534	0.8427	n/a	n/a	0.281
X-X, +D+0.750Lr	3.0	n/a	13.844	0.0	1.028	n/a	n/a	0.343
X-X, +D+0.750S	3.0	n/a	4.183	0.4164	0.8057	n/a	n/a	0.269
X-X, +D+0.60W	3.0	n/a	11.330	0.05983	0.8125	n/a	n/a	0.271
X-X, +D+0.750Lr+0.450W	3.0	n/a	19.268	0.0	1.184	n/a	n/a	0.395
X-X, +D+0.750S+0.450W	3.0	n/a	7.717	0.2322	0.8940	n/a	n/a	0.298
X-X, +0.60D+0.60W	3.0	n/a	16.598	0.0	0.5450	n/a	n/a	0.182
X-X, +0.60D	3.0	n/a	5.112	0.1833	0.4169	n/a	n/a	0.139
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	0.5001	0.5001	0.167
Z-Z, +D+Lr	3.0	0.0	n/a	n/a	n/a	0.5001	0.5001	0.167
Z-Z, +D+S	3.0	0.0	n/a	n/a	n/a	0.6480	0.6480	0.216
Z-Z, +D+0.750Lr	3.0	0.0	n/a	n/a	n/a	0.5001	0.5001	0.167
Z-Z, +D+0.750S	3.0	0.0	n/a	n/a	n/a	0.6110	0.6110	0.204
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	0.4362	0.4362	0.145
Z-Z, +D+0.750Lr+0.450W	3.0	0.0	n/a	n/a	n/a	0.4522	0.4522	0.151
Z-Z, +D+0.750S+0.450W	3.0	0.0	n/a	n/a	n/a	0.5631	0.5631	0.188
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	0.2361	0.2361	0.079
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.3001	0.3001	0.100

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	9.0 k-ft	68.668 k-ft	7.630	OK
X-X, +D+Lr	29.50 k-ft	68.668 k-ft	2.328	OK
X-X, +D+S	9.0 k-ft	88.981 k-ft	9.887	OK
X-X, +D+0.750Lr	24.375 k-ft	68.668 k-ft	2.817	OK
X-X, +D+0.750S	9.0 k-ft	83.903 k-ft	9.323	OK
X-X, +D+0.60W	26.175 k-ft	68.668 k-ft	2.623	OK
X-X, +D+0.750Lr+0.450W	37.256 k-ft	68.668 k-ft	1.843	OK
X-X, +D+0.750S+0.450W	21.881 k-ft	83.903 k-ft	3.834	OK
X-X, +0.60D+0.60W	22.575 k-ft	41.201 k-ft	1.825	OK
X-X, +0.60D	5.40 k-ft	41.201 k-ft	7.630	OK
Z-Z, D Only	None	0.0 k-ft	Infinity	OK
Z-Z, +D+Lr	None	0.0 k-ft	Infinity	OK

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BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: Exterior Canopy Footing

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Z-Z, +D+S	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750Lr	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750S	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750Lr+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750S+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D	None	0.0 k-ft	Infinity	OK

All units k

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	1.450	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.40D	0.4879	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50Lr	2.032	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50Lr	1.207	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50S	1.634	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50S	0.02756	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60Lr	4.099	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60Lr	2.608	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60Lr+0.50W	5.027	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60Lr+0.50W	2.757	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60S	2.493	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60S	0.8318	-Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60S+0.50W	2.750	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+1.60S+0.50W	0.01216	-Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50Lr+W	2.785	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50Lr+W	2.607	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50S+W	2.148	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.50S+W	1.667	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.70S	1.790	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +1.20D+0.70S	0.1287	-Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +0.90D+W	1.532	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +0.90D+W	1.868	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
X-X, +0.90D	0.9324	+Z	Bottom	0.7776	AsMin	0.8123	117.717	OK
X-X, +0.90D	0.3136	-Z	Top	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.40D	0.4813	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.40D	0.4813	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50Lr	0.4125	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50Lr	0.4125	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50S	0.8031	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50S	0.8031	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60Lr	0.4125	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60Lr	0.4125	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60Lr+0.50W	0.1313	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60Lr+0.50W	0.1313	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60S	1.663	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60S	1.663	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60S+0.50W	1.381	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+1.60S+0.50W	1.381	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50Lr+W	0.150	-X	Top	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50Lr+W	0.150	+X	Top	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50S+W	0.2406	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.50S+W	0.2406	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.70S	0.9594	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +1.20D+0.70S	0.9594	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +0.90D+W	0.2531	-X	Top	0.7776	AsMin	0.8123	117.717	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240741-CALC PACKAGE COPY.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Exterior Canopy Footing

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, +0.90D+W	0.2531	+X	Top	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +0.90D	0.3094	-X	Bottom	0.7776	AsMin	0.8123	117.717	OK
Z-Z, +0.90D	0.3094	+X	Bottom	0.7776	AsMin	0.8123	117.717	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.12 psi	0.12 psi	0.21 psi	0.45 psi	0.45 psi	82.16 psi	0.01	OK
+1.20D+0.50Lr	0.10 psi	0.10 psi	0.45 psi	0.66 psi	0.66 psi	82.16 psi	0.01	OK
+1.20D+0.50S	0.20 psi	0.20 psi	0.09 psi	0.48 psi	0.48 psi	82.16 psi	0.01	OK
+1.20D+1.60Lr	0.10 psi	0.10 psi	0.69 psi	1.42 psi	1.42 psi	82.16 psi	0.02	OK
+1.20D+1.60Lr+0.50W	0.03 psi	0.03 psi	0.69 psi	2.01 psi	2.01 psi	82.16 psi	0.02	OK
+1.20D+1.60S	0.41 psi	0.41 psi	0.13 psi	0.70 psi	0.70 psi	82.16 psi	0.01	OK
+1.20D+1.60S+0.50W	0.34 psi	0.34 psi	0.13 psi	0.81 psi	0.81 psi	82.16 psi	0.01	OK
+1.20D+0.50Lr+W	0.04 psi	0.04 psi	0.69 psi	1.01 psi	1.01 psi	82.16 psi	0.01	OK
+1.20D+0.50S+W	0.06 psi	0.06 psi	0.59 psi	0.71 psi	0.71 psi	82.16 psi	0.01	OK
+1.20D+0.70S	0.24 psi	0.24 psi	0.05 psi	0.52 psi	0.52 psi	82.16 psi	0.01	OK
+0.90D+W	0.06 psi	0.06 psi	0.51 psi	0.56 psi	0.56 psi	82.16 psi	0.01	OK
+0.90D	0.08 psi	0.08 psi	0.14 psi	0.29 psi	0.29 psi	82.16 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	0.73 psi	164.32psi	0.00443	OK
+1.20D+0.50Lr	0.62 psi	164.32psi	0.003797	OK
+1.20D+0.50S	1.22 psi	164.32psi	0.007393	OK
+1.20D+1.60Lr	0.80 psi	164.32psi	0.004876	OK
+1.20D+1.60Lr+0.50W	0.76 psi	164.32psi	0.004654	OK
+1.20D+1.60S	2.52 psi	164.32psi	0.0153	OK
+1.20D+1.60S+0.50W	2.09 psi	164.32psi	0.01272	OK
+1.20D+0.50Lr+W	0.23 psi	164.32psi	0.001381	OK
+1.20D+0.50S+W	0.36 psi	164.32psi	0.002215	OK
+1.20D+0.70S	1.45 psi	164.32psi	0.008831	OK
+0.90D+W	0.38 psi	164.32psi	0.00233	OK
+0.90D	0.47 psi	164.32psi	0.002848	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 240741-CALC PACKAGE COPY.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing w/ Column Load

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	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
ϕ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

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

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Soil Density	=	100.0 pcf
Increase Bearing By Footing Weight	=	Yes
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	=	ft
Allow press. increase per foot of depth when footing base is below	=	ksf
	=	ft

Increases based on footing plan dimension

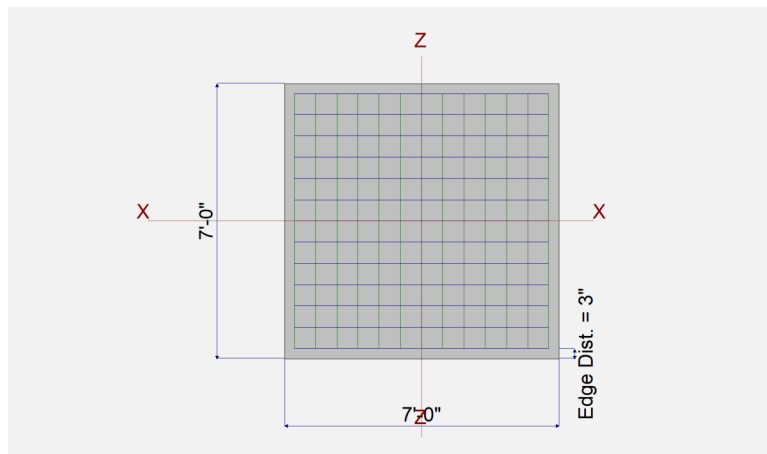
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	7.0 ft
Length parallel to Z-Z Axis	=	7.0 ft
Footing Thickness	=	36.0 in

Pedestal dimensions...

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



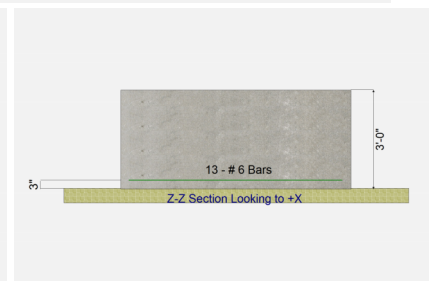
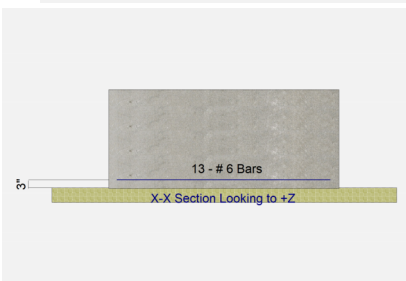
Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	13
Reinforcing Bar Size	=	# 6
Bars parallel to Z-Z Axis	=	
Number of Bars	=	13
Reinforcing Bar Size	=	# 6

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	=	7.950	4.20		10.550	-1.0	k
OB : Overburden	=						ksf
M-xx	=	9.0	20.50		14.0		k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240741-CALC PACKAGE COPY.ecb

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing w/ Column Load

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.3476	Soil Bearing	1.194 ksf	3.435 ksf	+D+Lr about X-X axis
PASS	3.518	Overturing - X-X	32.250 k-ft	113.453 k-ft	+D+0.750Lr+0.450W
PASS	n/a	Overturing - Z-Z	0.0 k-ft	0.0 k-ft	No Overturing
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	29.265	Uplift	-0.60 k	17.559 k	+0.60D+0.60W
PASS	0.02789	Z Flexure (+X)	3.303 k-ft/ft	118.40 k-ft/ft	+1.20D+1.60S
PASS	0.02789	Z Flexure (-X)	3.303 k-ft/ft	118.40 k-ft/ft	+1.20D+1.60S
PASS	0.04719	X Flexure (+Z)	5.587 k-ft/ft	118.40 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.02138	X Flexure (-Z)	2.531 k-ft/ft	118.40 k-ft/ft	+1.20D+1.60S
PASS	0.01276	1-way Shear (+X)	1.048 psi	82.158 psi	+1.20D+1.60S
PASS	0.01276	1-way Shear (-X)	1.048 psi	82.158 psi	+1.20D+1.60S
PASS	0.02628	1-way Shear (+Z)	2.159 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.01097	1-way Shear (-Z)	0.9010 psi	82.158 psi	+1.20D+1.60Lr+0.50W
PASS	0.03101	2-way Punching	5.095 psi	164.317 psi	+1.20D+1.60S



Top reinforcing mat required (see 'Bending' tab).

Hand check required for anchor pullout.

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xeccc	Zeccc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.435	n/a	3.690	0.4414	0.7531	n/a	n/a	0.219
X-X, +D+Lr	3.435	n/a	10.578	0.1721	1.194	n/a	n/a	0.348
X-X, +D+S	3.435	n/a	2.713	0.6567	0.9684	n/a	n/a	0.282
X-X, +D+0.750Lr	3.435	n/a	9.024	0.2394	1.084	n/a	n/a	0.316
X-X, +D+0.750S	3.435	n/a	2.905	0.6029	0.9146	n/a	n/a	0.266
X-X, +D+0.60W	3.435	n/a	7.284	0.2837	0.8863	n/a	n/a	0.258
X-X, +D+0.750Lr+0.450W	3.435	n/a	11.516	0.1211	1.184	n/a	n/a	0.345
X-X, +D+0.750S+0.450W	3.435	n/a	4.999	0.4846	1.015	n/a	n/a	0.296
X-X, +0.60D+0.60W	3.435	n/a	9.765	0.1071	0.5851	n/a	n/a	0.170
X-X, +0.60D	3.435	n/a	3.690	0.2648	0.4519	n/a	n/a	0.132
Z-Z, D Only	3.435	0.0	n/a	n/a	n/a	0.5972	0.5972	0.174
Z-Z, +D+Lr	3.435	0.0	n/a	n/a	n/a	0.6830	0.6830	0.199
Z-Z, +D+S	3.435	0.0	n/a	n/a	n/a	0.8126	0.8126	0.237
Z-Z, +D+0.750Lr	3.435	0.0	n/a	n/a	n/a	0.6615	0.6615	0.193
Z-Z, +D+0.750S	3.435	0.0	n/a	n/a	n/a	0.7587	0.7587	0.221
Z-Z, +D+0.60W	3.435	0.0	n/a	n/a	n/a	0.5850	0.5850	0.170
Z-Z, +D+0.750Lr+0.450W	3.435	0.0	n/a	n/a	n/a	0.6523	0.6523	0.190
Z-Z, +D+0.750S+0.450W	3.435	0.0	n/a	n/a	n/a	0.7495	0.7495	0.218
Z-Z, +0.60D+0.60W	3.435	0.0	n/a	n/a	n/a	0.3461	0.3461	0.101
Z-Z, +0.60D	3.435	0.0	n/a	n/a	n/a	0.3583	0.3583	0.104

Overturing Stability

Rotation Axis & Load Combination...	Overturing Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	9.0 k-ft	102.428 k-ft	11.381	OK
X-X, +D+Lr	29.50 k-ft	117.128 k-ft	3.970	OK
X-X, +D+S	9.0 k-ft	139.353 k-ft	15.484	OK
X-X, +D+0.750Lr	24.375 k-ft	113.453 k-ft	4.654	OK
X-X, +D+0.750S	9.0 k-ft	130.121 k-ft	14.458	OK
X-X, +D+0.60W	19.50 k-ft	102.428 k-ft	5.253	OK
X-X, +D+0.750Lr+0.450W	32.250 k-ft	113.453 k-ft	3.518	OK
X-X, +D+0.750S+0.450W	16.875 k-ft	130.121 k-ft	7.711	OK
X-X, +0.60D+0.60W	15.90 k-ft	61.457 k-ft	3.865	OK
X-X, +0.60D	5.40 k-ft	61.457 k-ft	11.381	OK
Z-Z, D Only	None	0.0 k-ft	Infinity	OK
Z-Z, +D+Lr	None	0.0 k-ft	Infinity	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240741-CALC PACKAGE COPY.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing w/ Column Load

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Z-Z, +D+S	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750Lr	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750S	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750Lr+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750S+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D	None	0.0 k-ft	Infinity	OK

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	2.291	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.40D	0.4913	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50Lr	2.958	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50Lr	0.04842	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50S	2.623	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50S	1.081	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60Lr	5.146	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60Lr	1.081	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60Lr+0.50W	5.587	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60Lr+0.50W	1.641	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60S	4.074	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60S	2.531	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60S+0.50W	4.511	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+1.60S+0.50W	1.969	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50Lr+W	3.833	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50Lr+W	1.173	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50S+W	3.498	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.50S+W	0.04438	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.70S	2.887	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +1.20D+0.70S	1.344	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +0.90D+W	2.348	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +0.90D+W	0.8090	-Z	Top	0.7776	AsMin	0.8171	118.40	OK
X-X, +0.90D	1.473	+Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
X-X, +0.90D	0.3159	-Z	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.40D	1.391	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.40D	1.391	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50Lr	1.455	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50Lr	1.455	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50S	1.852	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50S	1.852	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60Lr	2.033	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60Lr	2.033	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.970	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.970	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60S	3.303	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60S	3.303	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60S+0.50W	3.240	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+1.60S+0.50W	3.240	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50Lr+W	1.330	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50Lr+W	1.330	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50S+W	1.727	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.50S+W	1.727	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.70S	2.116	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +1.20D+0.70S	2.116	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +0.90D+W	0.7694	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK

Project Title:
 Engineer:
 Project ID:
 Project Descr:

General Footing

Project File: 240741-CALC PACKAGE COPY.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing w/ Column Load

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, +0.90D+W	0.7694	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +0.90D	0.8944	-X	Bottom	0.7776	AsMin	0.8171	118.40	OK
Z-Z, +0.90D	0.8944	+X	Bottom	0.7776	AsMin	0.8171	118.40	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.44 psi	0.44 psi	0.06 psi	0.82 psi	0.82 psi	82.16 psi	0.01	OK
+1.20D+0.50Lr	0.46 psi	0.46 psi	0.18 psi	1.10 psi	1.10 psi	82.16 psi	0.01	OK
+1.20D+0.50S	0.59 psi	0.59 psi	0.26 psi	0.91 psi	0.91 psi	82.16 psi	0.01	OK
+1.20D+1.60Lr	0.65 psi	0.65 psi	0.67 psi	1.97 psi	1.97 psi	82.16 psi	0.02	OK
+1.20D+1.60Lr+0.50W	0.63 psi	0.63 psi	0.90 psi	2.16 psi	2.16 psi	82.16 psi	0.03	OK
+1.20D+1.60S	1.05 psi	1.05 psi	0.72 psi	1.38 psi	1.38 psi	82.16 psi	0.02	OK
+1.20D+1.60S+0.50W	1.03 psi	1.03 psi	0.49 psi	1.57 psi	1.57 psi	82.16 psi	0.02	OK
+1.20D+0.50Lr+W	0.42 psi	0.42 psi	0.64 psi	1.48 psi	1.48 psi	82.16 psi	0.02	OK
+1.20D+0.50S+W	0.55 psi	0.55 psi	0.20 psi	1.30 psi	1.30 psi	82.16 psi	0.02	OK
+1.20D+0.70S	0.67 psi	0.67 psi	0.34 psi	1.00 psi	1.00 psi	82.16 psi	0.01	OK
+0.90D+W	0.24 psi	0.24 psi	0.42 psi	0.91 psi	0.91 psi	82.16 psi	0.01	OK
+0.90D	0.28 psi	0.28 psi	0.04 psi	0.53 psi	0.53 psi	82.16 psi	0.01	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	2.15 psi	164.32psi	0.01306	OK
+1.20D+0.50Lr	2.25 psi	164.32psi	0.01366	OK
+1.20D+0.50S	2.86 psi	164.32psi	0.01739	OK
+1.20D+1.60Lr	3.14 psi	164.32psi	0.01908	OK
+1.20D+1.60Lr+0.50W	3.04 psi	164.32psi	0.0185	OK
+1.20D+1.60S	5.10 psi	164.32psi	0.03101	OK
+1.20D+1.60S+0.50W	5.00 psi	164.32psi	0.03042	OK
+1.20D+0.50Lr+W	2.05 psi	164.32psi	0.01249	OK
+1.20D+0.50S+W	2.66 psi	164.32psi	0.01621	OK
+1.20D+0.70S	3.26 psi	164.32psi	0.01986	OK
+0.90D+W	1.19 psi	164.32psi	0.007223	OK
+0.90D	1.38 psi	164.32psi	0.008397	OK

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing

Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Load Combinations Used : IBC 2021

General Information

Pole Footing Shape Circular
Pole Footing Diameter 36.0 in
Calculate Min. Depth for Allowable Pressures
Lateral Restraint at Ground Surface
Allow Passive 150.0 pcf
Max Passive 3,000.0 psf

Controlling Values

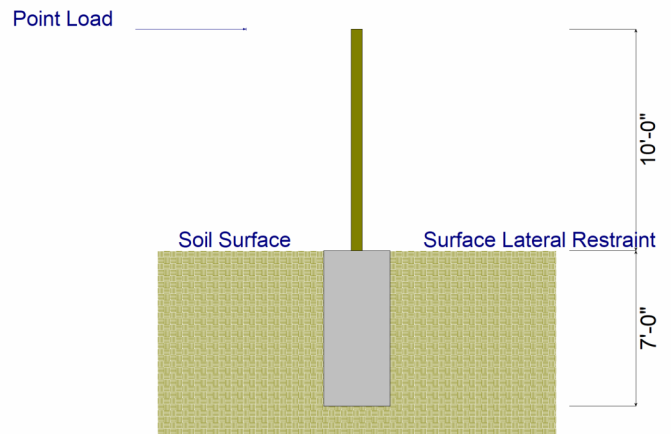
Governing Load Combination $D+0.750Lr+0.450W$
Lateral Load 0.3825 k
Moment 34.50 k-ft

Restraint @ Ground Surface

Pressure at Depth
Actual **997.45** psf
Allowable **1,050.0** psf
Surface Retraint Force 10,855.7 lbs

Minimum Required Depth 7.0 ft

Footing Base Area 7.069 ft²
Maximum Soil Pressure 1.273 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k)		Applied Moment (kft)	Vertical Load (k)
D : Dead Load	k		k/ft	9.0 k-ft	2.750 k
Lr : Roof Live	k		k/ft	20.50 k-ft	k
L : Live	k		k/ft	k-ft	k
S : Snow	k		k/ft	k-ft	6.250 k
W : Wind	0.850 k		k/ft	14.0 k-ft	-4.50 k
E : Earthquake	0.90 k		k/ft	3.50 k-ft	k
H : Lateral Earth	k		k/ft	k-ft	k
Load distance above ground surface	10.0 ft	TOP of Load above ground surface	ft		
		BOTTOM of Load above ground surface	ft		

Load Combination Results

Load Combination	Forces @ Ground Surface		Required Depth - (ft)	Pressure at Depth		Soil Increase Factor
	Loads - (k)	Moments - (ft-k)		Actual - (psf)	Allow - (psf)	
D Only	0.000	9.000	4.50	629.6	675.0	1.000
+D+Lr	0.000	29.500	6.63	952.2	993.8	1.000
+D+S	0.000	9.000	4.50	629.6	675.0	1.000
+D+0.750Lr	0.000	24.375	6.25	884.0	937.5	1.000
+D+0.750S	0.000	9.000	4.50	629.6	675.0	1.000
+D+0.60W	0.510	22.500	6.00	885.4	900.0	1.000
+D+0.70E	0.630	17.750	5.63	794.7	843.8	1.000
+D+0.750Lr+0.450W	0.383	34.500	7.00	997.4	1,050.0	1.000
+D+0.750S+0.450W	0.383	19.125	5.75	819.5	862.5	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30 BRITT PETERS & ASSOCIATES INC. (c) ENERCALC INC 1983-2023

DESCRIPTION: Canopy Footing

+D+0.750S+0.5250E	0.473	15.563	5.38	763.1	806.3	1.000
+0.60D+0.60W	0.510	18.900	5.75	809.8	862.5	1.000
+0.60D+0.70E	0.630	14.150	5.13	763.2	768.8	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 (Non truss bearing)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

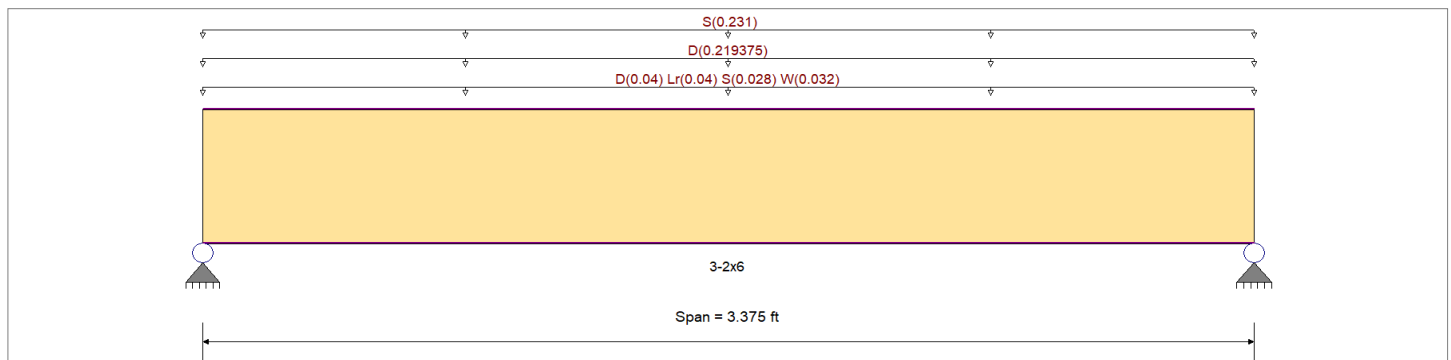
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0140, W = 0.0160 ksf, Tributary Width = 2.0 ft, (Roof)

Uniform Load : D = 0.0150 ksf, Tributary Width = 14.625 ft, (Wall Weight)

Uniform Load : S = 0.2310, Tributary Width = 1.0 ft, (Snow Drift)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.343	1	Maximum Shear Stress Ratio	=	0.194	: 1
Section used for this span		3-2x6		Section used for this span		3-2x6	
fb: Actual	=	394.83	psi	fv: Actual	=	39.14	psi
F'b	=	1,150.00	psi	F'v	=	201.25	psi
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	1.688	ft	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		0.009	in	Ratio =	4651	>=360	Span: 1 : S Only
Max Upward Transient Deflection		0	in	Ratio =	0	<360	n/a
Max Downward Total Deflection		0.018	in	Ratio =	2297	>=180	Span: 1 : +D+S
Max Upward Total Deflection		0	in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only																	
Length = 3.363 ft	1	0.222	0.126	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.38	199.8	900.0	0.33	19.8	157.5
Length = 0.01232 ft	1	0.003	0.126	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	2.9	900.0	0.33	19.8	157.5
+D+Lr																	
Length = 3.363 ft	1	0.184	0.104	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.43	229.9	1,250.0	0.38	22.8	218.8
Length = 0.01232 ft	1	0.003	0.104	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	3.3	1,250.0	0.38	22.8	218.8
+D+S																	
Length = 3.363 ft	1	0.343	0.194	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.75	394.8	1,150.0	0.65	39.1	201.3
Length = 0.01232 ft	1	0.005	0.194	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	5.7	1,150.0	0.65	39.1	201.3

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 (Non truss bearing)

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
+D+0.750Lr						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.178	0.101	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.42	222.4	1,250.0	0.36	22.0	218.8
Length = 0.01232 ft	1		0.003	0.101	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	3.2	1,250.0	0.36	22.0	218.8
+D+0.750S						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.301	0.170	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.65	346.1	1,150.0	0.57	34.3	201.3
Length = 0.01232 ft	1		0.004	0.170	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	5.0	1,150.0	0.57	34.3	201.3
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.134	0.076	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.41	214.2	1,600.0	0.35	21.2	280.0
Length = 0.01232 ft	1		0.002	0.076	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	3.1	1,600.0	0.35	21.2	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.146	0.083	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.44	233.2	1,600.0	0.38	23.1	280.0
Length = 0.01232 ft	1		0.002	0.083	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	3.4	1,600.0	0.38	23.1	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.223	0.126	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.67	356.9	1,600.0	0.58	35.4	280.0
Length = 0.01232 ft	1		0.003	0.126	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.01	5.2	1,600.0	0.58	35.4	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.084	0.048	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.25	134.3	1,600.0	0.22	13.3	280.0
Length = 0.01232 ft	1		0.001	0.048	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.00	2.0	1,600.0	0.22	13.3	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.363 ft	1		0.075	0.042	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.23	119.9	1,600.0	0.20	11.9	280.0
Length = 0.01232 ft	1		0.001	0.042	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.00	1.7	1,600.0	0.20	11.9	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0176	1.700		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.885	0.885
Max Upward from Load Combinations	0.885	0.885
Max Upward from Load Cases	0.448	0.448
D Only	0.448	0.448
+D+Lr	0.515	0.515
+D+S	0.885	0.885
+D+0.750Lr	0.498	0.498
+D+0.750S	0.775	0.775
+D+0.60W	0.480	0.480
+D+0.750Lr+0.450W	0.523	0.523
+D+0.750S+0.450W	0.800	0.800
+0.60D+0.60W	0.301	0.301
+0.60D	0.269	0.269
Lr Only	0.068	0.068
S Only	0.437	0.437
W Only	0.054	0.054

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 OP

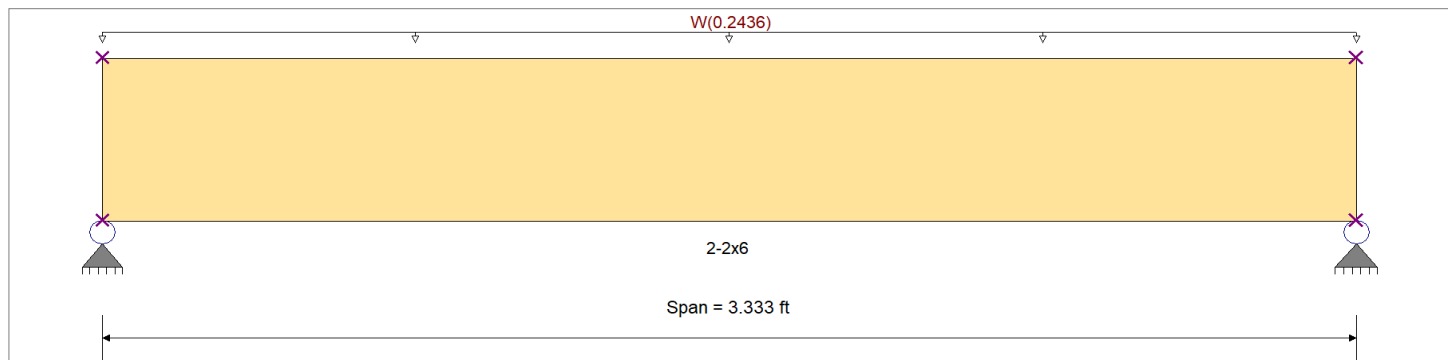
CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity	
Load Combination : IBC 2021	Fb -	1,000.0 psi	Ebend- xx	1,400.0ksi
	Fc - Prll	1,400.0 psi	Eminbend - xx	510.0ksi
Wood Species : Southern Pine	Fc - Perp	565.0 psi		
Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide	Fv	175.0 psi		
	Ft	600.0 psi	Density	34.330pcf
Beam Bracing : Completely Unbraced				



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.0290 ksf, Tributary Width = 8.40 ft, (Wind OP)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.101 : 1	Maximum Shear Stress Ratio	=	0.058 : 1
Section used for this span		2-2x6	Section used for this span		2-2x6
fb: Actual	=	161.03 psi	fv: Actual	=	16.16 psi
F'b	=	1,588.18 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	1.667 ft	Location of maximum on span	=	2.883 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.012 in	Ratio = 3423 >=360	Span: 1 : W Only		
Max Upward Transient Deflection	0 in	Ratio = 0 <360	n/a		
Max Downward Total Deflection	0.007 in	Ratio = 5705 >=180	Span: 1 : +0.60W		
Max Upward Total Deflection	0 in	Ratio = 0 <180	n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
	Length = 3.333 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			896.5	0.00	0.0	157.5
	Length = 3.333 ft	1	0.101	0.058	1.60	1.00	1.00	0.99	1.000	1.00	1.00	1.00	0.20	161.0	1,588.2	0.18	16.2	280.0
+0.450W						1.00	1.00	0.99	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 3.333 ft	1	0.076	0.043	1.60	1.00	1.00	0.99	1.000	1.00	1.00	1.00	0.15	120.8	1,588.2	0.13	12.1	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.0117	1.679		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 OP

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.406	0.406
Max Upward from Load Combinations	0.244	0.244
Max Upward from Load Cases	0.406	0.406
+0.60W	0.244	0.244
+0.450W	0.183	0.183
W Only	0.406	0.406

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 King Stud (Non Truss Bearing) (+)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

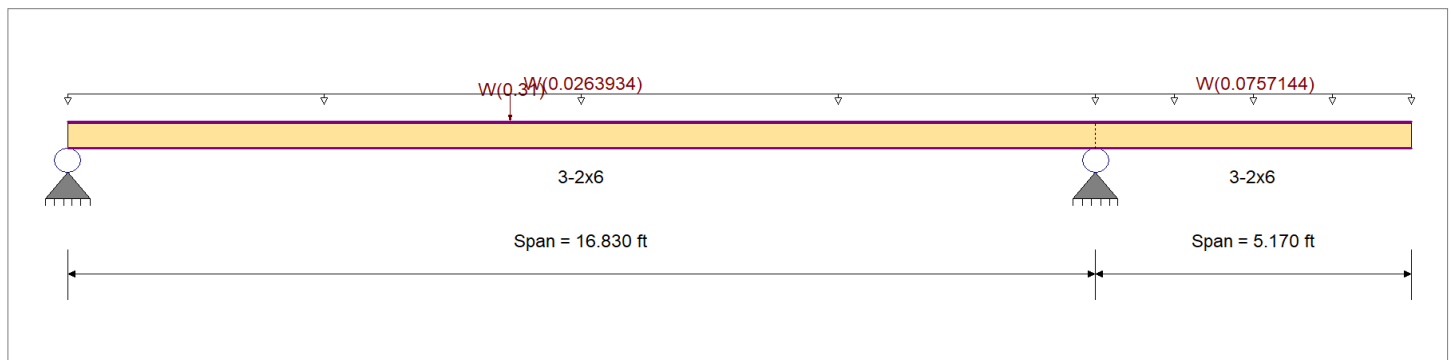
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.310 k @ 7.250 ft, (H1 Reaction)

Load for Span Number 2

Uniform Load : W = 0.05680 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.349 : 1	Maximum Shear Stress Ratio	=	0.053 : 1
Section used for this span		3-2x6	Section used for this span		3-2x6
fb: Actual	=	558.07 psi	fv: Actual	=	14.76 psi
F'b	=	1,600.00 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	7.240ft	Location of maximum on span	=	16.454 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.335 in	Ratio = 602 >= 240	Span: 1 : +0.420W		
Max Upward Transient Deflection	-0.146 in	Ratio = 850 >= 240	Span: 2 : +0.420W		
Max Downward Total Deflection	0.479 in	Ratio = 421 >= 180	Span: 1 : +0.60W		
Max Upward Total Deflection	-0.208 in	Ratio = 594 >= 180	Span: 2 : +0.60W		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.349	0.053	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.06	558.1	1,600.0	0.24	14.8	280.0
Length = 5.170 ft	2	0.201	0.053	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.61	321.1	1,600.0	0.22	14.8	280.0
+0.450W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 King Stud (Non Truss Bearing) (+)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1	0.262	0.040	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.79	418.6	1,600.0	0.18	11.1	280.0
Length = 5.170 ft	2	0.151	0.040	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.46	240.8	1,600.0	0.16	11.1	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.4792	7.804	+0.60W	0.0000	0.000
	2	0.0000	7.804		-0.2085	5.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.338	0.807	
Max Upward from Load Combinations	0.203	0.484	
Max Upward from Load Cases	0.338	0.807	
+0.60W	0.203	0.484	
+0.450W	0.152	0.363	
W Only	0.338	0.807	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 King Stud (Non Truss Bearing) (-)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

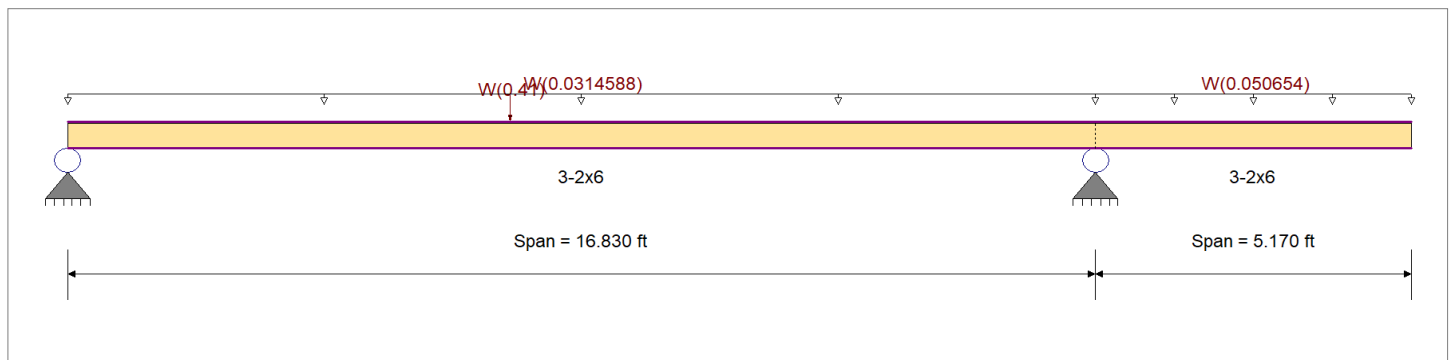
Fb + 1000 psi
 Fb - 1000 psi
 Fc - Prll 1400 psi
 Fc - Perp 565 psi
 Fv 175 psi
 Ft 600 psi

E : Modulus of Elasticity

Ebend- xx 1400ksi

Eminbend - xx 510ksi

Density 34.33pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.02360 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.410 k @ 7.250 ft, (H1 Reaction)

Load for Span Number 2

Uniform Load : W = 0.0380 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.494	1	Maximum Shear Stress Ratio	=	0.061	1
Section used for this span		3-2x6		Section used for this span		3-2x6	
fb: Actual	=	790.38	psi	fv: Actual	=	17.08	psi
F'b	=	1,600.00	psi	F'v	=	280.00	psi
Load Combination		+0.60W		Load Combination		+0.60W	
Location of maximum on span	=	7.240	ft	Location of maximum on span	=	16.454	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.509	in	Ratio =	396	>=240	Span: 1 : +0.420W
Max Upward Transient Deflection		-0.360	in	Ratio =	344	>=240	Span: 2 : +0.420W
Max Downward Total Deflection		0.727	in	Ratio =	277	>=180	Span: 1 : +0.60W
Max Upward Total Deflection		-0.514	in	Ratio =	240	>=180	Span: 2 : +0.60W

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.494	0.061	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.49	790.4	1,600.0	0.28	17.1	280.0
Length = 5.170 ft	2	0.134	0.061	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.41	214.8	1,600.0	0.14	17.1	280.0
+0.450W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 King Stud (Non Truss Bearing) (-)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1	0.370	0.046	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.12	592.8	1,600.0	0.21	12.8	280.0
Length = 5.170 ft	2	0.101	0.046	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.30	161.1	1,600.0	0.11	12.8	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.7271	7.992	+0.60W	0.0000	0.000
	2	0.0000	7.992		-0.5136	5.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.458	0.743	
Max Upward from Load Combinations	0.275	0.446	
Max Upward from Load Cases	0.458	0.743	
+0.60W	0.275	0.446	
+0.450W	0.206	0.335	
W Only	0.458	0.743	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 Jack Stud

Code References

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

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	7.25 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Southern Pine			Exact Width	1.50 in	Allow Stress Modification Factors
Wood Grade	No.2: 2"-4" Thick: 5"-6" Wide			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	1000 psi	Fv	175 psi	Area	8.250 in^2	Cf or Cv for Compression 1.0
Fb -	1000 psi	Ft	600 psi	Ix	20.797 in^4	Cf or Cv for Tension 1.0
Fc - Prll	1400 psi	Density	34.33 pcf	Iy	1.547 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	565 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1400	1400	1400 ksi		Kf : Built-up columns 1.0
	Minimum	510	510			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 7.25 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 14.259 lbs * Dead Load Factor

AXIAL LOADS . . .

Header Reaction: Axial Load at 7.250 ft, D = 0.450, Lr = 0.070, S = 0.440, W = 0.050 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.09662 : 1**
 Load Combination +D+S
 Governing NDS Formula Comp Only, f_c/F_c'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 0.9043 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 1,134.36 psi

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

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

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 7.250 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 280.0 psi

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

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.779	0.05731	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+Lr	1.250	0.676	0.05476	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+S	1.150	0.705	0.09662	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+0.750Lr	1.250	0.676	0.05297	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+0.750S	1.150	0.705	0.08487	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+0.60W	1.600	0.584	0.04580	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+0.750Lr+0.450W	1.600	0.584	0.04997	PASS	0.0 ft	0.0	PASS	7.250 ft
+D+0.750S+0.450W	1.600	0.584	0.07568	PASS	0.0 ft	0.0	PASS	7.250 ft
+0.60D+0.60W	1.600	0.584	0.02859	PASS	0.0 ft	0.0	PASS	7.250 ft
+0.60D	1.600	0.584	0.02581	PASS	0.0 ft	0.0	PASS	7.250 ft

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 Jack Stud

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
D Only						0.464					
+D+Lr						0.534					
+D+S						0.904					
+D+0.750Lr						0.517					
+D+0.750S						0.794					
+D+0.60W						0.494					
+D+0.750Lr+0.450W						0.539					
+D+0.750S+0.450W						0.817					
+0.60D+0.60W						0.309					
+0.60D						0.279					
Lr Only						0.070					
S Only						0.440					
W Only						0.050					

Maximum Deflections for Load Combinations

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

Wood Column

Project File: 240741.ec6

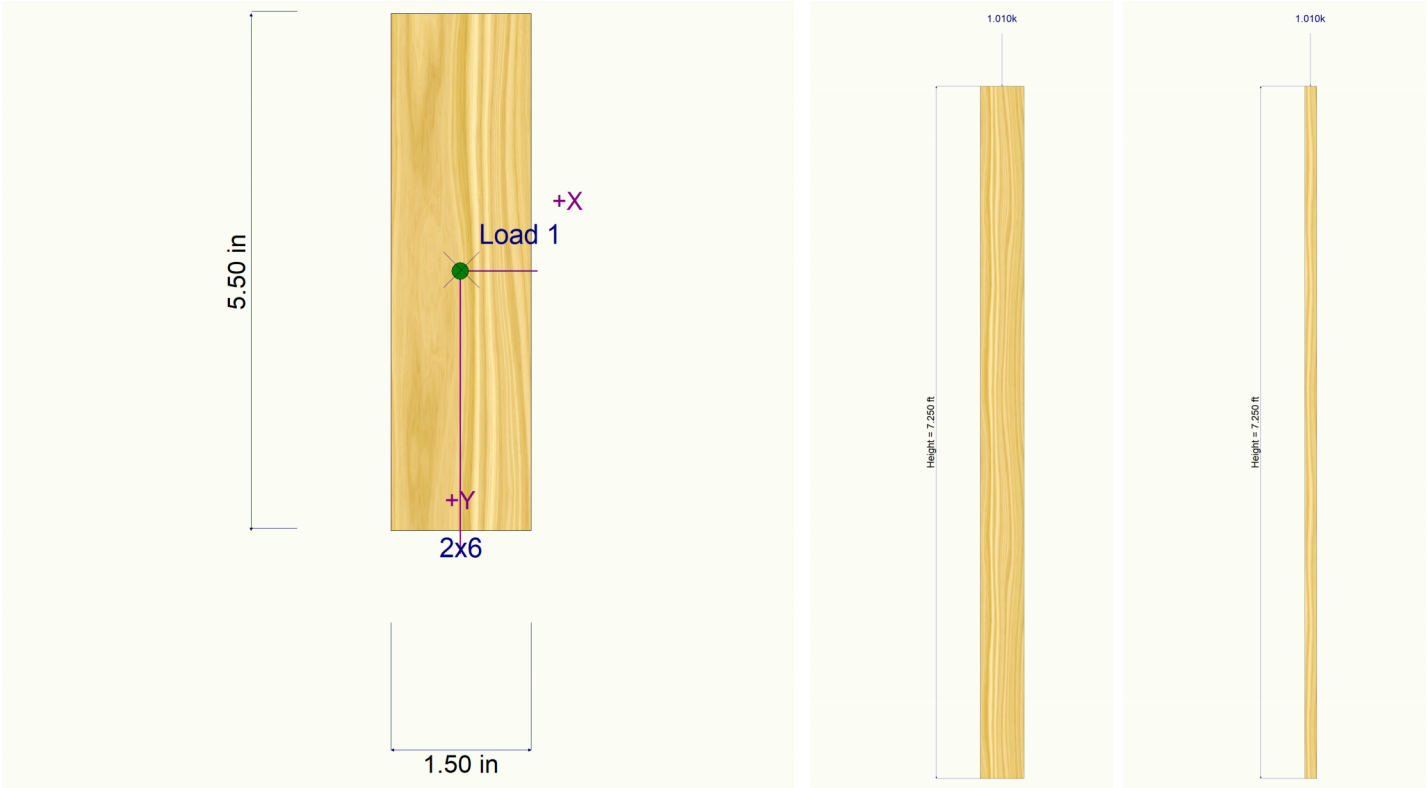
LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H1 Jack Stud

Sketches



Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Non Truss Bearing)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 12" Wide

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

Fb + 750.0 psi

Fb - 750.0 psi

Fc - Prll 1,250.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

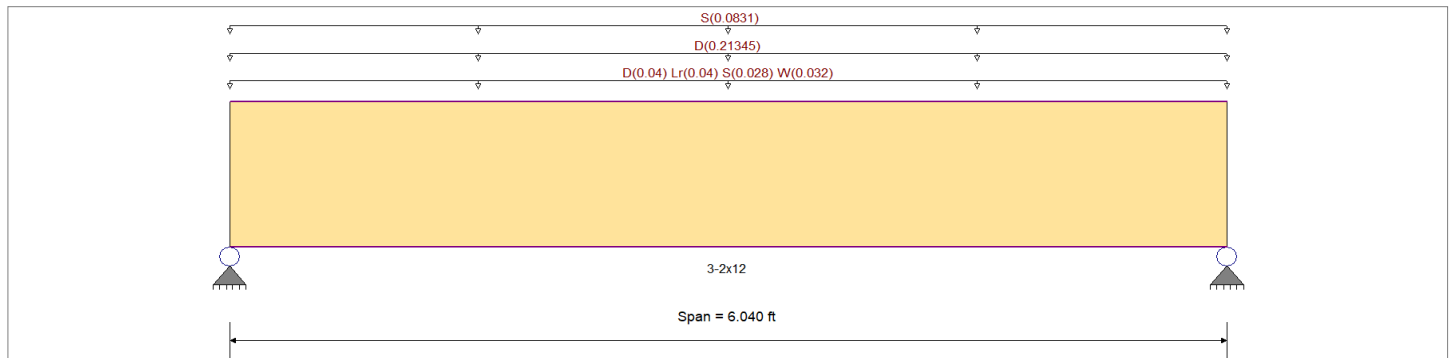
Ft 450.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0140, W = 0.0160 ksf, Tributary Width = 2.0 ft, (Roof Weight)

Uniform Load : D = 0.0150 ksf, Tributary Width = 14.230 ft, (Wall Weight)

Uniform Load : S = 0.08310, Tributary Width = 1.0 ft, (Snow Drift)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.252	1	Maximum Shear Stress Ratio	=	0.116	: 1
Section used for this span		3-2x12		Section used for this span		3-2x12	
fb: Actual	=	217.12	psi	fv: Actual	=	23.37	psi
F'b	=	862.50	psi	F'v	=	201.25	psi
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	3.020	ft	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	0.004 in	Ratio =	16190	>=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.015 in	Ratio =	4776	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.040 ft	1	0.227	0.105	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.21	153.1	675.0	0.56	16.5	157.5
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1	0.188	0.087	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.39	176.1	937.5	0.64	19.0	218.8
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1	0.252	0.116	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.72	217.1	862.5	0.79	23.4	201.3
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1	0.182	0.084	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.35	170.4	937.5	0.62	18.3	218.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: Header H2 (Non Truss Bearing)

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F _b	V	fv	F _v
Length = 6.040 ft	1		0.233	0.108	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.59	201.1	862.5	0.73	21.6	201.3
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1		0.137	0.063	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.30	164.1	1,200.0	0.60	17.7	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1		0.149	0.069	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.41	178.7	1,200.0	0.65	19.2	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1		0.175	0.080	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.66	209.4	1,200.0	0.76	22.5	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1		0.086	0.040	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.81	102.9	1,200.0	0.37	11.1	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.040 ft	1		0.077	0.035	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.73	91.8	1,200.0	0.33	9.9	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0152	3.042		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.137	1.137
Max Upward from Load Combinations	1.137	1.137
Max Upward from Load Cases	0.802	0.802
D Only	0.802	0.802
+D+Lr	0.923	0.923
+D+S	1.137	1.137
+D+0.750Lr	0.892	0.892
+D+0.750S	1.054	1.054
+D+0.60W	0.860	0.860
+D+0.750Lr+0.450W	0.936	0.936
+D+0.750S+0.450W	1.097	1.097
+0.60D+0.60W	0.539	0.539
+0.60D	0.481	0.481
Lr Only	0.121	0.121
S Only	0.336	0.336
W Only	0.097	0.097

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2/H3 OP

CODE REFERENCES

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

Load Combination Set : IBC 2021

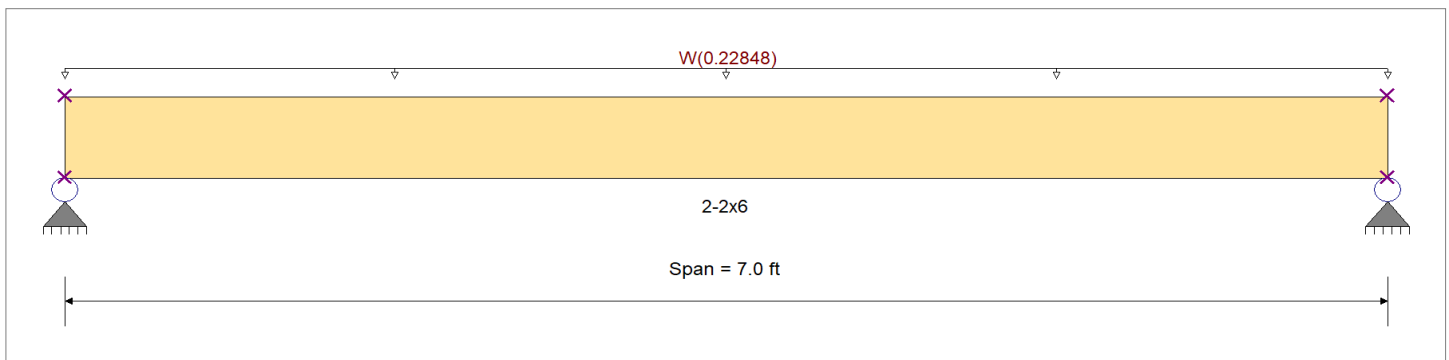
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination : IBC 2021

Wood Species : Southern Pine
 Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

Beam Bracing : Completely Unbraced

F_b + 1,000.0 psi E : Modulus of Elasticity
 F_b - 1,000.0 psi Ebend- xx 1,400.0ksi
 F_c - Prll 1,400.0 psi Eminbend - xx 510.0ksi
 F_c - Perp 565.0 psi
 F_v 175.0 psi
 F_t 600.0 psi Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.02720 ksf, Tributary Width = 8.40 ft, (Wind OP)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	0.423	1	Section used for this span	=	0.136	1
fb: Actual	=	666.18	psi	fv: Actual	=	38.21	psi
F'b	=	1,574.72	psi	F'v	=	280.00	psi
Load Combination	=	+0.60W		Load Combination	=	+0.60W	
Location of maximum on span	=	3.500	ft	Location of maximum on span	=	6.566	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.213 in	Ratio =	393 >= 360	Span: 1 : W Only			
Max Upward Transient Deflection	0 in	Ratio =	0 < 360	n/a			
Max Downward Total Deflection	0.128 in	Ratio =	656 >= 180	Span: 1 : +0.60W			
Max Upward Total Deflection	0 in	Ratio =	0 < 180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 7.0 ft	1			0.90	1.00	1.00	0.99	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	0.99	1.000	1.00	1.00	1.00			892.9	0.00	0.0	157.5
Length = 7.0 ft	1	0.423	0.136	1.60	1.00	1.00	0.98	1.000	1.00	1.00	1.00	0.84	666.2	1,574.7	0.42	38.2	280.0
+0.450W					1.00	1.00	0.98	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 7.0 ft	1	0.317	0.102	1.60	1.00	1.00	0.98	1.000	1.00	1.00	1.00	0.63	499.6	1,574.7	0.32	28.7	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.2132	3.526		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

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DESCRIPTION: Header H2/H3 OP

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.800	0.800
Max Upward from Load Combinations	0.480	0.480
Max Upward from Load Cases	0.800	0.800
+0.60W	0.480	0.480
+0.450W	0.360	0.360
W Only	0.800	0.800

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Non Truss Bearing) (+)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

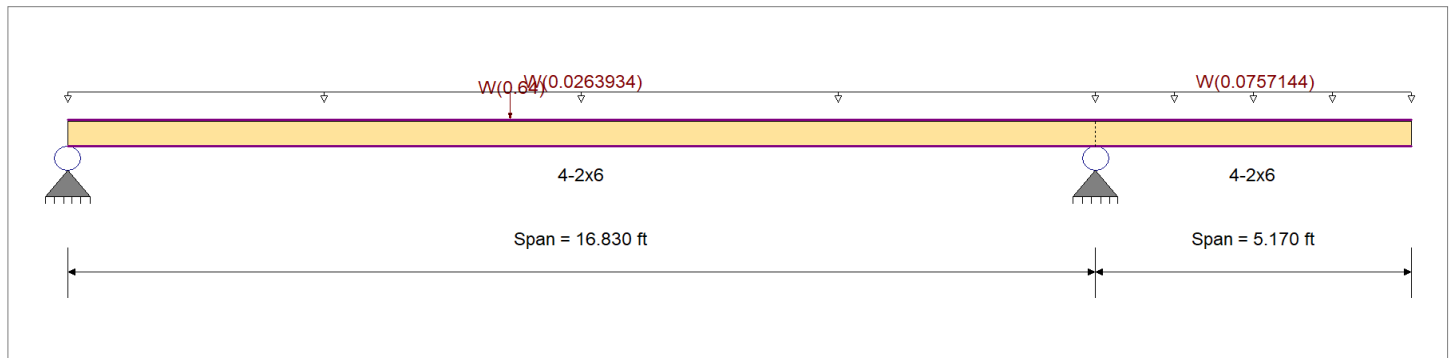
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.640 k @ 7.250 ft, (H2 Reaction)

Load for Span Number 2

Uniform Load : W = 0.05680 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio		=	0.464 : 1	Maximum Shear Stress Ratio		=	0.053 : 1
Section used for this span			4-2x6	Section used for this span			4-2x6
fb: Actual	=		742.24 psi	fv: Actual	=		14.95 psi
F'b	=		1,600.00 psi	F'v	=		280.00 psi
Load Combination	=		+0.60W	Load Combination	=		+0.60W
Location of maximum on span	=		7.240ft	Location of maximum on span	=		16.454 ft
Span # where maximum occurs	=		Span # 1	Span # where maximum occurs	=		Span # 1
Maximum Deflection							
Max Downward Transient Deflection		0.452 in	Ratio = 446 >=240	Span: 1 : +0.420W			
Max Upward Transient Deflection		-0.286 in	Ratio = 434 >=240	Span: 2 : +0.420W			
Max Downward Total Deflection		0.646 in	Ratio = 312 >=180	Span: 1 : +0.60W			
Max Upward Total Deflection		-0.408 in	Ratio = 304 >=180	Span: 2 : +0.60W			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.464	0.053	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.87	742.2	1,600.0	0.33	14.9	280.0
Length = 5.170 ft	2	0.151	0.053	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.61	240.8	1,600.0	0.22	14.9	280.0
+0.450W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Non Truss Bearing) (+)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1	0.348	0.040	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.40	556.7	1,600.0	0.25	11.2	280.0
Length = 5.170 ft	2	0.113	0.040	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.46	180.6	1,600.0	0.16	11.2	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.6460	7.898	+0.60W	0.0000	0.000
	2	0.0000	7.898		-0.4079	5.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.526	0.949	
Max Upward from Load Combinations	0.316	0.570	
Max Upward from Load Cases	0.526	0.949	
+0.60W	0.316	0.570	
+0.450W	0.237	0.427	
W Only	0.526	0.949	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Non Truss Bearing) (-)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

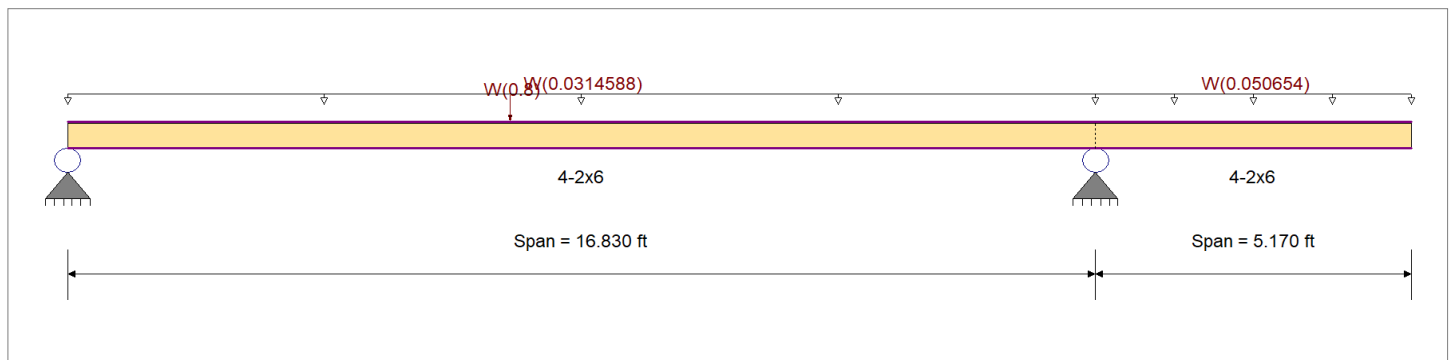
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.02360 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.80 k @ 7.250 ft, (H2 Reaction)

Load for Span Number 2

Uniform Load : W = 0.0380 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.610 : 1	Maximum Shear Stress Ratio	=	0.065 : 1
Section used for this span		4-2x6	Section used for this span		4-2x6
fb: Actual	=	975.32 psi	fv: Actual	=	18.22 psi
F'b	=	1,600.00 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	7.240ft	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	0.619 in	Ratio = 326 >= 240	Span: 1 : +0.420W		
Max Upward Transient Deflection	-0.478 in	Ratio = 258 >= 240	Span: 2 : +0.420W		
Max Downward Total Deflection	0.884 in	Ratio = 228 >= 180	Span: 1 : +0.60W		
Max Upward Total Deflection	-0.683 in	Ratio = 180 >= 180	Span: 2 : +0.60W		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.610	0.065	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.46	975.3	1,600.0	0.40	18.2	280.0
Length = 5.170 ft	2	0.101	0.065	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.41	161.1	1,600.0	0.14	18.2	280.0
+0.450W				1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Non Truss Bearing) (-)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1	0.457	0.049	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.84	731.5	1,600.0	0.30	13.7	280.0
Length = 5.170 ft	2	0.076	0.049	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.30	120.8	1,600.0	0.11	13.7	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.8845	8.086		0.0000	0.000
	2	0.0000	8.086	+0.60W	-0.6825	5.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.680	0.911	
Max Upward from Load Combinations	0.408	0.547	
Max Upward from Load Cases	0.680	0.911	
+0.60W	0.408	0.547	
+0.450W	0.306	0.410	
W Only	0.680	0.911	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 12" Wide

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

Fb + 750.0 psi

Fb - 750.0 psi

Fc - Prll 1,250.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

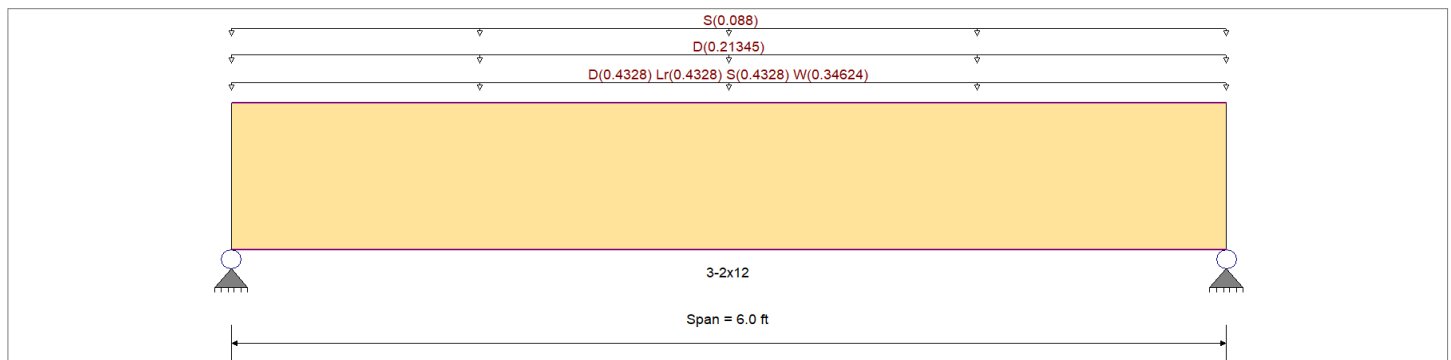
Ft 450.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.020, W = 0.0160 ksf, Tributary Width = 21.640 ft, (Roof)

Uniform Load : D = 0.0150 ksf, Tributary Width = 14.230 ft, (Wall Weight)

Uniform Load : S = 0.0880, Tributary Width = 1.0 ft, (Snow Drift)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.778	1	Maximum Shear Stress Ratio	=	0.361	1
Section used for this span		3-2x12		Section used for this span		3-2x12	
fb: Actual	=	670.79	psi	fv: Actual	=	72.68	psi
F'b	=	862.50	psi	F'v	=	201.25	psi
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	3.000	ft	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		0.020	in	Ratio =	3523	>=360	Span: 1 : S Only
Max Upward Transient Deflection		0	in	Ratio =	0	<360	n/a
Max Downward Total Deflection		0.046	in	Ratio =	1556	>=180	Span: 1 : +D+S
Max Upward Total Deflection		0	in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.555	0.258	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.96	374.5	675.0	1.37	40.6	157.5
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.662	0.307	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.91	620.7	937.5	2.27	67.3	218.8
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.778	0.361	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.31	670.8	862.5	2.45	72.7	201.3
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.596	0.277	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.42	559.2	937.5	2.04	60.6	218.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing)

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.0 ft	1		0.692	0.321	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.72	596.7	862.5	2.18	64.7	201.3
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.411	0.191	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.90	492.7	1,200.0	1.80	53.4	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.540	0.251	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.12	647.8	1,200.0	2.37	70.2	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.571	0.265	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.42	685.4	1,200.0	2.51	74.3	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.286	0.133	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.71	342.9	1,200.0	1.25	37.2	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.187	0.087	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.78	224.7	1,200.0	0.82	24.3	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0463	3.022		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	3.614	3.614
Max Upward from Load Combinations	3.614	3.614
Max Upward from Load Cases	1.975	1.975
D Only	1.975	1.975
+D+Lr	3.273	3.273
+D+S	3.537	3.537
+D+0.750Lr	2.949	2.949
+D+0.750S	3.147	3.147
+D+0.60W	2.598	2.598
+D+0.750Lr+0.450W	3.416	3.416
+D+0.750S+0.450W	3.614	3.614
+0.60D+0.60W	1.808	1.808
+0.60D	1.185	1.185
Lr Only	1.298	1.298
S Only	1.562	1.562
W Only	1.039	1.039

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Truss Bearing) (+)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

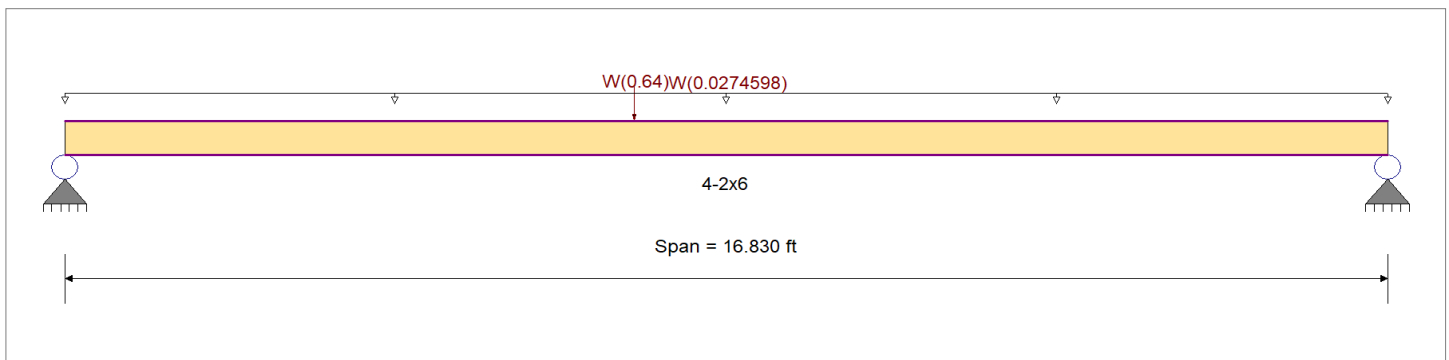
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.02060 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.640 k @ 7.250 ft, (H2 Reaction)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.535	1	Maximum Shear Stress Ratio	=	0.057	1
Section used for this span		4-2x6		Section used for this span		4-2x6	
fb: Actual	=	855.43psi		fv: Actual	=	15.92 psi	
F'b	=	1,600.00psi		F'v	=	280.00 psi	
Load Combination		+0.60W		Load Combination		+0.60W	
Location of maximum on span	=	7.248ft		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	0.568 in	Ratio =	355	>=240	Span: 1 : +0.420W
Max Upward Transient Deflection	0 in	Ratio =	0	<240	n/a
Max Downward Total Deflection	0.811 in	Ratio =	248	>=180	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	Ct	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.535	0.057	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.16	855.4	1,600.0	0.35	15.9	280.0
+0.450W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.401	0.043	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.62	641.6	1,600.0	0.26	11.9	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.8113	8.169		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30 BRITT PETERS & ASSOCIATES INC. (c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Truss Bearing) (+)

Vertical Reactions	Support notation : Far left is #1		Values in KIPS
	Support 1	Support 2	
Load Combination			
Max Upward from all Load Conditions	0.595	0.507	
Max Upward from Load Combinations	0.357	0.304	
Max Upward from Load Cases	0.595	0.507	
+0.60W	0.357	0.304	
+0.450W	0.268	0.228	
W Only	0.595	0.507	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Truss Bearing) (-)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

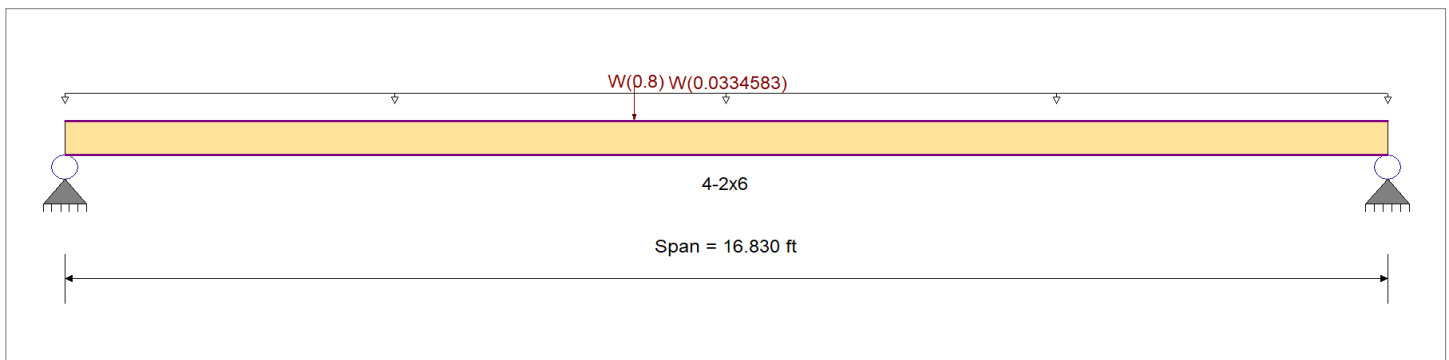
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.02510 ksf, Tributary Width = 1.333 ft, (Wind on Wall)

Point Load : W = 0.80 k @ 7.250 ft, (H2 Reaction)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.664	1	Maximum Shear Stress Ratio	=	0.070	1
Section used for this span		4-2x6		Section used for this span		4-2x6	
fb: Actual	=	1,062.12 psi		fv: Actual	=	19.71 psi	
F'b	=	1,600.00 psi		F'v	=	280.00 psi	
Load Combination		+0.60W		Load Combination		+0.60W	
Location of maximum on span	=	7.248 ft		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	0.704 in	Ratio =	286 >=240	Span: 1 : +0.420W			
Max Upward Transient Deflection	0 in	Ratio =	0 <240	n/a			
Max Downward Total Deflection	1.006 in	Ratio =	200 >=180	Span: 1 : +0.60W			
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.664	0.070	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.68	1,062.1	1,600.0	0.43	19.7	280.0
+0.450W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.830 ft	1	0.498	0.053	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.01	796.6	1,600.0	0.33	14.8	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	1.0060	8.169		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 King Stud (Truss Bearing) (-)

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.737	0.626
Max Upward from Load Combinations	0.442	0.376
Max Upward from Load Cases	0.737	0.626
+0.60W	0.442	0.376
+0.450W	0.332	0.282
W Only	0.737	0.626

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing) E-W Drift

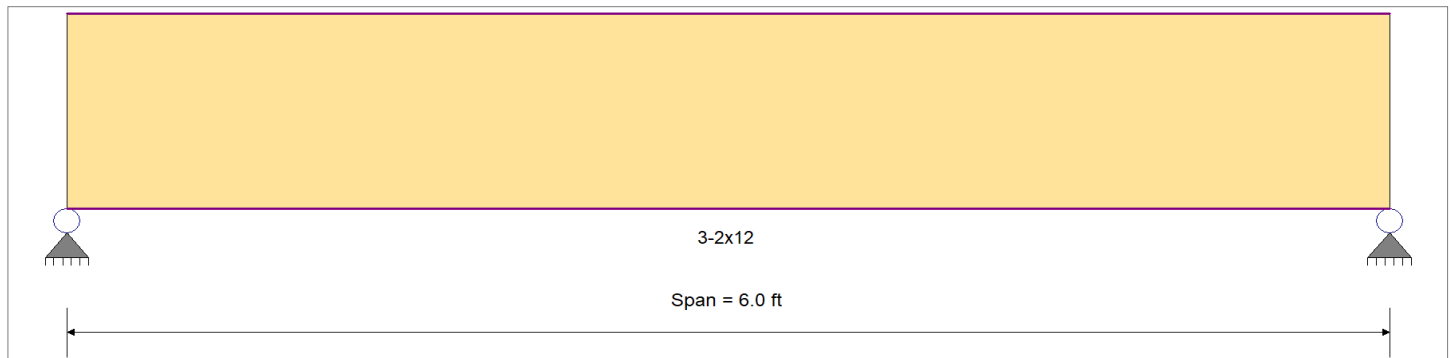
CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design	Fb +	750.0 psi	E : Modulus of Elasticity	
Load Combination : IBC 2021	Fb -	750.0 psi	Ebend- xx	1,400.0ksi
	Fc - Prll	1,250.0 psi	Eminbend - xx	510.0ksi
Wood Species : Southern Pine	Fc - Perp	565.0 psi		
Wood Grade : No.2: 2"-4" Thick: 12" Wide	Fv	175.0 psi		
	Ft	450.0 psi	Density	34.330pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Beam self weight calculated and added to loading

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.941 : 1	Maximum Shear Stress Ratio	=	0.445 : 1
Section used for this span		3-2x12	Section used for this span		3-2x12
fb: Actual	=	811.97 psi	fv: Actual	=	89.54 psi
F'b	=	862.50 psi	F'v	=	201.25 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	3.088ft	Location of maximum on span	=	5.080 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.034 in	Ratio = 2109 >=360	Span: 1 : S Only		
Max Upward Transient Deflection	0 in	Ratio = 0 <360	n/a		
Max Downward Total Deflection	0.056 in	Ratio = 1286 >=180	Span: 1 : +D+S		
Max Upward Total Deflection	0 in	Ratio = 0 <180	n/a		

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only															0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.469	0.218	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.50	316.3	675.0	1.16	34.3	157.5
+D+Lr						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.580	0.269	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.30	543.9	937.5	1.99	58.9	218.8
+D+S						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.941	0.445	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	6.42	812.0	862.5	3.02	89.5	201.3
+D+0.750Lr						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.519	0.241	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.85	487.0	937.5	1.78	52.8	218.8
+D+0.750S						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.798	0.376	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.44	688.0	862.5	2.56	75.7	201.3
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing) E-W Drift

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F ^b	V	f _v	F ^v
Length = 6.0 ft	1		0.355	0.165	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.37	425.6	1,200.0	1.56	46.1	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.474	0.220	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.50	568.9	1,200.0	2.08	61.6	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.642	0.302	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	6.09	769.9	1,200.0	2.86	84.6	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.249	0.116	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.37	299.0	1,200.0	1.09	32.4	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.158	0.073	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.50	189.8	1,200.0	0.69	20.6	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0560	3.022		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.028	4.528
Max Upward from Load Combinations	4.028	4.528
Max Upward from Load Cases	2.360	2.860
D Only	1.668	1.668
+D+Lr	2.868	2.868
+D+S	4.028	4.528
+D+0.750Lr	2.568	2.568
+D+0.750S	3.438	3.813
+D+0.60W	2.244	2.244
+D+0.750Lr+0.450W	3.000	3.000
+D+0.750S+0.450W	3.870	4.245
+0.60D+0.60W	1.577	1.577
+0.60D	1.001	1.001
Lr Only	1.200	1.200
S Only	2.360	2.860
W Only	0.960	0.960

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing) @ Tormax Door

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 12" Wide

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

Fb + 750.0 psi

Fb - 750.0 psi

Fc - Prll 1,250.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

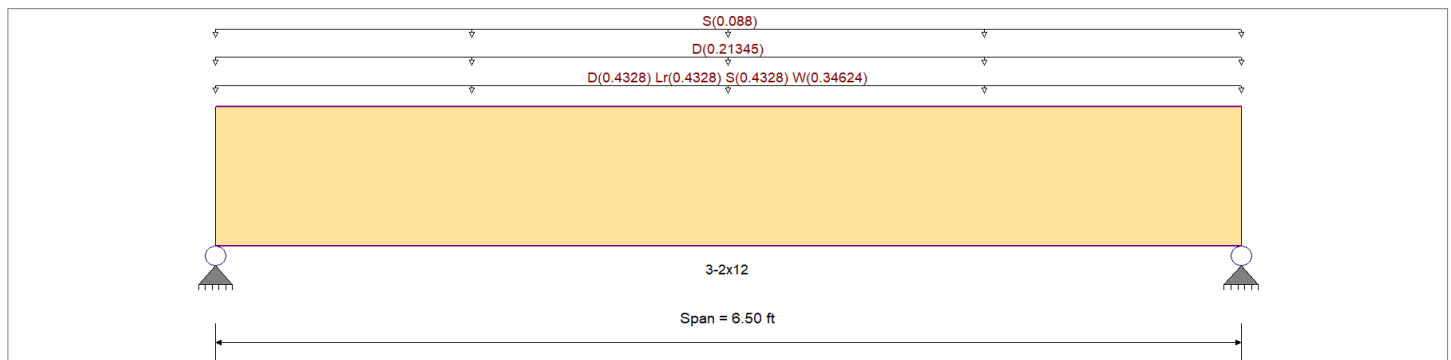
Ft 450.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.020, W = 0.0160 ksf, Tributary Width = 21.640 ft, (Roof)

Uniform Load : D = 0.0150 ksf, Tributary Width = 14.230 ft, (Wall Weight)

Uniform Load : S = 0.0880, Tributary Width = 1.0 ft, (Snow Drift)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.913	1	Maximum Shear Stress Ratio	=	0.404	: 1
Section used for this span		3-2x12		Section used for this span		3-2x12	
fb: Actual	=	787.24	psi	fv: Actual	=	81.22	psi
F'b	=	862.50	psi	F'v	=	201.25	psi
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	3.250	ft	Location of maximum on span	=	5.575	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.028	in	Ratio =	2771	>=360	Span: 1 : S Only
Max Upward Transient Deflection		0	in	Ratio =	0	<360	n/a
Max Downward Total Deflection		0.064	in	Ratio =	1224	>=180	Span: 1 : +D+S
Max Upward Total Deflection		0	in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.651	0.288	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.48	439.5	675.0	1.53	45.3	157.5
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.777	0.344	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.76	728.5	937.5	2.54	75.2	218.8
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.913	0.404	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	6.23	787.2	862.5	2.74	81.2	201.3
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.700	0.310	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.19	656.3	937.5	2.29	67.7	218.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 (Truss Bearing) @ Tormax Door

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.50 ft	1		0.812	0.359	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	5.54	700.3	862.5	2.44	72.3	201.3
+D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1		0.482	0.213	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	4.57	578.2	1,200.0	2.01	59.7	280.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1		0.634	0.280	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	6.01	760.3	1,200.0	2.65	78.4	280.0
+D+0.750S+0.450W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1		0.670	0.296	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	6.36	804.3	1,200.0	2.80	83.0	280.0
+0.60D+0.60W						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1		0.335	0.148	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	3.18	402.4	1,200.0	1.40	41.5	280.0
+0.60D						1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1		0.220	0.097	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.09	263.7	1,200.0	0.92	27.2	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0637	3.274		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	3.915	3.915
Max Upward from Load Combinations	3.915	3.915
Max Upward from Load Cases	2.140	2.140
D Only	2.140	2.140
+D+Lr	3.546	3.546
+D+S	3.832	3.832
+D+0.750Lr	3.194	3.194
+D+0.750S	3.409	3.409
+D+0.60W	2.815	2.815
+D+0.750Lr+0.450W	3.701	3.701
+D+0.750S+0.450W	3.915	3.915
+0.60D+0.60W	1.959	1.959
+0.60D	1.284	1.284
Lr Only	1.407	1.407
S Only	1.693	1.693
W Only	1.125	1.125

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 Jack Stud

Code References

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

Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber
Overall Column Height	9.67 ft			Wood Member Type	Sawn
(Used for non-slender calculations)					
Wood Species	Southern Pine			Exact Width	1.50 in
Wood Grade	No.2: 2"-4" Thick: 5"-6" Wide			Exact Depth	5.50 in
Fb +	1,000.0 psi	Fv	175.0 psi	Area	8.250 in^2
Fb -	1,000.0 psi	Ft	600.0 psi	Ix	20.797 in^4
Fc - Prll	1,400.0 psi	Density	34.330 pcf	Iy	1.547 in^4
Fc - Perp	565.0 psi				
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial		
	Basic	1,400.0	1,400.0	1,400.0 ksi	
	Minimum	510.0	510.0		
	Column Buckling Condition:				
	ABOUT X-X Axis: Lux = 9.67 ft, Kx = 1.0				
	Fully braced against buckling ABOUT Y-Y Axis				

Applied Loads

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

Column self weight included : 19.019 lbs * Dead Load Factor

AXIAL LOADS . . .

Header Reaction: Axial Load at 9.670 ft, D = 1.670, Lr = 1.20, S = 2.860, W = 0.960 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = 0.6982 : 1

Load Combination	+D+S
------------------	------

Governing NDS Formula	Comp Only, f_c/F_c'
-----------------------	-----------------------

Location of max.above base	0.0 ft
----------------------------	--------

At maximum location values are .

Applied Axial	4.549 k
---------------	---------

Applied Mx	0.0 k-ft
------------	----------

Applied My	0.0 k-ft
------------	----------

F_c : Allowable 789.72 psi

PASS Maximum Shear Stress Ratio = 0.0 : 1

Load Combination	+0.60D
------------------	--------

Location of max.above base	9.670 ft
----------------------------	----------

Applied Design Shear	0.0 psi
----------------------	---------

Allowable Shear	280.0 psi
-----------------	-----------

Maximum SERVICE Lateral Load Reactions . .

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

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

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.0 in at 0.0 ft above base

for load combination : n/a

Along X-X 0.0 in at 0.0 ft above base

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

Other Factors used to calculate allowable stresses . . .

Bending Compression Tension

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.584	0.2784	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+Lr	1.250	0.460	0.4351	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+S	1.150	0.491	0.6982	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+0.750Lr	1.250	0.460	0.390	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+0.750S	1.150	0.491	0.5885	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+0.60W	1.600	0.375	0.3266	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+0.750Lr+0.450W	1.600	0.375	0.4355	PASS	0.0 ft	0.0	PASS	9.670 ft
+D+0.750S+0.450W	1.600	0.375	0.6150	PASS	0.0 ft	0.0	PASS	9.670 ft
+0.60D+0.60W	1.600	0.375	0.2291	PASS	0.0 ft	0.0	PASS	9.670 ft
+0.60D	1.600	0.375	0.1461	PASS	0.0 ft	0.0	PASS	9.670 ft

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 Jack Stud

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
D Only						1.689					
+D+Lr						2.889					
+D+S						4.549					
+D+0.750Lr						2.589					
+D+0.750S						3.834					
+D+0.60W						2.265					
+D+0.750Lr+0.450W						3.021					
+D+0.750S+0.450W						4.266					
+0.60D+0.60W						1.589					
+0.60D						1.013					
Lr Only						1.200					
S Only						2.860					
W Only						0.960					

Maximum Deflections for Load Combinations

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

Wood Column

Project File: 240741.ec6

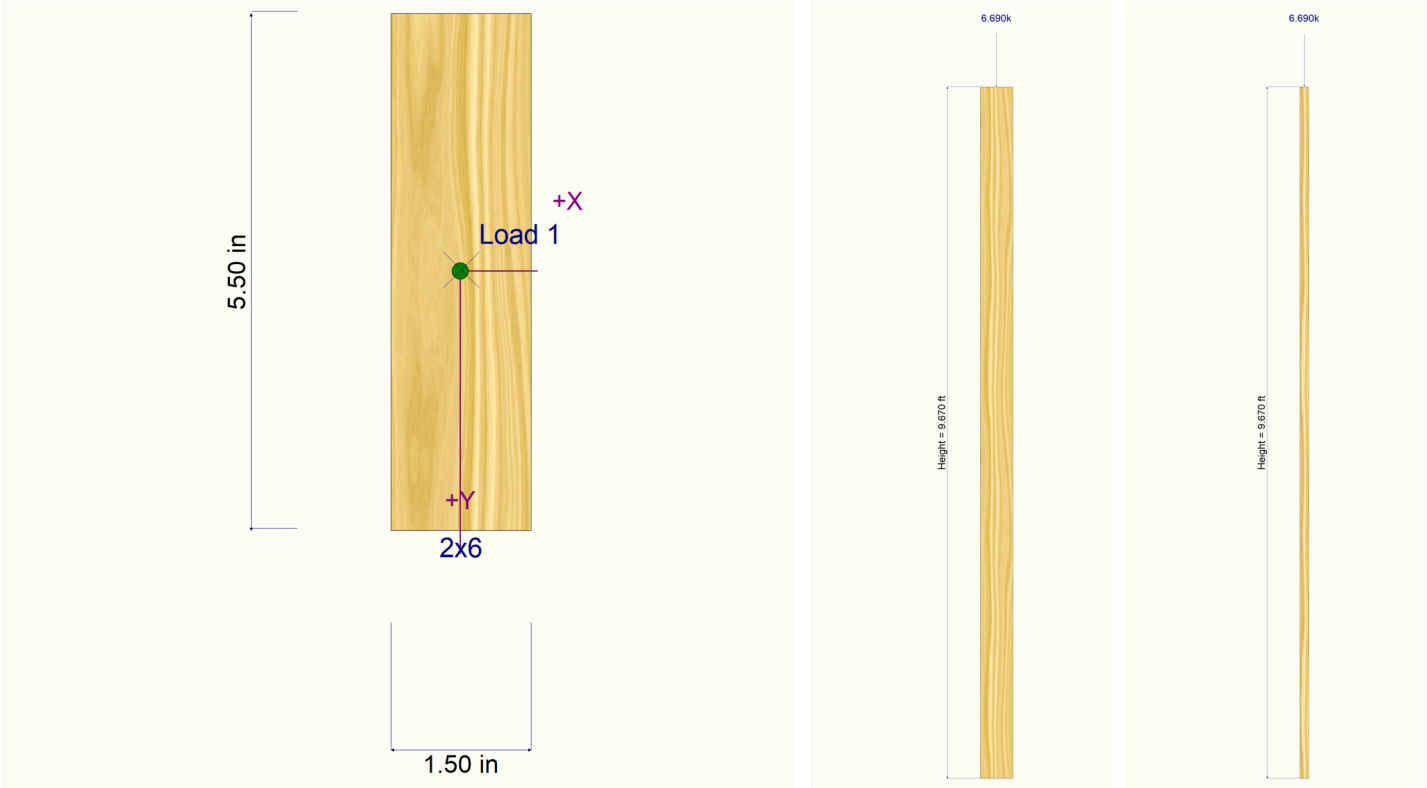
LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H2 Jack Stud

Sketches



Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H3 (Truss Bearing) (RTU Loads AC3)

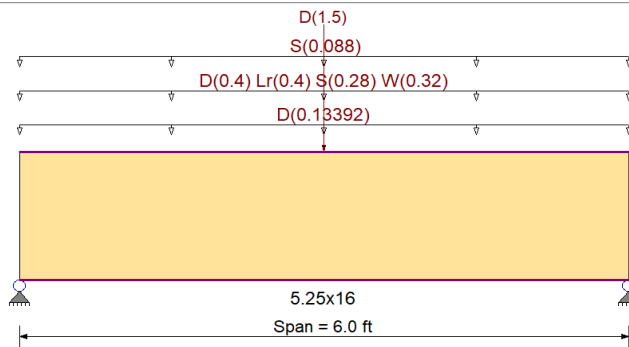
CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	2,900.0 psi	<i>E : Modulus of Elasticity</i>	
Load Combination :	IBC 2021	Fb -	2,900.0 psi	Ebend- xx	2,000.0ksi
		Fc - Prll	2,635.0 psi	Eminbend - xx	1,036.83ksi
Wood Species :	RedBuilt	Fc - Perp	750.0 psi		
Wood Grade :	RedLam LVL Beam/Joist	Fv	285.0 psi		
		Ft	1,660.0 psi	Density	42.010pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.0120 ksf, Tributary Width = 11.160 ft, (Wall Weight)

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0140, W = 0.0160 ksf, Tributary Width = 20.0 ft, (Roof)

Uniform Load : S = 0.0880, Tributary Width = 1.0 ft, (Snow Drift)

Point Load : D = 1.50 k @ 3.0 ft, (RTU 3)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.107	1	Maximum Shear Stress Ratio	=	0.126	1
Section used for this span		5.25x16		Section used for this span		5.25x16	
fb: Actual	=	343.87 psi		fv: Actual	=	41.29 psi	
F'b	=	3,207.04 psi		F'v	=	327.75 psi	
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	3.000ft		Location of maximum on span	=	0.000 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.003 in	Ratio =	21995 >=360	Span: 1 : Lr Only			
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection	0.011 in	Ratio =	6274 >=180	Span: 1 : +D+0.750Lr+0.450W			
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.102	0.118	0.90	1.00	1.00	1.00	0.962	1.00	1.00	1.00	4.76	255.2	2,509.9	1.69	30.2	256.5
+D+Lr					1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.101	0.119	1.25	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.56	351.6	3,485.9	2.37	42.3	356.3
+D+S					1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.107	0.126	1.15	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.42	343.9	3,207.0	2.31	41.3	327.8
+D+0.750Lr					1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.094	0.110	1.25	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.11	327.5	3,485.9	2.20	39.2	356.3

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H3 (Truss Bearing) (RTU Loads AC3)

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F _b	V	fv	F _v
+D+0.750S						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.100	0.118	1.15	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.00	321.7	3,207.0	2.16	38.5	327.8
+D+0.60W						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.068	0.079	1.60	1.00	1.00	1.00	0.962	1.00	1.00	1.00	5.63	301.4	4,462.0	2.02	36.0	456.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.081	0.096	1.60	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.76	362.2	4,462.0	2.44	43.6	456.0
+D+0.750S+0.450W						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.080	0.094	1.60	1.00	1.00	1.00	0.962	1.00	1.00	1.00	6.65	356.4	4,462.0	2.40	42.9	456.0
+0.60D+0.60W						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.045	0.052	1.60	1.00	1.00	1.00	0.962	1.00	1.00	1.00	3.72	199.4	4,462.0	1.34	23.9	456.0
+0.60D						1.00	1.00	1.00	0.962	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1		0.034	0.040	1.60	1.00	1.00	1.00	0.962	1.00	1.00	1.00	2.86	153.1	4,462.0	1.01	18.1	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750Lr+0.450W	1	0.0115	3.022		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	3.757	3.757
Max Upward from Load Combinations	3.757	3.757
Max Upward from Load Cases	2.425	2.425
D Only	2.425	2.425
+D+Lr	3.625	3.625
+D+S	3.529	3.529
+D+0.750Lr	3.325	3.325
+D+0.750S	3.253	3.253
+D+0.60W	3.001	3.001
+D+0.750Lr+0.450W	3.757	3.757
+D+0.750S+0.450W	3.685	3.685
+0.60D+0.60W	2.031	2.031
+0.60D	1.455	1.455
Lr Only	1.200	1.200
S Only	1.104	1.104
W Only	0.960	0.960

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H3 Jack Stud

Code References

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

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	10.67 ft			Wood Member Type	Sawn	
(Used for non-slender calculations)						
Wood Species	Southern Pine			Exact Width	1.50 in	Allow Stress Modification Factors
Wood Grade	No.2: 2"-4" Thick: 5"-6" Wide			Exact Depth	5.50 in	Cf or Cv for Bending 1.0
Fb +	1,000.0 psi	Fv	175.0 psi	Area	8.250 in^2	Cf or Cv for Compression 1.0
Fb -	1,000.0 psi	Ft	600.0 psi	Ix	20.797 in^4	Cf or Cv for Tension 1.0
Fc - Prll	1,400.0 psi	Density	34.330 pcf	Iy	1.547 in^4	Cm : Wet Use Factor 1.0
Fc - Perp	565.0 psi					Ct : Temperature Fact 1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor 1.0
	Basic	1,400.0	1,400.0	1,400.0 ksi		Kf : Built-up columns 1.0
	Minimum	510.0	510.0			Use Cr : Repetitive ? No
Column Buckling Condition:						
ABOUT X-X Axis: Lux = 10.67 ft, Kx = 1.0						
Fully braced against buckling ABOUT Y-Y Axis						

Applied Loads

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

Column self weight included : 20.986 lbs * Dead Load Factor

AXIAL LOADS . . .

Header Reaction: Axial Load at 10.670 ft, D = 2.430, Lr = 1.20, S = 1.10, W = 0.960 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.6476 : 1**
 Load Combination +D+0.750Lr+0.450W
 Governing NDS Formula Comp Only, fc/Fc'
 Location of max.above base 0.0 ft
 At maximum location values are .
 Applied Axial 3.783 k
 Applied Mx 0.0 k-ft
 Applied My 0.0 k-ft
 Fc : Allowable 708.07 psi

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

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

PASS Maximum Shear Stress Ratio = **0.0 : 1**
 Load Combination +0.60D
 Location of max.above base 10.670 ft
 Applied Design Shear 0.0 psi
 Allowable Shear 280.0 psi

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

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.509	0.4636	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+Lr	1.250	0.392	0.6458	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+S	1.150	0.420	0.6369	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750Lr	1.250	0.392	0.5927	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750S	1.150	0.420	0.5876	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.60W	1.600	0.316	0.5182	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750Lr+0.450W	1.600	0.316	0.6476	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750S+0.450W	1.600	0.316	0.6348	PASS	0.0 ft	0.0	PASS	10.670 ft
+0.60D+0.60W	1.600	0.316	0.3503	PASS	0.0 ft	0.0	PASS	10.670 ft
+0.60D	1.600	0.316	0.2517	PASS	0.0 ft	0.0	PASS	10.670 ft

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H3 Jack Stud

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
D Only						2.451					
+D+Lr						3.651					
+D+S						3.551					
+D+0.750Lr						3.351					
+D+0.750S						3.276					
+D+0.60W						3.027					
+D+0.750Lr+0.450W						3.783					
+D+0.750S+0.450W						3.708					
+0.60D+0.60W						2.047					
+0.60D						1.471					
Lr Only						1.200					
S Only						1.100					
W Only						0.960					

Maximum Deflections for Load Combinations

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

Wood Column

Project File: 240741.ec6

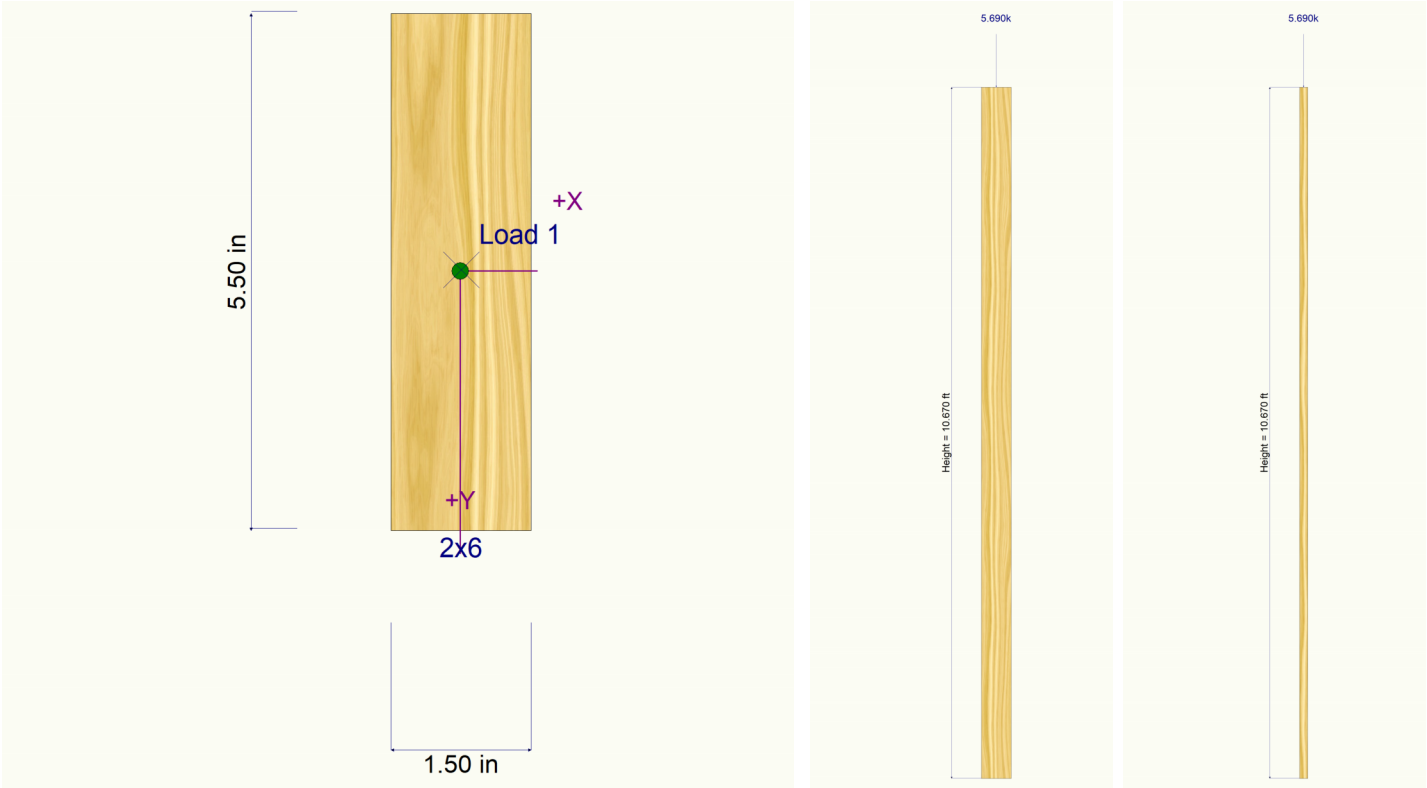
LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H3 Jack Stud

Sketches



Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 (Truss Bearing)

CODE REFERENCES

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

Load Combination Set : IBC 2021

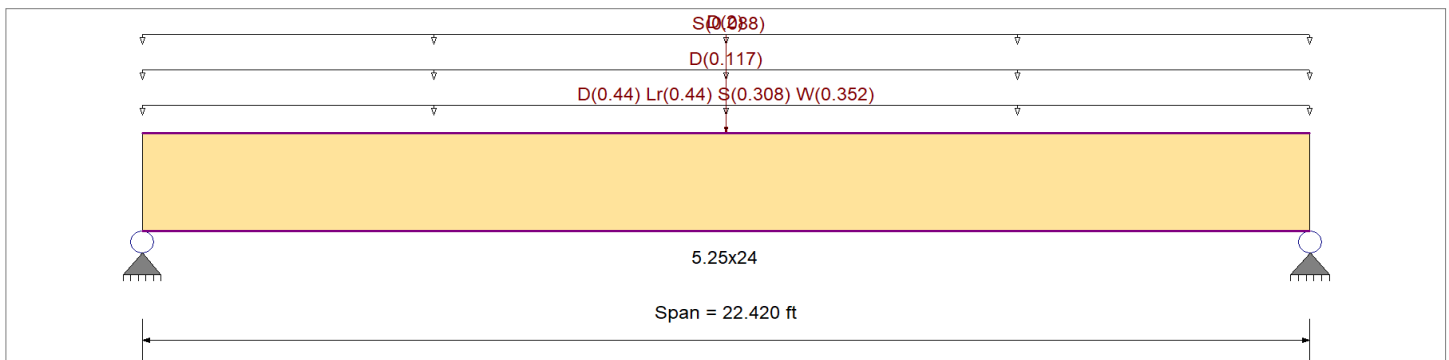
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : RedBuilt
Wood Grade : RedLam LVL Beam/Joist

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

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



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0140, W = 0.0160 ksf, Tributary Width = 22.0 ft, (Roof)

Uniform Load : D = 0.0120 ksf, Tributary Width = 9.750 ft, (Wall Weight)

Uniform Load : S = 0.0880, Tributary Width = 1.0 ft, (Snow Drift N-S)

Point Load : D = 2.0 k @ 11.210 ft, (RTU)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.576	1	Maximum Shear Stress Ratio	=	0.369	: 1
Section used for this span		5.25x24		Section used for this span		5.25x24	
fb: Actual	=	1,747.59	psi	fv: Actual	=	120.85	psi
F'b	=	3,034.98	psi	F'v	=	327.75	psi
Load Combination		+D+S		Load Combination		+D+S	
Location of maximum on span	=	11.210	ft	Location of maximum on span	=	20.456	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.208	in	Ratio =	1293	>=360	Span: 1 : Lr Only
Max Upward Transient Deflection		0	in	Ratio =	0	<360	n/a
Max Downward Total Deflection		0.557	in	Ratio =	483	>=180	Span: 1 : +D+0.750Lr+0.3150W
Max Upward Total Deflection		0	in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0			
Length = 22.420 ft	1	0.486	0.301	0.90	1.00	1.00	1.00	0.910	1.00	1.00	1.00	48.52	1,155.2	2,375.2	6.49	77.3	256.5
+D+Lr					1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1	0.550	0.353	1.25	1.00	1.00	1.00	0.910	1.00	1.00	1.00	76.16	1,813.4	3,298.9	10.56	125.7	356.3
+D+S					1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1	0.576	0.369	1.15	1.00	1.00	1.00	0.910	1.00	1.00	1.00	73.40	1,747.6	3,035.0	10.15	120.9	327.8
+D+0.750Lr					1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1	0.500	0.319	1.25	1.00	1.00	1.00	0.910	1.00	1.00	1.00	69.25	1,648.8	3,298.9	9.54	113.6	356.3

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 (Truss Bearing)

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F _b	V	fv	F _v
+D+0.750S						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.527	0.335	1.15	1.00	1.00	1.00	0.910	1.00	1.00	1.00	67.18	1,599.5	3,035.0	9.24	110.0	327.8
+D+0.60W						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.348	0.220	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	61.79	1,471.1	4,222.6	8.44	100.5	456.0
+D+0.750Lr+0.450W						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.447	0.287	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	79.20	1,885.8	4,222.6	11.01	131.0	456.0
+D+0.750S+0.450W						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.435	0.279	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	77.13	1,836.4	4,222.6	10.70	127.4	456.0
+0.60D+0.60W						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.239	0.153	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	42.38	1,009.1	4,222.6	5.85	69.6	456.0
+0.60D						1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft	1		0.164	0.102	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	29.11	693.1	4,222.6	3.89	46.4	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750Lr+0.3150W	1	0.5566	11.292		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	13.131	13.131
Max Upward from Load Combinations	13.131	13.131
Max Upward from Load Cases	7.656	7.656
D Only	7.656	7.656
+D+Lr	12.588	12.588
+D+S	12.095	12.095
+D+0.750Lr	11.355	11.355
+D+0.750S	10.985	10.985
+D+0.60W	10.024	10.024
+D+0.750Lr+0.450W	13.131	13.131
+D+0.750S+0.450W	12.761	12.761
+0.60D+0.60W	6.961	6.961
+0.60D	4.594	4.594
Lr Only	4.932	4.932
S Only	4.439	4.439
W Only	3.946	3.946

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 (Truss Bearing) OP

CODE REFERENCES

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

Load Combination Set : IBC 2021

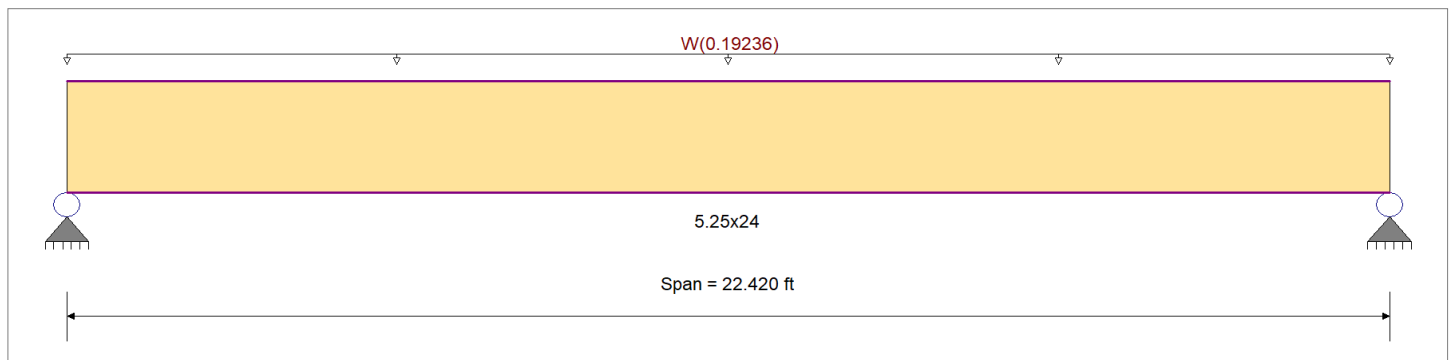
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : RedBuilt
Wood Grade : RedLam LVL Beam/Joist

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

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



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = 0.02290 ksf, Tributary Width = 8.40 ft, (Wind)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio				Maximum Shear Stress Ratio			
Section used for this span	=	0.187 : 1		Section used for this span	=	0.028 : 1	
fb: Actual	=	789.31 psi		fv: Actual	=	12.70 psi	
F'b	=	4,222.58 psi		F'v	=	456.00 psi	
Load Combination	=	+0.60W		Load Combination	=	+0.60W	
Location of maximum on span	=	11.210ft		Location of maximum on span	=	20.456 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection	0.798 in	Ratio =	337 >=180	Span: 1 : +0.420W			
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 22.420 ft 1				0.90	1.00	1.00	1.00	0.910	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W						1.00	1.00	1.00	0.910	1.00	1.00			2,375.2	0.00	0.0	256.5
Length = 22.420 ft 1		0.187	0.028	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	7.25	789.3	4,222.6	1.07	12.7	456.0
+0.450W						1.00	1.00	1.00	0.910	1.00	1.00			0.0	0.00	0.0	0.0
Length = 22.420 ft 1		0.140	0.021	1.60	1.00	1.00	1.00	0.910	1.00	1.00	1.00	5.44	592.0	4,222.6	0.80	9.5	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.420W	1	0.7981	11.292		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 (Truss Bearing) OP

Vertical Reactions	Support notation : Far left is #1		Values in KIPS
	Support 1	Support 2	
Load Combination			
Max Upward from all Load Conditions	2.156	2.156	
Max Upward from Load Combinations	1.294	1.294	
Max Upward from Load Cases	2.156	2.156	
+0.60W	1.294	1.294	
+0.450W	0.970	0.970	
W Only	2.156	2.156	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 King Stud (Truss Bearing, Full Height) (+)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

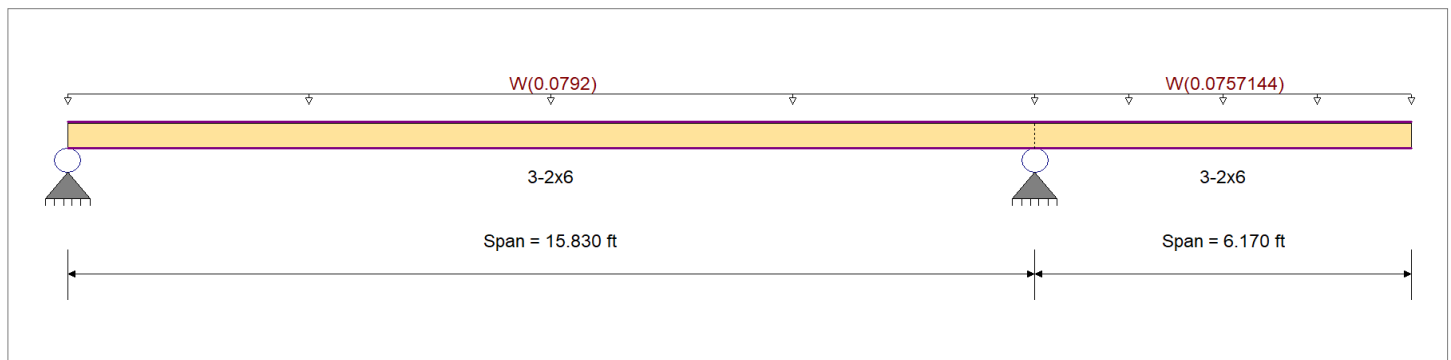
Fb + 1000 psi
 Fb - 1000 psi
 Fc - Prll 1400 psi
 Fc - Perp 565 psi
 Fv 175 psi
 Ft 600 psi

E : Modulus of Elasticity

Ebend- xx 1400ksi

Eminbend - xx 510ksi

Density 34.33pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 4.0 ft, (Wind on Wall)

Load for Span Number 2

Uniform Load : W = 0.05680 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.360 : 1	Maximum Shear Stress Ratio	=	0.089 : 1
Section used for this span		3-2x6	Section used for this span		3-2x6
fb: Actual	=	575.20 psi	fv: Actual	=	24.83 psi
F'b	=	1,600.00 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	6.810ft	Location of maximum on span	=	15.388 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.356 in	Ratio = 533 >=240	Span: 1 : +0.420W		
Max Upward Transient Deflection	-0.168 in	Ratio = 882 >=240	Span: 2 : +0.420W		
Max Downward Total Deflection	0.509 in	Ratio = 373 >=180	Span: 1 : +0.60W		
Max Upward Total Deflection	-0.240 in	Ratio = 618 >=180	Span: 2 : +0.60W		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 15.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft	1	0.360	0.089	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.09	575.2	1,600.0	0.41	24.8	280.0
Length = 6.170 ft	2	0.286	0.089	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.86	457.4	1,600.0	0.26	24.8	280.0
+0.450W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft	1	0.270	0.067	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.82	431.4	1,600.0	0.31	18.6	280.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 King Stud (Truss Bearing, Full Height) (+)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.170 ft	2	0.214	0.067	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.65	343.0	1,600.0	0.19	18.6	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.5087	7.429		0.0000	0.000
	2	0.0000	7.429	+0.60W	-0.2396	6.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.536	1.185	
Max Upward from Load Combinations	0.321	0.711	
Max Upward from Load Cases	0.536	1.185	
+0.60W	0.321	0.711	
+0.450W	0.241	0.533	
W Only	0.536	1.185	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 King Stud (Truss Bearing, Full Height) (-)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

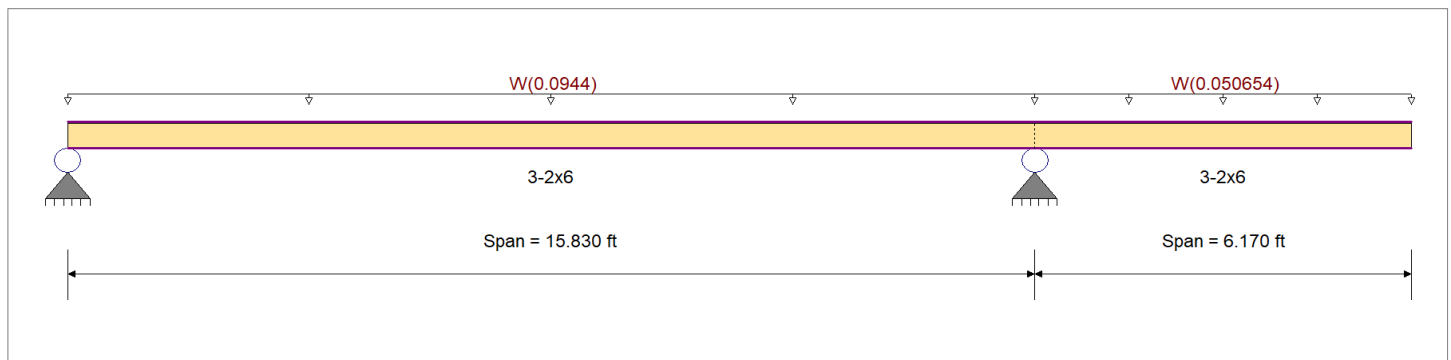
Fb + 1000 psi
 Fb - 1000 psi
 Fc - Prll 1400 psi
 Fc - Perp 565 psi
 Fv 175 psi
 Ft 600 psi

E : Modulus of Elasticity

Ebend- xx 1400ksi

Eminbend - xx 510ksi

Density 34.33pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.02360 ksf, Tributary Width = 4.0 ft, (Wind on Wall)

Load for Span Number 2

Uniform Load : W = 0.0380 ksf, Tributary Width = 1.333 ft, (Wind on Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.495	1	Maximum Shear Stress Ratio	=	0.100	: 1
Section used for this span		3-2x6		Section used for this span		3-2x6	
fb: Actual	=	791.64 psi		fv: Actual	=	27.87 psi	
F'b	=	1,600.00 psi		F'v	=	280.00 psi	
Load Combination		+0.60W		Load Combination		+0.60W	
Location of maximum on span	=	7.252ft		Location of maximum on span	=	15.388 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0.521 in	Ratio =	364	>=240	Span: 1 : +0.420W		
Max Upward Transient Deflection	-0.463 in	Ratio =	318	>=240	Span: 2 : +0.420W		
Max Downward Total Deflection	0.745 in	Ratio =	255	>=180	Span: 1 : +0.60W		
Max Upward Total Deflection	-0.662 in	Ratio =	222	>=180	Span: 2 : +0.60W		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 15.830 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.170 ft	2			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			900.0	0.00	0.0	157.5
+0.60W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft	1	0.495	0.100	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.50	791.6	1,600.0	0.46	27.9	280.0
Length = 6.170 ft	2	0.191	0.100	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.58	306.0	1,600.0	0.17	27.9	280.0
+0.450W						1.00	1.00	1.00	1.000	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft	1	0.371	0.075	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.12	593.7	1,600.0	0.34	20.9	280.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 King Stud (Truss Bearing, Full Height) (-)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.170 ft	2	0.143	0.075	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.43	229.5	1,600.0	0.13	20.9	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.7448	7.694		0.0000	0.000
	2	0.0000	7.694	+0.60W	-0.6616	6.170

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.686	1.121	
Max Upward from Load Combinations	0.412	0.672	
Max Upward from Load Cases	0.686	1.121	
+0.60W	0.412	0.672	
+0.450W	0.309	0.504	
W Only	0.686	1.121	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 Jack Stud

Code References

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

General Information

Analysis Method	Allowable Stress Design			Wood Section Name	3-2x6		
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber		
Overall Column Height	10.67 ft			Wood Member Type	Sawn		
(Used for non-slender calculations)							
Wood Species	Southern Pine			Exact Width	4.50 in	Allow Stress Modification Factors	
Wood Grade	No.2: 2"-4" Thick: 5"-6" Wide			Exact Depth	5.50 in	Cf or Cv for Bending	1.0
Fb +	1,000.0 psi	Fv	175.0 psi	Area	24.750 in^2	Cf or Cv for Compression	1.0
Fb -	1,000.0 psi	Ft	600.0 psi	Ix	62.391 in^4	Cf or Cv for Tension	1.0
Fc - Prll	1,400.0 psi	Density	34.330 pcf	Iy	41.766 in^4	Cm : Wet Use Factor	1.0
Fc - Perp	565.0 psi					Ct : Temperature Fact	1.0
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial			Cfu : Flat Use Factor	1.0
	Basic	1,400.0	1,400.0	1,400.0 ksi		Kf : Built-up columns	1.0
	Minimum	510.0	510.0			Use Cr : Repetitive ?	No
Column Buckling Condition:							
ABOUT X-X Axis: Lux = 10.67 ft, Kx = 1.0							
Fully braced against buckling ABOUT Y-Y Axis							

Applied Loads

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

Column self weight included : 62.958 lbs * Dead Load Factor

AXIAL LOADS . . .

Header Reaction: Axial Load at 10.670 ft, D = 7.660, Lr = 4.930, S = 4.440, W = 3.950 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7531 : 1**

Load Combination	+D+0.750Lr+0.450W
Governing NDS Formula	Comp Only, f_c/F_c'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	13.198 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	708.07 psi

Maximum SERVICE Lateral Load Reactions . .

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

Maximum SERVICE Load Lateral Deflections . . .

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

Other Factors used to calculate allowable stresses . . .

Bending Compression Tension

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

Load Combination	+0.60D
Location of max.above base	10.670 ft
Applied Design Shear	0.0 psi
Allowable Shear	280.0 psi

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.509	0.4869	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+Lr	1.250	0.392	0.7460	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+S	1.150	0.420	0.7272	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750Lr	1.250	0.392	0.6733	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750S	1.150	0.420	0.6609	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.60W	1.600	0.316	0.5759	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750Lr+0.450W	1.600	0.316	0.7531	PASS	0.0 ft	0.0	PASS	10.670 ft
+D+0.750S+0.450W	1.600	0.316	0.7321	PASS	0.0 ft	0.0	PASS	10.670 ft
+0.60D+0.60W	1.600	0.316	0.3997	PASS	0.0 ft	0.0	PASS	10.670 ft
+0.60D	1.600	0.316	0.2644	PASS	0.0 ft	0.0	PASS	10.670 ft

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Column

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 Jack Stud

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
D Only						7.723					
+D+Lr						12.653					
+D+S						12.163					
+D+0.750Lr						11.420					
+D+0.750S						11.053					
+D+0.60W						10.093					
+D+0.750Lr+0.450W						13.198					
+D+0.750S+0.450W						12.830					
+0.60D+0.60W						7.004					
+0.60D						4.634					
Lr Only						4.930					
S Only						4.440					
W Only						3.950					

Maximum Deflections for Load Combinations

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

Wood Column

Project File: 240741.ec6

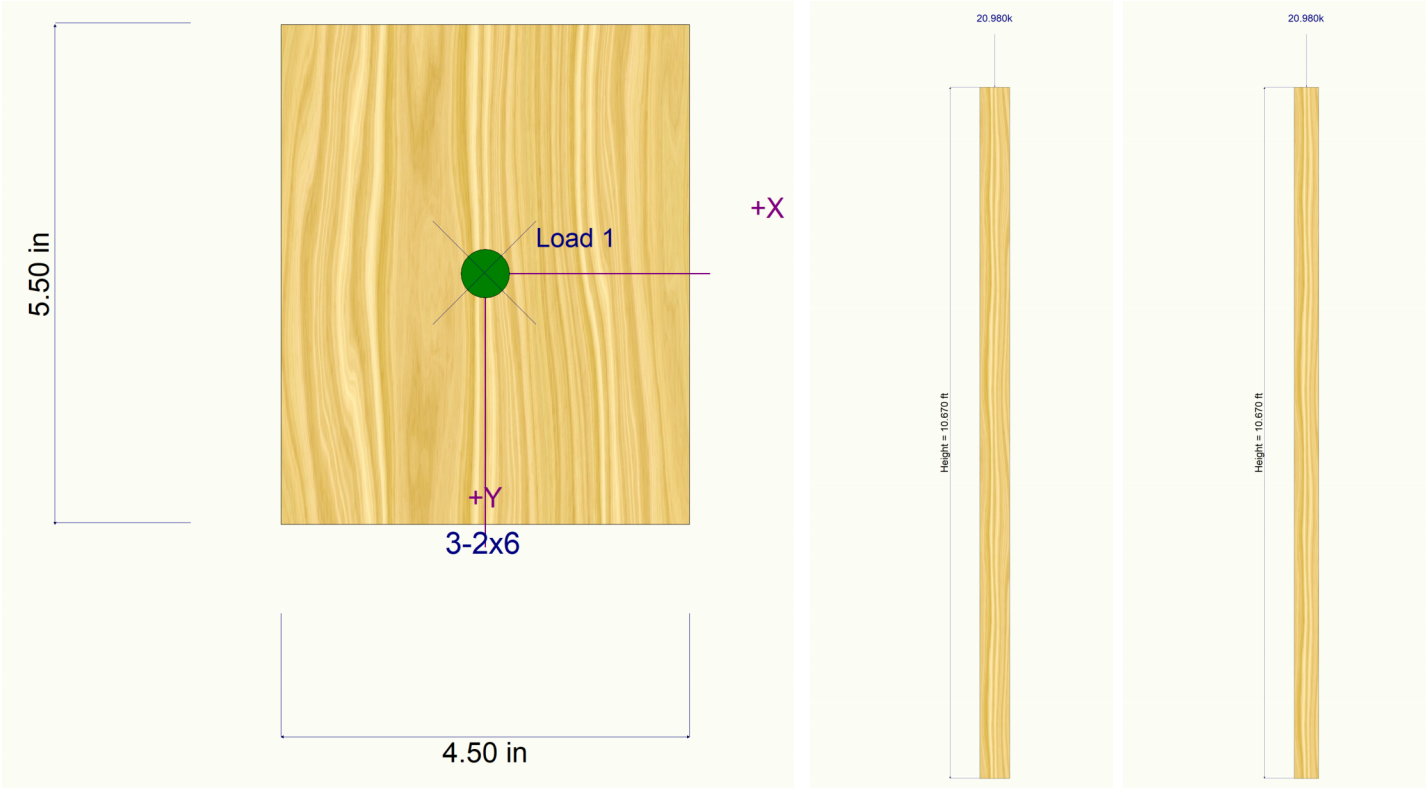
LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Header H4 Jack Stud

Sketches



Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: LVL Beam Plan South

CODE REFERENCES

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

Load Combination Set : IBC 2021

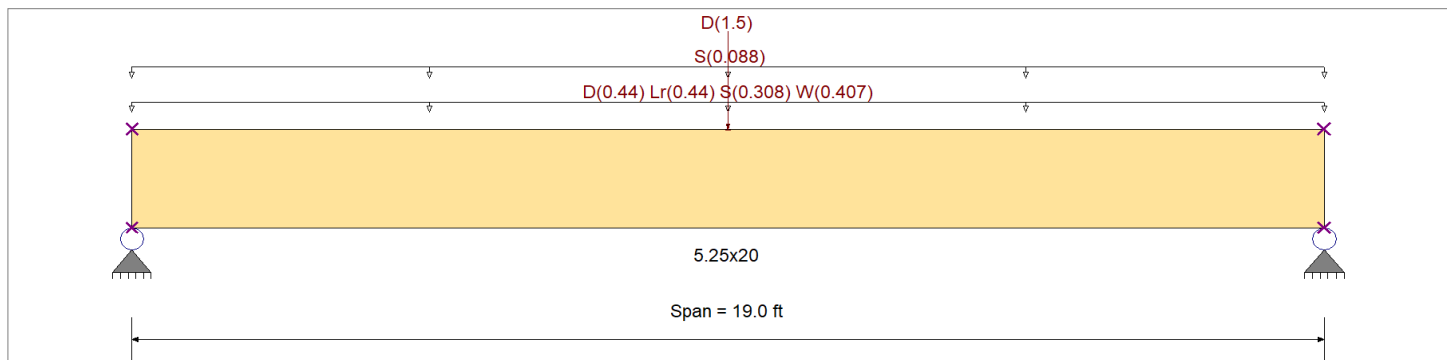
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : RedLam 2.0E 2500 Fb
Wood Grade : Manufactured

Beam Bracing : Completely Unbraced

Fb +	2,500.0 psi	E : Modulus of Elasticity	
Fb -	2,500.0 psi	Ebend- xx	2,000.0ksi
Fc - Prll	2,635.0 psi	Eminbend - xx	1,037.0ksi
Fc - Perp	750.0 psi		
Fv	285.0 psi		
Ft	1,660.0 psi	Density	35.0pcf



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.020, Lr = 0.020, S = 0.0140, W = 0.01850 ksf, Tributary Width = 22.0 ft, (Roof Loads)

Uniform Load : S = 0.0880, Tributary Width = 1.0 ft, (Snow Drift N-S)

Point Load : D = 1.50 k @ 9.50 ft, (RTU)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.637 : 1	Maximum Shear Stress Ratio	=	0.327 : 1
Section used for this span		5.25x20	Section used for this span		5.25x20
fb: Actual	=	1,577.18 psi	fv: Actual	=	107.15 psi
F'b	=	2,476.99 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	9.500ft	Location of maximum on span	=	17.336 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0.185 in	Ratio =	1229 >=360	Span: 1 : Lr Only	
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a	
Max Downward Total Deflection	0.466 in	Ratio =	489 >=180	Span: 1 : +D+0.750Lr+0.450W	
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
D Only														0.0			
Length = 19.0 ft	1	0.483	0.245	0.90	1.00	1.00	0.95	0.933	1.00	1.00	1.00	28.13	964.5	1,997.9	4.40	62.8	256.5
+D+Lr														0.0			
Length = 19.0 ft	1	0.621	0.315	1.25	1.00	1.00	0.91	0.933	1.00	1.00	1.00	47.99	1,645.3	2,649.9	7.85	112.1	356.3
+D+S														0.0			
Length = 19.0 ft	1	0.637	0.327	1.15	1.00	1.00	0.92	0.933	1.00	1.00	1.00	46.00	1,577.2	2,477.0	7.50	107.2	327.8
+D+0.750Lr														0.0			
Length = 19.0 ft	1	0.557	0.280	1.25	1.00	1.00	0.91	0.933	1.00	1.00	1.00	43.02	1,475.1	2,649.9	6.98	99.8	356.3
+D+0.750S														0.0			
														0.0			

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: LVL Beam Plan South

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios										Moment Values			Shear Values		
			M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F _b	V	f _v	F _v
Length = 19.0 ft	1		0.575	0.293	1.15	1.00	1.00	0.92	0.933	1.00	1.00	1.00	41.53	1,424.0	2,477.0	6.72	96.1	327.8
+D+0.60W						1.00	1.00	0.92	0.933	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 19.0 ft	1		0.428	0.198	1.60	1.00	1.00	0.84	0.933	1.00	1.00	1.00	39.15	1,342.3	3,139.9	6.31	90.2	456.0
+D+0.750Lr+0.450W						1.00	1.00	0.84	0.933	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 19.0 ft	1		0.560	0.264	1.60	1.00	1.00	0.84	0.933	1.00	1.00	1.00	51.29	1,758.4	3,139.9	8.42	120.3	456.0
+D+0.750S+0.450W						1.00	1.00	0.84	0.933	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 19.0 ft	1		0.544	0.256	1.60	1.00	1.00	0.84	0.933	1.00	1.00	1.00	49.80	1,707.4	3,139.9	8.16	116.6	456.0
+0.60D+0.60W						1.00	1.00	0.84	0.933	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 19.0 ft	1		0.305	0.143	1.60	1.00	1.00	0.84	0.933	1.00	1.00	1.00	27.90	956.5	3,139.9	4.55	65.0	456.0
+0.60D						1.00	1.00	0.84	0.933	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 19.0 ft	1		0.184	0.083	1.60	1.00	1.00	0.84	0.933	1.00	1.00	1.00	16.88	578.7	3,139.9	2.64	37.7	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750Lr+0.450W	1	0.4655	9.569		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	10.047	10.047
Max Upward from Load Combinations	10.047	10.047
Max Upward from Load Cases	5.172	5.172
D Only	5.172	5.172
+D+Lr	9.352	9.352
+D+S	8.934	8.934
+D+0.750Lr	8.307	8.307
+D+0.750S	7.994	7.994
+D+0.60W	7.492	7.492
+D+0.750Lr+0.450W	10.047	10.047
+D+0.750S+0.450W	9.734	9.734
+0.60D+0.60W	5.423	5.423
+0.60D	3.103	3.103
Lr Only	4.180	4.180
S Only	3.762	3.762
W Only	3.867	3.867

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 4 ft

CODE REFERENCES

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

Load Combination Set : IBC 2021

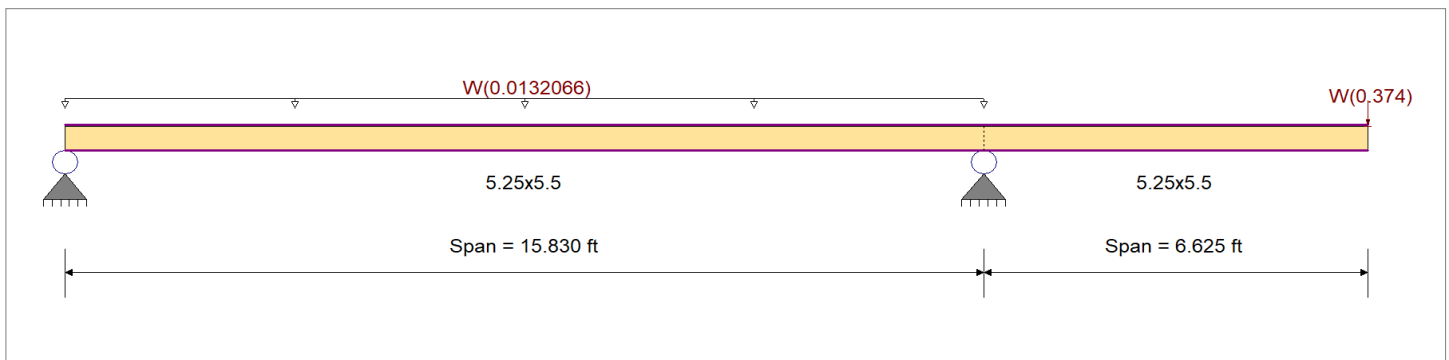
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination : IBC 2021

Wood Species : RedBuilt
 Wood Grade : RedLam LVL Beam/Joist

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

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



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 0.6670 ft, (Wind on Wall)

Load for Span Number 2

Point Load : W = 0.3740 k @ 6.625 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio			=	0.131 : 1	Maximum Shear Stress Ratio			=	0.026 : 1
Section used for this span				5.25x5.5	Section used for this span				5.25x5.5
fb: Actual			=	673.99psi	fv: Actual			=	11.66 psi
F'b			=	5,159.38 psi	F'v			=	456.00 psi
Load Combination				+0.60W	Load Combination				+0.60W
Location of maximum on span			=	15.830ft	Location of maximum on span			=	15.830 ft
Span # where maximum occurs			=	Span # 1	Span # where maximum occurs			=	Span # 1
Maximum Deflection									
Max Downward Transient Deflection			0 in	Ratio =	0	<240	n/a		
Max Upward Transient Deflection			0 in	Ratio =	0	<240	n/a		
Max Downward Total Deflection			0.540 in	Ratio =	294	>=240	Span: 2 : +0.420W		
Max Upward Total Deflection			-0.148 in	Ratio =	1284	>=240	Span: 1 : +0.420W		

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 15.830 ft 1				0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			2,902.1	0.00	0.0	256.5
Length = 6.625 ft 2				0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			2,902.1	0.00	0.0	256.5
+0.60W						1.00	1.00	1.00	1.112	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft 1		0.131	0.026	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.49	674.0	5,159.4	0.22	11.7	456.0
Length = 6.625 ft 2		0.131	0.026	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.49	674.0	5,159.4	0.22	11.7	456.0
+0.450W						1.00	1.00	1.00	1.112	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft 1		0.098	0.019	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.11	505.5	5,159.4	0.17	8.7	456.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 4 ft

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.625 ft	2	0.098	0.019	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.11	505.5	5,159.4	0.17	8.7	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+0.420W	-0.1478	9.639
+0.420W	2	0.5397	6.625		0.0000	9.639

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		0.635	
Max Upward from Load Combinations		0.381	
Max Upward from Load Cases		0.635	
Max Downward from all Load Conditions	-0.052		
Max Downward from Load Combinations	-0.031		
Max Downward from Load Cases (Resis)	-0.052		
+0.60W	-0.031	0.381	
+0.450W	-0.023	0.286	
W Only	-0.052	0.635	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 5.5 ft

CODE REFERENCES

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

Load Combination Set : IBC 2021

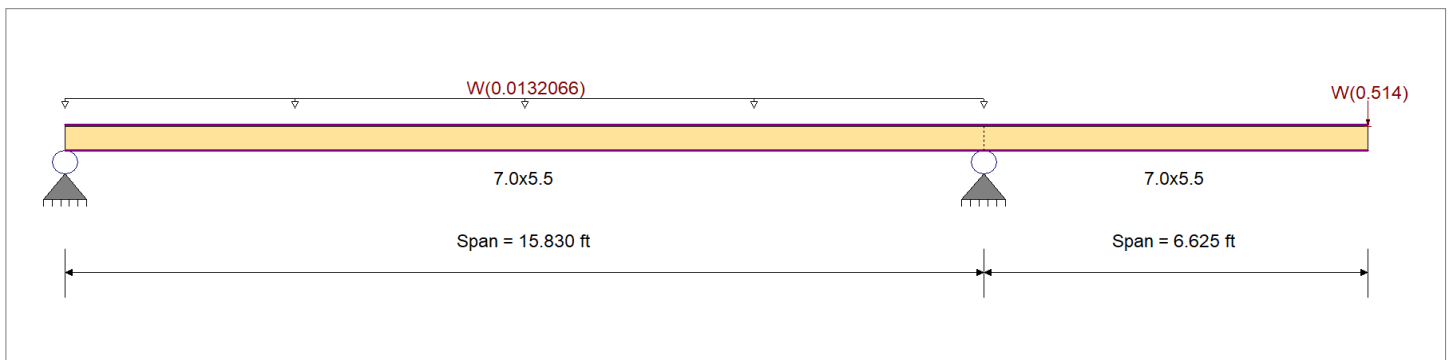
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : RedBuilt
Wood Grade : RedLam LVL Beam/Joist

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

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



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 0.6670 ft, (Wind on Wall)

Load for Span Number 2

Point Load : W = 0.5140 k @ 6.625 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.135	1	Maximum Shear Stress Ratio	=	0.026	: 1
Section used for this span		7.0x5.5		Section used for this span		7.0x5.5	
fb: Actual	=	694.72	psi	fv: Actual	=	12.02	psi
F'b	=	5,159.38	psi	F'v	=	456.00	psi
Load Combination		+0.60W		Load Combination		+0.60W	
Location of maximum on span	=	15.830	ft	Location of maximum on span	=	15.830	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection	0 in	Ratio =	0 < 240	n/a			
Max Upward Transient Deflection	0 in	Ratio =	0 < 240	n/a			
Max Downward Total Deflection	0.577 in	Ratio =	274 >= 240	Span: 2 : +0.420W			
Max Upward Total Deflection	-0.167 in	Ratio =	1138 >= 240	Span: 1 : +0.420W			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios											Moment Values			Shear Values		
Segment	Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
+0.60W	Length = 15.830 ft	1			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 6.625 ft	2			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			2,902.1	0.00	0.0	256.5
						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.135	0.026	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.04	694.7	5,159.4	0.31	12.0	456.0
	Length = 6.625 ft	2	0.135	0.026	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.04	694.7	5,159.4	0.31	12.0	456.0
+0.450W						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.101	0.020	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.53	521.0	5,159.4	0.23	9.0	456.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 5.5 ft

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.625 ft	2	0.101	0.020	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	1.53	521.0	5,159.4	0.23	9.0	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+0.420W	-0.1669	9.463
+0.420W	2	0.5765	6.625		0.0000	9.463

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		0.834	
Max Upward from Load Combinations		0.500	
Max Upward from Load Cases		0.834	
Max Downward from all Load Conditions	-0.111		
Max Downward from Load Combinations	-0.066		
Max Downward from Load Cases (Resis)	-0.111		
+0.60W	-0.066	0.500	
+0.450W	-0.050	0.375	
W Only	-0.111	0.834	

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC#: KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 8 ft

CODE REFERENCES

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

Load Combination Set : IBC 2021

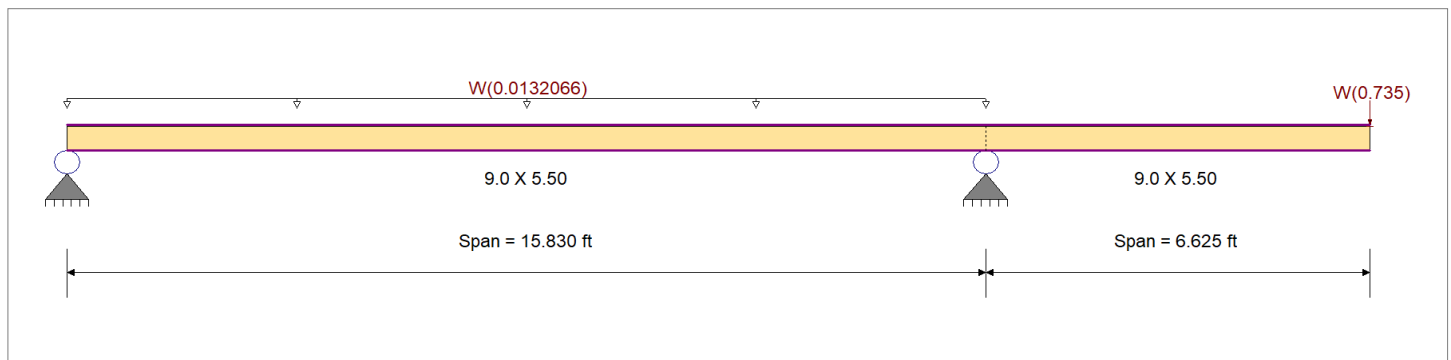
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination : IBC 2021

Wood Species : RedBuilt
 Wood Grade : RedLam LVL Beam/Joist

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

F_b + 2,900.0 psi
 F_b - 2,900.0 psi
 F_c - Prll 2,635.0 psi
 F_c - Perp 750.0 psi
 F_v 285.0 psi
 F_t 1,660.0 psi
 E : Modulus of Elasticity
 E_{bend}- xx 2,000.0ksi
 E_{minbend} - xx 1,036.83ksi
 Density 42.010pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Load for Span Number 1

Uniform Load : W = 0.01980 ksf, Tributary Width = 0.6670 ft, (Wind on Wall)

Load for Span Number 2

Point Load : W = 0.7350 k @ 6.625 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio		=	0.150 : 1	Maximum Shear Stress Ratio		=	0.029 : 1
Section used for this span			9.0 X 5.50	Section used for this span			9.0 X 5.50
fb: Actual		=	772.66 psi	fv: Actual		=	13.36 psi
F'b		=	5,159.38 psi	F'v		=	456.00 psi
Load Combination			+0.60W	Load Combination			+0.60W
Location of maximum on span		=	15.830ft	Location of maximum on span		=	15.830 ft
Span # where maximum occurs		=	Span # 1	Span # where maximum occurs		=	Span # 1
Maximum Deflection							
Max Downward Transient Deflection		0 in	Ratio =	0	<240	n/a	
Max Upward Transient Deflection		0 in	Ratio =	0	<240	n/a	
Max Downward Total Deflection		0.659 in	Ratio =	240	>=240	Span: 2 : +0.420W	
Max Upward Total Deflection		-0.199 in	Ratio =	956	>=240	Span: 1 : +0.420W	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios											Moment Values			Shear Values		
Segment	Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
+0.60W	Length = 15.830 ft	1			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 6.625 ft	2			0.90	1.00	1.00	1.00	1.112	1.00	1.00	1.00			2,902.1	0.00	0.0	256.5
						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.150	0.029	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.92	772.7	5,159.4	0.44	13.4	456.0
	Length = 6.625 ft	2	0.150	0.029	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.92	772.7	5,159.4	0.44	13.4	456.0
+0.450W						1.00	1.00	1.00	1.112	1.00	1.00	1.00			0.0	0.00	0.0	0.0
	Length = 15.830 ft	1	0.112	0.022	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.19	579.5	5,159.4	0.33	10.0	456.0

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Panel Segment - 8 ft

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.625 ft	2	0.112	0.022	1.60	1.00	1.00	1.00	1.112	1.00	1.00	1.00	2.19	579.5	5,159.4	0.33	10.0	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+0.420W	-0.1987	9.374
+0.420W	2	0.6593	6.625		0.0000	9.374

Vertical Reactions

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		1.147	
Max Upward from Load Combinations		0.688	
Max Upward from Load Cases		1.147	
Max Downward from all Load Conditions	-0.203		
Max Downward from Load Combinations	-0.122		
Max Downward from Load Cases (Resis)	-0.203		
+0.60W	-0.122	0.688	
+0.450W	-0.091	0.516	
W Only	-0.203	1.147	

Support notation : Far left is #1

Values in KIPS

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Wall Studs (Ridge)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

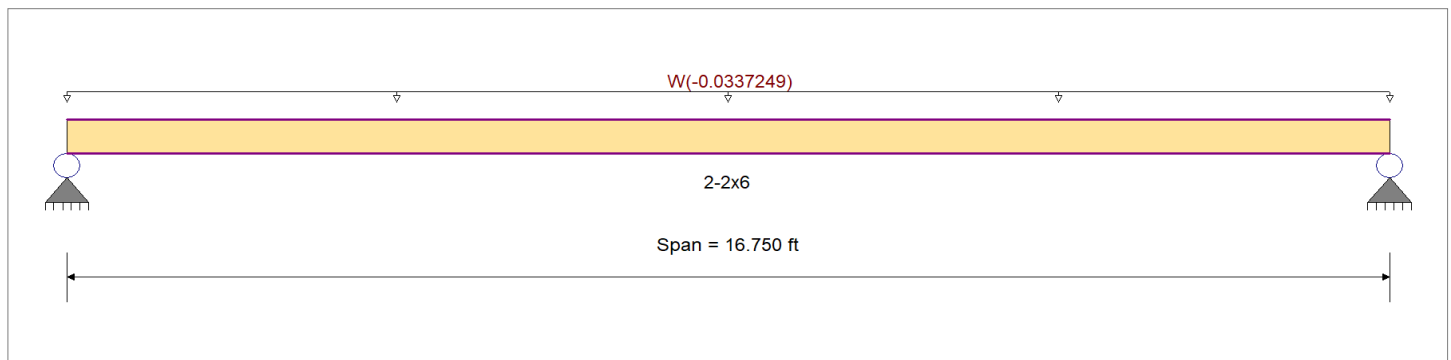
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : $W = -0.02530$ ksf, Tributary Width = 1.333 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.352 1	Maximum Shear Stress Ratio	=	0.052 : 1
Section used for this span		2-2x6	Section used for this span		2-2x6
fb: Actual	=	563.02 psi	fv: Actual	=	14.62 psi
F'b	=	1,600.00 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	8.375 ft	Location of maximum on span	=	16.322 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	0 in	Ratio =	0 < 360	n/a	
Max Upward Transient Deflection	-0.433 in	Ratio =	463 >= 360	Span: 1 : +0.420W	
Max Downward Total Deflection	0 in	Ratio =	0 < 180	n/a	
Max Upward Total Deflection	-0.619 in	Ratio =	324 >= 180	Span: 1 : +0.60W	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 16.750 ft 1				0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.750 ft 1		0.352	0.052	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.71	563.0	1,600.0	0.16	14.6	280.0
+0.450W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.750 ft 1		0.264	0.039	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.53	422.3	1,600.0	0.12	11.0	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+0.60W	-0.6190	8.436

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Wall Studs (Ridge)

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Downward from all Load Conditio	-0.282	-0.282
Max Downward from Load Combinations	-0.169	-0.169
Max Downward from Load Cases (Resis	-0.282	-0.282
+0.60W	-0.169	-0.169
+0.450W	-0.127	-0.127
W Only	-0.282	-0.282

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Wall Studs (Eave)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

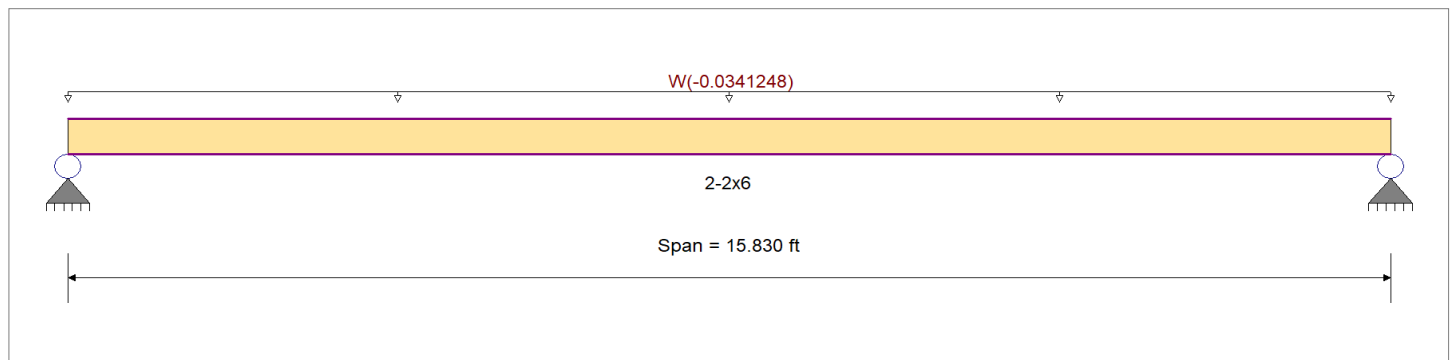
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : W = -0.02560 ksf, Tributary Width = 1.333 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.318 1	Maximum Shear Stress Ratio	=	0.050 : 1
Section used for this span		2-2x6	Section used for this span		2-2x6
fb: Actual	=	508.84 psi	fv: Actual	=	13.98 psi
F'b	=	1,600.00 psi	F'v	=	280.00 psi
Load Combination		+0.60W	Load Combination		+0.60W
Location of maximum on span	=	7.915 ft	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 in	Ratio =	0 < 360	n/a	
Max Upward Transient Deflection	-0.350 in	Ratio =	543 >= 360	Span: 1 : +0.420W	
Max Downward Total Deflection	0 in	Ratio =	0 < 180	n/a	
Max Upward Total Deflection	-0.500 in	Ratio =	380 >= 180	Span: 1 : +0.60W	

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 15.830 ft 1				0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft 1		0.318	0.050	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.64	508.8	1,600.0	0.15	14.0	280.0
+0.450W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 15.830 ft 1		0.239	0.037	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.48	381.6	1,600.0	0.12	10.5	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+0.60W	-0.4997	7.973

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Wall Studs (Eave)

Vertical Reactions		Support notation : Far left is #1		Values in KIPS
Load Combination	Support 1	Support 2		
Max Downward from all Load Conditio	-0.270	-0.270		
Max Downward from Load Combinations	-0.162	-0.162		
Max Downward from Load Cases (Resis	-0.270	-0.270		
+0.60W	-0.162	-0.162		
+0.450W	-0.122	-0.122		
W Only	-0.270	-0.270		

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Parapet Studs (Worst Case)

CODE REFERENCES

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

Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design

Load Combination : IBC 2021

Wood Species : Southern Pine

Wood Grade : No.2: 2"-4" Thick: 5"-6" Wide

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

Fb + 1,000.0 psi

Fb - 1,000.0 psi

Fc - Prll 1,400.0 psi

Fc - Perp 565.0 psi

Fv 175.0 psi

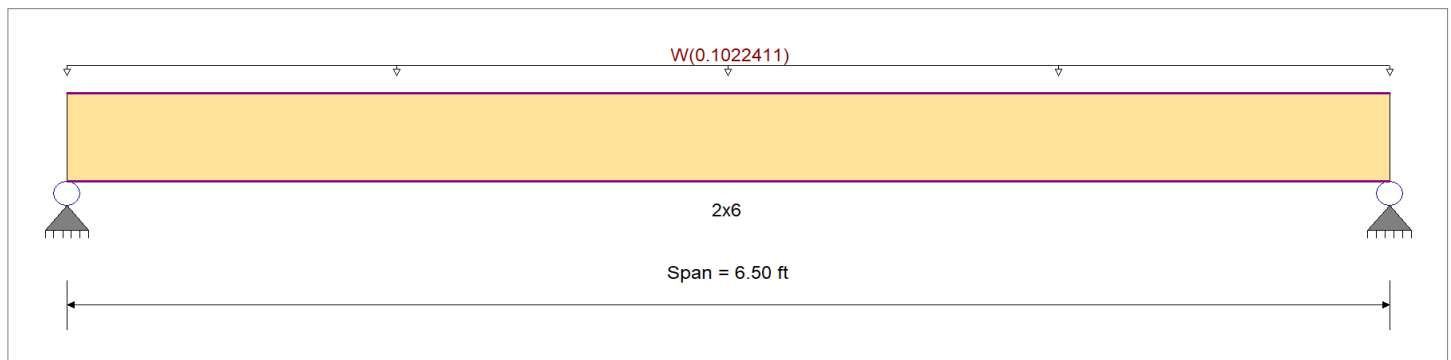
Ft 600.0 psi

E : Modulus of Elasticity

Ebend- xx 1,400.0ksi

Eminbend - xx 510.0ksi

Density 34.330pcf



Applied Loads

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

Beam self weight NOT internally calculated and added

Uniform Load : $W = 0.07670$ ksf, Tributary Width = 1.333 ft, (Wind)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio			=	0.321 : 1	Maximum Shear Stress Ratio			=	0.112 : 1
Section used for this span				2x6	Section used for this span				2x6
fb: Actual			=	514.08 psi	fv: Actual			=	31.22 psi
F'b			=	1,600.00 psi	F'v			=	280.00 psi
Load Combination				+0.60W	Load Combination				+0.60W
Location of maximum on span			=	3.250ft	Location of maximum on span			=	6.049ft
Span # where maximum occurs			=	Span # 1	Span # where maximum occurs			=	Span # 1
Maximum Deflection									
Max Downward Transient Deflection			0.060 in	Ratio =	1309 >=360	Span: 1 : +0.420W			
Max Upward Transient Deflection			0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection			0.085 in	Ratio =	916 >=180	Span: 1 : +0.60W			
Max Upward Total Deflection			0 in	Ratio =	0 <180	n/a			

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C _t	CLx	C _F	C _{fu}	C _i	C _r	M	fb	F'b	V	fv	F'v
Length = 6.50 ft	1			0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
+0.60W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.321	0.112	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.32	514.1	1,600.0	0.17	31.2	280.0
+0.450W					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.50 ft	1	0.241	0.084	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.24	385.6	1,600.0	0.13	23.4	280.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+0.60W	1	0.0851	3.274		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: 240741.ec6

LIC# : KW-06014569, Build:20.23.08.30

BRITT PETERS & ASSOCIATES INC.

(c) ENERCALC INC 1983-2023

DESCRIPTION: Load Bearing Parapet Studs (Worst Case)

Vertical Reactions	Support notation : Far left is #1		Values in KIPS
	Support 1	Support 2	
Load Combination			
Max Upward from all Load Conditions	0.332	0.332	
Max Upward from Load Combinations	0.199	0.199	
Max Upward from Load Cases	0.332	0.332	
+0.60W	0.199	0.199	
+0.450W	0.150	0.150	
W Only	0.332	0.332	