Chase Pryor & Lowenstein
Lee's Summit, MO

Chase Bank
Structural Calculations

Prepared For:
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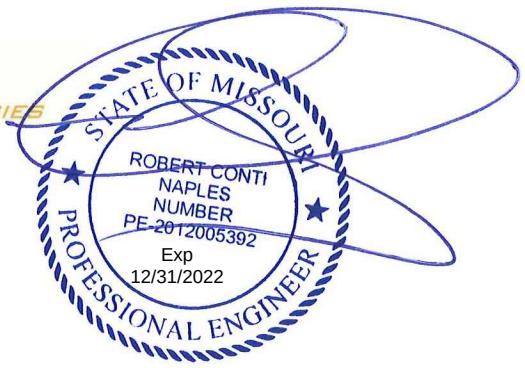
ITI Project No.: 121-438



COA # 2012012048
02/21/2022

Rev.	Date.	By	Chk:	Comments
0	*02/21/2022*	*SFZ*	*DTS*	*Issued for Approval*

Project Index

Note to Reviewer

The purpose of this calculation is to design the envelope structure at the Pryor & Lowenstein Chase Bank project at 900 NW Pryor Rd, Lee's Summit, MO.

The design is in U.S. Customary units and uses the LRFD design and ASD design methods. Design conforms to the 2018 International Building Code (IBC 2018) and all local amendments.

The proposed structures and foundations are adequate for the imposed loading.

Design Criteria

- Seismic Criteria:
  - S_{DS} = 0.106 — ATC Hazard By Location
  - S_{D1} = 0.109
  - Risk Category = II
  - Site Class = D
  - Seismic Design Category, SDC = B
  - Seismic Design Procedure = Equivalent Lateral Force
- Wind Criteria:
  - Wind Speed = 109 mph — ATC Hazard By Location
  - Total Wall Wind Pressure = 24 psf — MecaWind
  - Max Parapet Wind Pressure = 58 psf
  - Roof Wind Uplift = -20 psf
- Snow Criteria:
  - Design Snow Load = 20 psf
- Soil Criteria:
  - Bearing Pressure = 3500 psf — Kaw Valley Engineering geotechnical report #C21G1105, December 6, 2021
  - Coefficient of Friction = 0.25

Hazards by Location

Search Information

Address: 900 NW Pryor Rd, Lee's Summit, MO 64081, USA

Coordinates: 38.9283179, -94.41276889999999

Elevation: 986 ft

Timestamp: 2022-02-15T16:35:54.815Z

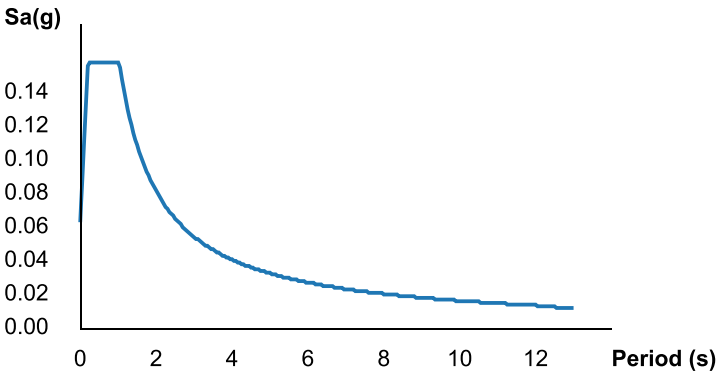
Hazard Type: Seismic

Reference Document: ASCE7-16

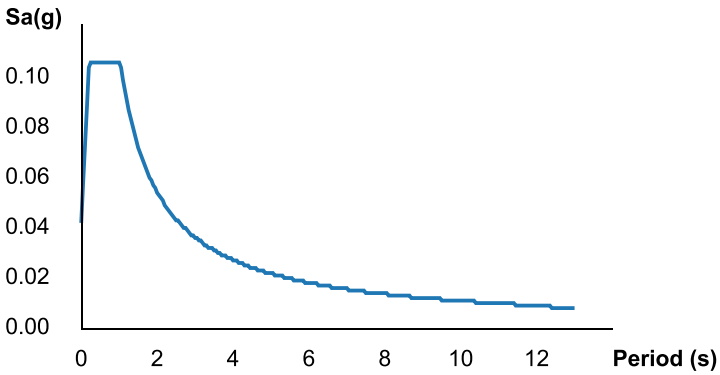
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.099	MCE_R ground motion (period=0.2s)
S_1	0.068	MCE_R ground motion (period=1.0s)
S_{MS}	0.158	Site-modified spectral acceleration value
S_{M1}	0.163	Site-modified spectral acceleration value
S_{DS}	0.106	Numeric seismic design value at 0.2s SA
S_{D1}	0.109	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s

Sheet 0.4

CR_S	0.927	Coefficient of risk (0.2s)
CR_1	0.877	Coefficient of risk (1.0s)
PGA	0.047	MCE_G peak ground acceleration
F_{PGA}	1.6	Site amplification factor at PGA
PGA_M	0.075	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	0.099	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.107	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.068	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.077	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Hazards by Location

Search Information

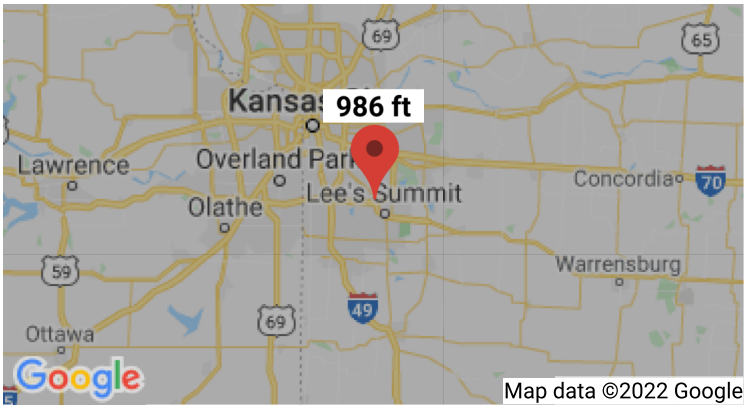
Address: 900 NW Pryor Rd, Lee's Summit, MO 64081, USA

Coordinates: 38.9283179, -94.41276889999999

Elevation: 986 ft

Timestamp: 2022-02-15T16:37:18.889Z

Hazard Type: Snow



ASCE 7-16		ASCE 7-10		ASCE 7-05	
Ground Snow Load	20 lb/sqft	Ground Snow Load	20 lb/sqft	Ground Snow Load	20 lb/sqft

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer.

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Hazards by Location

Search Information

Address: 900 NW Pryor Rd, Lee's Summit, MO 64081, USA

Coordinates: 38.9283179, -94.41276889999999

Elevation: 986 ft

Timestamp: 2022-02-15T16:37:41.752Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	76 mph
MRI 25-Year	83 mph
MRI 50-Year	88 mph
MRI 100-Year	94 mph
Risk Category I	103 mph
Risk Category II	109 mph
Risk Category III	117 mph
Risk Category IV	122 mph

ASCE 7-10

MRI 10-Year	76 mph
MRI 25-Year	84 mph
MRI 50-Year	90 mph
MRI 100-Year	96 mph
Risk Category I	105 mph
Risk Category II	115 mph
Risk Category III-IV	120 mph

ASCE 7-05

ASCE 7-05 Wind Speed	90 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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MecaWind v2381

Software Developer: Meca Enterprises Inc., www.meca.biz, Copyright © 2020

Calculations Prepared by:
Date: Feb 15, 2022

File Location:
P:\121-438 - EBI - Chase Bank - Pryor Rd. & Lownstein Dr._MO\04-Calculations\
121-438 Wind Loading.wnd

Basic Wind Parameters

Wind Load Standard	= ASCE 7-16	Exposure Category	= C
Wind Design Speed	= 109.0 mph	Risk Category	= II
Structure Type	= Building	Building Type	= Enclosed

General Wind Settings

Incl_LF	= Include ASD Load Factor of 0.6 in Pressures	= False
DynType	= Dynamic Type of Structure	= Rigid
NF	= Natural Frequency of Structure (Mode 1)	= 1.000 Hz
Zg	= Altitude (Ground Elevation) above Sea Level	= 986.000 ft
Bdist	= Base Elevation of Structure	= 0.000 ft
SDB	= Simple Diaphragm Building	= True
Reacs	= Show the Base Reactions in the output	= True
MWFRSType	= MWFRS Method Selected	= Ch 27 Pt 1

Topographic Factor per Fig 26.8-1

Topo	= Topographic Feature	= None
Kzt	= Topographic Factor	= 1.000

Building Inputs

RoofType:	Building Roof Type	= Flat	RfHt :	Roof Height	= 15.500 ft
W :	Building Width	= 43.000 ft	L :	Building Length	= 80.000 ft
Par :	Is there a Parapet	= True	PHt :	Height of Parapet	= 1.500 ft
Por :	Parapet Porosity	= Low	P_GCPi :	Parapet Int Press	= +/-0.18

Exposure Constants per Table 26.11-1:

Alpha:	Table 26.11-1 Const	= 9.500	Zg:	Table 26.11-1 Const	= 900.000 ft
At:	Table 26.11-1 Const	= 0.105	Bt:	Table 26.11-1 Const	= 1.000
Am:	Table 26.11-1 Const	= 0.154	Bm:	Table 26.11-1 Const	= 0.650
C:	Table 26.11-1 Const	= 0.200	Eps:	Table 26.11-1 Const	= 0.200

Overhang Inputs:

Overhang Location	Overhang Type	Overhang Width in
OH_ALL	None	0.0000
OH_X	Overhang	3.0000
OH_Y	Overhang	3.0000

Main Wind Force Resisting System (MWFRS) Calculations per Ch 27 Part 1:

h	= Mean Roof Height above grade	= 15.500 ft
Kh	= 15 ft [4.572 m]< Z <Zg -->(2.01*(Z/zg)^(2/Alpha) {Table 26.10-1}	= 0.855
Kzt	= Topographic Factor is 1 since no Topographic feature specified	= 1.000
Kd	= Wind Directionality Factor per Table 26.6-1	= 0.85
Zg	= Elevation above Sea Level	= 986.000 ft
Ke	= Ground Elevation Factor: Ke = e^-(0.0000362*Zg) {Table 26.9-1}	= 0.965
GCPi	= Ref Table 26.13-1 for Enclosed Building	= +/-0.18
RA	= Roof Area	= 4214.00 sq ft
LF	= Load Factor based upon STRENGTH Design	= 1.00
qh	= (0.00256 * Kh * Kzt * Kd * Ke * V^2) * LF	= 21.32 psf
qin	= For Negative Internal Pressure of Enclosed Building use qh*LF	= 21.32 psf
qip	= For Positive Internal Pressure of Enclosed Building use qh*LF	= 21.32 psf

Gust Factor Calculation:

Gust Factor Category I Rigid Structures - Simplified Method

G1	= For Rigid Structures (Nat. Freq.>1 Hz) use 0.85	= 0.85

Gust Factor Category II Rigid Structures - Complete Analysis

Zm	= 0.6 * Ht	= 15.000 ft
Izm	= Cc * (33 / Zm) ^ 0.167	= 0.228
Lzm	= L * (Zm / 33) ^ Epsilon	= 427.057
Q	= (1 / (1 + 0.63 * ((B + Ht) / Lzm)^0.63))^0.5	= 0.921
G2	= 0.925*((1+1.7*lzm*3.4*Q)/(1+1.7*3.4*lzm))	= 0.883

Gust Factor Used in Analysis

G	= Lessor Of G1 Or G2	= 0.850

MWFRS Wind Normal to Ridge (Ref Fig 27.3-1}

h	= Mean Roof Height Of Building	= 15.500 ft
hp	= Height to the top of the Parapet	= 17.000 ft
RHt	= Ridge Height Of Roof	= 15.500 ft
B	= Horizontal Dimension Of Building Normal To Wind Direction	= 80.000 ft
L	= Horizontal Dimension Of building Parallel To Wind Direction	= 43.000 ft
L/B	= Ratio Of L/B used For Cp determination	= 0.538
h/L	= Ratio Of h/L used For Cp determination	= 0.360
Slope	= Slope of Roof	= 0.0 Deg
OH_Bot_-Y	= Overhang Bottom -Y (Windward Face Only)	= 0.8, 0.8
OH_Top	= Overhang Top Coeff (0 to h/2) (0.000 ft to 7.750 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (0 to h/2) (0.000 ft to 3.000 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (h/2 to h) (7.750 ft to 15.500 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (h to 2h) (15.500 ft to 31.000 ft)	= -0.18, -0.5
OH_Top	= Overhang Top Coeff (>2h) (>31.000 ft)	= -0.18, -0.3
OH_Top	= Overhang Top Coeff (>2h) (>46.000 ft)	= -0.18, -0.3
Roof	= Roof Coeff (0 to h/2) (3.000 ft to 7.750 ft)	= -0.18, -0.9
Roof	= Roof Coeff (h/2 to h) (7.750 ft to 15.500 ft)	= -0.18, -0.9
Roof	= Roof Coeff (h to 2h) (15.500 ft to 31.000 ft)	= -0.18, -0.5
Roof	= Roof Coeff (>2h) (>31.000 ft)	= -0.18, -0.3

Cp_WW	= Windward Wall Coefficient (All L/B Values)	= 0.80
Cp_LW	= Leward Wall Coefficient using L/B	= -0.50
Cp_SW	= Side Wall Coefficient (All L/B values)	= -0.70
GCpn_WW	= Parapet Combined Net Pressure Coefficient (Windward Parapet)	= 1.50
GCpn_LW	= Parapet Combined Net Pressure Coefficient (Leeward Parapet)	= -1.00

Wall Wind Pressures based On Positive Internal Pressure (+GCPi) - Normal to Ridge
All wind pressures include a load factor of 1.0

Elev ft	Kz	Kzt	qz psf	GCPi	Windward Press psf	Leeward Press psf	Side Press psf	Total Press psf	Minimum Pressure* psf
17.00	0.872	1.000	21.74	Parapet	32.61	-21.74	-12.69	54.36	16.00
15.50	0.855	1.000	21.32	0.18	10.66	-12.90	-16.53	23.56	16.00

Wall Wind Pressures based on Negative Internal Pressure (-GCPi) - Normal to Ridge
All wind pressures include a load factor of 1.0

Elev ft	Kz	Kzt	qz psf	GCPi	Windward Press psf	Leeward Press psf	Side Press psf	Total Press psf	Minimum Pressure* psf
17.00	0.872	1.000	21.74	Parapet	32.61	-21.74	-12.69	54.36	16.00
15.50	0.855	1.000	21.32	-0.18	18.34	-5.22	-8.85	23.56	16.00

Notes Wall Pressures:

Kz	= Velocity Press Exp Coeff	Kzt	= Topographical Factor
qz	= 0.00256*Kz*Kzt*Kd*V^2	GCPi	= Internal Press Coefficient
Side	= qh * G * Cp_SW - qip * +GCPi	Windward	= qz * G * Cp_WW - qip * +GCPi
Leeward	= qh * G * Cp_LW - qip * +GCPi	Total	= Windward Press - Leeward Press
Windward Parapet	= qz*GCpn_WW	Leeward Parapet	= qz*GCpn_LW

* Minimum Pressure: Para 27.1.5 no less than 16.00 psf (Incl LF) applied to Walls

\+ Pressures Acting TOWARD Surface - Pressures Acting AWAY from Surface

Roof Wind Pressures for Positive & Negative Internal Pressure (+/- GCPi) - Normal to Ridge
All wind pressures include a load factor of 1.0

Roof Var	Start Dist ft	End Dist ft	Cp_min	Cp_max	GCPi	Pressure Pn_min* psf	Pressure Pp_min* psf	Pressure Pn_max psf	Pressure Pp_max psf
OH_Bot_-Y	N/A	N/A	0.800	0.800	0.000	14.50	14.50	14.50	14.50
OH_Top (-X)	0.000	7.750	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-Y)	0.000	3.000	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (+X)	0.000	7.750	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-X)	7.750	15.500	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (+X)	7.750	15.500	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-X)	15.500	31.000	-0.180	-0.500	0.000	-3.26	-3.26	-9.06	-9.06
OH_Top (+X)	15.500	31.000	-0.180	-0.500	0.000	-3.26	-3.26	-9.06	-9.06
OH_Top (-X)	31.000	49.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44

OH_Top (+X)	31.000	49.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44
OH_Top (+Y)	46.000	49.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44
Roof (All)	3.000	7.750	-0.180	-0.900	0.180	0.58	-7.10	-12.47	-20.15
Roof (All)	7.750	15.500	-0.180	-0.900	0.180	0.58	-7.10	-12.47	-20.15
Roof (All)	15.500	31.000	-0.180	-0.500	0.180	0.58	-7.10	-5.22	-12.90
Roof (All)	31.000	46.000	-0.180	-0.300	0.180	0.58	-7.10	-1.60	-9.28

Notes Roof Pressures:
Start Dist = Start Dist from Windward Edge End Dist = End Dist from Windward Edge
Cp_Max = Largest Coefficient Magnitude Cp_Min = Smallest Coefficient Magnitude
Pp_max = qh*G*Cp_max - qip*(+GCPi) Pn_max = qh*G*Cp_max - qin*(-GCpi)
Pp_min* = qh*G*Cp_min - qip*(+GCPi) Pn_min* = qh*G*Cp_min - qin*(-GCPi)
OH = Overhang X = Dir along Ridge Y = Dir Perpendcular to Ridge Z = Vertical
* The smaller uplift pressures due to Cp_Min can become critical when wind is combined with roof live load or snow load; load combinations are given in ASCE 7
+ Pressures Acting TOWARD Surface - Pressures Acting AWAY from Surface

Reactions Walls+Roof +GCPi Normal to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	120.00	0.00	-2.61	0.00	42.40	0.00	0.00
Leeward Wall	-12.90	1240.00	0.00	-16.00	0.00	123.98	0.00	0.00
OH_Bot_-Y	14.50	240.00	0.00	0.00	-3.48	80.04	0.00	0.00
OH_Top (+X)	-5.44	54.00	0.00	0.00	-0.29	-4.55	12.19	0.00
OH_Top (+X)	-9.06	46.50	0.00	0.00	-0.42	0.53	17.49	0.00
OH_Top (+X)	-16.31	23.25	0.00	0.00	-0.38	7.82	15.74	0.00
OH_Top (+X)	-16.31	23.25	0.00	0.00	-0.38	4.88	15.74	0.00
OH_Top (+Y)	-5.44	240.00	0.00	0.00	-1.30	-30.01	0.00	0.00
OH_Top (-X)	-5.44	54.00	0.00	0.00	-0.29	-4.55	-12.19	0.00
OH_Top (-X)	-9.06	46.50	0.00	0.00	-0.42	0.53	-17.49	0.00
OH_Top (-X)	-16.31	23.25	0.00	0.00	-0.38	7.82	-15.74	0.00
OH_Top (-X)	-16.31	23.25	0.00	0.00	-0.38	4.88	-15.74	0.00
OH_Top (-Y)	-16.31	240.00	0.00	0.00	-3.91	90.04	0.00	0.00
Roof (All)	-9.28	1200.00	0.00	0.00	-11.13	-155.83	0.00	0.00
Roof (All)	-12.90	1240.00	0.00	0.00	-16.00	20.00	0.00	0.00
Roof (All)	-20.15	620.00	0.00	0.00	-12.49	160.85	0.00	0.00
Roof (All)	-20.15	380.00	0.00	0.00	-7.66	146.44	0.00	0.00
Side Wall	-16.53	666.50	-11.01	0.00	0.00	0.00	-85.36	0.00
Side Wall	-16.53	666.50	11.01	0.00	0.00	0.00	85.36	0.00
Windward Parapet	32.61	120.00	0.00	-3.91	0.00	63.60	0.00	0.00
Windward Wall	10.66	1240.00	0.00	-13.22	0.00	102.46	0.00	0.00
Total	0.00	8507.00	0.00	-35.74	-58.93	661.32	0.00	0.00

Reactions Walls Only +GCPi Normal to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	120.00	0.00	-2.61	0.00	42.40	0.00	0.00
Leeward Wall	-12.90	1240.00	0.00	-16.00	0.00	123.98	0.00	0.00
Side Wall	-16.53	666.50	-11.01	0.00	0.00	0.00	-85.36	0.00
Side Wall	-16.53	666.50	11.01	0.00	0.00	0.00	85.36	0.00
Windward Parapet	32.61	120.00	0.00	-3.91	0.00	63.60	0.00	0.00
Windward Wall	10.66	1240.00	0.00	-13.22	0.00	102.46	0.00	0.00
Total	0.00	4053.00	0.00	-35.74	0.00	332.43	0.00	0.00

Reactions Walls+Roof -GCPi Normal to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	120.00	0.00	-2.61	0.00	42.40	0.00	0.00
Leeward Wall	-5.22	1240.00	0.00	-6.48	0.00	50.20	0.00	0.00
OH_Bot_-Y	14.50	240.00	0.00	0.00	-3.48	80.04	0.00	0.00
OH_Top (+X)	-3.26	54.00	0.00	0.00	-0.18	-2.73	7.31	0.00
OH_Top (+X)	-3.26	46.50	0.00	0.00	-0.15	0.19	6.30	0.00
OH_Top (+X)	-3.26	23.25	0.00	0.00	-0.08	1.56	3.15	0.00
OH_Top (+X)	-3.26	23.25	0.00	0.00	-0.08	0.98	3.15	0.00
OH_Top (+Y)	-3.26	240.00	0.00	0.00	-0.78	-18.01	0.00	0.00
OH_Top (-X)	-3.26	54.00	0.00	0.00	-0.18	-2.73	-7.31	0.00

OH_Top (-X)	-3.26	46.50	0.00	0.00	-0.15	0.19	-6.30	0.00
OH_Top (-X)	-3.26	23.25	0.00	0.00	-0.08	1.56	-3.15	0.00
OH_Top (-X)	-3.26	23.25	0.00	0.00	-0.08	0.98	-3.15	0.00
OH_Top (-Y)	-3.26	240.00	0.00	0.00	-0.78	18.01	0.00	0.00
Roof (All)	0.58	1240.00	0.00	0.00	0.71	-0.89	0.00	0.00
Roof (All)	0.58	1200.00	0.00	0.00	0.69	9.67	0.00	0.00
Roof (All)	0.58	620.00	0.00	0.00	0.36	-4.60	0.00	0.00
Roof (All)	0.58	380.00	0.00	0.00	0.22	-4.18	0.00	0.00
Side Wall	-8.85	666.50	-5.90	0.00	0.00	0.00	-45.71	0.00
Side Wall	-8.85	666.50	5.90	0.00	0.00	0.00	45.71	0.00
Windward Parapet	32.61	120.00	0.00	-3.91	0.00	63.60	0.00	0.00
Windward Wall	18.34	1240.00	0.00	-22.74	0.00	176.23	0.00	0.00
Total	0.00	8507.00	0.00	-35.74	-4.02	412.47	0.00	0.00

Reactions Walls Only -GCPi Normal to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	120.00	0.00	-2.61	0.00	42.40	0.00	0.00
Leeward Wall	-5.22	1240.00	0.00	-6.48	0.00	50.20	0.00	0.00
Side Wall	-8.85	666.50	-5.90	0.00	0.00	0.00	-45.71	0.00
Side Wall	-8.85	666.50	5.90	0.00	0.00	0.00	45.71	0.00
Windward Parapet	32.61	120.00	0.00	-3.91	0.00	63.60	0.00	0.00
Windward Wall	18.34	1240.00	0.00	-22.74	0.00	176.23	0.00	0.00
Total	0.00	4053.00	0.00	-35.74	0.00	332.43	0.00	0.00

Reactions Walls+Roof Minimum Pressure Normal to Ridge

Description	Pressure psf	Area* ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Windward Parapet	16.00	120.00	0.00	-1.92	0.00	31.20	0.00	0.00
Windward Wall	16.00	1240.00	0.00	-19.84	0.00	153.76	0.00	0.00
Total	0.00	1360.00	0.00	-21.76	0.00	184.96	0.00	0.00

Notes:
X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical
MIN = Minimum pressures on Walls = 16.00 psf and Roof = 8.00 psf
Area* = Area of the surface projected onto a vertical plane normal to wind.

MWFRS Wind Parallel to Ridge (Ref Fig 27.3-1}

h	= Mean Roof Height Of Building	= 15.500 ft
hp	= Height to the top of the Parapet	= 17.000 ft
RHt	= Ridge Height Of Roof	= 15.500 ft
B	= Horizontal Dimension Of Building Normal To Wind Direction	= 43.000 ft
L	= Horizontal Dimension Of building Parallel To Wind Direction	= 80.000 ft
L/B	= Ratio Of L/B used For Cp determination	= 1.860
h/L	= Ratio Of h/L used For Cp determination	= 0.194
Slope	= Slope of Roof	= 0.0 Deg
OH_Bot_-X	= Overhang Bottom -X (Windward Face Only)	= 0.8, 0.8
OH_Top	= Overhang Top Coeff (0 to h/2) (0.000 ft to 3.000 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (0 to h/2) (3.000 ft to 7.750 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (h/2 to h) (7.750 ft to 15.500 ft)	= -0.18, -0.9
OH_Top	= Overhang Top Coeff (h to 2h) (15.500 ft to 31.000 ft)	= -0.18, -0.5
OH_Top	= Overhang Top Coeff (>2h) (>31.000 ft)	= -0.18, -0.3
OH_Top	= Overhang Top Coeff (>2h) (>83.000 ft)	= -0.18, -0.3
Roof	= Roof Coeff (0 to h/2) (3.000 ft to 7.750 ft)	= -0.18, -0.9
Roof	= Roof Coeff (h/2 to h) (7.750 ft to 15.500 ft)	= -0.18, -0.9
Roof	= Roof Coeff (h to 2h) (15.500 ft to 31.000 ft)	= -0.18, -0.5
Roof	= Roof Coeff (>2h) (>31.000 ft)	= -0.18, -0.3
Cp_WW	= Windward Wall Coefficient (All L/B Values)	= 0.80
Cp_LW	= Leward Wall Coefficient using L/B	= -0.33
Cp_SW	= Side Wall Coefficient (All L/B values)	= -0.70
GCpn_WW	= Parapet Combined Net Pressure Coefficient (Windward Parapet)	= 1.50
GCpn_LW	= Parapet Combined Net Pressure Coefficient (Leeward Parapet)	= -1.00

Wall Wind Pressures based On Positive Internal Pressure (+GCPi) - Parallel to Ridge
All wind pressures include a load factor of 1.0

Elev	Kz	Kzt	qz	GCPi	Windward	Leeward	Side	Total	Minimum

ft			psf		Press psf	Press psf	Press psf	Press psf	Pressure* psf
17.00	0.872	1.000	21.74	Parapet	32.61	-21.74	-12.69	54.36	16.00
15.50	0.855	1.000	21.32	0.18	10.66	-9.78	-16.53	20.44	16.00

Wall Wind Pressures based on Negative Internal Pressure (-GCPi) - Parallel to Ridge
All wind pressures include a load factor of 1.0

Elev ft	Kz	Kzt	qz psf	GCPi	Windward Press psf	Leeward Press psf	Side Press psf	Total Press psf	Minimum Pressure* psf
17.00	0.872	1.000	21.74	Parapet	32.61	-21.74	-12.69	54.36	16.00
15.50	0.855	1.000	21.32	-0.18	18.34	-2.11	-8.85	20.44	16.00

Notes Wall Pressures:
Kz = Velocity Press Exp Coeff — Kzt = Topographical Factor
qz = 0.00256*Kz*Kzt*Kd*V^2 — GCPi = Internal Press Coefficient
Side = qh * G * Cp_SW - qip * +GCPi — Windward = qz * G * Cp_WW - qip * +GCPi
Leeward = qh * G * Cp_LW - qip * +GCPi — Total = Windward Press - Leeward Press
Windward Parapet = qz*GCpn_WW — Leeward Parapet = qz*GCpn_LW
* Minimum Pressure: Para 27.1.5 no less than 16.00 psf (Incl LF) applied to Walls
+ Pressures Acting TOWARD Surface — - Pressures Acting AWAY from Surface

Roof Wind Pressures for Positive & Negative Internal Pressure (+/- GCPi) - Parallel to Ridge
All wind pressures include a load factor of 1.0

Roof Var	Start Dist ft	End Dist ft	Cp_min	Cp_max	GCPi	Pressure Pn_min* psf	Pressure Pp_min* psf	Pressure Pn_max psf	Pressure Pp_max psf
OH_Bot_-X	N/A	N/A	0.800	0.800	0.000	14.50	14.50	14.50	14.50
OH_Top (-X)	0.000	3.000	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-Y)	3.000	7.750	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (+Y)	3.000	7.750	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-Y)	7.750	15.500	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (+Y)	7.750	15.500	-0.180	-0.900	0.000	-3.26	-3.26	-16.31	-16.31
OH_Top (-Y)	15.500	31.000	-0.180	-0.500	0.000	-3.26	-3.26	-9.06	-9.06
OH_Top (+Y)	15.500	31.000	-0.180	-0.500	0.000	-3.26	-3.26	-9.06	-9.06
OH_Top (-Y)	31.000	83.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44
OH_Top (+Y)	31.000	83.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44
OH_Top (+X)	83.000	86.000	-0.180	-0.300	0.000	-3.26	-3.26	-5.44	-5.44
Roof (All)	3.000	7.750	-0.180	-0.900	0.180	0.58	-7.10	-12.47	-20.15
Roof (All)	7.750	15.500	-0.180	-0.900	0.180	0.58	-7.10	-12.47	-20.15
Roof (All)	15.500	31.000	-0.180	-0.500	0.180	0.58	-7.10	-5.22	-12.90
Roof (All)	31.000	83.000	-0.180	-0.300	0.180	0.58	-7.10	-1.60	-9.28

Notes Roof Pressures:
Start Dist = Start Dist from Windward Edge — End Dist = End Dist from Windward Edge
Cp_Max = Largest Coefficient Magnitude — Cp_Min = Smallest Coefficient Magnitude
Pp_max = qh*G*Cp_max - qip*(+GCPi) — Pn_max = qh*G*Cp_max - qin*(-GCpi)
Pp_min* = qh*G*Cp_min - qip*(+GCPi) — Pn_min* = qh*G*Cp_min - qin*(-GCPi)
OH = Overhang X = Dir along Ridge Y = Dir Perpendcular to Ridge Z = Vertical
* The smaller uplift pressures due to Cp_Min can become critical when wind is combined with roof live load or snow load; load combinations are given in ASCE 7
+ Pressures Acting TOWARD Surface — - Pressures Acting AWAY from Surface

Reactions Walls+Roof +GCPi Parallel to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	64.50	-1.40	0.00	0.00	0.00	-22.79	0.00
Leeward Wall	-9.78	666.50	-6.52	0.00	0.00	0.00	-50.53	0.00
OH_Bot_-X	14.50	147.00	0.00	0.00	-2.13	0.00	-88.46	0.00
OH_Top (+X)	-5.44	147.00	0.00	0.00	-0.80	0.00	33.17	0.00
OH_Top (+Y)	-5.44	156.00	0.00	0.00	-0.85	-19.51	11.88	0.00
OH_Top (+Y)	-9.06	46.50	0.00	0.00	-0.42	-9.69	-8.32	0.00
OH_Top (+Y)	-16.31	23.25	0.00	0.00	-0.38	-8.72	-11.90	0.00
OH_Top (+Y)	-16.31	14.25	0.00	0.00	-0.23	-5.35	-8.75	0.00
OH_Top (-X)	-16.31	147.00	0.00	0.00	-2.40	0.00	-99.51	0.00
OH_Top (-Y)	-5.44	156.00	0.00	0.00	-0.85	19.51	11.88	0.00

OH_Top (-Y)	-9.06	46.50	0.00	0.00	-0.42	9.69	-8.32	0.00
OH_Top (-Y)	-16.31	23.25	0.00	0.00	-0.38	8.72	-11.90	0.00
OH_Top (-Y)	-16.31	14.25	0.00	0.00	-0.23	5.35	-8.75	0.00
Roof (All)	-9.28	2236.00	0.00	0.00	-20.74	0.00	290.37	0.00
Roof (All)	-12.90	666.50	0.00	0.00	-8.60	0.00	-169.82	0.00
Roof (All)	-20.15	333.25	0.00	0.00	-6.72	0.00	-210.69	0.00
Roof (All)	-20.15	204.25	0.00	0.00	-4.12	0.00	-154.86	0.00
Side Wall	-16.53	1240.00	0.00	20.49	0.00	-158.81	0.00	0.00
Side Wall	-16.53	1240.00	0.00	-20.49	0.00	158.81	0.00	0.00
Windward Parapet	32.61	64.50	-2.10	0.00	0.00	0.00	-34.18	0.00
Windward Wall	10.66	666.50	-7.11	0.00	0.00	0.00	-55.07	0.00
Total	0.00	8303.00	-17.13	0.00	-49.26	0.00	-596.55	0.00

Reactions Walls Only +GCPi Parallel to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	64.50	-1.40	0.00	0.00	0.00	-22.79	0.00
Leeward Wall	-9.78	666.50	-6.52	0.00	0.00	0.00	-50.53	0.00
Side Wall	-16.53	1240.00	0.00	20.49	0.00	-158.81	0.00	0.00
Side Wall	-16.53	1240.00	0.00	-20.49	0.00	158.81	0.00	0.00
Windward Parapet	32.61	64.50	-2.10	0.00	0.00	0.00	-34.18	0.00
Windward Wall	10.66	666.50	-7.11	0.00	0.00	0.00	-55.07	0.00
Total	0.00	3942.00	-17.13	0.00	0.00	0.00	-162.57	0.00

Reactions Walls+Roof -GCPi Parallel to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	64.50	-1.40	0.00	0.00	0.00	-22.79	0.00
Leeward Wall	-2.11	666.50	-1.40	0.00	0.00	0.00	-10.87	0.00
OH_Bot_-X	14.50	147.00	0.00	0.00	-2.13	0.00	-88.46	0.00
OH_Top (+X)	-3.26	147.00	0.00	0.00	-0.48	0.00	19.90	0.00
OH_Top (+Y)	-3.26	156.00	0.00	0.00	-0.51	-11.71	7.13	0.00
OH_Top (+Y)	-3.26	46.50	0.00	0.00	-0.15	-3.49	-3.00	0.00
OH_Top (+Y)	-3.26	23.25	0.00	0.00	-0.08	-1.74	-2.38	0.00
OH_Top (+Y)	-3.26	14.25	0.00	0.00	-0.05	-1.07	-1.75	0.00
OH_Top (-X)	-3.26	147.00	0.00	0.00	-0.48	0.00	-19.90	0.00
OH_Top (-Y)	-3.26	156.00	0.00	0.00	-0.51	11.71	7.13	0.00
OH_Top (-Y)	-3.26	46.50	0.00	0.00	-0.15	3.49	-3.00	0.00
OH_Top (-Y)	-3.26	23.25	0.00	0.00	-0.08	1.74	-2.38	0.00
OH_Top (-Y)	-3.26	14.25	0.00	0.00	-0.05	1.07	-1.75	0.00
Roof (All)	0.58	2236.00	0.00	0.00	1.29	0.00	-18.02	0.00
Roof (All)	0.58	666.50	0.00	0.00	0.38	0.00	7.58	0.00
Roof (All)	0.58	333.25	0.00	0.00	0.19	0.00	6.02	0.00
Roof (All)	0.58	204.25	0.00	0.00	0.12	0.00	4.42	0.00
Side Wall	-8.85	1240.00	0.00	10.97	0.00	-85.04	0.00	0.00
Side Wall	-8.85	1240.00	0.00	-10.97	0.00	85.04	0.00	0.00
Windward Parapet	32.61	64.50	-2.10	0.00	0.00	0.00	-34.18	0.00
Windward Wall	18.34	666.50	-12.22	0.00	0.00	0.00	-94.72	0.00
Total	0.00	8303.00	-17.13	0.00	-2.68	0.00	-251.02	0.00

Reactions Walls Only -GCPi Parallel to Ridge

Description	Pressure psf	Area ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Leeward Parapet	-21.74	64.50	-1.40	0.00	0.00	0.00	-22.79	0.00
Leeward Wall	-2.11	666.50	-1.40	0.00	0.00	0.00	-10.87	0.00
Side Wall	-8.85	1240.00	0.00	10.97	0.00	-85.04	0.00	0.00
Side Wall	-8.85	1240.00	0.00	-10.97	0.00	85.04	0.00	0.00
Windward Parapet	32.61	64.50	-2.10	0.00	0.00	0.00	-34.18	0.00
Windward Wall	18.34	666.50	-12.22	0.00	0.00	0.00	-94.72	0.00
Total	0.00	3942.00	-17.13	0.00	0.00	0.00	-162.57	0.00

Reactions Walls+Roof Minimum Pressure Parallel to Ridge

Description	Pressure psf	Area* ft	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft

Windward Parapet	16.00	64.50	-1.03	0.00	0.00	0.00	-16.77	0.00
Windward Wall	16.00	666.50	-10.66	0.00	0.00	0.00	-82.65	0.00
Total	0.00	731.00	-11.70	0.00	0.00	0.00	-99.42	0.00

Notes:
X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical
MIN = Minimum pressures on Walls = 16.00 psf and Roof = 8.00 psf
Area* = Area of the surface projected onto a vertical plane normal to wind.

Reaction Summary (MWFRS)

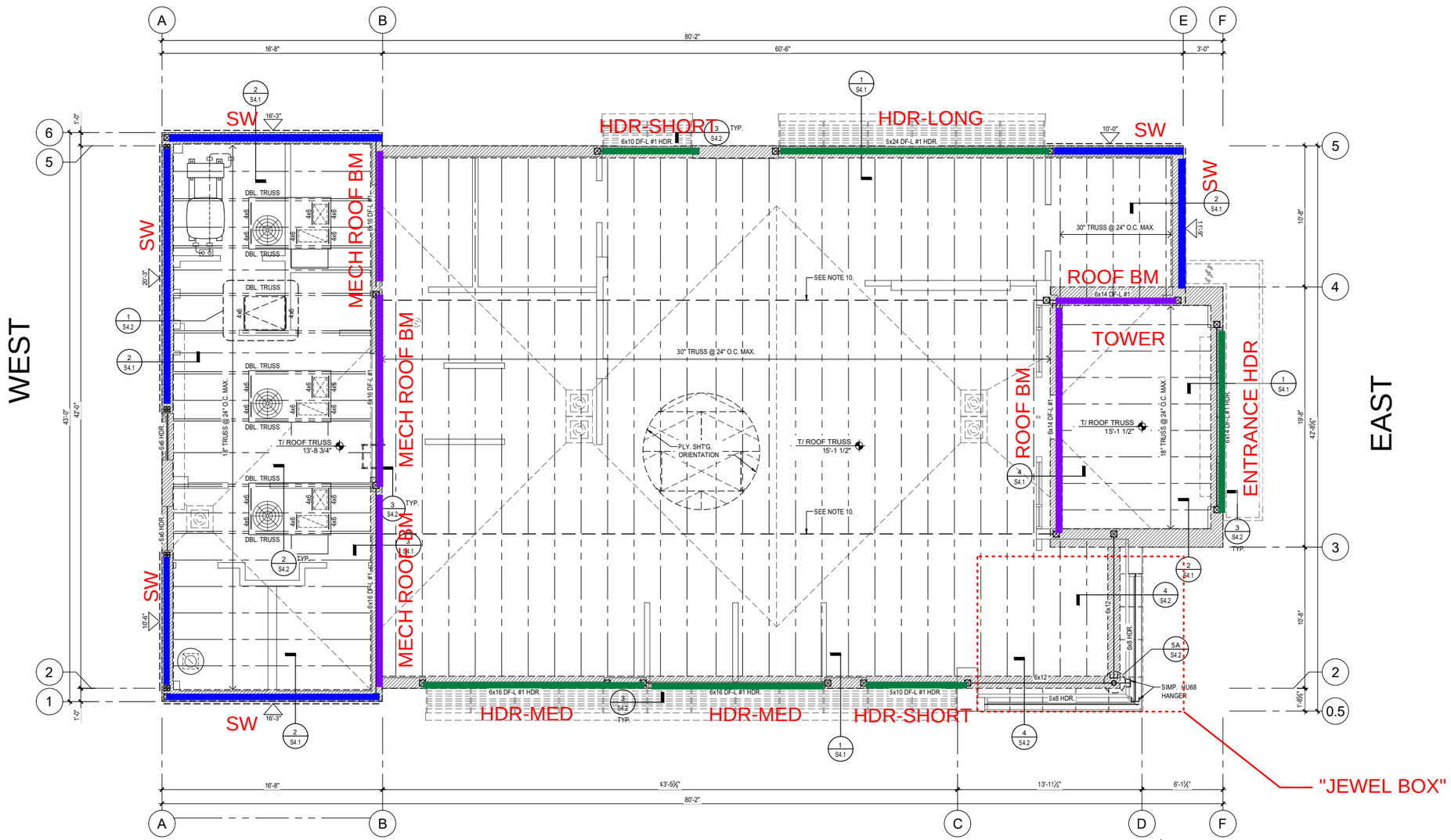
Description	Fx Kip	Fy Kip	Fz Kip	Mx k-ft	My k-ft	Mz k-ft
Normal to Ridge Walls+Roof +GCPi	0.00	-35.74	-58.93	661.32	0.00	0.00
Normal to Ridge Walls Only +GCPi	0.00	-35.74	0.00	332.43	0.00	0.00
Normal to Ridge Walls+Roof -GCPi	0.00	-35.74	-4.02	412.47	0.00	0.00
Normal to Ridge Walls Only -GCPi	0.00	-35.74	0.00	332.43	0.00	0.00
Normal to Ridge Walls+Roof Minimum Pressure	0.00	-21.76	0.00	184.96	0.00	0.00
Parallel to Ridge Walls+Roof +GCPi	-17.13	0.00	-49.26	0.00	-596.55	0.00
Parallel to Ridge Walls Only +GCPi	-17.13	0.00	0.00	0.00	-162.57	0.00
Parallel to Ridge Walls+Roof -GCPi	-17.13	0.00	-2.68	0.00	-251.02	0.00
Parallel to Ridge Walls Only -GCPi	-17.13	0.00	0.00	0.00	-162.57	0.00
Parallel to Ridge Walls+Roof Minimum Pressure	-11.70	0.00	0.00	0.00	-99.42	0.00

Notes applyig to MWFRS Reactions
* Per Figure 27.4-1 Note 9, Use greater of Shear calculated with or without roof.
* X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical
* Minimum Pressures applied to a vertical plane normal to wind.
* Reactions calculated about the geometric center of the footprint

Calculations

STRUCTURE SCHEMATIC

NORTH



SOUTH

Project Design Loads

Total Imposed Dead Load (psf)								
Code	Building Systems	Roof Membrane	Roof Insulation (avg)	Roof Sheathing	MEP	Ceiling	Roof Framing	Total
WF1	Wood Framed, Wood Joist, WSP	0.5	5	2.5	7	1.5	3.5	20
WF2	Wood Framed, Wood Truss, WSP	0.5	5	2.5	7	1.5	8.5	25
SF1	Steel Framed, Wood Joist, WSP		5		7	1.5		13.5
SF2	Steel Framed, Steel Joist, Deck		5		7	1.5		13.5
SF3	Steel Framed, Steel Truss, Deck		5		7	1.5		13.5

Design Roof Wind Load (psf)	
Down	1
Up	-20

Design Snow Load (psf) = 20

Roof Gravity Loading (psf)				
System	Dead Load, DL	Roof Live Load, RLL	Wind Load, WL	Snow Load, SL
WF2	25	20	20	20

Gross Roof Area = 3474 sq.ft. **awnings included*

Roof Weight = 86.85 kips

Wall ID	Wall Type	Weight (psf)	Used Area	Total Load (kips)	Load tributary to Roof (kips)
WD-ext	2x6, 1" Rigid Insul., Alum. Panel Fnsh., R-21 Batt, 1-gyp., 1/2" WSP		0	0.00	0.00
WC-ext	2x6, 1" Rigid Insul., Fiber Cmnt Comp. Panel, R-21 Batt, 1-gyp., 1/2" WSP	13	1842	23.95	11.97
WB-ext	2x6, 1/2" Rigid Insul., 1" Sim. Msnry, Port. Cmt. Mortar, 3/8" Prt.Cmt. Scratch Coat w/ Lath, R-21 Batt, 1-gyp., 1/2" WSP	17	1756	29.85	14.93
WJ-int	2x4, 5/8" gyp ea. Side, 3.5" Batt	8.75	2500	21.88	10.94
			Total	75.67	37.84

Seismic Weight @ Roof = 124.69 kips
Seismic Weight @ Base = 162.52 kips
Cs (Enercalc) = 0.0162

Seismic Story Shear @ Roof = 2.02 kips
Seismic Story Shear @ Base = 2.63 kips

Roof Diaphragm Design Force = 2.64 kips (Enercalc)

Distribution of Seismic Force to SWs

Wall ID	Length	Load	PLF
NE-H	9.5	0.47	50
NE-V	11.75	1.13	97
NW-H	16.25	1.05	65
NW-V	20.25	1.92	95
SW-H	16.25	1.25	77
SW-V	10.5	0.69	66

ID	Wall Component	Total Wind Pressure (psf)	Elevation (ft)
W	Wall	23.6	15.5
P1	Parapet 1	54.4	17
P2	Parapet 2	55.9	19.33
P3	Parapet 3	57.1	21.5

					Orthogonal Wind Load (kips)			
Elevation	W Area (sq.ft.)	P1 (sq.ft.)	P2 (sq.ft.)	P3 (sq.ft.)	W	P1	P2	P3
South	1240	124	103	86	29.26	6.75	5.76	4.91
North	1240	105	103	86	29.26	5.71	5.76	4.91
East	671	33	190	117	15.84	1.80	10.62	6.68
West	642	0	190	53	15.15	0.00	10.62	3.03

Elevation	Wind Story Shear @ Roof (kips)	Wind Story Shear @ Base (kips)
South	**32.05**	**46.68**
North	**31.01**	**45.64**
East	**27.01**	**34.93**
West	**21.22**	**28.80**

Controlling Orthogonal Load Condition			
Direction	Service Load (kips)	Estimated Design Load (kips)	Load Case
North-South	**46.68**	**28.01**	**Wind**
East-West	**34.93**	**20.96**	**Wind**

Bldg Gross Dimensions	
X dim	80 ft
Y dim	44 ft

	Distribution of Wind Load thru Rigid Diaphragm (cases per ASCE 27.3-8)						
Wall ID	Length	Case 1	Case 2	Case 3	Case 4	Max PLF	Control
NE-H	9.5	8.15	6.31	7.59	5.91	858	Case 1
NE-V	11.75	2.37	11.25	2.59	13.82	1176	Case 4
NW-H	16.25	18.30	14.15	16.99	13.27	1126	Case 1
NW-V	20.25	24.39	20.46	30.53	25.64	1508	Case 3
SW-H	16.25	20.82	17.21	19.91	16.51	1281	Case 1
SW-V	10.5	8.76	7.35	10.96	9.21	1044	Case 3

	Total Orthogonal Loads (kips)					Control
X dir Load	34.93	26.20	26.20	19.67		Case 1
Y dir Load	46.68	35.01	35.01	26.28		Case 1
	Load per Foot Bldg Length (lb/ft)				Control	
X Wall Load	794	595	595	447	794	Case 1
Y Wall Load	583	438	438	328	583	Case 1

PER NDS 2015 SDPWS TABLE 4.2A, USE BLOCKED STRUCT I DIAPHRAGM, 10d NAILS, 15/32 PANEL, 2in NOMINAL WIDTH NAILED FACE, 2.5" EDGE & 4" FIELD NAILING,

V_w = 1790 PLF > 794 PLF*2.0 (ASD FACTOR) = 1588 PLF

ASCE Seismic Base Shear

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Risk Category

Calculations per ASCE 7-16

Risk Category of Building or Other Structure : "II" : All Buildings and other structures except those listed as Category I, III, and IV — *ASCE 7-16, Page 4, Table 1.5-1*

Seismic Importance Factor = 1 — *ASCE 7-16, Page 5, Table 1.5-2*

USER DEFINED Ground Motion

ASCE 7-16 11.4.2

Max. Ground Motions, 5% Damping :

S_S = 0.0990 g, 0.2 sec response
S_1 = 0.0680 g, 1.0 sec response

Site Class, Site Coeff. and Design Category

Site Classification "D" : Shear Wave Velocity 600 to 1,200 ft/sec = **D** (Based on Testing) — *ASCE 7-16 Table 20.3-1*

Site Coefficients Fa & Fv — *ASCE 7-16 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)
Fa = 1.60
Fv = 2.40

Maximum Considered Earthquake Acceleration
S_{MS} = Fa * Ss = 0.158 — *ASCE 7-16 Eq. 11.4-1*
S_{M1} = Fv * S1 = 0.163 — *ASCE 7-16 Eq. 11.4-2*

Design Spectral Acceleration
$S_{DS} = S_{MS} * 2/3$ = 0.106 — *ASCE 7-16 Eq. 11.4-3*
$S_{D1} = S_{M1} * 2/3$ = 0.109 — *ASCE 7-16 Eq. 11.4-4*

Seismic Design Category = **B** — *ASCE 7-16 Table 11.6-1 & -2*

Resisting System

ASCE 7-16 Table 12.2-1

Basic Seismic Force Resisting System . . . **Bearing Wall Systems**
15.Light-frame (wood) walls sheathed w/wood structural panels rated for shear resistance.

Response Modification Coefficient " R " = 6.50
System Overstrength Factor " Wo " = 3.00
Deflection Amplification Factor " Cd " = 4.00

NOTE! See ASCE 7-16 for all applicable footnotes.

Building height Limits :
Category "A & B" Limit: No Limit
Category "C" Limit: No Limit
Category "D" Limit: Limit = 65
Category "E" Limit: Limit = 65
Category "F" Limit: Limit = 65

Lateral Force Procedure

ASCE 7-16 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-16 12.8

Determine Building Period

Use ASCE 12.8-7

Structure Type for Building Period Calculation : All Other Structural Systems
" Ct " value = 0.020
" x " value = 0.75
" hn " : Height from base to highest level = 21.50 ft
" Ta " Approximate fundemental period using Eq. 12.8-7 : Ta = Ct * (hn ^ x) = 0.200 sec
"TL" : Long-period transition period per ASCE 7-16 Maps 22-14 -> 22-17 = 12.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.200 sec

" Cs " Response Coefficient

ASCE 7-16 Section 12.8.1.1

S_{DS}: Short Period Design Spectral Response = 0.106
" R " : Response Modification Factor = 6.50
" I " : Seismic Importance Factor = 1

From Eq. 12.8-2, Preliminary Cs = 0.016
From Eq. 12.8-3 & 12.8-4 , Cs need not exceed = 0.084
From Eq. 12.8-5 & 12.8-6, Cs not be less than = 0.010

Cs : Seismic Response Coefficient = 0.0162

Seismic Base Shear

ASCE 7-16 Section 12.8.1

Cs = 0.0162 from 12.8.1.1

W (see Sum Wi below) = 0.00 k
Seismic Base Shear V = Cs * W = 0.00 k

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Vertical Distribution of Seismic Forces

ASCE 7-16 Section 12.8.3

" k " : hx exponent based on Ta = 1.00

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi^k)	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
Sum Wi =	0.00 k	Sum Wi * Hi =	0.00 k-ft		Total Base Shear =	0.00 k	
						Base Moment =	0.0 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-16 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force

Wpx . . . . . Weight at level of diaphragm and other structure elements attached to it.

Fi . . . . . Design Lateral Force applied at the level.

Sum Fi . . . . . Sum of "Lat. Force" of current level plus all levels above

MIN Req'd Force @ Level . . . . . 0.20 * S^{*}_{DS} I * Wpx

MAX Req'd Force @ Level . . . . . 0.40 * S^{*}_{DS} I * Wpx

Fpx : Design Force @ Level . . . . . Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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DESCRIPTION: Lateral Force Distribution

Torsional Analysis of Rigid Diaphragm

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Innova Technologies

DESCRIPTION: (1) Load Distribution - Seismic

General Information

IBC 2018, CBC 2019, ASCE 7-16

Applied Lateral Force in "X" DIrection	2.640 k	Center of Shear Application :	
Applied Lateral Force in "Y" DIrection	2.640 k	Distance from "X" datum point	40.0 ft
		Distance from "Y" datum point	22.0 ft
Note: These loads are resolved into X & Y components when applied to the system of elements at angular increments.		Accidental Torsion values per ASCE 7-05 12.8.4.2	
		Ecc. as % of Maximum Dimension	5.00 %
Load Orientation Angular Increment	15.0 deg		
Load Location Angular Increment	15.0 deg	Maximum Dimensions :	
		Along "X" Axis	80.0 ft
Center of Rigidity Location (calculated) . . .		Along "Y" Axis	44.0 ft
"X" dist. from Datum	ft		
"Y" dist. from Datum	ft		

Accidental Eccentricity +/- from "Y" Coord. of Center of Load Application : 4.0 ft

Accidental Eccentricity +/- from "X" Coord. of Center of Load Application : 2.20 ft

Wall Information

Label : NE-H		X Wall C.G. Location	72 ft	Length	10 ft
		Y Wall C.G. Location	42.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	1.3956E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.4903E-001 in			E - Shear	0.4 Mpsi
Label : NE-V		X Wall C.G. Location	76.75 ft	Length	11.75 ft
		Y Wall C.G. Location	36.5 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.0422E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.1194E-001 in			E - Shear	0.4 Mpsi
Label : NW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	43.5 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : NW-V		X Wall C.G. Location	0.42 ft	Length	20.25 ft
		Y Wall C.G. Location	33.1 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	4.5746E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.2298E-001 in			E - Shear	0.4 Mpsi
Label : SW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	1.17 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : SW-V		X Wall C.G. Location	0.42 ft	Length	10.5 ft
		Y Wall C.G. Location	6.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.2742E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.3717E-001 in			E - Shear	0.4 Mpsi

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
NE-H	0	-20.93	-1.78	**0.469**	90	-19.89	-1.86	**0.005**
NE-V	75	-19.89	-6.11	**1.133**	0	-16.93	-3.98	**0.003**
NW-H	0	-20.93	-1.78	**1.053**	90	-24.93	-3.98	**0.005**
NW-V	90	-24.93	-3.98	**1.916**	0	-16.93	-3.98	**0.005**
SW-H	15	-22.93	-5.89	**1.245**	90	-24.93	-3.98	**0.005**
SW-V	90	-24.93	-3.98	**0.688**	15	-22.93	-5.89	**0.003**

Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Load Distribution - Seismic

Layout of Resisting Elements

Legend : Defined Wall; Datum; Center of Rigidity; Center of Mass; Accidental eccentricity application boundary

Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Load Distribution - Seismic

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

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DESCRIPTION: (1) Wind Load Case 1

General Information

IBC 2018, CBC 2019, ASCE 7-16

Applied Lateral Force in "X" DIrection	46.680 k	Center of Shear Application :	
Applied Lateral Force in "Y" DIrection	34.930 k	Distance from "X" datum point	40.0 ft
		Distance from "Y" datum point	22.0 ft

Note: These loads are resolved into X & Y components when applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0 deg	Accidental Torsion values per ASCE 7-05 12.8.4.2	
Load Location Angular Increment	15.0 deg	Ecc. as % of Maximum Dimension	0.00 %
		Maximum Dimensions :	
Center of Rigidity Location (calculated) . . .		Along "X" Axis	80.0 ft
"X" dist. from Datum	ft	Along "Y" Axis	44.0 ft
"Y" dist. from Datum	ft		

Accidental Eccentricity +/- from "Y" Coord. of Center of Load Application : 0.0 ft

Accidental Eccentricity +/- from "X" Coord. of Center of Load Application : 0.0 ft

Wall Information

Label : NE-H		X Wall C.G. Location	72 ft	Length	10 ft
		Y Wall C.G. Location	42.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	1.3956E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.4903E-001 in			E - Shear	0.4 Mpsi
Label : NE-V		X Wall C.G. Location	76.75 ft	Length	11.75 ft
		Y Wall C.G. Location	36.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.0422E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.1194E-001 in			E - Shear	0.4 Mpsi
Label : NW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	43.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : NW-V		X Wall C.G. Location	0.42 ft	Length	20.25 ft
		Y Wall C.G. Location	33.1 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	4.5746E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.2298E-001 in			E - Shear	0.4 Mpsi
Label : SW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	1.17 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : SW-V		X Wall C.G. Location	0.42 ft	Length	10.5 ft
		Y Wall C.G. Location	6.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.2742E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.3717E-001 in			E - Shear	0.4 Mpsi

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
NE-H	165	-20.93	-3.91	**8.151**	90	-20.93	-3.91	**0.036**
NE-V	135	-20.93	-3.91	**2.372**	0	-20.93	-3.91	**0.056**
NW-H	165	-20.93	-3.91	**18.299**	90	-20.93	-3.91	**0.066**
NW-V	90	-20.93	-3.91	**24.389**	0	-20.93	-3.91	**0.096**
SW-H	195	-20.93	-3.91	**20.823**	90	-20.93	-3.91	**0.066**
SW-V	90	-20.93	-3.91	**8.756**	195	-20.93	-3.91	**0.053**

Torsional Analysis of Rigid Diaphragm

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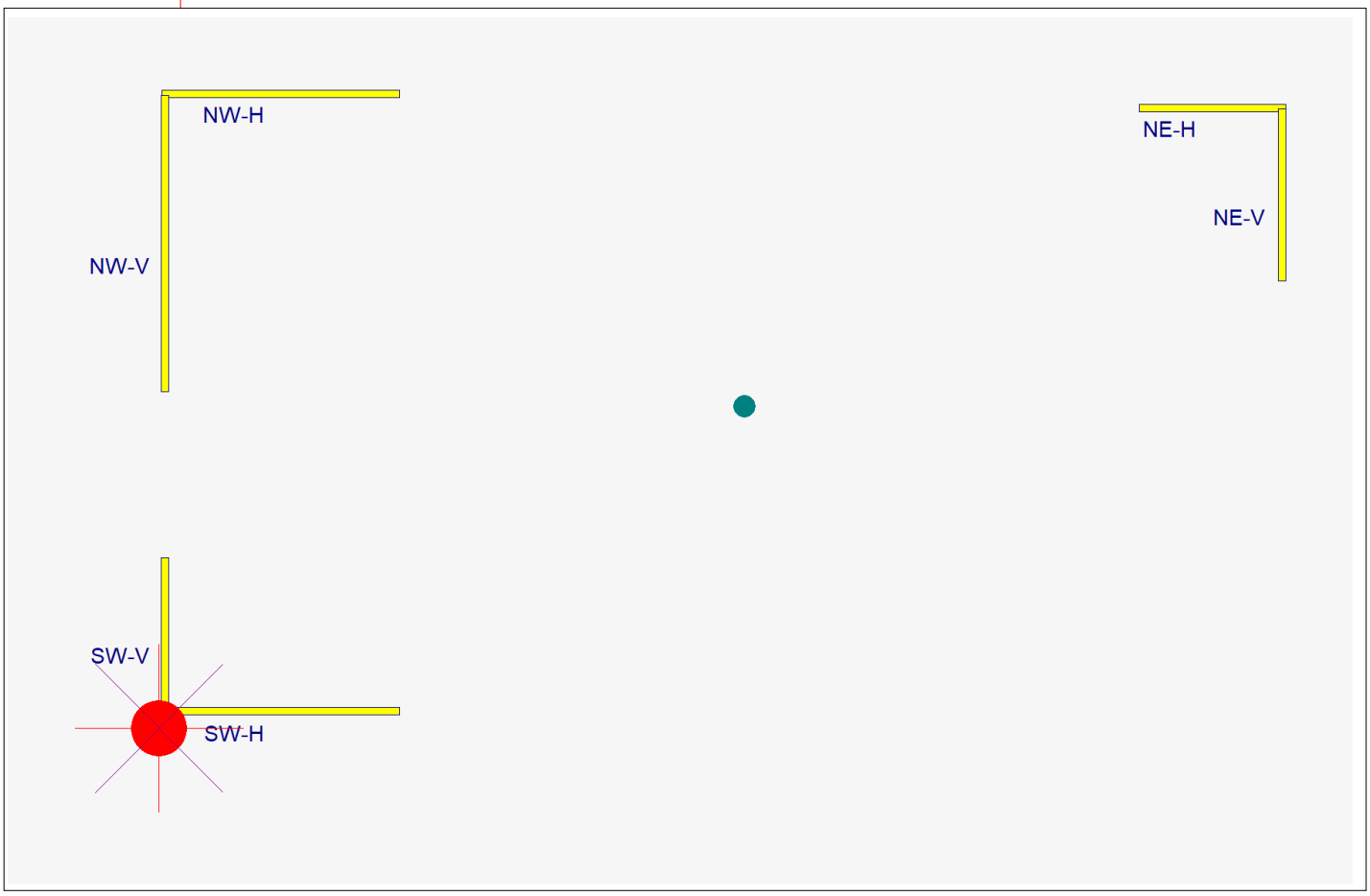
DESCRIPTION: (1) Wind Load Case 1

Layout of Resisting Elements

Legend : Defined Wall | Datum | Center of Rigidity | Center of Mass | Accidental eccentricity application boundary



Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Wind Load Case 1

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

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DESCRIPTION: (1) Wind Load Case 2

General Information

IBC 2018, CBC 2019, ASCE 7-16

Applied Lateral Force in "X" DIrection	35.010 k	Center of Shear Application :	
Applied Lateral Force in "Y" DIrection	26.20 k	Distance from "X" datum point	40.0 ft
		Distance from "Y" datum point	22.0 ft
Note: These loads are resolved into X & Y components when applied to the system of elements at angular increments.		Accidental Torsion values per ASCE 7-05 12.8.4.2	
		Ecc. as % of Maximum Dimension	15.00 %
Load Orientation Angular Increment	15.0 deg		
Load Location Angular Increment	15.0 deg	Maximum Dimensions :	
		Along "X" Axis	80.0 ft
Center of Rigidity Location (calculated) . . .		Along "Y" Axis	44.0 ft
"X" dist. from Datum	ft		
"Y" dist. from Datum	ft		

Accidental Eccentricity +/- from "Y" Coord. of Center of Load Application : 12.0 ft

Accidental Eccentricity +/- from "X" Coord. of Center of Load Application : 6.60 ft

Wall Information

Label : NE-H		X Wall C.G. Location	72 ft	Length	10 ft
		Y Wall C.G. Location	42.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	1.3956E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.4903E-001 in			E - Shear	0.4 Mpsi
Label : NE-V		X Wall C.G. Location	76.75 ft	Length	11.75 ft
		Y Wall C.G. Location	36.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.0422E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.1194E-001 in			E - Shear	0.4 Mpsi
Label : NW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	43.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : NW-V		X Wall C.G. Location	0.42 ft	Length	20.25 ft
		Y Wall C.G. Location	33.1 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	4.5746E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.2298E-001 in			E - Shear	0.4 Mpsi
Label : SW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	1.17 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : SW-V		X Wall C.G. Location	0.42 ft	Length	10.5 ft
		Y Wall C.G. Location	6.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.2742E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.3717E-001 in			E - Shear	0.4 Mpsi

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
NE-H	0	-10.53	-0.61	**6.306**	255	-17.82	-10.29	**0.045**
NE-V	255	-17.82	-10.29	**11.251**	0	-8.93	-3.91	**0.042**
NW-H	0	-10.53	-0.61	**14.153**	90	-32.93	-3.91	**0.054**
NW-V	90	-32.93	-3.91	**20.464**	0	-8.93	-3.91	**0.072**
SW-H	195	-24.03	-10.29	**17.212**	90	-32.93	-3.91	**0.054**
SW-V	90	-32.93	-3.91	**7.347**	195	-24.03	-10.29	**0.043**

Torsional Analysis of Rigid Diaphragm

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DESCRIPTION: (1) Wind Load Case 2

Layout of Resisting Elements

Legend : Defined Wall | Datum | Center of Rigidity | Center of Mass | Accidental eccentricity application boundary

Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Wind Load Case 2

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

File: 121-438-Chase Pryor & Lowenstein.ec6
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Innova Technologies

DESCRIPTION: (1) Wind Load Case 3

General Information

IBC 2018, CBC 2019, ASCE 7-16

Applied Lateral Force	35.010 k
.....Additional Orthogonal Force	26.20 k
Maximum Load Used for Analysis :	43.728 k

Note: This load is the vector resolved from the above two entries and will be applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0 deg
Load Location Angular Increment	15.0 deg

Center of Rigidity Location (calculated) . . .
"X" dist. from Datum ft
"Y" dist. from Datum ft

Center of Shear Application :
Distance from "X" datum point 40.0 ft
Distance from "Y" datum point 22.0 ft

Accidental Torsion values per ASCE 7-05 12.8.4.2
Ecc. as % of Maximum Dimension 0.00 %

Maximum Dimensions :
Along "X" Axis 80.0 ft
Along "Y" Axis 44.0 ft

Accidental Eccentricity +/- from "X" Coord. of Load Application : 0.0 ft
Accidental Eccentricity +/- from "Y" Coord. of Load Application : 0.0 ft

Wall Information

Label : NE-H		X Wall C.G. Location	72 ft	Length	10 ft
		Y Wall C.G. Location	42.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	1.3956E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.4903E-001 in			E - Shear	0.4 Mpsi
Label : NE-V		X Wall C.G. Location	76.75 ft	Length	11.75 ft
		Y Wall C.G. Location	36.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.0422E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.1194E-001 in			E - Shear	0.4 Mpsi
Label : NW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	43.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : NW-V		X Wall C.G. Location	0.42 ft	Length	20.25 ft
		Y Wall C.G. Location	33.1 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	4.5746E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.2298E-001 in			E - Shear	0.4 Mpsi
Label : SW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	1.17 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : SW-V		X Wall C.G. Location	0.42 ft	Length	10.5 ft
		Y Wall C.G. Location	6.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.2742E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.3717E-001 in			E - Shear	0.4 Mpsi

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
NE-H	0	-20.93	-3.91	**7.589**	90	-20.93	-3.91	**0.044**
NE-V	315	-20.93	-3.91	**2.588**	0	-20.93	-3.91	**0.052**
NW-H	0	-20.93	-3.91	**16.993**	90	-20.93	-3.91	**0.083**
NW-V	90	-20.93	-3.91	**30.532**	0	-20.93	-3.91	**0.090**
SW-H	15	-20.93	-3.91	**19.908**	90	-20.93	-3.91	**0.083**
SW-V	90	-20.93	-3.91	**10.961**	15	-20.93	-3.91	**0.051**

Torsional Analysis of Rigid Diaphragm

File: 121-438-Chase Pryor & Lowenstein.ec6
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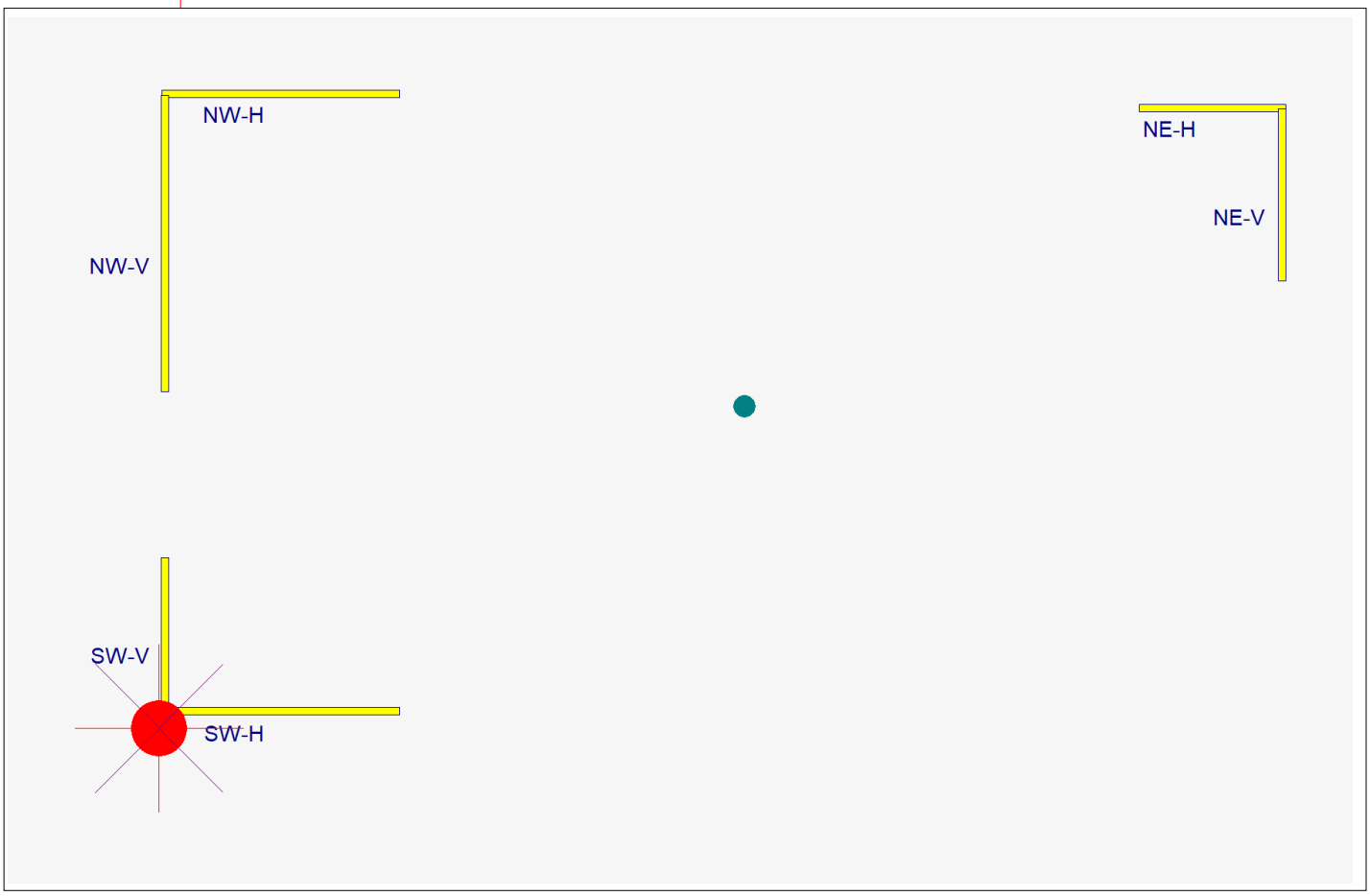
DESCRIPTION: (1) Wind Load Case 3

Layout of Resisting Elements

Legend : Defined Wall | Datum | Center of Rigidity | Center of Mass | Accidental eccentricity application boundary



Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Wind Load Case 3

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

Torsional Analysis of Rigid Diaphragm

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Innova Technologies

DESCRIPTION: (1) Wind Load Case 4

General Information

IBC 2018, CBC 2019, ASCE 7-16

Applied Lateral Force	26.280 k
.....Additional Orthogonal Force	19.670 k
Maximum Load Used for Analysis :	32.826 k

Note: This load is the vector resolved from the above two entries and will be applied to the system of elements at angular increments.

Load Orientation Angular Increment	15.0 deg
Load Location Angular Increment	15.0 deg

Center of Rigidity Location (calculated) . . .
"X" dist. from Datum ft
"Y" dist. from Datum ft

Center of Shear Application :
Distance from "X" datum point 40.0 ft
Distance from "Y" datum point 22.0 ft

Accidental Torsion values per ASCE 7-05 12.8.4.2
Ecc. as % of Maximum Dimension 15.00 %

Maximum Dimensions :
Along "X" Axis 80.0 ft
Along "Y" Axis 44.0 ft

Accidental Eccentricity +/- from "X" Coord. of Load Application : 12.0 ft
Accidental Eccentricity +/- from "Y" Coord. of Load Application : 6.60 ft

Wall Information

Label : NE-H		X Wall C.G. Location	72 ft	Length	10 ft
		Y Wall C.G. Location	42.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	1.3956E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.4903E-001 in			E - Shear	0.4 Mpsi
Label : NE-V		X Wall C.G. Location	76.75 ft	Length	11.75 ft
		Y Wall C.G. Location	36.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.0422E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.1194E-001 in			E - Shear	0.4 Mpsi
Label : NW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	43.33 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : NW-V		X Wall C.G. Location	0.42 ft	Length	20.25 ft
		Y Wall C.G. Location	33.1 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	4.5746E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.2298E-001 in			E - Shear	0.4 Mpsi
Label : SW-H		X Wall C.G. Location	8.33 ft	Length	16.25 ft
		Y Wall C.G. Location	1.17 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	0 deg	Thickness	6 in
Along Wall "y" Dir	6.2156E-004 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	1.5325E-001 in			E - Shear	0.4 Mpsi
Label : SW-V		X Wall C.G. Location	0.42 ft	Length	10.5 ft
		Y Wall C.G. Location	6.42 ft	Height	15.5 ft
Wall Deflections (Stiffness) for 1.0 kip load :		Wall Angle CCW	90 deg	Thickness	6 in
Along Wall "y" Dir	1.2742E-003 in	Wall Fixity	Fix-Fix	E - Bending	1 Mpsi
Along Wall "x" Dir	2.3717E-001 in			E - Shear	0.4 Mpsi

ANALYSIS SUMMARY

Maximum shear forces applied to resisting elements. Eccentricity with respect to Center of Rigidity

	Max Shear along Member Local "y-y" Axis				Max Shear along Member Local "x-x" Axis			
Resisting Element	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)	Load Angle	X-Ecc (ft)	Y-Ecc (ft)	Shear Force (k)
NE-H	0	-10.53	-0.61	**5.912**	75	-17.82	-10.29	**0.056**
NE-V	75	-17.82	-10.29	**13.820**	0	-8.93	-3.91	**0.039**
NW-H	0	-10.53	-0.61	**13.270**	90	-32.93	-3.91	**0.067**
NW-V	90	-32.93	-3.91	**25.639**	0	-8.93	-3.91	**0.068**
SW-H	15	-26.93	-9.63	**16.510**	90	-32.93	-3.91	**0.067**
SW-V	90	-32.93	-3.91	**9.205**	15	-26.93	-9.63	**0.041**

Torsional Analysis of Rigid Diaphragm

File: 121-438-Chase Pryor & Lowenstein.ec6
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DESCRIPTION: (1) Wind Load Case 4

Layout of Resisting Elements

Legend : Defined Wall | Datum | Center of Rigidity | Center of Mass | Accidental eccentricity application boundary

Torsional Analysis of Rigid Diaphragm

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: (1) Wind Load Case 4

Analysis Notes

This program is designed to distribute an applied shear load to a set of resisting elements.

Each resisting element data entry specifies a deflection along a "major" and "minor" axis due to a 1,000 lb load. Each resisting element may be entered as a wall or a column (whereby the deflection is calculated), or as a generic resisting element with specified deflection. The deflections define the stiffness of each resisting element.

Each resisting element is defined at an (X,Y) location from a datum the user has previously defined. A counter-clockwise rotation of the element can be entered with respect to a traditional "+X" axis line.

A main "shear" load and an optional orthogonal shear load are specified for distribution to the system of resisting elements. In addition the maximum orthogonal dimensions of the structure and minimum accidental eccentricity percentage are specified.

From the entered loads the program calculates resultant force vectors for each angular orientation that is requested. The force is applied to the resisting elements in angular increments to generate a series of resulting direct and torsional shear loads on each element. This application of force is then repeated at angular intervals along an elliptical path defined by the minimum accidental eccentricity.

The end result is a table of direct shear and torsional shear values for each element from the iterated angles of load application and accidental eccentricity. These values are then searched to find the maximum major and minor axis shears applied to each resisting element.

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DESCRIPTION: Lateral Force Resisting System Design

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NE-H

General Information

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

Total Wall Length	9.5 ft
Number of Storys	1
Story #1 Height	17.0 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

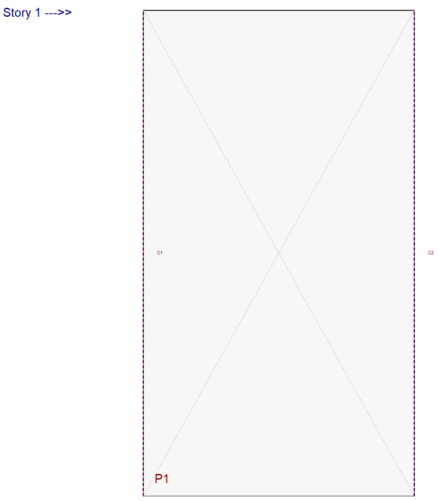
Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 4x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 19.250 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft



Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
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DESCRIPTION: NE-H

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	9.50	15.0	0.1380	0.110		0.110	0.110	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					8.151	0.470

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Shear Summary & Attachment Actual (plf)	Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	4.891	+D+0.60W	1	514.8	715.0	OK	Use 4" at panel edges, 12" in field	1.79	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**4x6**	**0.34**	**Comp**	**OK**

Comp Values : Max. Down : 9.9 k Load Comb : +D-0.60W — Max fc = 514 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 7.9 k Load Comb : +0.60D+0.60W — Max ft = 412 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	9.50	0.0	+D+0.60W	**1**	**4x6**	**0.35**	**Comp**	**OK**

Comp Values : Max. Down : 10.1 k Load Comb : +D+0.60W — Max fc = 523 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 8.1 k Load Comb : +0.60D-0.60W — Max ft = 421 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NE-H

Footing Information

Footing Dimensions

Dist. Left	5.0 ft	f'c	4.0 ksi		Rebar Cover	3.0 in
Wall Length	9.5 ft	Fy	60.0 ksi		Footing Thickness	36.0 in
Dist. Right	5.0 ft				Width	1.50 ft
Total Ftg Length	19.50 ft					

Max Factored Soil Pressures

@ Left Side of Footing	3,423.46	psf
.... governing load comb	+1.20D+L+0.50S-W	
@ Right Side of Footing	3,423.46	psf
.... governing load comb	+1.20D+L+0.50S+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	4,705.30	psf
.... governing load comb	+0.60D-0.60W	
@ Right Side of Footing	4,705.30	psf
.... governing load comb	+0.60D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	19.709	psi
vu @ Right End of Footing	19.709	psi
vn * phi : Allowable	107.517	psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	88.031 k-ft	88.031 k-ft
Resisting Moment	96.952 k-ft	96.952 k-ft
Stability Ratio	1.101 : 1	1.101 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	50.996 k-ft	50.996 k-ft
Ru	34.688 psi	34.688 psi
As % Req'd	0.00180 in^2	0.00180 in^2
As Req'd in Footing Width	1.069 in^2	1.069 in^2

Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NE-V

General Information

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

Total Wall Length	11.750 ft
Number of Storys	1
Story #1 Height	17.0 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 4x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 19.250 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
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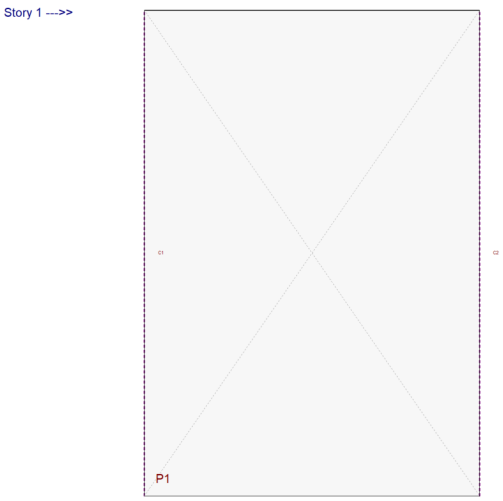
				ft
				ft
				ft
				ft



Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
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DESCRIPTION: NE-V

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	11.750	15.0	0.0250	0.020		0.020	0.020	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					13.820	1.130

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Shear Summary & Attachment Actual (plf)	Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	8.292	+D+0.60W	1	705.7	715.0	OK	Use 4" at panel edges, 12" in field	1.45	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**4x6**	**0.46**	**Comp**	**OK**

Comp Values : Max. Down : 13.3 k Load Comb : +D-0.60W — Max fc = 692 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 11.2 k Load Comb : +0.60D+0.60W — Max ft = 581 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	11.75	0.0	+D+0.60W	**1**	**4x6**	**0.46**	**Comp**	**OK**

Comp Values : Max. Down : 13.3 k Load Comb : +D+0.60W — Max fc = 693 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 11.2 k Load Comb : +0.60D-0.60W — Max ft = 583 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NE-V

Footing Information

Footing Dimensions

Dist. Left	7.0 ft	f'c	4.0 ksi		Rebar Cover	3.0 in
Wall Length	11.750 ft	Fy	60.0 ksi		Footing Thickness	36.0 in
Dist. Right	7.0 ft				Width	1.50 ft
Total Ftg Length	25.750 ft					

Max Factored Soil Pressures

@ Left Side of Footing	4,594.51	psf
.... governing load comb	+1.20D+0.50S-W	
@ Right Side of Footing	4,594.51	psf
.... governing load comb	+1.20D+0.50S+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	4,087.65	psf
.... governing load comb	+0.60D-0.60W	
@ Right Side of Footing	4,087.65	psf
.... governing load comb	+0.60D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	39.90 psi
vu @ Right End of Footing	39.90 psi
vn * phi : Allowable	107.517 psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	149.256 k-ft	149.256 k-ft
Resisting Moment	156.599 k-ft	156.599 k-ft
Stability Ratio	1.049 : 1	1.049 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	110.966 k-ft	110.966 k-ft
Ru	75.480 psi	75.480 psi
As % Req'd	0.00180 in^2	0.00180 in^2
As Req'd in Footing Width	1.069 in^2	1.069 in^2

Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-V

General Information

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

Total Wall Length	20.250 ft
Number of Storys	1
Story #1 Height	19.330 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 6x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 27.563 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft

Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-V

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	20.250	15.0	0.1880	0.150		0.150	0.150	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					30.530	1.920

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Actual (plf)	Shear Summary & Attachment Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	18.318	+D+0.60W	1	904.6	930.0	OK	Use 3" at panel edges, 12" in field	0.95	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**6x6**	**0.82**	**Tension**	**OK**

Comp Values : Max. Down : 20.9 k Load Comb : +D-0.60W Max fc = 760 psi Allow F'c = 0 psi
Tens Values : Max. Uplift : 15.2 k Load Comb : +0.60D+0.60W Max ft = 552 psi Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	# Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	20.25	0.0	+D+0.60W	**1**	**6x6**	**0.83**	**Tension**	**OK**

Comp Values : Max. Down : 21.2 k Load Comb : +D+0.60W Max fc = 769 psi Allow F'c = 0 psi
Tens Values : Max. Uplift : 15.5 k Load Comb : +0.60D-0.60W Max ft = 561 psi Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-V

Footing Information

Footing Dimensions

Dist. Left	5.0 ft	f'c	4.0 ksi			Rebar Cover	3.0 in
Wall Length	20.250 ft	Fy	60.0 ksi			Footing Thickness	36.0 in
Dist. Right	5.0 ft					Width	2.50 ft
Total Ftg Length	30.250 ft						

Max Factored Soil Pressures

@ Left Side of Footing	25,816.7	psf
.... governing load comb	+0.90D-W	
@ Right Side of Footing	25,816.7	psf
.... governing load comb	+0.90D+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	2,450.63	psf
.... governing load comb	+0.60D-0.60W	
@ Right Side of Footing	2,450.63	psf
.... governing load comb	+0.60D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	44.305	psi
vu @ Right End of Footing	44.305	psi
vn * phi : Allowable	107.517	psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	329.724 k-ft	329.724 k-ft
Resisting Moment	403.770 k-ft	403.770 k-ft
Stability Ratio	1.225 : 1	1.225 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	172.055 k-ft	172.055 k-ft
Ru	70.219 psi	70.219 psi
As % Req'd	0.00180 in^2	0.00180 in^2
As Req'd in Footing Width	1.782 in^2	1.782 in^2

Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-H

General Information

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

Total Wall Length	16.250 ft
Number of Storys	1
Story #1 Height	19.330 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

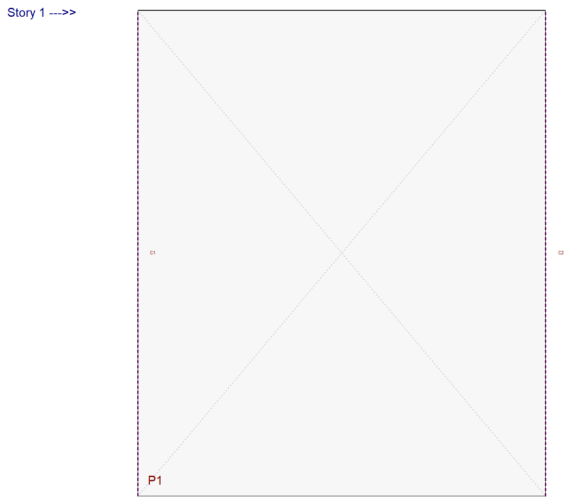
Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 6x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 27.563 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft



Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-H

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	16.250	13.750	0.0250	0.020		0.020	0.020	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					18.30	1.050

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Shear Summary & Attachment Actual (plf)	Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	10.980	+D+0.60W	1	675.7	715.0	OK	Use 4" at panel edges, 12" in field	1.19	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**6x6**	**0.61**	**Tension**	**OK**

Comp Values : Max. Down : 15.7 k Load Comb : +D-0.60W — Max fc = 571 psi — Allow F'c = 0 psi
Tens Values : Max. Uplift : 11.4 k Load Comb : +0.60D+0.60W — Max ft = 414 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	16.25	0.0	+D+0.60W	**1**	**6x6**	**0.62**	**Tension**	**OK**

Comp Values : Max. Down : 15.8 k Load Comb : +D+0.60W — Max fc = 573 psi — Allow F'c = 0 psi
Tens Values : Max. Uplift : 11.5 k Load Comb : +0.60D-0.60W — Max ft = 416 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: NW-H

Footing Information

Footing Dimensions

Dist. Left	7.0 ft	f'c	4.0 ksi		Rebar Cover	3.0 in
Wall Length	16.250 ft	Fy	60.0 ksi		Footing Thickness	36.0 in
Dist. Right	7.0 ft				Width	2.5 ft
Total Ftg Length	30.250 ft					

Max Factored Soil Pressures

@ Left Side of Footing	1,607.46	psf
.... governing load comb	+0.90D-W	
@ Right Side of Footing	1,607.46	psf
.... governing load comb	+0.90D+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	1,038.98	psf
.... governing load comb	+D-0.60W	
@ Right Side of Footing	1,038.98	psf
.... governing load comb	+D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	17.887	psi
vu @ Right End of Footing	17.887	psi
vn * phi : Allowable	107.517	psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	197.640 k-ft	197.640 k-ft
Resisting Moment	360.980 k-ft	360.980 k-ft
Stability Ratio	1.826 : 1	1.826 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	85.623 k-ft	85.623 k-ft
Ru	34.945 psi	34.945 psi
As % Req'd	0.00180 in^2	0.00180 in^2
As Req'd in Footing Width	1.782 in^2	1.782 in^2

Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-H

General Information

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

Total Wall Length	16.250 ft
Number of Storys	1
Story #1 Height	19.330 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

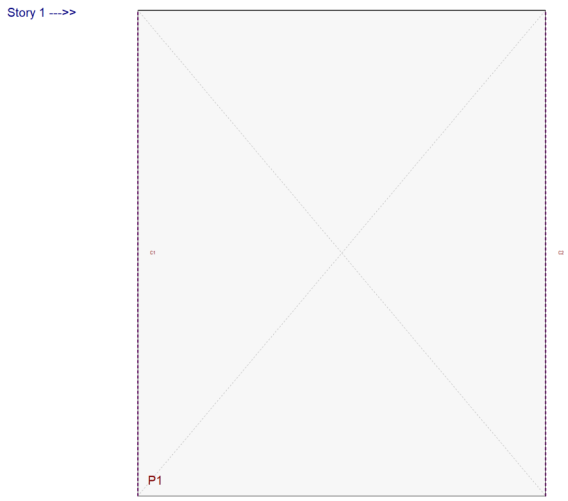
Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 6x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 27.563 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft



Wood Shear Wall

File: 121-438-Chase Pryor & Lowenstein.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-H

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	16.250	13.750	0.0250	0.020		0.020	0.020	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					20.820	1.250

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Shear Summary & Attachment Actual (plf)	Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	12.492	+D+0.60W	1	768.7	930.0	OK	Use 3" at panel edges, 12" in field	1.19	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**6x6**	**0.71**	**Tension**	**OK**

Comp Values : Max. Down : 17.5 k Load Comb : +D-0.60W — Max fc = 637 psi — Allow F'c = 0 psi
Tens Values : Max. Uplift : 13.2 k Load Comb : +0.60D+0.60W — Max ft = 480 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	16.25	0.0	+D+0.60W	**1**	**6x6**	**0.71**	**Tension**	**OK**

Comp Values : Max. Down : 17.6 k Load Comb : +D+0.60W — Max fc = 638 psi — Allow F'c = 0 psi
Tens Values : Max. Uplift : 13.3 k Load Comb : +0.60D-0.60W — Max ft = 481 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-H

Footing Information

Footing Dimensions

Dist. Left	7.0 ft	f'c	4.0 ksi		Rebar Cover	3.0 in
Wall Length	16.250 ft	Fy	60.0 ksi		Footing Thickness	36.0 in
Dist. Right	7.0 ft				Width	1.50 ft
Total Ftg Length	30.250 ft					

Max Factored Soil Pressures

@ Left Side of Footing	5,166.78	psf
.... governing load comb	+1.20D+0.50S-W	
@ Right Side of Footing	5,166.78	psf
.... governing load comb	+1.20D+0.50S+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	3,337.34	psf
.... governing load comb	+0.60D-0.60W	
@ Right Side of Footing	3,337.34	psf
.... governing load comb	+0.60D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	47.236	psi
vu @ Right End of Footing	47.236	psi
vn * phi : Allowable	107.517	psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	224.856 k-ft	224.856 k-ft
Resisting Moment	237.447 k-ft	237.447 k-ft
Stability Ratio	1.056 : 1	1.056 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	132.348 k-ft	132.348 k-ft
Ru	90.024 psi	90.024 psi
As % Req'd	0.002028 in^2	0.002028 in^2
As Req'd in Footing Width	1.204 in^2	1.204 in^2

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-V

General Information

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

Total Wall Length	10.50 ft
Number of Storys	1
Story #1 Height	19.330 ft

Framing & Chord Material :

Wood Species :	Douglas Fir-Larch		
Wood Grade :	No.1		
Fc - Prll =	1,500.0 psi	Ft - Tension	675.0 psi
Fc - Perp =	625.0 psi	E	1,700.0 ksi
Specific Gravity =	).5002		
SDC : Seismic Design Category :	B		

Sheathing

Main Sheathing

SDPWS 2015 Construction Table : 4.3A

Wood Structural Panels, Struct I, 15/32" Thk, 1-1/2" Min Pen, 10d Fstnrs

Nominal Seismic Shear Capacities (plf) :

6" Spac.	680	3" Spac.	1330
4" Spac.	1020	2" Spac.	1740

Nominal Wind Shear Capacities (plf) :

6" Spac.	950	3" Spac.	1860
4" Spac.	1430	2" Spac.	2435

Chord Data

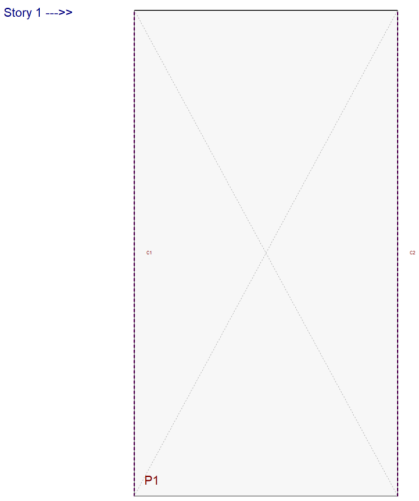
Chord Member Size for each level : See Chord Summary Tables for number of Chords required at each panel end.

Level 1 Chord Size : 4x6 Chord Cf: Comp: 1.0 Tens: 1.0 Max. Allow Stress Ratio : 1.0 : 1

Chord Area = 19.250 in^2

All chords treated as fully braced about both axes

Opening ID	Dist to Left Edge	Opening Width	Dist to Bottom	Opening Height
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft
				ft



Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-V

Applied Distributed Vertical Loads

Load Location (ft)			Load Magnitude (klf)					
Start Location	End Location	Height of Application	Dead	Roof Live	Live	Snow	Wind	Seismic
	10.50	15.0	0.1880	0.150		0.150	0.150	

Applied Concentrated Lateral Loads

Load "Y" Location (ft)	Load Magnitude (kips)					
	Dead	Roof Live	Live	Snow	Wind	Seismic
15.0					10.960	0.690

Shear Panel Summary

Panel ID	Level #	Max Shear (kips)	Load Comb	# Sides Used	Shear Summary & Attachment Actual (plf)	Allow	Status	Attachment	Height/Width Ratio Actual	Allow	Notes
P1	1	6.576	+D+0.60W	1	626.3	715.0	OK	Use 4" at panel edges, 12" in field	1.84	3.50	Ratio OK

Chord Summary

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C1	1	0.00	0.0	+D-0.60W	**1**	**4x6**	**0.48**	**Comp**	**OK**

Comp Values : Max. Down : 14.0 k Load Comb : +D-0.60W — Max fc = 725 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 10.8 k Load Comb : +0.60D+0.60W — Max ft = 561 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord ID	Level #	Dist from Left (ft)	Force (kips)	Load Comb	CHORD DESIGN SUMMARY # Req'd @ Location	Member Size	Stress Ratio	Governs	Status
C2	1	10.50	0.0	+D+0.60W	**1**	**4x6**	**0.49**	**Comp**	**OK**

Comp Values : Max. Down : 14.2 k Load Comb : +D+0.60W — Max fc = 738 psi — Allow F'c = 1,500 psi
Tens Values : Max. Uplift : 11.0 k Load Comb : +0.60D-0.60W — Max ft = 574 psi — Allow F't = 675 psi

User-specified anchorage device : _____

Chord Naming Information : C : Item is a Chord L : Followed by level number # : Followed by chord number from left to right
WL : Indicates Chord is on left edge of wall WR : Indicates Chord is on right edge of wall

Wood Shear Wall

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: SW-V

Footing Information

Footing Dimensions

Dist. Left	5.0 ft	f'c	4.0 ksi			Rebar Cover	3.0 in
Wall Length	10.50 ft	Fy	60.0 ksi			Footing Thickness	36.0 in
Dist. Right	5.0 ft					Width	2.50 ft
Total Ftg Length	20.50 ft						

Max Factored Soil Pressures

@ Left Side of Footing	3,073.61	psf
.... governing load comb	+0.90D-W	
@ Right Side of Footing	3,073.61	psf
.... governing load comb	+0.90D+W	

Max UNfactored Soil Pressures

@ Left Side of Footing	1,354.67	psf
.... governing load comb	+0.60D-0.60W	
@ Right Side of Footing	1,354.67	psf
.... governing load comb	+0.60D+0.60W	

Footing One-Way Shear Check...

vu @ Left End of Footing	16.877	psi
vu @ Right End of Footing	16.877	psi
vn * phi : Allowable	107.517	psi

Overturning Stability...

	@ Left End of Ftg	@ Right End of Ftg
Overturning Moment	118.368 k-ft	118.368 k-ft
Resisting Moment	175.194 k-ft	175.194 k-ft
Stability Ratio	1.480 : 1	1.480 : 1
.... governing load comb	+0.60D+0.60W	+0.60D+0.60W

Footing Bending Design...

	@ Left End	@ Right End
Mu	70.642 k-ft	70.642 k-ft
Ru	28.831 psi	28.831 psi
As % Req'd	0.00180 in^2	0.00180 in^2
As Req'd in Footing Width	1.782 in^2	1.782 in^2

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DESCRIPTION: Gravity Component Design

Wood Beam

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Lic. # : KW-06013963
Innova Technologies

DESCRIPTION: Roof Bm @ Tower

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

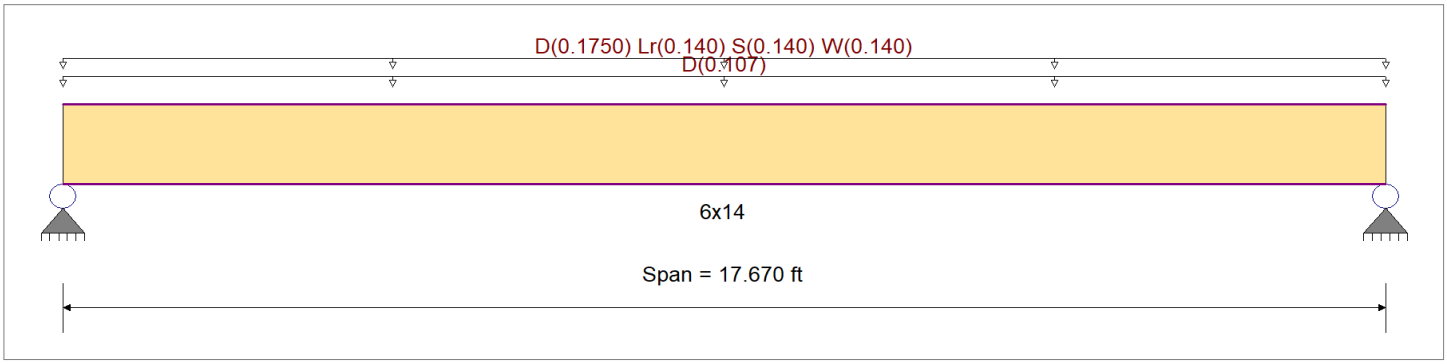
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 7.0 ft
Uniform Load : D = 0.1070 , Tributary Width = 1.0 ft, (Tall Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.791 : 1	Maximum Shear Stress Ratio	=	0.350 : 1
Section used for this span		6x14	Section used for this span		6x14
fb: Actual	=	1,228.15 psi	fv: Actual	=	68.49 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	8.835 ft	Location of maximum on span	=	16.574 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.171 in	Ratio =	1238 >=360
Max Upward Transient Deflection	-0.171 in	Ratio =	1238 >=360
Max Downward Total Deflection	0.570 in	Ratio =	372 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.688	0.305	0.90	0.987	1.00	1.00	1.00	1.00	1.00	11.63	835.67	1215.00	2.31	46.60	153.00
+D+Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.728	0.322	1.25	0.987	1.00	1.00	1.00	1.00	1.00	17.10	1,228.15	1687.50	3.39	68.49	212.50
+D+S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.791	0.350	1.15	0.987	1.00	1.00	1.00	1.00	1.00	17.10	1,228.15	1552.50	3.39	68.49	195.50
+D+0.750Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.670	0.297	1.25	0.987	1.00	1.00	1.00	1.00	1.00	15.73	1,130.03	1687.50	3.12	63.02	212.50
+D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.728	0.322	1.15	0.987	1.00	1.00	1.00	1.00	1.00	15.73	1,130.03	1552.50	3.12	63.02	195.50
+D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: Roof Bm @ Tower

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 17.670 ft	1	0.496	0.220	1.60	0.987	1.00	1.00	1.00	1.00	1.00	14.91	1,071.16	2160.00	2.96	59.74	272.00
+D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.278	0.123	1.60	0.987	1.00	1.00	1.00	1.00	1.00	8.36	600.19	2160.00	1.66	33.47	272.00
+D+0.750Lr+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.605	0.268	1.60	0.987	1.00	1.00	1.00	1.00	1.00	18.19	1,306.65	2160.00	3.61	72.87	272.00
+D+0.750Lr-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.441	0.195	1.60	0.987	1.00	1.00	1.00	1.00	1.00	13.27	953.42	2160.00	2.63	53.17	272.00
+D+0.750S+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.605	0.268	1.60	0.987	1.00	1.00	1.00	1.00	1.00	18.19	1,306.65	2160.00	3.61	72.87	272.00
+D+0.750S-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.441	0.195	1.60	0.987	1.00	1.00	1.00	1.00	1.00	13.27	953.42	2160.00	2.63	53.17	272.00
+0.60D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.341	0.151	1.60	0.987	1.00	1.00	1.00	1.00	1.00	10.26	736.89	2160.00	2.03	41.09	272.00
+0.60D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.123	0.055	1.60	0.987	1.00	1.00	1.00	1.00	1.00	3.70	265.92	2160.00	0.73	14.83	272.00
+1.015D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.393	0.174	1.60	0.987	1.00	1.00	1.00	1.00	1.00	11.81	848.43	2160.00	2.34	47.31	272.00
+1.011D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.528	0.234	1.60	0.987	1.00	1.00	1.00	1.00	1.00	15.87	1,139.60	2160.00	3.15	63.55	272.00
+0.5847D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 17.670 ft	1	0.226	0.100	1.60	0.987	1.00	1.00	1.00	1.00	1.00	6.80	488.65	2160.00	1.35	27.25	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.5699	8.899		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.118	4.118
Overall MINimum	-1.237	-1.237
D Only	2.634	2.634
+D+Lr	3.871	3.871
+D+S	3.871	3.871
+D+0.750Lr	3.561	3.561
+D+0.750S	3.561	3.561
+D+0.60W	3.376	3.376
+D-0.60W	1.892	1.892
+D+0.750Lr+0.450W	4.118	4.118
+D+0.750Lr-0.450W	3.005	3.005
+D+0.750S+0.450W	4.118	4.118
+D+0.750S-0.450W	3.005	3.005
+0.60D+0.60W	2.322	2.322
+0.60D-0.60W	0.838	0.838
+0.60D	1.580	1.580
Lr Only	1.237	1.237
S Only	1.237	1.237
W Only	1.237	1.237
-W	-1.237	-1.237

Wood Beam

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Innova Technologies

DESCRIPTION: Roof Girder @ Tower

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

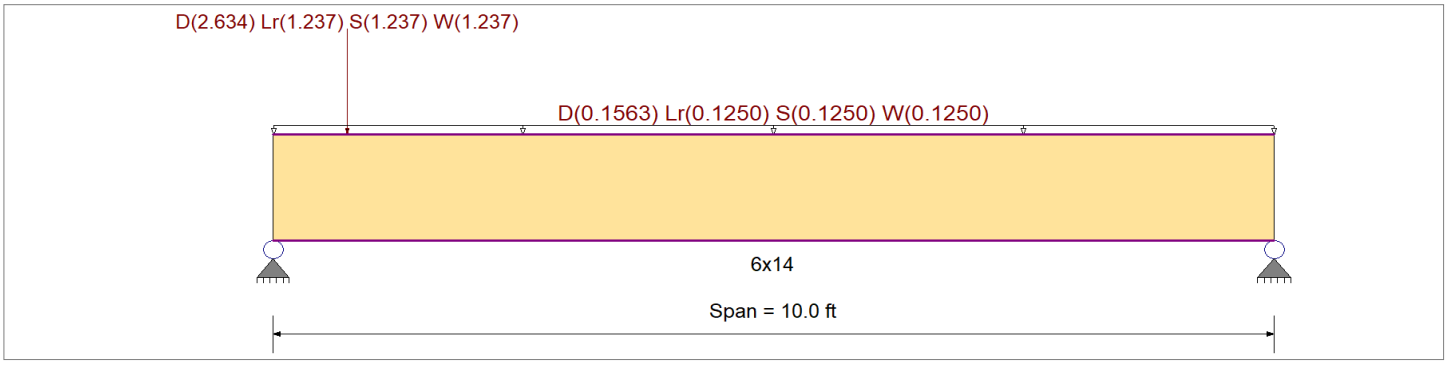
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 6.250 ft
Point Load : D = 2.634, Lr = 1.237, S = 1.237, W = 1.237 k @ 0.750 ft, (Roof Bm)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.246 : 1	Maximum Shear Stress Ratio	=	0.150 : 1
Section used for this span		6x14	Section used for this span		6x14
fb: Actual	=	381.42 psi	fv: Actual	=	29.32 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.015 ft	Location of maximum on span	=	8.905 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.021 in	Ratio =	5640 >=360
Max Upward Transient Deflection	-0.021 in	Ratio =	5640 >=360
Max Downward Total Deflection	0.059 in	Ratio =	2031 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.192	0.115	0.90	0.987	1.00	1.00	1.00	1.00	1.00	3.26	233.82	1215.00	0.87	17.59	153.00
+D+Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.226	0.138	1.25	0.987	1.00	1.00	1.00	1.00	1.00	5.31	381.42	1687.50	1.45	29.32	212.50
+D+S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.246	0.150	1.15	0.987	1.00	1.00	1.00	1.00	1.00	5.31	381.42	1552.50	1.45	29.32	195.50
+D+0.750Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.204	0.124	1.25	0.987	1.00	1.00	1.00	1.00	1.00	4.80	344.48	1687.50	1.31	26.39	212.50
+D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.222	0.135	1.15	0.987	1.00	1.00	1.00	1.00	1.00	4.80	344.48	1552.50	1.31	26.39	195.50
+D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: Roof Girder @ Tower

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 10.0 ft	1	0.149	0.091	1.60	0.987	1.00	1.00	1.00	1.00	1.00	4.49	322.33	2160.00	1.22	24.63	272.00
+D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.067	0.039	1.60	0.987	1.00	1.00	1.00	1.00	1.00	2.03	145.79	2160.00	0.52	10.55	272.00
+D+0.750Lr+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.190	0.116	1.60	0.987	1.00	1.00	1.00	1.00	1.00	5.72	410.98	2160.00	1.57	31.67	272.00
+D+0.750Lr-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.129	0.078	1.60	0.987	1.00	1.00	1.00	1.00	1.00	3.87	278.05	2160.00	1.04	21.11	272.00
+D+0.750S+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.190	0.116	1.60	0.987	1.00	1.00	1.00	1.00	1.00	5.72	410.98	2160.00	1.57	31.67	272.00
+D+0.750S-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.129	0.078	1.60	0.987	1.00	1.00	1.00	1.00	1.00	3.87	278.05	2160.00	1.04	21.11	272.00
+0.60D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.106	0.065	1.60	0.987	1.00	1.00	1.00	1.00	1.00	3.19	228.85	2160.00	0.87	17.59	272.00
+0.60D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.025	0.013	1.60	0.987	1.00	1.00	1.00	1.00	1.00	0.74	53.08	2160.00	0.17	3.51	272.00
+1.015D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.110	0.066	1.60	0.987	1.00	1.00	1.00	1.00	1.00	3.30	237.39	2160.00	0.88	17.86	272.00
+1.011D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.161	0.098	1.60	0.987	1.00	1.00	1.00	1.00	1.00	4.83	347.16	2160.00	1.32	26.59	272.00
+0.5847D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.063	0.038	1.60	0.987	1.00	1.00	1.00	1.00	1.00	1.90	136.72	2160.00	0.51	10.28	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.0591	4.781		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	5.421	1.921
Overall MINimum	-1.769	-0.718
D Only	3.298	1.059
+D+Lr	5.067	1.777
+D+S	5.067	1.777
+D+0.750Lr	4.625	1.598
+D+0.750S	4.625	1.598
+D+0.60W	4.360	1.490
+D-0.60W	2.237	0.629
+D+0.750Lr+0.450W	5.421	1.921
+D+0.750Lr-0.450W	3.829	1.275
+D+0.750S+0.450W	5.421	1.921
+D+0.750S-0.450W	3.829	1.275
+0.60D+0.60W	3.040	1.066
+0.60D-0.60W	0.917	0.205
+0.60D	1.979	0.636
Lr Only	1.769	0.718
S Only	1.769	0.718
W Only	1.769	0.718
-W	-1.769	-0.718

Wood Beam

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Innova Technologies

DESCRIPTION: HDR - Long

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

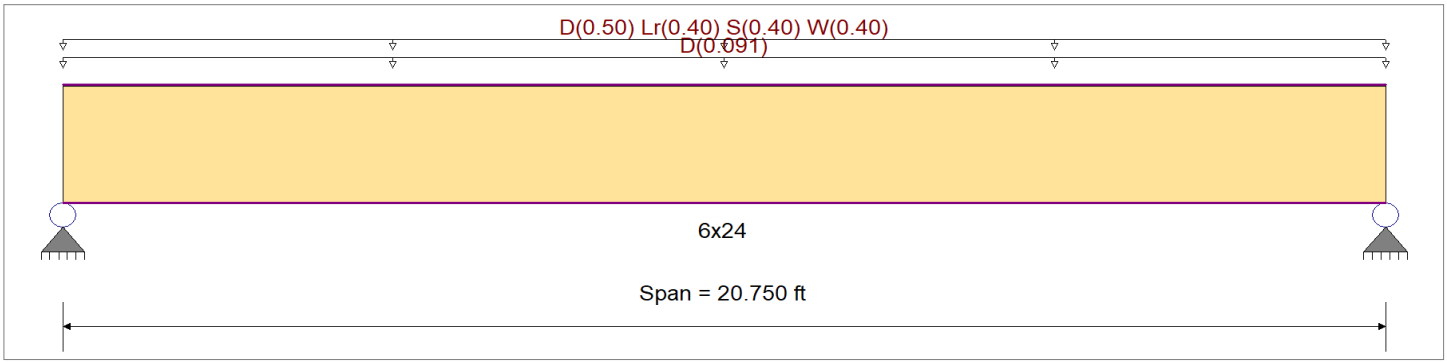
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 20.0 ft
Uniform Load : D = 0.0910 , Tributary Width = 1.0 ft, (Wall Above)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.837 : 1	Maximum Shear Stress Ratio	=	0.513 : 1
Section used for this span		6x24	Section used for this span		6x24
fb: Actual	=	1,300.05 psi	fv: Actual	=	100.31 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	10.375 ft	Location of maximum on span	=	18.857 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.176 in	Ratio =	1412 >=360
Max Upward Transient Deflection	-0.176 in	Ratio =	1412 >=360
Max Downward Total Deflection	0.484 in	Ratio =	513 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.650	0.398	0.90	0.928	1.00	1.00	1.00	1.00	1.00	33.32	789.73	1215.00	5.25	60.93	153.00
+D+Lr					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.770	0.472	1.25	0.928	1.00	1.00	1.00	1.00	1.00	54.84	1,300.05	1687.50	8.64	100.31	212.50
+D+S					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.837	0.513	1.15	0.928	1.00	1.00	1.00	1.00	1.00	54.84	1,300.05	1552.50	8.64	100.31	195.50
+D+0.750Lr					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.695	0.426	1.25	0.928	1.00	1.00	1.00	1.00	1.00	49.46	1,172.47	1687.50	7.79	90.46	212.50
+D+0.750S					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.755	0.463	1.15	0.928	1.00	1.00	1.00	1.00	1.00	49.46	1,172.47	1552.50	7.79	90.46	195.50
+D+0.60W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: HDR - Long

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 20.750 ft	1	0.507	0.311	1.60	0.928	1.00	1.00	1.00	1.00	1.00	46.23	1,095.92	2160.00	7.29	84.56	272.00
+D-0.60W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.224	0.137	1.60	0.928	1.00	1.00	1.00	1.00	1.00	20.40	483.54	2160.00	3.21	37.31	272.00
+D+0.750Lr+0.450W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.649	0.398	1.60	0.928	1.00	1.00	1.00	1.00	1.00	59.15	1,402.11	2160.00	9.32	108.18	272.00
+D+0.750Lr-0.450W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.436	0.267	1.60	0.928	1.00	1.00	1.00	1.00	1.00	39.77	942.83	2160.00	6.27	72.74	272.00
+D+0.750S+0.450W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.649	0.398	1.60	0.928	1.00	1.00	1.00	1.00	1.00	59.15	1,402.11	2160.00	9.32	108.18	272.00
+D+0.750S-0.450W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.436	0.267	1.60	0.928	1.00	1.00	1.00	1.00	1.00	39.77	942.83	2160.00	6.27	72.74	272.00
+0.60D+0.60W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.361	0.221	1.60	0.928	1.00	1.00	1.00	1.00	1.00	32.91	780.03	2160.00	5.19	60.18	272.00
+0.60D-0.60W					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.078	0.048	1.60	0.928	1.00	1.00	1.00	1.00	1.00	7.07	167.65	2160.00	1.11	12.94	272.00
+1.015D					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.371	0.227	1.60	0.928	1.00	1.00	1.00	1.00	1.00	33.81	801.45	2160.00	5.33	61.84	272.00
+1.011D+0.750S					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.547	0.335	1.60	0.928	1.00	1.00	1.00	1.00	1.00	49.83	1,181.26	2160.00	7.85	91.14	272.00
+0.5852D					0.928	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 20.750 ft	1	0.214	0.131	1.60	0.928	1.00	1.00	1.00	1.00	1.00	19.49	462.12	2160.00	3.07	35.66	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.4845	10.451		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	11.402	11.402
Overall MINimum	-4.150	-4.150
D Only	6.422	6.422
+D+Lr	10.572	10.572
+D+S	10.572	10.572
+D+0.750Lr	9.535	9.535
+D+0.750S	9.535	9.535
+D+0.60W	8.912	8.912
+D-0.60W	3.932	3.932
+D+0.750Lr+0.450W	11.402	11.402
+D+0.750Lr-0.450W	7.667	7.667
+D+0.750S+0.450W	11.402	11.402
+D+0.750S-0.450W	7.667	7.667
+0.60D+0.60W	6.343	6.343
+0.60D-0.60W	1.363	1.363
+0.60D	3.853	3.853
Lr Only	4.150	4.150
S Only	4.150	4.150
W Only	4.150	4.150
-W	-4.150	-4.150

Wood Beam

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DESCRIPTION: HDR - Med

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

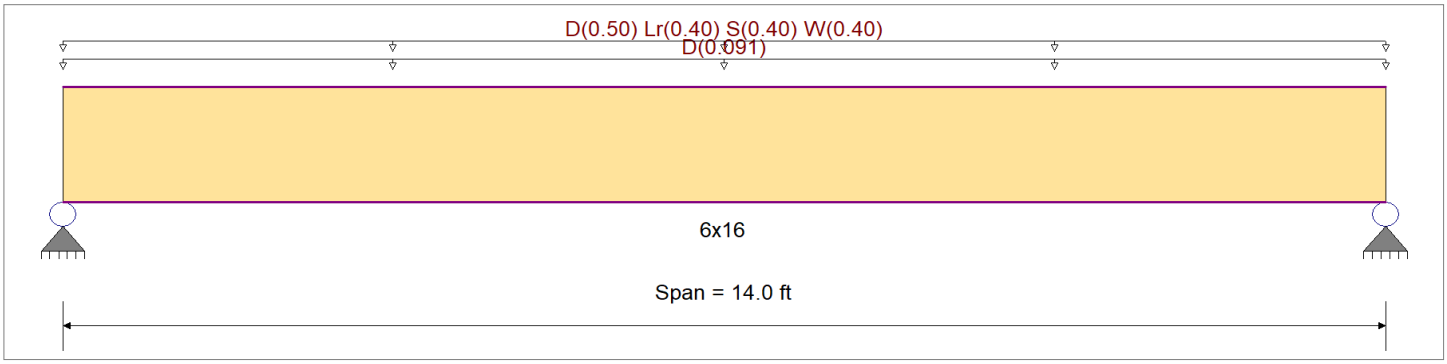
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 20.0 ft
Uniform Load : D = 0.0910 , Tributary Width = 1.0 ft, (Wall Above)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.868 : 1	Maximum Shear Stress Ratio	=	0.520 : 1
Section used for this span		6x16	Section used for this span		6x16
fb: Actual	=	1,347.62 psi	fv: Actual	=	101.65 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	7.000 ft	Location of maximum on span	=	12.723 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.127 in	Ratio =	1319 >=360
Max Upward Transient Deflection	-0.127 in	Ratio =	1319 >=360
Max Downward Total Deflection	0.347 in	Ratio =	484 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.670	0.401	0.90	0.972	1.00	1.00	1.00	1.00	1.00	14.93	813.64	1215.00	3.49	61.37	153.00
+D+Lr					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.799	0.478	1.25	0.972	1.00	1.00	1.00	1.00	1.00	24.73	1,347.62	1687.50	5.78	101.65	212.50
+D+S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.868	0.520	1.15	0.972	1.00	1.00	1.00	1.00	1.00	24.73	1,347.62	1552.50	5.78	101.65	195.50
+D+0.750Lr					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.719	0.431	1.25	0.972	1.00	1.00	1.00	1.00	1.00	22.28	1,214.13	1687.50	5.20	91.58	212.50
+D+0.750S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.782	0.468	1.15	0.972	1.00	1.00	1.00	1.00	1.00	22.28	1,214.13	1552.50	5.20	91.58	195.50
+D+0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: HDR - Med

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 14.0 ft	1	0.525	0.314	1.60	0.972	1.00	1.00	1.00	1.00	1.00	20.81	1,134.03	2160.00	4.86	85.54	272.00
+D-0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.228	0.137	1.60	0.972	1.00	1.00	1.00	1.00	1.00	9.05	493.24	2160.00	2.11	37.20	272.00
+D+0.750Lr+0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.673	0.403	1.60	0.972	1.00	1.00	1.00	1.00	1.00	26.69	1,454.42	2160.00	6.23	109.70	272.00
+D+0.750Lr-0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.451	0.270	1.60	0.972	1.00	1.00	1.00	1.00	1.00	17.87	973.83	2160.00	4.17	73.45	272.00
+D+0.750S+0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.673	0.403	1.60	0.972	1.00	1.00	1.00	1.00	1.00	26.69	1,454.42	2160.00	6.23	109.70	272.00
+D+0.750S-0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.451	0.270	1.60	0.972	1.00	1.00	1.00	1.00	1.00	17.87	973.83	2160.00	4.17	73.45	272.00
+0.60D+0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.374	0.224	1.60	0.972	1.00	1.00	1.00	1.00	1.00	14.84	808.57	2160.00	3.47	60.99	272.00
+0.60D-0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.078	0.047	1.60	0.972	1.00	1.00	1.00	1.00	1.00	3.08	167.79	2160.00	0.72	12.66	272.00
+1.015D					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.382	0.229	1.60	0.972	1.00	1.00	1.00	1.00	1.00	15.15	825.71	2160.00	3.54	62.28	272.00
+1.011D+0.750S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.566	0.339	1.60	0.972	1.00	1.00	1.00	1.00	1.00	22.45	1,223.18	2160.00	5.24	92.26	272.00
+0.5852D					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.220	0.132	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.74	476.11	2160.00	2.04	35.91	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.3469	7.051		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	7.626	7.626
Overall MINimum	-2.800	-2.800
D Only	4.266	4.266
+D+Lr	7.066	7.066
+D+S	7.066	7.066
+D+0.750Lr	6.366	6.366
+D+0.750S	6.366	6.366
+D+0.60W	5.946	5.946
+D-0.60W	2.586	2.586
+D+0.750Lr+0.450W	7.626	7.626
+D+0.750Lr-0.450W	5.106	5.106
+D+0.750S+0.450W	7.626	7.626
+D+0.750S-0.450W	5.106	5.106
+0.60D+0.60W	4.240	4.240
+0.60D-0.60W	0.880	0.880
+0.60D	2.560	2.560
Lr Only	2.800	2.800
S Only	2.800	2.800
W Only	2.800	2.800
-W	-2.800	-2.800

Wood Beam

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DESCRIPTION: HDR - Short

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

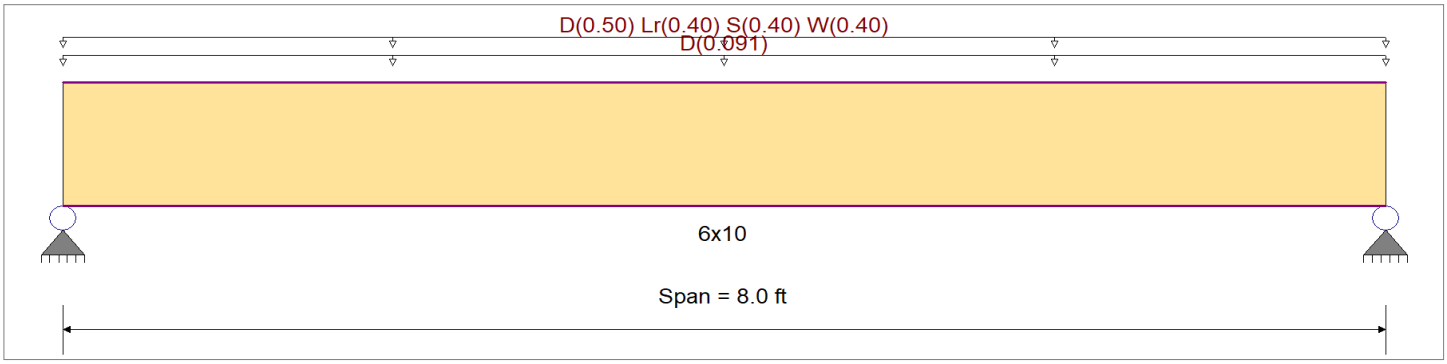
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 20.0 ft
Uniform Load : D = 0.0910 , Tributary Width = 1.0 ft, (Wall Above)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.749 : 1	Maximum Shear Stress Ratio	=	0.473 : 1
Section used for this span		6x10	Section used for this span		6x10
fb: Actual	=	1,163.11 psi	fv: Actual	=	92.42 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	7.212 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.059 in	Ratio =	1627 >=360
Max Upward Transient Deflection	-0.059 in	Ratio =	1627 >=360
Max Downward Total Deflection	0.160 in	Ratio =	601 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.575	0.363	0.90	1.000	1.00	1.00	1.00	1.00	1.00	4.82	698.95	1215.00	1.93	55.54	153.00
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.689	0.435	1.25	1.000	1.00	1.00	1.00	1.00	1.00	8.02	1,163.11	1687.50	3.22	92.42	212.50
+D+S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.749	0.473	1.15	1.000	1.00	1.00	1.00	1.00	1.00	8.02	1,163.11	1552.50	3.22	92.42	195.50
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.620	0.392	1.25	1.000	1.00	1.00	1.00	1.00	1.00	7.22	1,047.07	1687.50	2.90	83.20	212.50
+D+0.750S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.674	0.426	1.15	1.000	1.00	1.00	1.00	1.00	1.00	7.22	1,047.07	1552.50	2.90	83.20	195.50
+D+0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: HDR - Short

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 8.0 ft	1	0.453	0.286	1.60	1.000	1.00	1.00	1.00	1.00	1.00	6.74	977.44	2160.00	2.71	77.66	272.00
+D-0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.195	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.90	420.45	2160.00	1.16	33.41	272.00
+D+0.750Lr+0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.581	0.367	1.60	1.000	1.00	1.00	1.00	1.00	1.00	8.66	1,255.94	2160.00	3.48	99.79	272.00
+D+0.750Lr-0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.388	0.245	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.78	838.19	2160.00	2.32	66.60	272.00
+D+0.750S+0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.581	0.367	1.60	1.000	1.00	1.00	1.00	1.00	1.00	8.66	1,255.94	2160.00	3.48	99.79	272.00
+D+0.750S-0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.388	0.245	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.78	838.19	2160.00	2.32	66.60	272.00
+0.60D+0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.323	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.81	697.87	2160.00	1.93	55.45	272.00
+0.60D-0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.065	0.041	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.97	140.87	2160.00	0.39	11.19	272.00
+1.015D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.328	0.207	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.89	709.32	2160.00	1.96	56.36	272.00
+1.011D+0.750S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.488	0.308	1.60	1.000	1.00	1.00	1.00	1.00	1.00	7.27	1,054.85	2160.00	2.92	83.81	272.00
+0.5852D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.189	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.82	408.99	2160.00	1.13	32.50	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.1596	4.029		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.329	4.329
Overall MINimum	-1.600	-1.600
D Only	2.409	2.409
+D+Lr	4.009	4.009
+D+S	4.009	4.009
+D+0.750Lr	3.609	3.609
+D+0.750S	3.609	3.609
+D+0.60W	3.369	3.369
+D-0.60W	1.449	1.449
+D+0.750Lr+0.450W	4.329	4.329
+D+0.750Lr-0.450W	2.889	2.889
+D+0.750S+0.450W	4.329	4.329
+D+0.750S-0.450W	2.889	2.889
+0.60D+0.60W	2.406	2.406
+0.60D-0.60W	0.486	0.486
+0.60D	1.446	1.446
Lr Only	1.600	1.600
S Only	1.600	1.600
W Only	1.600	1.600
-W	-1.600	-1.600

Wood Beam

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DESCRIPTION: HDR - Tower Entrance

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

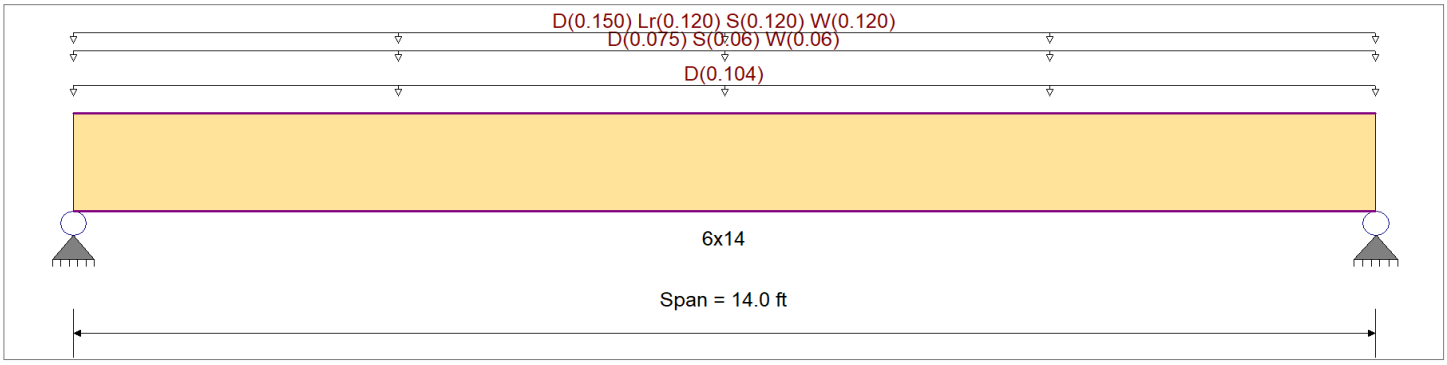
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 6.0 ft
Uniform Load : D = 0.1040 , Tributary Width = 1.0 ft, (Wall Above)
Uniform Load : D = 0.0750, S = 0.060, W = 0.060 , Tributary Width = 1.0 ft, (Awning)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.595 : 1	Maximum Shear Stress Ratio	=	0.319 : 1
Section used for this span		6x14	Section used for this span		6x14
fb: Actual	=	924.07 psi	fv: Actual	=	62.33 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	7.000 ft	Location of maximum on span	=	12.876 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.087 in	Ratio =	1936 >=360
Max Upward Transient Deflection	-0.087 in	Ratio =	1936 >=360
Max Downward Total Deflection	0.270 in	Ratio =	621 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.500	0.268	0.90	0.987	1.00	1.00	1.00	1.00	1.00	8.45	607.30	1215.00	2.03	40.96	153.00
+D+Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.485	0.260	1.25	0.987	1.00	1.00	1.00	1.00	1.00	11.39	818.48	1687.50	2.73	55.21	212.50
+D+S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.595	0.319	1.15	0.987	1.00	1.00	1.00	1.00	1.00	12.86	924.07	1552.50	3.09	62.33	195.50
+D+0.750Lr					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.454	0.243	1.25	0.987	1.00	1.00	1.00	1.00	1.00	10.66	765.68	1687.50	2.56	51.65	212.50
+D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.544	0.292	1.15	0.987	1.00	1.00	1.00	1.00	1.00	11.76	844.88	1552.50	2.82	56.99	195.50

Wood Beam

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DESCRIPTION: HDR - Tower Entrance

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
+D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.369	0.198	1.60	0.987	1.00	1.00	1.00	1.00	1.00	11.10	797.36	2160.00	2.66	53.78	272.00
+D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.193	0.103	1.60	0.987	1.00	1.00	1.00	1.00	1.00	5.81	417.24	2160.00	1.39	28.14	272.00
+D+0.750Lr+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.420	0.225	1.60	0.987	1.00	1.00	1.00	1.00	1.00	12.64	908.23	2160.00	3.03	61.26	272.00
+D+0.750Lr-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.288	0.155	1.60	0.987	1.00	1.00	1.00	1.00	1.00	8.68	623.14	2160.00	2.08	42.03	272.00
+D+0.750S+0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.457	0.245	1.60	0.987	1.00	1.00	1.00	1.00	1.00	13.75	987.42	2160.00	3.30	66.60	272.00
+D+0.750S-0.450W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.325	0.174	1.60	0.987	1.00	1.00	1.00	1.00	1.00	9.78	702.33	2160.00	2.35	47.37	272.00
+0.60D+0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.257	0.137	1.60	0.987	1.00	1.00	1.00	1.00	1.00	7.72	554.44	2160.00	1.85	37.40	272.00
+0.60D-0.60W					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.081	0.043	1.60	0.987	1.00	1.00	1.00	1.00	1.00	2.43	174.32	2160.00	0.58	11.76	272.00
+1.015D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.285	0.153	1.60	0.987	1.00	1.00	1.00	1.00	1.00	8.58	616.57	2160.00	2.06	41.59	272.00
+1.011D+0.750S					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.394	0.211	1.60	0.987	1.00	1.00	1.00	1.00	1.00	11.86	851.83	2160.00	2.84	57.46	272.00
+0.5847D					0.987	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 14.0 ft	1	0.164	0.088	1.60	0.987	1.00	1.00	1.00	1.00	1.00	4.94	355.11	2160.00	1.19	23.95	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.2704	7.051		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.928	3.928
Overall MINimum	-1.260	-1.260
D Only	2.416	2.416
+D+Lr	3.256	3.256
+D+S	3.676	3.676
+D+0.750Lr	3.046	3.046
+D+0.750S	3.361	3.361
+D+0.60W	3.172	3.172
+D-0.60W	1.660	1.660
+D+0.750Lr+0.450W	3.613	3.613
+D+0.750Lr-0.450W	2.479	2.479
+D+0.750S+0.450W	3.928	3.928
+D+0.750S-0.450W	2.794	2.794
+0.60D+0.60W	2.205	2.205
+0.60D-0.60W	0.693	0.693
+0.60D	1.449	1.449
Lr Only	0.840	0.840
S Only	1.260	1.260
W Only	1.260	1.260
-W	-1.260	-1.260

Wood Beam

File: 121-438-Chase Pryor & Lowenstein.ec6
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Lic. # : KW-06013963 — Innova Technologies

DESCRIPTION: Mech Roof Envelope Bm

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

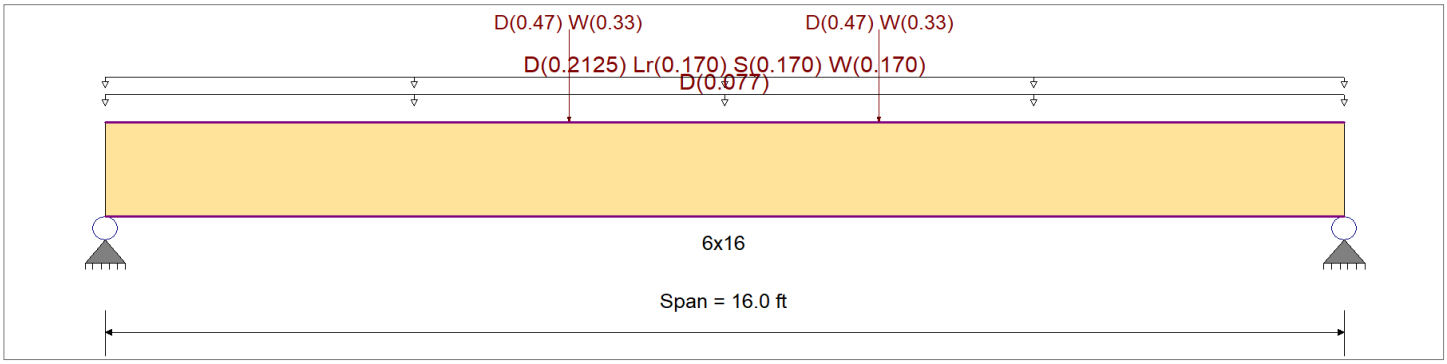
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Tributary Width = 8.50 ft
Point Load : D = 0.470, W = 0.330 k @ 10.0 ft, (RTU Supp)
Point Load : D = 0.470, W = 0.330 k @ 6.0 ft, (`)
Uniform Load : D = 0.0770 , Tributary Width = 1.0 ft, (Parapet)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.636 : 1	Maximum Shear Stress Ratio	=	0.331 : 1
Section used for this span		6x16	Section used for this span		6x16
fb: Actual	=	987.08 psi	fv: Actual	=	64.75 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	8.000 ft	Location of maximum on span	=	14.715 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.125 in	Ratio =	1534 >=360
Max Upward Transient Deflection	-0.125 in	Ratio =	1534 >=360
Max Downward Total Deflection	0.339 in	Ratio =	565 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.568	0.292	0.90	0.972	1.00	1.00	1.00	1.00	1.00	12.68	690.66	1215.00	2.54	44.66	153.00
+D+Lr					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.585	0.305	1.25	0.972	1.00	1.00	1.00	1.00	1.00	18.12	987.08	1687.50	3.68	64.75	212.50
+D+S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.636	0.331	1.15	0.972	1.00	1.00	1.00	1.00	1.00	18.12	987.08	1552.50	3.68	64.75	195.50
+D+0.750Lr					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.541	0.281	1.25	0.972	1.00	1.00	1.00	1.00	1.00	16.76	912.97	1687.50	3.39	59.72	212.50
+D+0.750S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

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DESCRIPTION: Mech Roof Envelope Bm

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 16.0 ft	1	0.588	0.305	1.15	0.972	1.00	1.00	1.00	1.00	1.00	16.76	912.97	1552.50	3.39	59.72	195.50
+D+0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.432	0.221	1.60	0.972	1.00	1.00	1.00	1.00	1.00	17.13	933.24	2160.00	3.42	60.20	272.00
+D-0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.207	0.107	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.22	448.07	2160.00	1.66	29.12	272.00
+D+0.750Lr+0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.507	0.262	1.60	0.972	1.00	1.00	1.00	1.00	1.00	20.09	1,094.91	2160.00	4.06	71.38	272.00
+D+0.750Lr-0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.338	0.177	1.60	0.972	1.00	1.00	1.00	1.00	1.00	13.42	731.03	2160.00	2.73	48.07	272.00
+D+0.750S+0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.507	0.262	1.60	0.972	1.00	1.00	1.00	1.00	1.00	20.09	1,094.91	2160.00	4.06	71.38	272.00
+D+0.750S-0.450W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.338	0.177	1.60	0.972	1.00	1.00	1.00	1.00	1.00	13.42	731.03	2160.00	2.73	48.07	272.00
+0.60D+0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.304	0.156	1.60	0.972	1.00	1.00	1.00	1.00	1.00	12.06	656.98	2160.00	2.41	42.33	272.00
+0.60D-0.60W					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.080	0.041	1.60	0.972	1.00	1.00	1.00	1.00	1.00	3.15	171.81	2160.00	0.64	11.26	272.00
+1.015D					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.325	0.167	1.60	0.972	1.00	1.00	1.00	1.00	1.00	12.87	701.20	2160.00	2.58	45.34	272.00
+1.011D+0.750S					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.426	0.221	1.60	0.972	1.00	1.00	1.00	1.00	1.00	16.90	920.88	2160.00	3.42	60.24	272.00
+0.5847D					0.972	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 16.0 ft	1	0.187	0.096	1.60	0.972	1.00	1.00	1.00	1.00	1.00	7.41	403.86	2160.00	1.48	26.11	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.3395	8.058		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.714	4.714
Overall MINimum	-1.690	-1.690
D Only	2.934	2.934
+D+Lr	4.294	4.294
+D+S	4.294	4.294
+D+0.750Lr	3.954	3.954
+D+0.750S	3.954	3.954
+D+0.60W	3.948	3.948
+D-0.60W	1.920	1.920
+D+0.750Lr+0.450W	4.714	4.714
+D+0.750Lr-0.450W	3.193	3.193
+D+0.750S+0.450W	4.714	4.714
+D+0.750S-0.450W	3.193	3.193
+0.60D+0.60W	2.774	2.774
+0.60D-0.60W	0.746	0.746
+0.60D	1.760	1.760
Lr Only	1.360	1.360
S Only	1.360	1.360
W Only	1.690	1.690
-W	-1.690	-1.690

Wood Beam

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DESCRIPTION: "Jewel Box" Beam

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-16

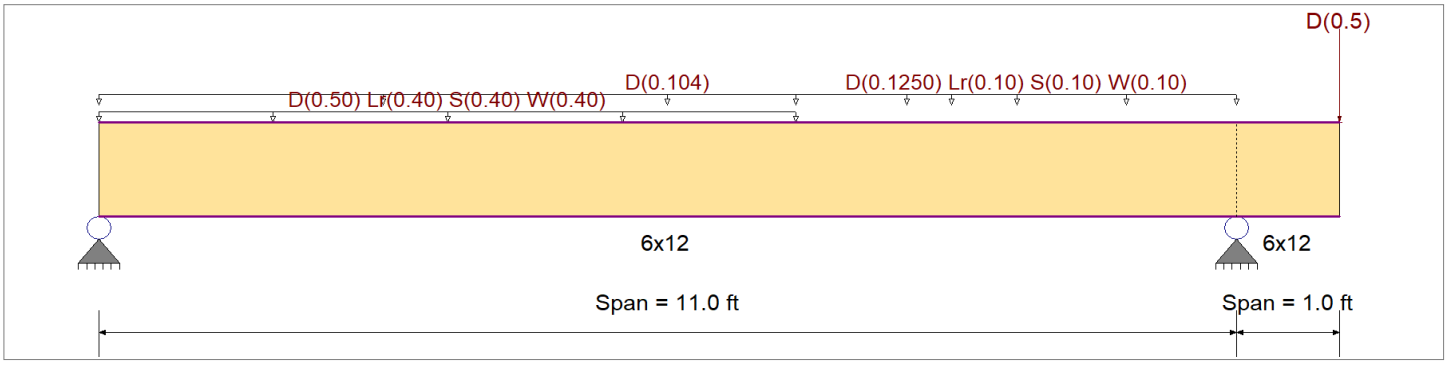
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

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

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Partial Length Uniform Load : D = 0.0250, Lr = 0.020, S = 0.020, W = 0.020 ksf, Extent = 0.0 -->> 6.750 ft, Tributary Width = 20.0 ft
Partial Length Uniform Load : D = 0.1250, Lr = 0.10, S = 0.10, W = 0.10 k/ft, Extent = 6.750 -->> 11.0 ft
Load for Span Number 1
Uniform Load : D = 0.1040 , Tributary Width = 1.0 ft, (Wall Above)
Load for Span Number 2
Point Load : D = 0.50 k @ 1.0 ft, (Jewel Box HDR)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.782 : 1	Maximum Shear Stress Ratio	=	0.492 : 1
Section used for this span		6x12	Section used for this span		6x12
fb: Actual	=	1,214.40 psi	fv: Actual	=	96.26 psi
Fb: Allowable	=	1,552.50 psi	Fv: Allowable	=	195.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.916 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	0.024 in	Ratio =	984 >=360
Max Upward Transient Deflection	-0.024 in	Ratio =	984 >=360
Max Downward Total Deflection	0.251 in	Ratio =	526 >=240
Max Upward Total Deflection	-0.067 in	Ratio =	360 >=240

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
D Only													0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.611	0.383	0.90	1.000	1.00	1.00	1.00	1.00	1.00	7.50	742.14	1215.00	2.47	58.67	153.00
Length = 1.0 ft	2	0.041	0.383	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	1215.00	0.50	58.67	153.00
+D+Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.720	0.453	1.25	1.000	1.00	1.00	1.00	1.00	1.00	12.27	1,214.40	1687.50	4.06	96.26	212.50
Length = 1.0 ft	2	0.030	0.453	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	1687.50	0.50	96.26	212.50

Wood Beam

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DESCRIPTION: "Jewel Box" Beam

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.782	0.492	1.15	1.000	1.00	1.00	1.00	1.00	1.00	12.27	1,214.40	1552.50	4.06	96.26	195.50
Length = 1.0 ft	2	0.032	0.492	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	1552.50	0.50	96.26	195.50
+D+0.750Lr					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.650	0.409	1.25	1.000	1.00	1.00	1.00	1.00	1.00	11.08	1,096.33	1687.50	3.66	86.86	212.50
Length = 1.0 ft	2	0.030	0.409	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	1687.50	0.50	86.86	212.50
+D+0.750S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.706	0.444	1.15	1.000	1.00	1.00	1.00	1.00	1.00	11.08	1,096.33	1552.50	3.66	86.86	195.50
Length = 1.0 ft	2	0.032	0.444	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	1552.50	0.50	86.86	195.50
+D+0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.475	0.299	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.36	1,025.50	2160.00	3.43	81.23	272.00
Length = 1.0 ft	2	0.023	0.299	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	81.23	272.00
+D-0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.212	0.133	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.64	458.80	2160.00	1.52	36.12	272.00
Length = 1.0 ft	2	0.023	0.133	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	36.12	272.00
+D+0.750Lr+0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.606	0.382	1.60	1.000	1.00	1.00	1.00	1.00	1.00	13.22	1,308.85	2160.00	4.38	103.78	272.00
Length = 1.0 ft	2	0.023	0.382	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	103.78	272.00
+D+0.750Lr-0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.409	0.257	1.60	1.000	1.00	1.00	1.00	1.00	1.00	8.93	883.82	2160.00	2.95	69.95	272.00
Length = 1.0 ft	2	0.023	0.257	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	69.95	272.00
+D+0.750S+0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.606	0.382	1.60	1.000	1.00	1.00	1.00	1.00	1.00	13.22	1,308.85	2160.00	4.38	103.78	272.00
Length = 1.0 ft	2	0.023	0.382	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	103.78	272.00
+D+0.750S-0.450W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.409	0.257	1.60	1.000	1.00	1.00	1.00	1.00	1.00	8.93	883.82	2160.00	2.95	69.95	272.00
Length = 1.0 ft	2	0.023	0.257	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.17	2160.00	0.50	69.95	272.00
+0.60D+0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.337	0.212	1.60	1.000	1.00	1.00	1.00	1.00	1.00	7.36	728.64	2160.00	2.44	57.76	272.00
Length = 1.0 ft	2	0.014	0.212	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.30	30.10	2160.00	0.30	57.76	272.00
+0.60D-0.60W					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.075	0.047	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.64	161.98	2160.00	0.53	12.65	272.00
Length = 1.0 ft	2	0.014	0.047	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.30	30.10	2160.00	0.30	12.65	272.00
+1.015D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.349	0.219	1.60	1.000	1.00	1.00	1.00	1.00	1.00	7.61	753.47	2160.00	2.51	59.57	272.00
Length = 1.0 ft	2	0.024	0.219	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.94	2160.00	0.51	59.57	272.00
+1.011D+0.750S					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.511	0.322	1.60	1.000	1.00	1.00	1.00	1.00	1.00	11.16	1,104.83	2160.00	3.69	87.54	272.00
Length = 1.0 ft	2	0.023	0.322	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.51	50.75	2160.00	0.51	87.54	272.00
+0.5847D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.0 ft	1	0.201	0.126	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.38	433.96	2160.00	1.45	34.31	272.00
Length = 1.0 ft	2	0.014	0.126	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.30	29.34	2160.00	0.29	34.31	272.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750S+0.450W	1	0.2509	5.346		0.0000	0.000
	2	0.0000	5.346	+D+0.750S+0.450W	-0.0666	1.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	5.388	4.077	
Overall MINimum	-1.954	-1.171	
D Only	3.043	2.671	
+D+Lr	4.997	3.843	
+D+S	4.997	3.843	
+D+0.750Lr	4.509	3.550	
+D+0.750S	4.509	3.550	
+D+0.60W	4.216	3.374	
+D-0.60W	1.871	1.969	
+D+0.750Lr+0.450W	5.388	4.077	

Wood Beam

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DESCRIPTION: "Jewel Box" Beam

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
+D+0.750Lr-0.450W	3.630	3.023	
+D+0.750S+0.450W	5.388	4.077	
+D+0.750S-0.450W	3.630	3.023	
+0.60D+0.60W	2.998	2.306	
+0.60D-0.60W	0.654	0.900	
+0.60D	1.826	1.603	
Lr Only	1.954	1.171	
S Only	1.954	1.171	
W Only	1.954	1.171	
-W	-1.954	-1.171	

Wood Column

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DESCRIPTION: Mech Roof Bm supp. Col (typ)

Code References

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

General Information

Analysis Method :	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	12.5 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.1		
Fb +	1,200.0 psi	Fv	170.0 psi
Fb -	1,200.0 psi	Ft	825.0 psi
Fc - Prll	1,000.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

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

Wood Section Name	**6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**5.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.0
Area	30.250 in^2	Cf or Cv for Compression	1.0
Ix	76.255 in^4	Cf or Cv for Tension	1.0
Iy	76.255 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Factor	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0 *NDS 15.3.2*
		Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 12.5 ft, K = 1.
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 12.5 ft, K = 1.

Applied Loads

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

Column self weight included : 81.953 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 12.50 ft, D = 5.868, Lr = 2.720, S = 2.720, W = 3.380 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.5457 : 1**

Load Combination	+D+0.750Lr+0.450W
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are . . .	
Applied Axial	9.511 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	576.14 psi

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

Load Combination	+0.5847D
Location of max.above base	12.50 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

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

Maximum SERVICE Load Lateral Deflections . . .

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

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.565	0.3867	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+Lr	1.250	0.443	0.5181	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+S	1.150	0.473	0.5273	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750Lr	1.250	0.443	0.4775	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750S	1.150	0.473	0.4859	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.60W	1.600	0.360	0.4578	PASS	0.0 ft	0.0	PASS	12.50 ft
+D-0.60W	1.600	0.360	0.2250	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750Lr+0.450W	1.600	0.360	0.5457	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750Lr-0.450W	1.600	0.360	0.3712	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750S+0.450W	1.600	0.360	0.5457	PASS	0.0 ft	0.0	PASS	12.50 ft
+D+0.750S-0.450W	1.600	0.360	0.3712	PASS	0.0 ft	0.0	PASS	12.50 ft
+0.60D+0.60W	1.600	0.360	0.3212	PASS	0.0 ft	0.0	PASS	12.50 ft

Wood Column

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DESCRIPTION: Mech Roof Bm supp. Col (typ)

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+0.60D-0.60W	1.600	0.360	0.08848	PASS	0.0 ft	0.0	PASS	12.50 ft
+1.015D	1.600	0.360	0.3466	PASS	0.0 ft	0.0	PASS	12.50 ft
+1.011D+0.750S	1.600	0.360	0.4624	PASS	0.0 ft	0.0	PASS	12.50 ft
+0.5847D	1.600	0.360	0.1996	PASS	0.0 ft	0.0	PASS	12.50 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction k @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					5.950				
+D+Lr					8.670				
+D+S					8.670				
+D+0.750Lr					7.990				
+D+0.750S					7.990				
+D+0.60W					7.978				
+D-0.60W					3.922				
+D+0.750Lr+0.450W					9.511				
+D+0.750Lr-0.450W					6.469				
+D+0.750S+0.450W					9.511				
+D+0.750S-0.450W					6.469				
+0.60D+0.60W					5.598				
+0.60D-0.60W					1.542				
+0.60D					3.570				
Lr Only					2.720				
S Only					2.720				

Maximum Deflections for Load Combinations

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

Wood Column

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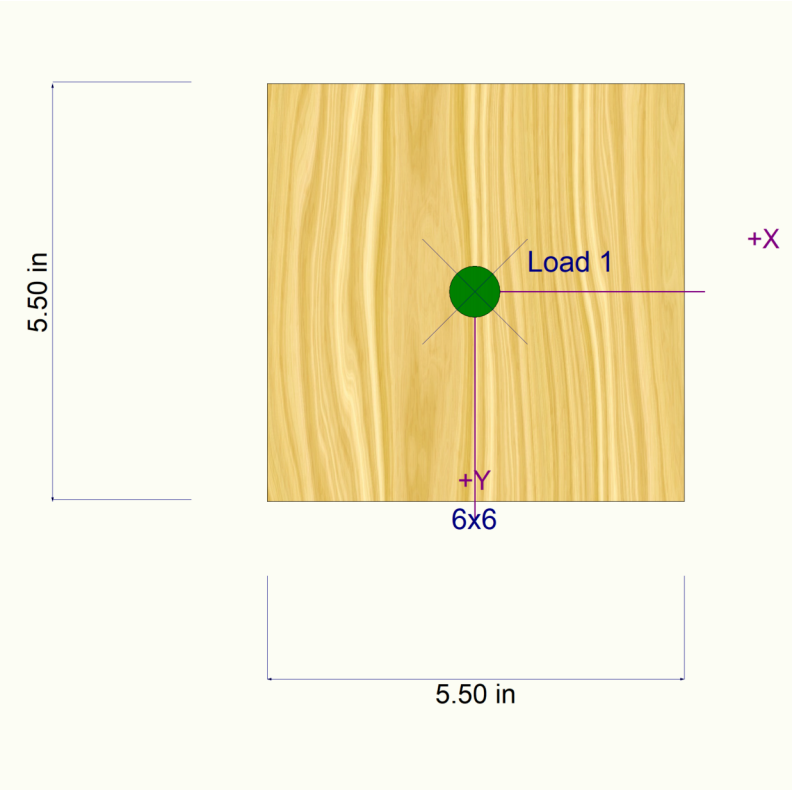
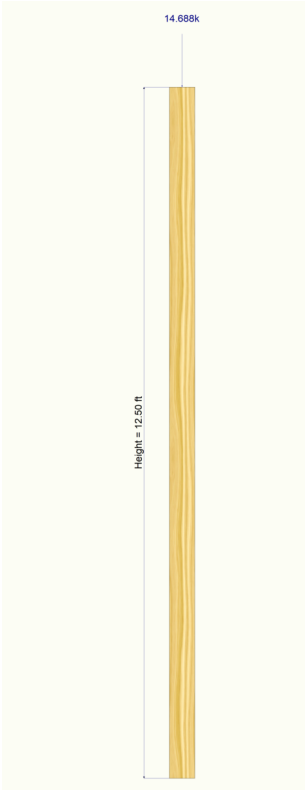
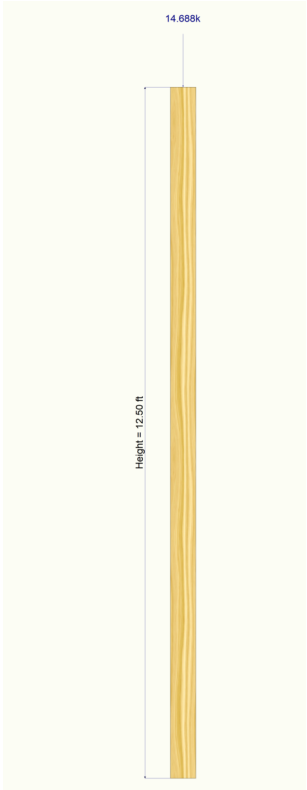
DESCRIPTION: Mech Roof Bm supp. Col (typ)

Sketches







Wood Column

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: Short Bearing HDR Post

Code References

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

General Information

Analysis Method :	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.1		
Fb +	1,200.0 psi	Fv	170.0 psi
Fb -	1,200.0 psi	Ft	825.0 psi
Fc - Prll	1,000.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

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

Wood Section Name	**6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**5.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.0
Area	30.250 in^2	Cf or Cv for Compression	1.0
Ix	76.255 in^4	Cf or Cv for Tension	1.0
Iy	76.255 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Factor	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0 *NDS 15.3.2*
		Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 10 ft, K = 1.0

Applied Loads

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

Column self weight included : 65.563 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 10.0 ft, D = 4.041, Lr = 2.584, S = 2.584, W = 2.584 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.2998 : 1**

Load Combination	+D+S
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are . . .	
Applied Axial	6.691 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	737.63 psi

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

Load Combination	+0.5859D
Location of max.above base	10.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

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

Maximum SERVICE Load Lateral Deflections . . .

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

Other Factors used to calculate allowable stresses . . .

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.727	0.2076	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+Lr	1.250	0.610	0.290	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.150	0.641	0.2998	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr	1.250	0.610	0.2620	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750S	1.150	0.641	0.2709	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.600	0.516	0.2265	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.450W	1.600	0.516	0.2886	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750S+0.450W	1.600	0.516	0.2886	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.60D+0.60W	1.600	0.516	0.1608	PASS	0.0 ft	0.0	PASS	10.0 ft
+1.014D	1.600	0.516	0.1668	PASS	0.0 ft	0.0	PASS	10.0 ft
+1.011D+0.750S	1.600	0.516	0.2438	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.5859D	1.600	0.516	0.09634	PASS	0.0 ft	0.0	PASS	10.0 ft

Wood Column

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: Short Bearing HDR Post

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Axial Reaction @ Base	My - End Moments @ Base	My - End Moments @ Top	k-ft	Mx - End Moments @ Base	Mx - End Moments @ Top
D Only						4.107					
+D+Lr						6.691					
+D+S						6.691					
+D+0.750Lr						6.045					
+D+0.750S						6.045					
+D+0.60W						5.657					
+D+0.750Lr+0.450W						7.207					
+D+0.750S+0.450W						7.207					
+0.60D+0.60W						4.014					
+0.60D						2.464					
Lr Only						2.584					
S Only						2.584					
W Only						2.584					

Maximum Deflections for Load Combinations

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

Wood Column

File: 121-438-Chase Pryor & Lowenstein.ec6
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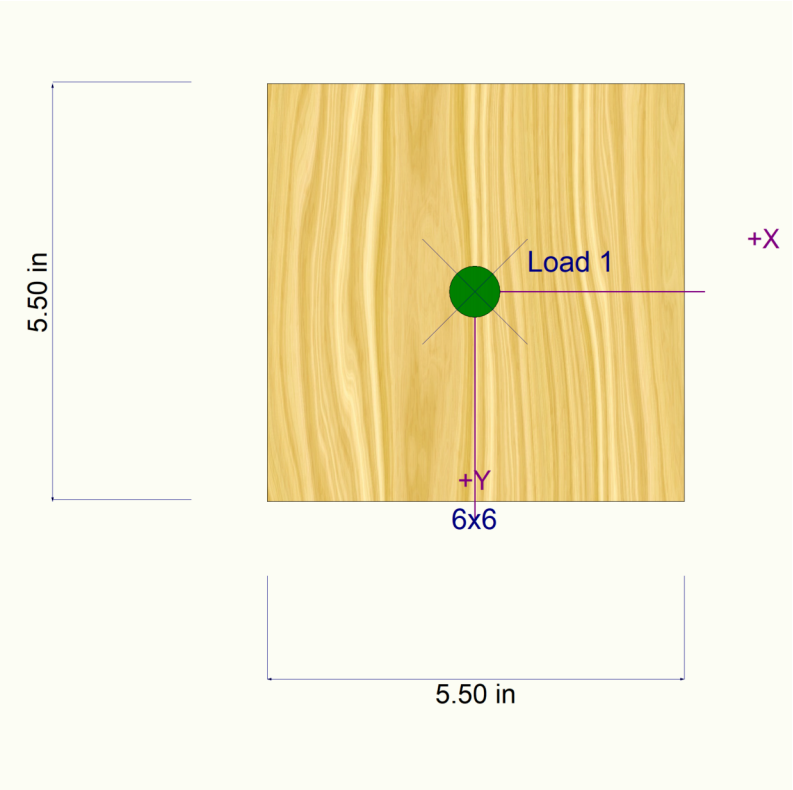
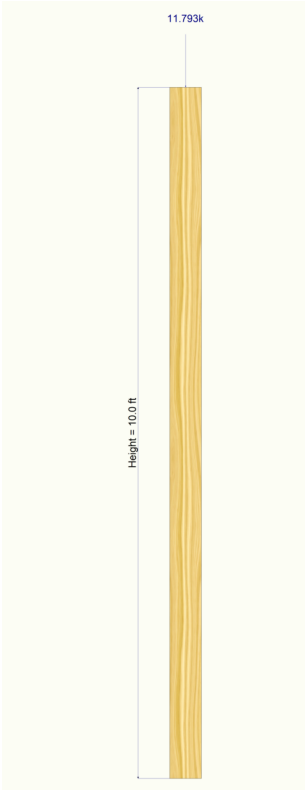
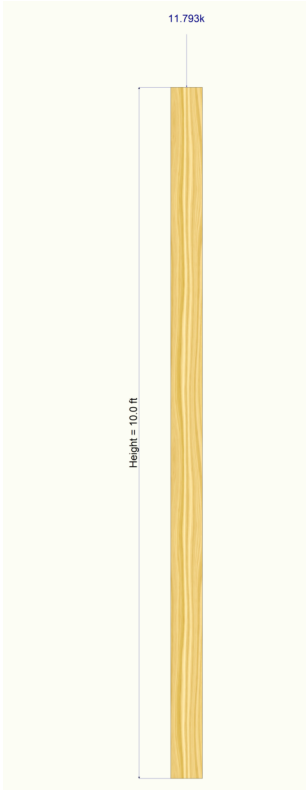
DESCRIPTION: Short Bearing HDR Post

Sketches







Wood Column

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Lic. # : KW-06013963 — Innova Technologies

DESCRIPTION: Post-Long HDR

Code References

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

General Information

Analysis Method :	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.1		
Fb +	1,200.0 psi	Fv	170.0 psi
Fb -	1,200.0 psi	Ft	825.0 psi
Fc - Prll	1,000.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

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

Wood Section Name	**3-2x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**4.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.30
Area	24.750 in^2	Cf or Cv for Compression	1.10
Ix	62.391 in^4	Cf or Cv for Tension	1.30
Iy	41.766 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Factor	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0 *NDS 15.3.2*
		Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 10 ft, K = 1.0

Applied Loads

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

Column self weight included : 53.642 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 10.0 ft, D = 6.422, Lr = 4.150, S = 4.150, W = 4.150 k

DESIGN SUMMARY

Bending & Shear Check Results

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

Load Combination	+D+0.750Lr+0.450W
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are . . .	
Applied Axial	11.456 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	606.63 psi

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

Load Combination	+0.5859D
Location of max.above base	10.0 ft
Applied Design Shear	0.0 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

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

Maximum SERVICE Load Lateral Deflections . . .

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

Other Factors used to calculate allowable stresses . . .

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.546	0.4841	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+Lr	1.250	0.425	0.7349	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.150	0.454	0.7470	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr	1.250	0.425	0.6632	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750S	1.150	0.454	0.6740	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.600	0.345	0.5971	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.450W	1.600	0.345	0.7630	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750S+0.450W	1.600	0.345	0.7630	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.60D+0.60W	1.600	0.345	0.4246	PASS	0.0 ft	0.0	PASS	10.0 ft
+1.014D	1.600	0.345	0.4374	PASS	0.0 ft	0.0	PASS	10.0 ft
+1.011D+0.750S	1.600	0.345	0.6432	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.5859D	1.600	0.345	0.2527	PASS	0.0 ft	0.0	PASS	10.0 ft

Wood Column

Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24

DESCRIPTION: Post-Long HDR

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Axial Reaction @ Base	My - End Moments @ Base	My - End Moments @ Top	k-ft	Mx - End Moments @ Base	Mx - End Moments @ Top
D Only						6.476					
+D+Lr						10.626					
+D+S						10.626					
+D+0.750Lr						9.588					
+D+0.750S						9.588					
+D+0.60W						8.966					
+D+0.750Lr+0.450W						11.456					
+D+0.750S+0.450W						11.456					
+0.60D+0.60W						6.375					
+0.60D						3.885					
Lr Only						4.150					
S Only						4.150					
W Only						4.150					

Maximum Deflections for Load Combinations

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

Wood Column

File: 121-438-Chase Pryor & Lowenstein.ec6
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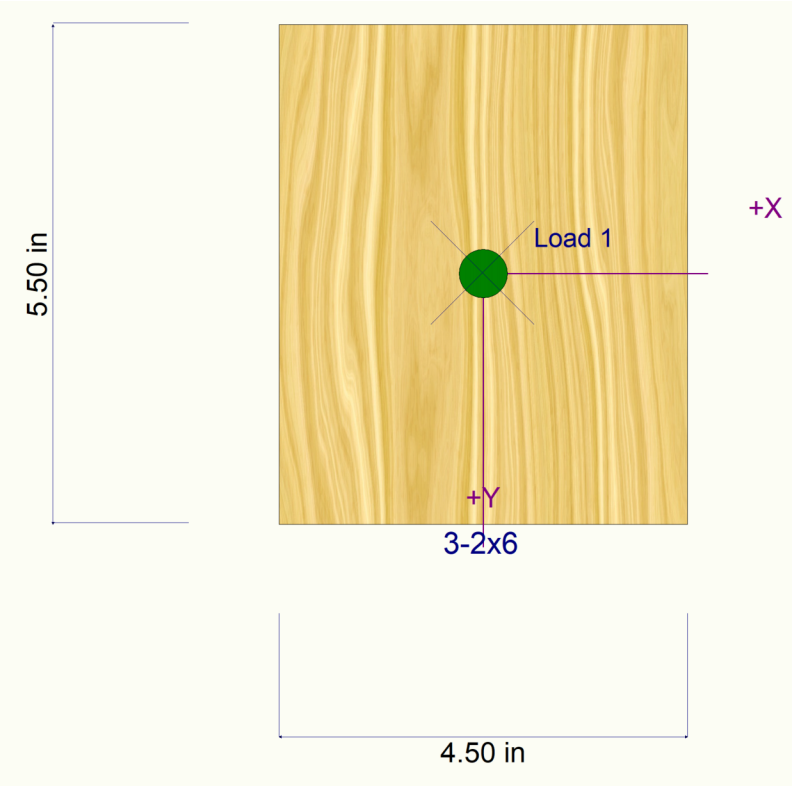
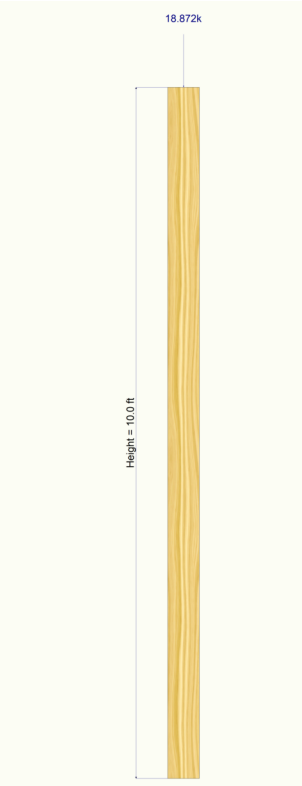
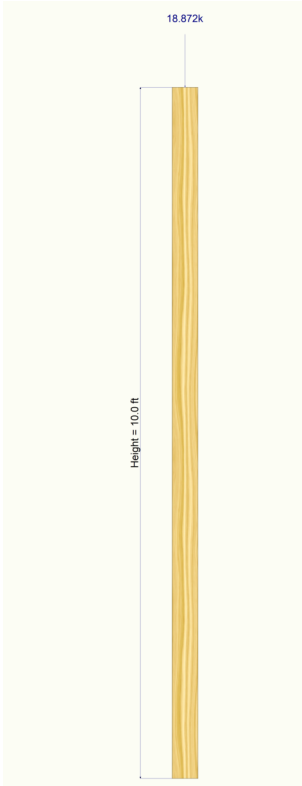
DESCRIPTION: Post-Long HDR

Sketches







Steel Column

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Innova Technologies

DESCRIPTION: steel post

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **Pipe4 Std**
Analysis Method : Allowable Strength
Steel Stress Grade
Fy : Steel Yield 35.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 10.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Unbraced Length for buckling ABOUT Y-Y Axis = 10.0 ft, K = 2
Y-Y (depth) axis :
Unbraced Length for buckling ABOUT X-X Axis = 10.0 ft, K = 2

Applied Loads

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

Column self weight included : 108.581 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 10.0 ft, D = 4.539, LR = 3.146, S = 3.146, W = 3.146 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4766** : 1
Load Combination +D+0.750Lr+0.450W
Location of max.above base 0.0 ft
At maximum location values are . . .
Pa : Axial 8.423 k
Pn / Omega : Allowable 17.671 k
Ma-x : Applied 0.0 k-ft
Mn-x / Omega : Allowable 7.073 k-ft
Ma-y : Applied 0.0 k-ft
Mn-y / Omega : Allowable 7.073 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
Load Combination 0.0
Location of max.above base 0.0 ft
At maximum location values are . . .
Va : Applied 0.0 k
Vn / Omega : Allowable 0.0 k

Maximum Load Reactions . .
Top along X-X k
Bottom along X-X k
Top along Y-Y k
Bottom along Y-Y k

Maximum Load Deflections . . .
Along Y-Y in at ft above base
for load combination :
Along X-X in at ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Maximum Shear Ratios: Stress Ratio	Status	Location

Maximum Reactions

Note: Only non-zero reactions are listed.

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

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top	k-ft	My - End Moments @ Base	My - End Moments @ Top

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance

Steel Section Properties : Pipe4 Std

Steel Column

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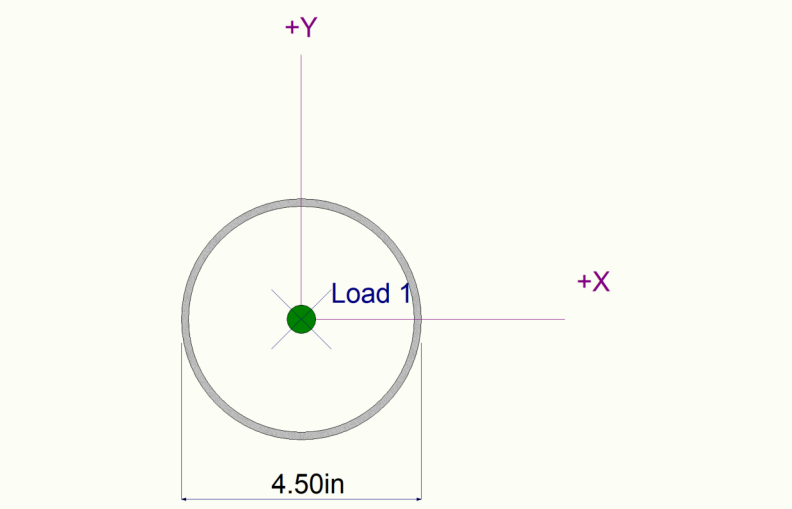
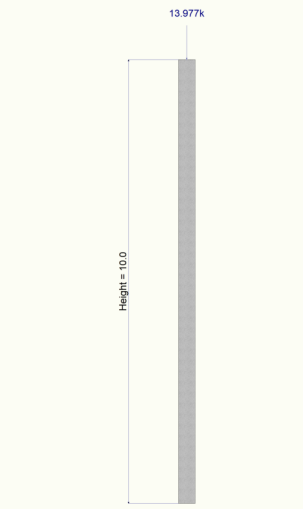
DESCRIPTION: steel post

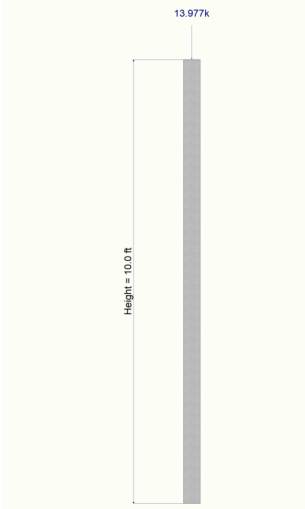
Steel Section Properties : Pipe4 Std

Depth	=	4.500	in	I xx	=	6.82	in^4	J	=	13.600 in^4
				S xx	=	3.03	in^3			
Diameter	=	4.500	in	R xx	=	1.510	in			
Wall Thick	=	0.237	in	Zx	=	4.050	in^3			
Area	=	2.970	in^2	I yy	=	6.820	in^4			
Weight	=	10.858	plf	S yy	=	3.030	in^3			
				R yy	=	1.510	in			
Ycg	=	0.000	in							

Sketches







General Footing

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Innova Technologies

DESCRIPTION: post ftg

Code References

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

General Information

Material Properties

f'c : Concrete 28 day strength	=	4.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,605.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

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

Soil Design Values

Allowable Soil Bearing	=	3.50	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	125.0	pcf
Soil/Concrete Friction Coeff.	=	0.250	

Increases based on footing Depth

Footing base depth below soil surface	=	2.0	ft
Allow press. increase per foot of depth	=		ksf
when footing base is below	=		ft

Increases based on footing plan dimension

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

Dimensions

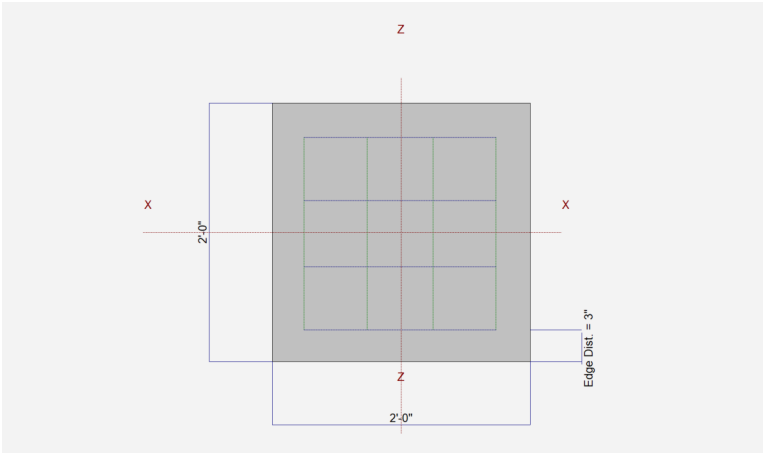
Width parallel to X-X Axis	=	2.0 ft
Length parallel to Z-Z Axis	=	2.0 ft
Footing Thickness	=	24.0 in

Pedestal dimensions...

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

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

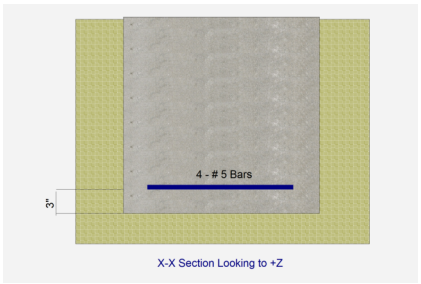


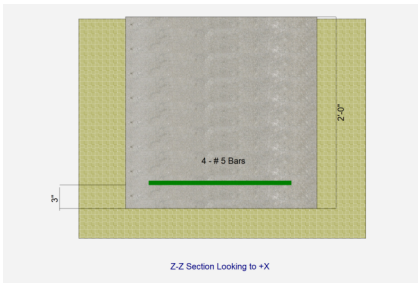
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		4
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		4
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	=	5.950	2.720		2.720	3.380			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

General Footing

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DESCRIPTION: post ftg

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7623	Soil Bearing	2.668 ksf	3.50 ksf	+D+0.750S+0.450W 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	0.02875	Z Flexure (+X)	1.648 k-ft/ft	57.318 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.02875	Z Flexure (-X)	1.648 k-ft/ft	57.318 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.02875	X Flexure (+Z)	1.648 k-ft/ft	57.318 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	0.02875	X Flexure (-Z)	1.648 k-ft/ft	57.318 k-ft/ft	+1.20D+1.60Lr+0.50W
PASS	n/a	1-way Shear (+X)	0.0 psi	94.868 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	94.868 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	94.868 psi	n/a
PASS	n/a	2-way Punching	1.686 psi	94.868 psi	+1.20D+1.60Lr+0.50W

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.50	n/a	0.0	1.778	1.778	n/a	n/a	0.508
X-X, +D+Lr	3.50	n/a	0.0	2.458	2.458	n/a	n/a	0.702
X-X, +D+S	3.50	n/a	0.0	2.458	2.458	n/a	n/a	0.702
X-X, +D+0.750Lr	3.50	n/a	0.0	2.288	2.288	n/a	n/a	0.654
X-X, +D+0.750S	3.50	n/a	0.0	2.288	2.288	n/a	n/a	0.654
X-X, +D+0.60W	3.50	n/a	0.0	2.285	2.285	n/a	n/a	0.653
X-X, +D+0.750Lr+0.450W	3.50	n/a	0.0	2.668	2.668	n/a	n/a	0.762
X-X, +D+0.750S+0.450W	3.50	n/a	0.0	2.668	2.668	n/a	n/a	0.762
X-X, +0.60D+0.60W	3.50	n/a	0.0	1.574	1.574	n/a	n/a	0.450
X-X, +0.60D	3.50	n/a	0.0	1.067	1.067	n/a	n/a	0.305
Z-Z, D Only	3.50	0.0	n/a	n/a	n/a	1.778	1.778	0.508
Z-Z, +D+Lr	3.50	0.0	n/a	n/a	n/a	2.458	2.458	0.702
Z-Z, +D+S	3.50	0.0	n/a	n/a	n/a	2.458	2.458	0.702
Z-Z, +D+0.750Lr	3.50	0.0	n/a	n/a	n/a	2.288	2.288	0.654
Z-Z, +D+0.750S	3.50	0.0	n/a	n/a	n/a	2.288	2.288	0.654
Z-Z, +D+0.60W	3.50	0.0	n/a	n/a	n/a	2.285	2.285	0.653
Z-Z, +D+0.750Lr+0.450W	3.50	0.0	n/a	n/a	n/a	2.668	2.668	0.762
Z-Z, +D+0.750S+0.450W	3.50	0.0	n/a	n/a	n/a	2.668	2.668	0.762
Z-Z, +0.60D+0.60W	3.50	0.0	n/a	n/a	n/a	1.574	1.574	0.450
Z-Z, +0.60D	3.50	0.0	n/a	n/a	n/a	1.067	1.067	0.305

Overturning Stability

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

Sliding Stability

All units k

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	1.041	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.40D	1.041	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50Lr	1.063	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50Lr	1.063	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK

General Footing

File: 121-438-Chase Pryor & Lowenstein.ec6
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DESCRIPTION: post ftg

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+0.50S	1.063	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50S	1.063	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60Lr	1.437	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60Lr	1.437	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60Lr+0.50W	1.648	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60Lr+0.50W	1.648	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60S	1.437	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60S	1.437	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60S+0.50W	1.648	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+1.60S+0.50W	1.648	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50Lr+W	1.485	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50Lr+W	1.485	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50S+W	1.485	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.50S+W	1.485	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +0.90D+W	1.092	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +0.90D+W	1.092	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.20S	0.9605	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +1.20D+0.20S	0.9605	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +0.90D	0.6694	+Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
X-X, +0.90D	0.6694	-Z	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.40D	1.041	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.40D	1.041	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50Lr	1.063	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50Lr	1.063	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50S	1.063	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50S	1.063	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60Lr	1.437	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60Lr	1.437	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.648	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.648	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60S	1.437	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60S	1.437	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60S+0.50W	1.648	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+1.60S+0.50W	1.648	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50Lr+W	1.485	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50Lr+W	1.485	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50S+W	1.485	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.50S+W	1.485	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +0.90D+W	1.092	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +0.90D+W	1.092	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.20S	0.9605	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +1.20D+0.20S	0.9605	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +0.90D	0.6694	-X	Bottom	0.5184	Min Temp %	0.620	57.318	OK
Z-Z, +0.90D	0.6694	+X	Bottom	0.5184	Min Temp %	0.620	57.318	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+0.50Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+0.50S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+1.60Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+1.60Lr+0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+1.60S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+1.60S+0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+0.50Lr+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+0.50S+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+0.90D+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+1.20D+0.20S	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	94.87 psi	0.00	OK

General Footing

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DESCRIPTION: post ftg

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	1.07 psi	189.74 psi	0.005615	OK
+1.20D+0.50Lr	1.09 psi	189.74 psi	0.005729	OK
+1.20D+0.50S	1.09 psi	189.74 psi	0.005729	OK
+1.20D+1.60Lr	1.47 psi	189.74 psi	0.007746	OK
+1.20D+1.60Lr+0.50W	1.69 psi	189.74 psi	0.008885	OK
+1.20D+1.60S	1.47 psi	189.74 psi	0.007746	OK
+1.20D+1.60S+0.50W	1.69 psi	189.74 psi	0.008885	OK
+1.20D+0.50Lr+W	1.52 psi	189.74 psi	0.008008	OK
+1.20D+0.50S+W	1.52 psi	189.74 psi	0.008008	OK
+0.90D+W	1.12 psi	189.74 psi	0.005888	OK
+1.20D+0.20S	0.98 psi	189.74 psi	0.005179	OK
+0.90D	0.68 psi	189.74 psi	0.00361	OK