Sidewalk Shade Structures

100% Calculation Package

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City of Phoenix

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DESIGN CRITERIA & REFERENCES

- 2018 International Building Code (IBC)
- Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE7-22)
- Steel Construction Manual, 15th Edition (AISC)
- City of Phoenix Development Guidelines & Interpretations

Design Parameters**:** The risk category for freestanding signs, billboards, and fences with maximum heights of 10 feet; and parking lot shade structures with a 10-foot maximum clear height shall be I per IBC Table 1604.5.

Since the maximum height of the shade strcutures is more than 10 feet, use Risk Category II for the rest of design.

LOAD COMBINATION FOR STRENGTH DESIGN - ASCE7-22 Section 2.3

Load Combination (LC):

LC-1	- 1.4D
LC-2	- 1.2D+1.6L+0.5Lr
LC-3a	- 1.2D+1.6Lr+0.5L
LC-3b	- 1.2D+1.6Lr+0.5W
LC-4	- 1.2D+1.0W+L+0.5Lr
LC-5	- 0.9DC+1.0W
LC-6	- 1.2D+Eh+Ev+0.5L
LC-7	- 0.9D+Eh-Ev

DEFLECTION CHECK CRITERIA

The deflection check is based on IBC Table 1604 and ASCE7 Appendix CC:

1. The deflection limit is 1/150 for horizontal cantilever member.
2. For steel structure, the dead loads are taken as zero.
3. The load combination used:
   LC-8 - L+Lr
   LC-9 - 0.5(L+Lr)+Wa

4. Wa is wind load based on serviceability wind speeds which equals strength-level wind pressure multipliies by 0.7. This 0.7 multiplication of the pressure resulted in an approximate 10-years MRI.
5. The deflection check uses the service condition, and the 300lb hanging load is considered an extreme event, and is not used in the deflection check. The 5 psf distributed roof load is the only roof live load considered for the deflection check.

STABILITY CHECK CRITERIA

There is no clear stability criteria for the self-supported shade structure. Use the critieria of retaining wall from IBC Section 1807.2.3. The self sitting foundation shall be designed to resist the lateral action to produce sliding and overturning with a minimum safety factor of 1.5 in each load case. The load combinations in the strength design shall not apply to this requirement. Instead, design shall be based on 0.7 times nominal earthquake loads, 1.0 times other nominal loads, and investigation with one or more of the variable loads set to zero. Based on the probability of occurrence and engineering adjustment, use the below load combination for stability design:

D+W
D+L
D+Lr
D+0.75(L+Lr)
D+0.5(L+Lr)+Wa
D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh

LIVE LOAD

There is no suitable live load from ASCE7-22. Per pratice, assuming a person will be leaning on the structure. Use below for live load design:

300Lbs point load horizontally applied at any direction at 4ft above the ground.

ROOF LIVE LOAD

The roof of the shade structure is not designed for maintenance or occpancy purpose.
Per ASCE7-22, for awnings and canopies or screen enclsoure support frame, the roof live load is 5psf uniform load.

Per practice, the a person may jump and hang on the edge of the roof. In this case, use larger of below for the roof live load:
- 5psf or
- 300Lbs vertically applied at the edge of the roof over 1 feet.

WIND LOAD

1. The basic wind speed is based on Risk Category II and Figure 26.5-1B from ASCE7-22.
2. The wind pressure for deflection shall be based on 10-yr MRI which equals 0.7 multiplies the nominal wind pressure.
3. To determine the net force coefficients, use below:
   - For vertical post, follow "Chapter 29.4 Desing Wind Loads: Other Structure"
   - For roof area, follow "Chapter 30 Wind Load: Components and Cladding"

SEISMIC LOAD

1. Since the Seismic Design Category is B, any method in Section 12.5.1 shall be permitted. In this case, use Equivalent Lateral Force Procesure based on Section 12.8.
2. Seismic Data are based on USGS Seismic Design Maps based on ASCE7-22.

DEAD LOAD

1. The dead load is based on the geometric of the structures and unit weight of the materials as shown below.
2. The shade strcutures are modeled in LARSA based on the actual geometric, total weight could be obtained from the LARSA.

Unit Weight of Steel: $0.49\ \frac{kip}{ft^3}$

Unit Weight of Concrete: $0.15\ \frac{kip}{ft^3}$

SNOW LOAD

No snow load applicable.

BLOSSOM DESIGN

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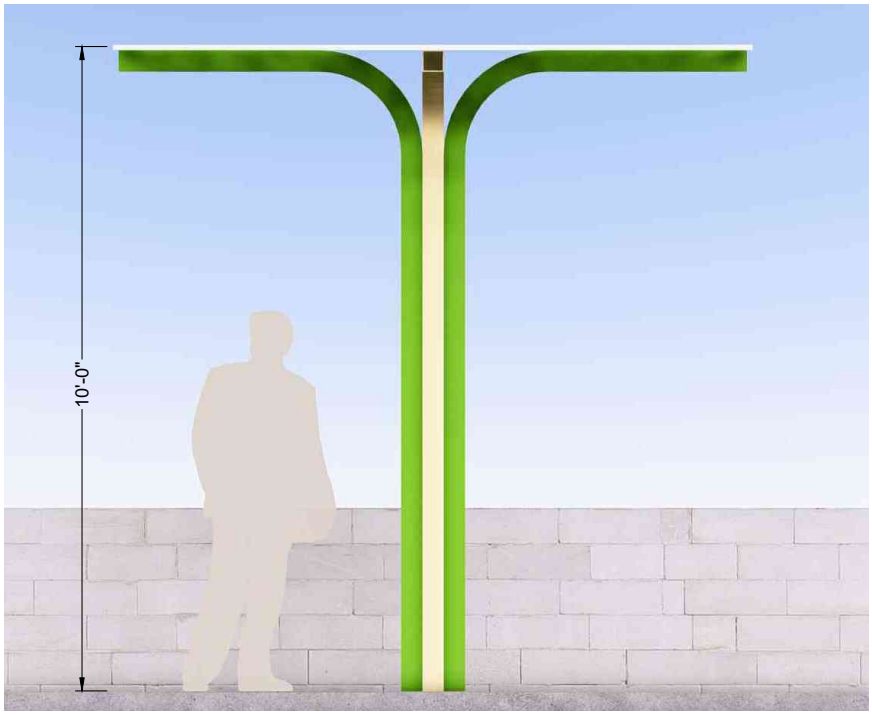


01 - Loads

Design Wind Pressure

For freestanding support, use Chapter 29.4 - Wind Load: Solid Freestanding Walls and Solid Freestanding Signs to determine the wind loads.

Cf factor for support member:

Force Coefficients, C_f

Cross Section	Type of Surface	h/D = 1	h/D = 7	h/D = 25
Square (wind normal to face)	All	1.3	1.4	2.0
Square (wind along diagonal)	All	1.0	1.1	1.5
Hexagonal or octagonal	All	1.0	1.2	1.4
Round, $D\sqrt{q_z} > 2.5$	Moderately smooth ($D'/D < 0.02$)	0.5	0.6	0.7
$D\sqrt{q_z} > 5.3$ (in SI)	Rough ($0.02 \le D'/D < 0.08$)	0.7	0.8	0.9
	Very rough ($D'/D = 0.08$)	0.8	1.0	1.2
Round, $D\sqrt{q_z} \le 2.5$	All	0.7	0.8	1.2
$D\sqrt{q_z} \le 5.3$ (in SI)				

For vertical post, similar with chimneys: Use Figure 29.4-1

The maximum structure height is 12.25', h/D = 12.25, where h is the height of the structure.

For square member (wind normal to face): $C_f := 1.58$

29.3 DESIGN WIND LOADS: SOLID FREESTANDING WALLS AND SOLID SIGNS

29.3.1 Solid Freestanding Walls and Solid Freestanding Signs The design wind force for solid freestanding walls and solid freestanding signs shall be determined by the following formula:

$$F = q_h K_d G C_f A_s \text{ (lb)} \qquad (29.3\text{-}1)$$

$$F = q_h K_d G C_f A_s \text{ (N)} \qquad (29.3\text{-}1.\text{SI})$$

where

q_h = Velocity pressure evaluated at height h (defined in Figure 29.3-1) as determined in accordance with Section 26.10;
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11;
C_f = Net force coefficient from Figure 29.3-1; and
A_s = Gross area of the solid freestanding wall or freestanding solid sign, ft^2 (m^2).

$q_z := 23.03 \ \frac{lbf}{ft^2}$

$K_d := 0.85$

$G := 0.85$

Design Wind Pressure on Vertical Member:

$F := q_z \cdot K_d \cdot G \cdot C_f = 26.29 \ \frac{lbf}{ft^2}$

For roof, use Chapter 30 - Wind Load: Components and Cladding to determine the roof wind loads. Consider the shade structure is open structure, use Section 30.5 and Figure 30.5-1.

30.5 BUILDING TYPES

The provisions of Section 30.5 are applicable to an open building of all heights that has a pitched free roof, monosloped free roof, or troughed free roof. The steps required for the determination of wind loads on C&C for these building types is shown in Table 30.5-1.

30.5.1 Conditions For the determination of the design wind pressures on C&Cs using the provisions of Section 30.5.2, the conditions indicated on the selected figure(s) shall be applicable to the building under consideration.

30.5.2 Design Wind Pressures The net design wind pressure for component and cladding elements of open buildings of all heights with monoslope, pitched, and troughed roofs shall be determined by the following equation:

$$p = q_h K_d G C_N \quad (30.5\text{-}1)$$

where

q_h = Velocity pressure evaluated at mean roof height h using the exposure as defined in Section 26.7.3 that results in the highest wind loads for any wind direction at the site; and
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11; and
C_N = Net pressure coefficient given in

- Figure 30.5-1 for monosloped roof,
- Figure 30.5-2 for pitched roof, and
- Figure 30.5-3 for troughed roof.

Net pressure coefficients, C_N, include contributions from top and bottom surfaces. All load cases shown for each roof angle shall be investigated. Plus and minus signs signify pressure acting toward and away from the top surface of the roof, respectively.

See Appendix B for Net Pressure Coefficient Calculation

For roof at slope 0°:

Minus signs: wind pressure acting away from the top roof surface:

$$C_{Naway} := -1.1$$

$$p_{away} := q_z \cdot K_d \cdot G \cdot C_{Naway} = -18.3 \ \frac{lbf}{ft^2}$$

Plus signs: wind pressure acting towards from the top roof surface:

$$C_{Ntowards} := 1.2$$

$$p_{towards} := q_z \cdot K_d \cdot G \cdot C_{Ntowards} = 19.97 \ \frac{lbf}{ft^2}$$

Use 20 psf for both direction.

Wind Load on LARSA:

For Vertical Post and Roof Member: $F = 26.29 \ \frac{lbf}{ft^2}$

For flat roof:
Wind pressure acting away from roof surface: $p_{away} := -20 \ \frac{lbf}{ft^2}$

Wind pressure acting towards roof surface: $p_{towards} := 20 \ \frac{lbf}{ft^2}$

Wind Load on Vertical Post and Roof Member - Applied in Horizontal:

Effective Width of Vertical Post: $b_{vp} := 12 \ in$

Vertical Post Wind Load: $W_{vp} := F \cdot b_{vp} = 0.0263 \ \frac{kip}{ft}$

Effective Width of Roof Member: $b_{rm} := 4 \ in$

Roof Member Wind Load: $W_{rm} := F \cdot b_{rm} = 0.0088 \ \frac{kip}{ft}$

Wind Load on Roof - Normal to the Roof:

Wind pressure acting away from roof surface: $p_{away} = -0.02 \ \frac{kip}{ft^2}$

Wind pressure acting towards roof surface: $p_{towards} = 0.02 \ \frac{kip}{ft^2}$

Seismic Loads:

Estimated Effective Weight
(Result from LARSA Model)

$W := 1.2641 \cdot kip$

Concrete Pot Weight

$W_P := 4.76\ kip$

Seismic Response Coefficient
(See Appendix C)

$C_s := 0.16$

Base Shear

$V_{base} := C_s \cdot W = 0.2\ kip$

$V_{baseP} := C_s \cdot W_P = 0.76\ kip$

Redundancy Factor

12.3.4.1 Conditions Where Value of ρ is 1.0

The value of ρ is permitted to equal 1.0 for the following:

1. Structures assigned to Seismic Design Category B or C.

$\rho := 1.0$

Horizontal Seismic Load Effect

12.4.2.1 Horizontal Seismic Load Effect

The horizontal seismic load effect, E_h, shall be determined in accordance with Eq. 12.4-3 as follows:

$$E_h = \rho Q_E \qquad (12.4\text{-}3)$$

$E_h := \rho \cdot V_{base} = 0.2\ kip$

$E_{hP} := \rho \cdot V_{baseP} = 0.76\ kip$

Vertical Seismic Load Effect

12.4.2.2 Vertical Seismic Load Effect

The vertical seismic load effect, E_v, shall be determined in accordance with Eq. 12.4-4 as follows:

$$E_v = 0.2 S_{DS} D \qquad (12.4\text{-}4)$$

$S_{DS} := 0.19 \cdot g$

$E_v := 0.2 \cdot \frac{S_{DS}}{g} \cdot W = 0.05\ kip$

$E_{vP} := 0.2 \cdot \frac{S_{DS}}{g} \cdot W_P = 0.18\ kip$

Direction of Loading

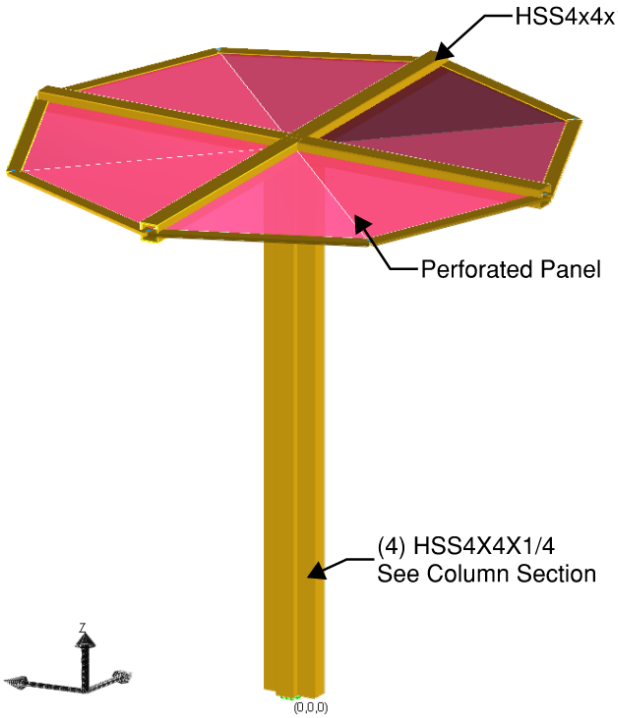
12.5.2 Seismic Design Category B. For structures assigned to Seismic Design Category B, the design seismic forces are permitted to be applied independently in each of two orthogonal directions, and orthogonal interaction effects are permitted to be neglected.

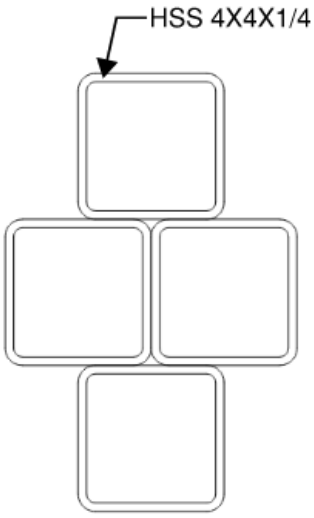
No orthogonal interaction is needed.

02 - Loads Application & Results

LARSA Model

Below is an orthographic view of the Blossom Shade Structure as modeled in LARSA, with the HSS and Plate members shown in yellow, and the shells used for the roof shown in red. The column is made up of 4 HSS members, also seen below.





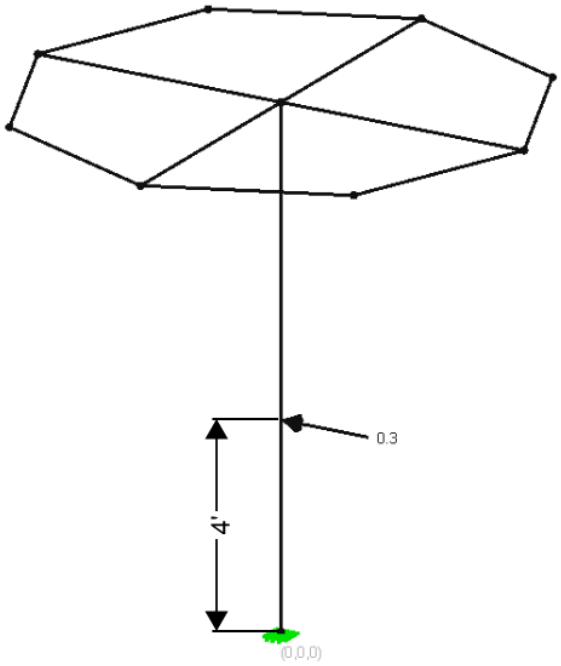
Column Section

Orthographic view of LARSA Model

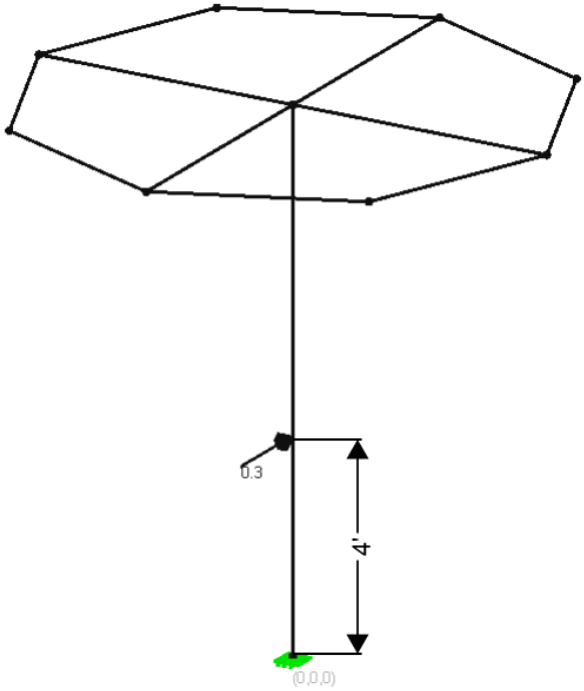
In the below simple rendering of the shade structure, the roof shell members are hidden for clarity. There is a 300 lb live load applied horizontally to the column 4ft above the ground. This load is applied seperately in the x and y axis. This is the Live Load Lean load case.

The Live Load Hang load case is also shown. This is a 300 lb load meant to simulate a person hanging from the rim of the structure. The load is distributed over a foot, and is applied seperately at three locations. First, it is applied on the rim of the roof at the end of the main roof HSS member that extends along the x axis. Then, it is applied in the same way at the end of the member extendind along the y axis. Lastly, it is applied at the midpoint along the rim between the main HSS roof supports.

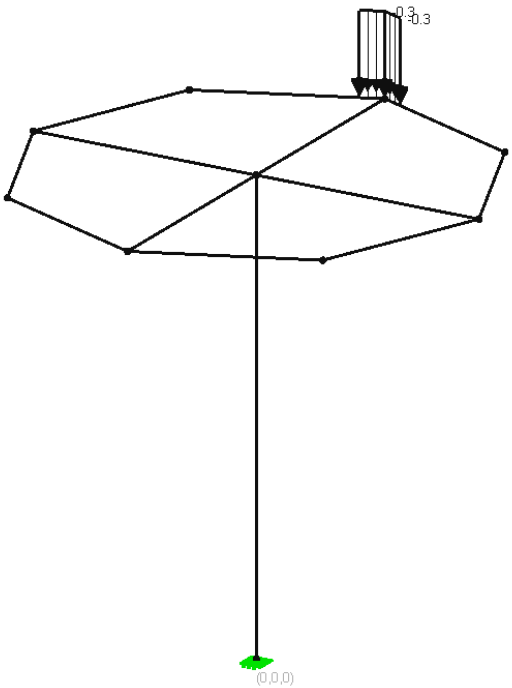
The Wind Loading is shown, with the horizontal and vertical loading shown separately for clarity, although the horizontal will be combined with downward and upward roof wind load as two different cases. The roof loading is applied as a distributed force on the shell members for the roof.



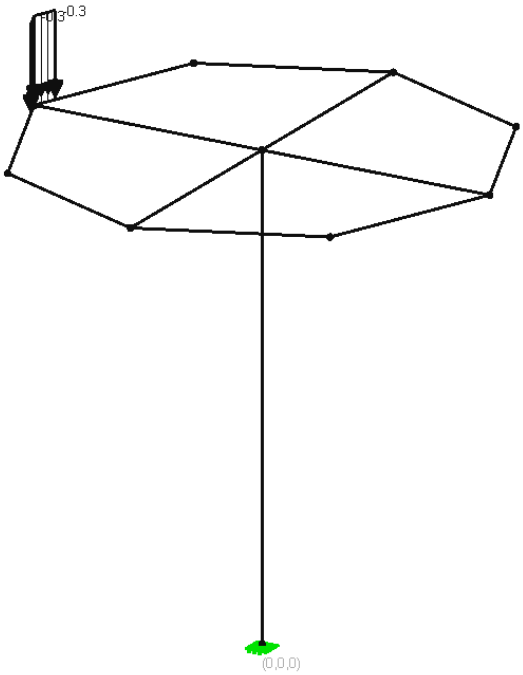
Live Load Lean in Y Direction



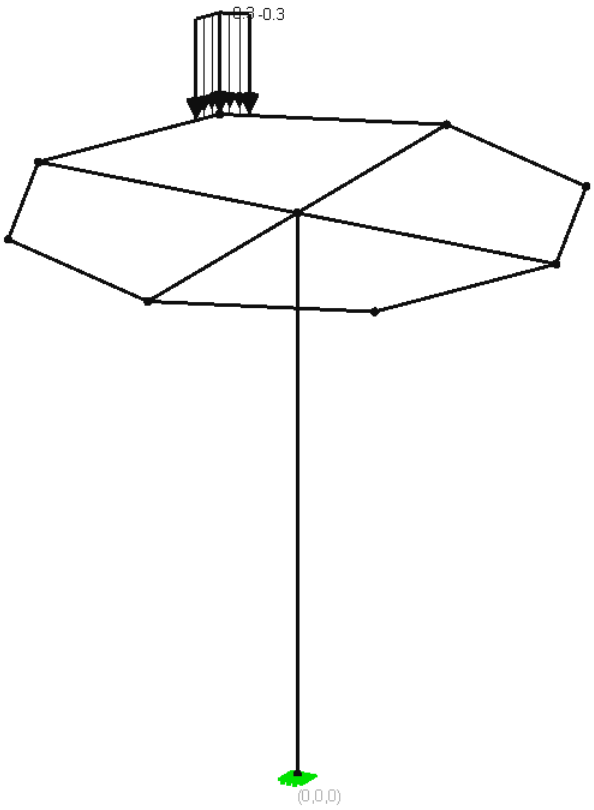
Live Load Lean in X Direction



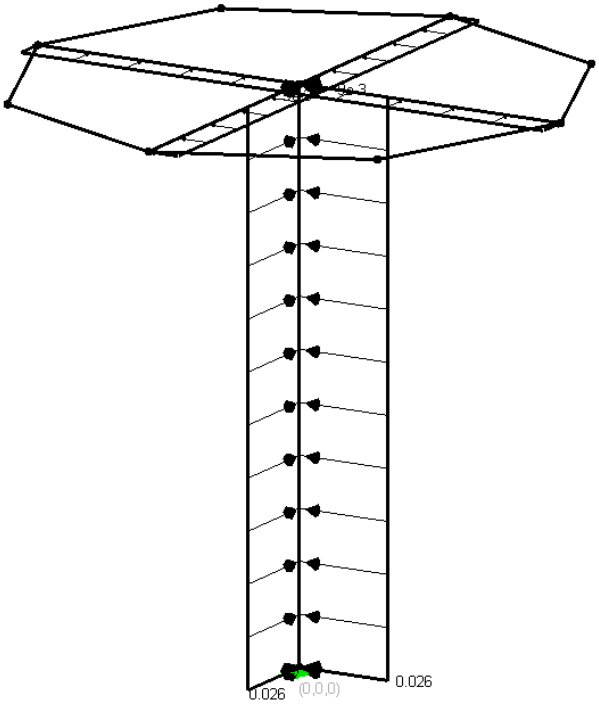
Live Load Hang on X axis Main Roof Member



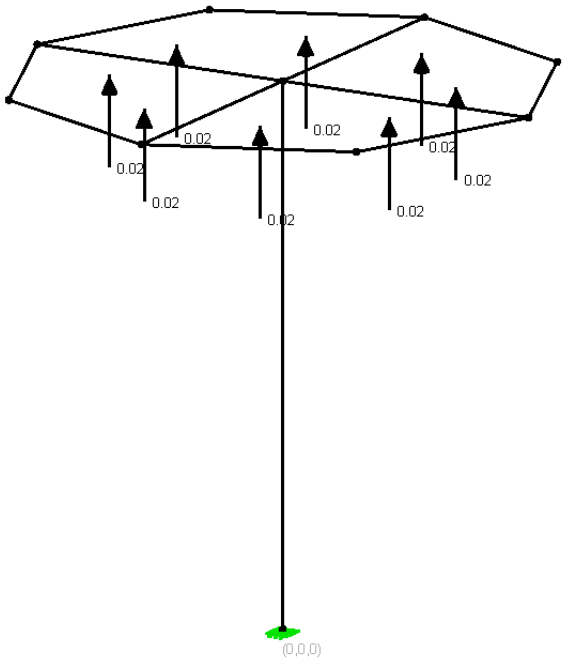
Live Load Hang on Y axis Main Roof Member



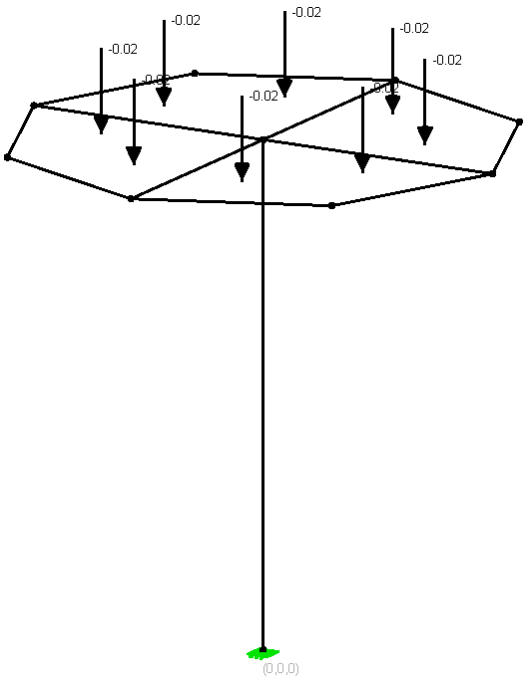
Live Load Hang Between Roof Members



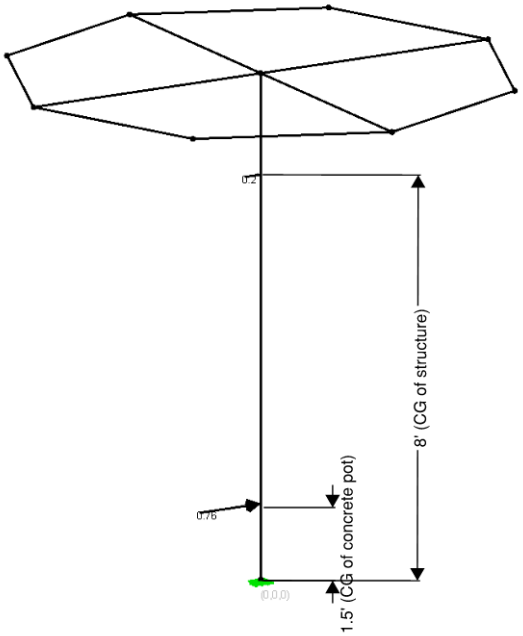
Horizontal Wind Load



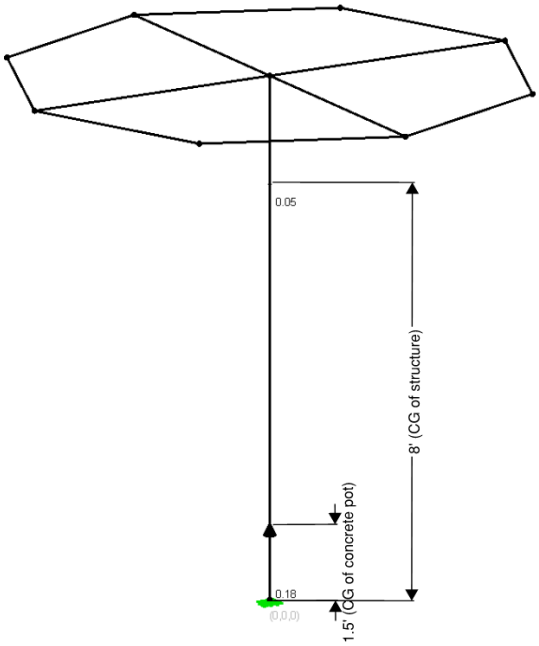
Roof Wind Load - Upwards



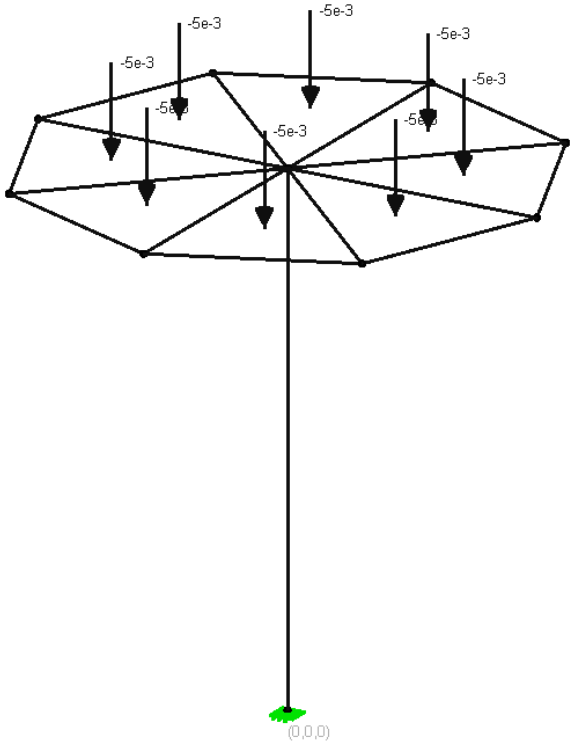
Roof Wind Load - Downwards



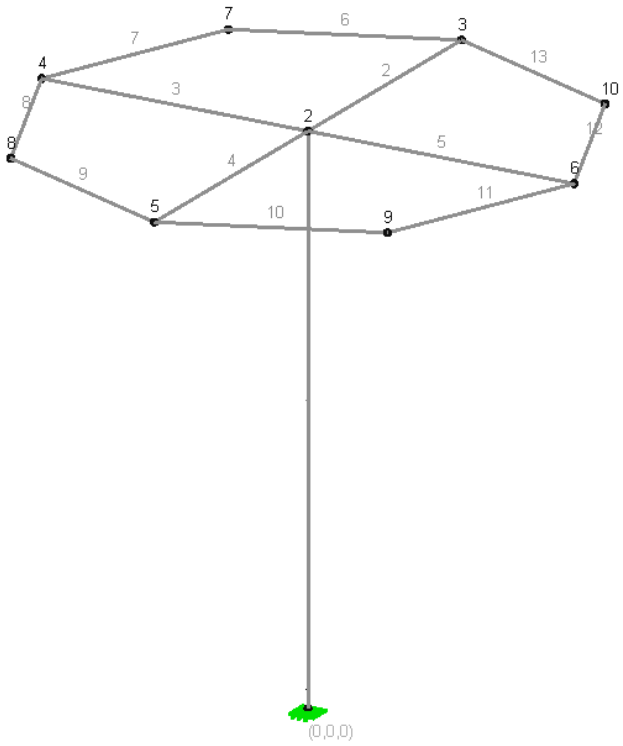
Horizontal Seismic Load
(Also Applied in +Y Direction)



Vertical Seismic Load
(Also loaded in downward direction)



Roof Live Load



Shade Structure with Beams & Joints numbered

Results:

Critical Resulted Forces are shown based on LARSA Analysis Result. To be conservative, the maximum values for each direction of moment & shear are taken, even if they do not occur simultaneously. The load cases listed are the load combinations, where the extreme effect of any load directionality is taken.

Column:	**Load Case**	
$M_y := 4.13\ kip \cdot ft$	LC-4	
$M_z := 4.13\ kip \cdot ft$	LC-4	
$V_y := 1.11\ kip$	LC-6	Base of column
$V_z := 1.11\ kip$	LC-6	Base of column
$P_{uMax} := 3.11\ kip$	LC-4	
$P_{uMin} := -0.28\ kip$	LC-5	
$\delta_{hC} := 0.05\ in$	LC-9	Horizontal deflection
Roof Beams - HSS 4x4x1/4		
$M_{yR} := 3.56\ kip \cdot ft$	LC-3b	
$M_{zR} := 0.04\ kip \cdot ft$	LC-4	
$V_{yR} := 0.03\ kip$	LC-5	
$V_{zR} := 0.79\ kip$	LC-3b	
$\delta_{vR} := -0.08\ in$	LC-9	Vertical deflection
Roof Rim Plates		
$M_{yRim} := 0.59\ kip \cdot ft$	LC-3b	
$M_{zRim} := 0.01\ kip \cdot ft$	LC-3b	
$V_{yRim} := 0.01\ kip$	LC-4	
$V_{zRim} := 0.31\ kip$	LC-3b	
$\delta_{vRim} := -0.28\ in$	LC-9	Vertical deflection

03 - HSS Member Flexure and Shear Design

AISC - F7 HSS Member Flexure Analysis

Member: ***HSS4X4 X1/4.*** A500 Gr. C

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 50 \cdot ksi$

Member Properties based on AISC Manual:

Width: $b := 4 \cdot in$

Design thickness: $t := 0.233 \cdot in$

b/t ratio: $bt := 14.2$

Plastic section modulus: $Z := 4.69 \cdot in^3$

Gross area: $A_g := 3.37 \cdot in^2$

Radius of gyration: $r := 1.52 \cdot in$

Torsional MOI: $J := 12.8 \cdot in^4$

a. Check if section is compact:

nts	17	Flanges of rectangular HSS	b/t	$1.12\sqrt{\frac{E}{F_y}}$	$1.40\sqrt{\frac{E}{F_y}}$	

Compact or noncompact limit (Table b4.1b): $\lambda_p := 1.12 \cdot \sqrt{\frac{E}{F_y}} = 26.97$

Compactness: $\text{if}\left(bt < \lambda_p, \text{“Compact”}, \text{“N.G”}\right) = \text{“Compact”}$

b. Check Yielding, Flange Local Buckling, and Web Local Buckling

For compact sections, the limit state of flange local buckling and web local buckling does not apply.

Yielding strength:

$M_n := F_y \cdot Z = 19.54 \ kip \cdot ft$

c. Check Lateral-Torsional Buckling

Unbraced Length $L_b := 10\ ft$

Plastic Moment $M_p := M_n = 19.54\ kip \cdot ft$

The limiting laterally unbraced length for the limit state of yielding:

$$L_p := 0.13 \cdot E \cdot r \cdot \frac{\sqrt{J \cdot A_g}}{M_p} = 13.37\ ft$$

$$\text{if}\left(L_b < L_p, \text{“LTB does not apply”}, \text{“N.G”}\right) = \text{“LTB does not apply”}$$

Flexural Demand: $M_y := 4.13\ kip \cdot ft$

$M_z := 4.13\ kip \cdot ft$

Flexural Demand per HSS Member: $M_{y4} := \frac{M_y}{4} = 1.03\ kip \cdot ft$

$M_{z4} := \frac{M_z}{4} = 1.03\ kip \cdot ft$

Flexural Demand for Roof HSS Member: $M_{yR} := 3.56\ kip \cdot ft$

$M_{zR} := 0.04\ kip \cdot ft$

Demand to Capacity Ratios $\phi := 0.9$

Roof: $\frac{M_{yR} + M_{zR}}{\phi \cdot M_n} = 0.2$

Column: $\frac{M_{y4} + M_{z4}}{\phi \cdot M_n} = 0.12$

AISC G4 - HSS Shear Analysis:

Member: ***HSS4X4X1/4*** A500 Gr.C

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 50 \cdot ksi$

Width: $b := 4 \cdot in$

Design thickness: $t := 0.233 \cdot in$

b/t ratio: $bt := 14.2$

Plastic section modulus: $Z := 4.69 \cdot in^3$

Gross area: $A_g := 3.37 \cdot in^2$

Radius of gyration: $r := 1.52 \cdot in$

Torsional MOI: $J := 12.8 \cdot in^4$

Shear Resistance

Width resisting shear force: $h := b - 3 \cdot t = 3.3\ in$

Area $A_w := 2 \cdot h \cdot t = 1.54\ in^2$

$\frac{h}{t} = 14.17$ $k_v := 5$

Web Shear Buckling Strength Coefficient $1.1 \sqrt{k_v \cdot \frac{E}{F_y}} = 59.24$

$C_{v2} := 1$

Nominal Shear Strength: $V_n := 0.6 \cdot F_y \cdot A_w \cdot C_{v2} = 46.15\ kip$

Column Shear Demand: $V_{yC} := 1.11\ kip$

$V_{zC} := 1.11\ kip$

Column Shear Demand of 1 Member:

$$V_{yC1} := \frac{V_{yC}}{4} = 0.28\ \textit{kip}$$

$$V_{zC1} := \frac{V_{zC}}{4} = 0.28\ \textit{kip}$$

Roof Member Shear Demand:

$$V_{zR} := 0.79\ \textit{kip}$$

$$V_{yR} := 0.03\ \textit{kip}$$

Shear Demand/Capacity Ratios:

$$\phi := 0.9$$

Roof: $\frac{V_{zR} + V_{yR}}{\phi \cdot V_n} = 0.02$

Column: $\frac{V_{yC1} + V_{zC1}}{\phi \cdot V_n} = 0.01$

04 - Roof Rim Design

Plate Flexure

The rim is considered as a rectangular bar, the flexure is checked based on AISC F11.1

Moment about local y (major) axis

Modulus of Elasticity: $E := 29000\ ksi$

Plate Yield Stress: $F_{yPlate} := 36\ ksi$

Plate width: $b_p := 3\ in$

Plate depth: $h_p := .625\ in$

Plate length of a quarter section: $L_b := \frac{(\pi \cdot 10\ ft)}{4} = 7.85\ ft$

Yielding limit requirement when bent about major axis:

$$\frac{L_b \cdot h_p}{b_p^{\ 2}} = 6.54$$

$$\frac{0.08 \cdot E}{F_{yPlate}} = 64.44$$

$$\text{if}\left(\frac{L_b \cdot h_p}{b_p^{\ 2}} \le \frac{0.08 \cdot E}{F_{yPlate}}, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$$

Plastic Section Modulus: $Z_P := \frac{b_p \cdot h_p^{\ 2}}{4} = 0.29\ in^3$

Section Modulus: $S_p := \frac{b_p \cdot h_p^{\ 2}}{6} = 0.2\ in^3$

Moment Capacity minimum of:

$M_{nP11} := 1.6 \cdot F_{yPlate} \cdot S_p = 0.94\ kip \cdot ft$

$M_{nP12} := F_{yPlate} \cdot Z_P = 0.88\ kip \cdot ft$

$M_{nP1} := min\left(M_{nP11}, M_{nP12}\right) = 0.88\ kip \cdot ft$

$\phi := 0.90$ $\quad \phi M_{nP1} := \phi \cdot M_{nP1} = 0.79\ kip \cdot ft$

Lateral torsional buckling limit state does not apply when yielding limit requirement is met

Moment Demand: $M_{yP} := 0.59\ kip \cdot ft$

Demand/Capacity Ratio: $DC_1 := \frac{M_{yP}}{\phi M_{nP1}} = 0.75$

Moment about local z (minor) axis

Modulus of Elasticity: $E := 29000\ ksi$

Plate Yield Stress: $F_{yPlate} := 36\ ksi$

Plate width: $b_{p2} := .625\ in$

Plate depth: $h_{p2} := 3\ in$

Plate length of a quarter section: $L_b := \frac{(\pi \cdot 10\ ft)}{4} = 7.85\ ft$

Yielding limit requirement not necessary when bent about minor axis

Plastic Section Modulus: $Z_{P2} := \frac{b_{p2} \cdot {h_{p2}}^2}{4} = 1.41\ in^3$

Section Modulus: $S_{p2} := \frac{b_{p2} \cdot {h_{p2}}^2}{6} = 0.94\ in^3$

Moment Capacity minimum of: $M_{nP12} := 1.6 \cdot F_{yPlate} \cdot S_{p2} = 4.5\ kip \cdot ft$

$M_{nP22} := F_{yPlate} \cdot Z_{P2} = 4.22\ kip \cdot ft$

$M_{nP2} := min\left(M_{nP12}, M_{nP22}\right) = 4.22\ kip \cdot ft$

$\phi := 0.90$ $\phi M_{nP2} := \phi \cdot M_{nP2} = 3.8\ kip \cdot ft$

Lateral torsional buckling need not be considered for bars bend about their minor axis

Moment Demand: $M_{zP2} := 0.01\ kip \cdot ft$

Demand/Capacity Ratio: $DC_2 := \frac{M_{zP2}}{\phi M_{nP2}} = 2.63 \cdot 10^{-3}$

Total Demand/Capacity Ratio: $DC := DC_1 + DC_2 = 0.75$

05 - Deflection Check

Deflection

Cantilever Arm $I := 5\ ft$

Max Allowable: $\delta_{max} := \frac{I}{150} = 0.4\ in$

Deflection in outer rim per LARSA Service Combinations $\delta := 0.28\ in$

Ratio: $\frac{\delta}{\delta_{max}} = 0.7$

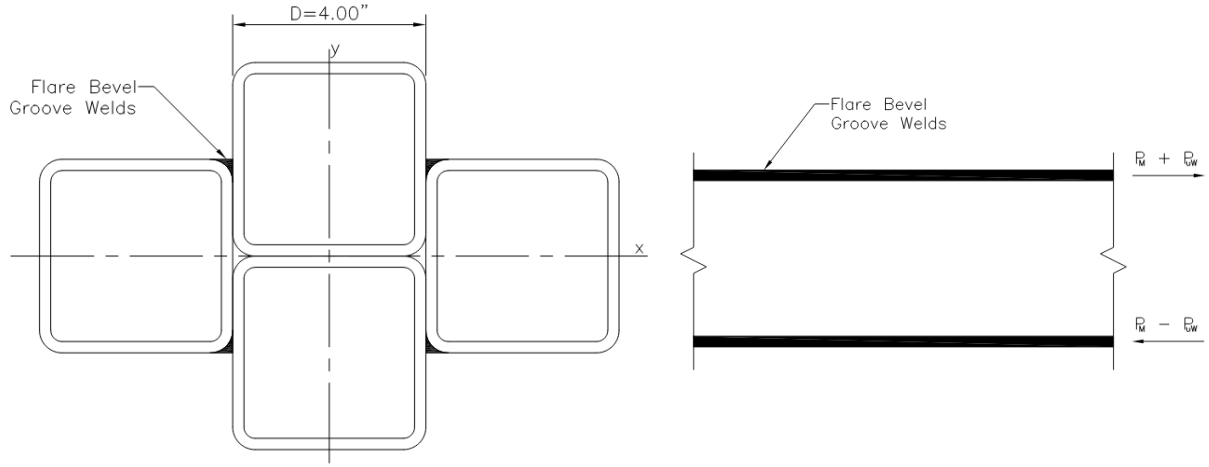
06 - Weld & Bolt Design

HSS Welding

Design Code: ASIC Manual 15th & AWS D1.1

Vertical HSS 4x4x1/4

The 4 vertical HSS members are welded together using 4 flare bevel groove welds to create the column.



HSS Width: $D := 4\ in$

HSS Design Thickness: $t := 0.233 \cdot in$

HSS Inside Dimension: $d_v := D - 2 \cdot t = 3.53\ in$

HSS Corner Radius: $R := 2 \cdot t = 0.47\ in$

Weld Data:

Specified minimum yield strength: $F_y := 50 \cdot ksi$

Filler metal classification strength: $F_{EXX} := 70 \cdot ksi$

Effective throat of weld per AISC Table J2.2: $t_w := R \cdot \frac{5}{16} = 0.146\ in$

Minimum effective throat per AISC Table J2.3: $t_{wmin} := \frac{3}{16}\ in = 0.19\ in$

Effective throat size is ok

TABLE J2.2 Effective Throat of Flare Groove Welds		
Welding Process	**Flare Bevel Groove[a]**	**Flare V-Groove**
GMAW and FCAW-G	$^5/_8R$	$^3/_4R$
SMAW and FCAW-S	$^5/_{16}R$	$^5/_8R$
SAW	$^5/_{16}R$	$^1/_2R$

[a] For flare bevel groove with $R < {}^3/_8$ in. (10 mm), use only reinforcing fillet weld on filled flush joint.
General note: R = radius of joint surface (is permitted to be $2t$ for HSS), in. (mm)

Welding

Flare-bevel welds made with E70XX electrodes.

Weld strength per in:
(AISC J2-4)

$$\phi R_n := 0.75 \cdot 0.6 \cdot F_{EXX} \cdot t_w = 4.59 \ \frac{kip}{in}$$

LARSA Results

Max. axial force at bottom of column - LC-4

$P_u := 3.11 \cdot kip$

Shear negligible for column welding

Max moment at bottom of column - LC-4
Combined in both directions

$M_u := 5.84 \ kip \cdot ft$

No Torsion Present in column

Required Weld Strength Vertical Members

Axial

Axial Force per weld:

$$P_{uW} := \frac{P_u}{4} = 0.78 \ kip$$

Moment

Axial Force from Moment Couple:

$$P_{uC} := \frac{M_u}{D} = 17.52 \ kip$$

$$P_{uCW} := \frac{P_{uC}}{2} = 8.76 \ kip$$

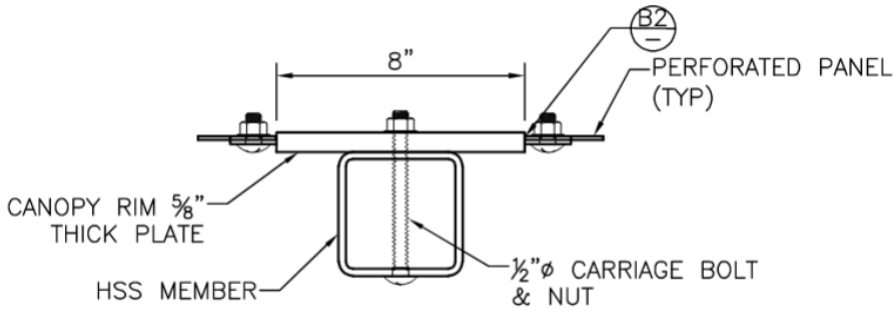
Total Axial Force per Weld: $P_{TW} := P_{uW} + P_{uCW} = 9.54\ kip$

Per inch of weld:
(Assuming 7ft before bend in column members begins): $P_{uInch} := \frac{P_{TW}}{7\ ft} = 0.11\ \frac{kip}{in}$

Demand to capacity ratio: $\frac{P_{uInch}}{\phi R_n} = 0.025$

Roof HSS Bolted to Roof Plate

The canopy rim is bolted to the roof HSS member, to allow different powder coat colors on each piece. Zinc yellow-chromate grade 8 bolts are used, with a tensile strength of 150 ksi. 1/2" diameter bolts are used.



Diameter of Bolt: $D_{Bolt} := \frac{1}{2}\ in$

Area of Bolt: $A_{Bolt} := \pi \cdot \left(\frac{D_{Bolt}}{2}\right)^2 = 0.2\ in^2$

Bolt tensile strength: $f_{Bolt} := 150\ ksi$

$\phi := 0.75$

Bolt capacity:

$B := \phi \cdot A_{Bolt} \cdot f_{Bolt} = 22.09\ kip$

Wind Uplift

Area of roof: $A_R := \pi \cdot (5\ ft)^2 = 78.54\ ft^2$

Wind uplift pressure: $w_p := 32\ psf$

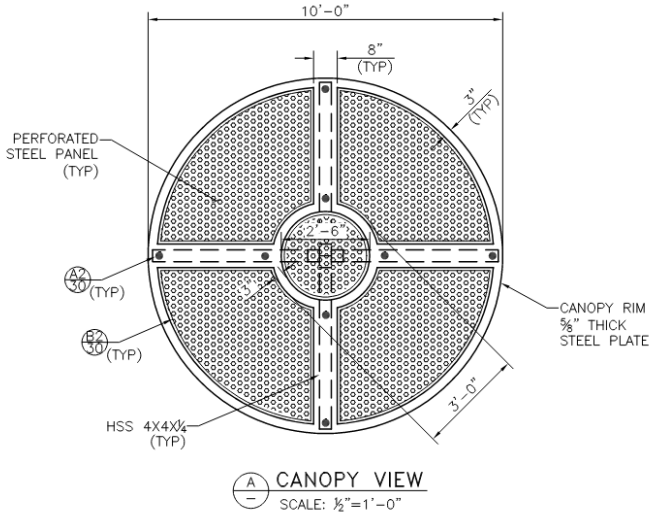
Total wind uplift force: $W := A_R \cdot w_p = 2.51\ kip$

Number of bolts used: $N_B := 8$

Total bolt capacity: $B_T := B \cdot N_B = 176.71\ \textit{kip}$

Capacity/Demand: $FS := \frac{B_T}{W} = 70.31$

Eight bolts are used for symmetry and safety, as shown below.



See Cactus Blossom Variegated Calculations for Further Details

07 - Drilled Shaft Design

Shaft Length Calculation:

The shaft length is determined based on the Section 13.6.1 from "LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals".

Per the project location, assuming the foundation is sand as cohesionless soils. The properties of the soil are estimated per engineering adjustment for lacking of Geotech information.

Angle of internal friction: $\phi := 30°$

Effective unit weight of soil: $\gamma := 0.11$ k/ft^3

Max Moment at groundline: Stability 5: D+0.5(L+Lr)+Wa

$M_x := 3.53$ k-ft $M_y := 3.53$ k-ft $M := \sqrt{M_x^2 + M_y^2} = 4.99$

Max Shear at groundline: Stability 6: D+0.7(Ev+Eh)

$V_y := 0.67$ k-ft $V_z := 0.67$ k-ft $V := \sqrt{V_y^2 + V_z^2} = 0.95$

Diameter of shaft: $D := 2$ ft

Overload Factor: $w := \frac{3}{0.7} = 4.29$

Factored Shear: $V_F := w \cdot V = 4.06$ kip

Factored Moment: $M_F := w \cdot M = 21.4$ k-ft

Broms' Equation for Cohesionless Soil:

$$K_p := \left(\tan\left(45° + \frac{\phi}{2}\right)\right)^2 = 3$$

$$L^3 = \frac{2 \cdot V_F \cdot L}{K_p \cdot \gamma \cdot D} + \frac{2 \cdot M_F}{K_p \cdot \gamma \cdot D} \xrightarrow[assume, L = real]{solve, float, 3} 5.02 \quad \text{Use: } L := 5.5\ ft$$

Maximum moment in the shaft: $M_u := V_F \cdot \left(\frac{M_F}{V_F} + 0.54 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}}\right) = 26.83$ k-ft

Maximum moment is located at (below groundline):

$$0.82 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}} = 2.03 \quad \text{ft}$$

Loading for Shaft Reinforcement Design:

Shear at groundline from LARSA Strength LC-6:

$V_{yG} := 1.11\ kip$ $V_{zG} := 1.11\ kip$ $V_{uG} := \sqrt{V_{yG}^2 + V_{zG}^2} = 1.57\ kip$

Moment at groundline from LARSA Strength LC-4:

$M_{yG} := 4.13\ kip \cdot ft$ $M_{zG} := 4.13\ kip \cdot ft$ $M_{uG} := \sqrt{M_{yG}^2 + M_{zG}^2} = 5.84\ ft \cdot kip$

Shear from Moment couple: $V_{MC} := \frac{M_{uG}}{L} = 1.06\ kip$

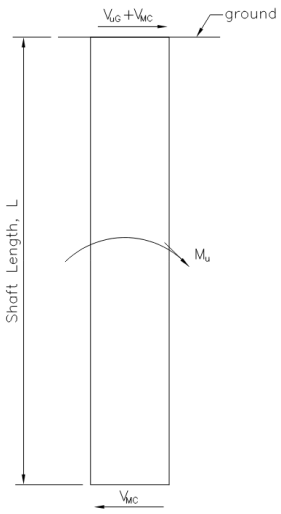
Total Shear for shaft design: $V_{uT} := V_{uG} + V_{MC} = 2.63\ kip$

Total Moment for shaft design: $M_u := M_u \cdot 1\ kip \cdot ft = 26.83\ kip \cdot ft$

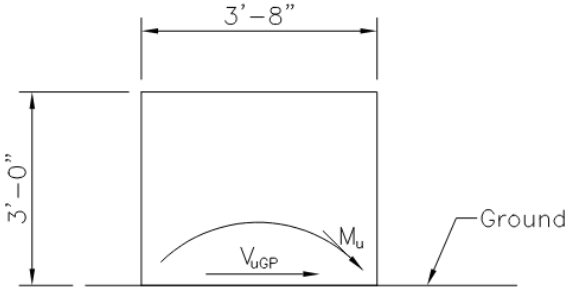
Axial Force for shaft design, from LARSA Strength:

$P_{uMax} := 3.11\ kip$ LC-4

$P_{uMin} := -0.28\ kip$ LC-5



Drilled Shaft Diagram



Pot Diagram

Loading for Pot Reinforcement Design:

Shear at groundline from LARSA Strength: $V_{uGP} := V_{uG} = 1.57\ kip$ LC-6

Moment at groundline from LARSA Strength: $M_{uGP} := M_{uG} = 5.84\ kip \cdot ft$ LC-4

Weight of Pot: (Overturn Calculation) $P_{Pot} := 4.76\ kip$

The weight of the pot is added to the axial load with a 1.2 factor in line with the controlling load case.

Axial Force for shaft design, from LARSA Strength, with pot: $P_{uMaxPot} := P_{uMax} + 1.2 \cdot P_{Pot} = 8.82\ kip$ LC-4

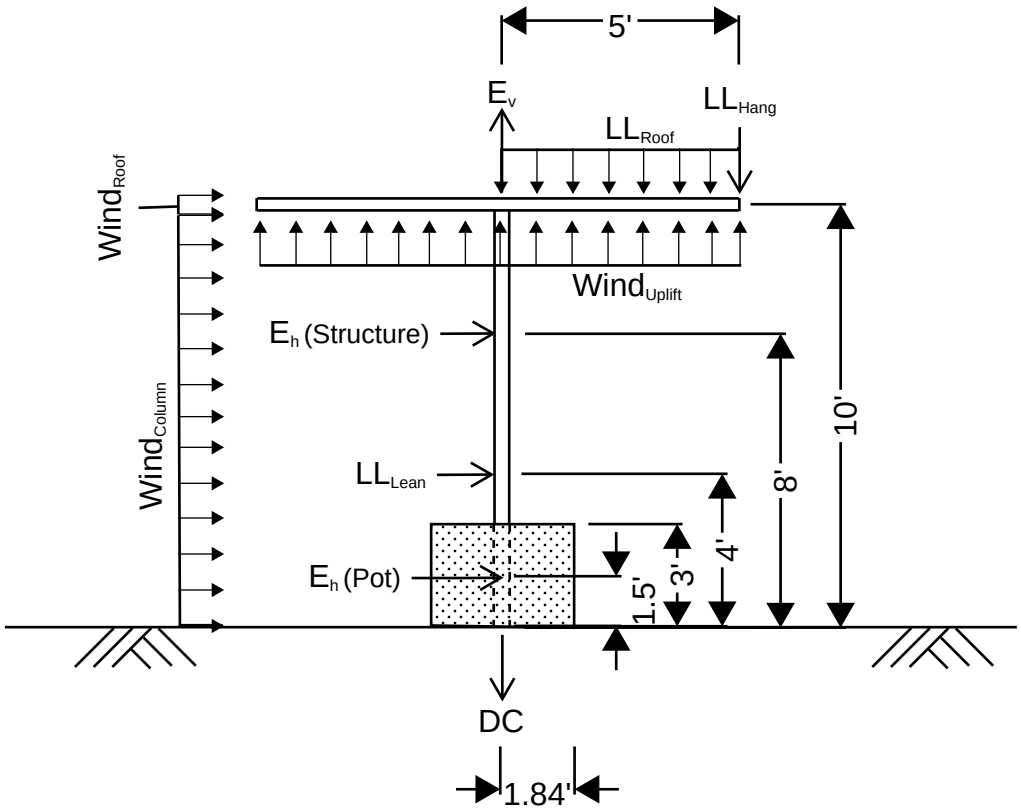
$P_{uMinPot} := P_{uMin} + 1.2 \cdot P_{Pot} = 5.43\ kip$ LC-5

See Appendix D for drilled shaft and pot reinforcement design

08 - Concrete Pot Stability Check

INTRODUCTION:

The potted option must be checked for overturning and sliding. The weight of the concrete pot and the steel structure will provide a moment about the bottom outer edge of the pot that will resist overturn moment due to applied wind, seismic and live loads. Friction forces between concrete pot and grade will resist sliding (assume $\mu = 0.2$). The resisting forces shall provide a minimum factor of safety of 1.5 for the load combinations specified in design criteria. All the loads applied on the structure are shown in the sketch below.



Load Application - Stability Check

Resistance:

Resistance from Pot:

Top Diameter: $D_T := 3.67\ ft$

Bottom Diameter: $D_B := 3.67\ ft$

Average Diameter: $D_P := \frac{(D_T + D_B)}{2} = 3.67\ ft$

Height of pot: $H_P := 3\ ft$

Volume of pot: $V_P := H_P \cdot \pi \cdot \left(\frac{D_P}{2}\right)^2 = 31.74\ ft^3$

Density: $\rho_{Conc} := 0.15\ \frac{kip}{ft^3}$

Total Weight $P_P := V_P \cdot \rho_{Conc} = 4.76\ kip$

Moment Arm to resist overturn: $L_{Pb} := \frac{D_B}{2} = 1.84\ ft$

Moment to resist overturn: $M_{ORP} := P_P \cdot L_{Pb} = 8.74\ kip \cdot ft$

Resistance from Shade Structure:

DC Axial Force (Weight): $P_{Shade} := 1.225\ kip$

Moment Resistance: $M_{Shade} := P_{Shade} \cdot L_{Pb} = 2.25\ kip \cdot ft$

Total Overturn Resistance: $M_{OR} := M_{ORP} + M_{Shade} = 10.98\ kip \cdot ft$

Overturn Moment from Loading:

Geometry:

Radius Roof: $R_R := 5\ ft$

Area of Roof: $A_R := \pi \cdot (R_R)^2 = 78.54\ ft^2$

Depth of Roof: $D_{Roof} := 0.33\ ft$

Vertical Member Height $H_{Vert} := 10\ ft$

% Perforation on Roof: $A_P := 41$

Live Load:

Leaning Force: $F_{Lean} := 300\ lbf$

Leaning Force Moment Arm: $L_{Lean} := 4\ ft$

Leaning Moment: $M_{Lean} := F_{Lean} \cdot L_{Lean} = 1.2\ kip \cdot ft$

Roof Live Load:

Hanging Load:

Hanging Force: $F_{Hang} := 300\ lbf$

Hanging Moment Arm: $L_{Hang} := R_R - L_{Pb} = 3.17\ ft$

Hanging Moment: $M_{Hang} := F_{Hang} \cdot L_{Hang} = 0.95\ kip \cdot ft$

Distributed Load:

Roof Distributed Loading: $p_{Roof} := 5\ psf$

Total Force Acting on half of roof: $F_{Roof} := p_{Roof} \cdot \frac{A_R}{2} = 196.35\ lbf$

Roof Moment Arm: $L_{Roof} := \frac{R_R}{2} - L_{Pb} = 0.67\ ft$

Moment: $M_{Roof} := F_{Roof} \cdot L_{Roof} = 0.13\ kip \cdot ft$

Wind Loads:

Wind Pressure Uplift: $P_z := 20\ psf$

Effective Wind Pressure Uplift: $P_{zu} := P_z \cdot \left(1 - \frac{A_P}{100}\right) = 11.8\ psf$

Wind Pressure on Column: $F := 26.29\ psf$

Horizontal Wind Load on Column:

Width of Column: $w := 12\ in$

Horizontal Force on Vertical Member: $F_{WH} := F \cdot w \cdot H_{Vert} = 0.26\ kip$

Horizontal Force Moment Arm: $L_{WH} := \frac{H_{Vert}}{2} = 5\ ft$

Horizontal Wind Moment: $M_{WH} := F_{WH} \cdot L_{WH} = 1.31\ kip \cdot ft$

Horizontal Wind Load on Roof:

Depth of Roof: $d := 4\ in$

Horizontal Force on Roof: $F_{WR} := F \cdot d \cdot 10\ ft = 87.63\ lbf$

Horizontal Force Moment Arm: $L_{WR} := H_{Vert} = 10\ ft$

Moment: $M_{WR} := F_{WR} \cdot L_{WR} = 0.88\ ft \cdot kip$

Vertical Wind Load:

Vertical Force on roof: $F_{WV} := P_{zu} \cdot A_R = 0.93\ kip$

Vertical Force Moment Arm: $L_{WV} := L_{Pb} = 1.84\ ft$

Vertical Wind Moment: $M_{WV} := F_{WV} \cdot L_{WV} = 1.7\ kip \cdot ft$

Seismic Loads:

Seismic Response Coefficient: $C_S := 0.16$

Redundancy Factor: $\rho := 1$

Horizontal Seismic Loads:

Horizontal Load on Steel Structure: $E_{hs} := \rho \cdot C_S \cdot P_{Shade} = 196\ lbf$

Moment Arm for E_{hs} (C.G. of steel structure) : $L_{Ehs} := 8\ ft$

Horizontal Load on Pot: $E_{hp} := \rho \cdot C_S \cdot P_P = 761.65\ lbf$

Moment Arm for E_{hp}: $L_{Ehp} := \frac{H_P}{2} = 1.5\ ft$

Moment due to E_{hs}: $M_{Ehs} := L_{Ehs} \cdot E_{hs} = 1.57\ ft \cdot kip$

Moment due to E_{hp}: $M_{Ehp} := L_{Ehp} \cdot E_{hp} = 1.14\ ft \cdot kip$

Vertical Seismic Loads:

Short Period Response Acceleration Paramater: $S_{DS} := 0.2\ g$

Vertical Load: $E_v := 0.2 \cdot \frac{S_{DS}}{g} \cdot \left(P_{Shade} + P_P\right) = 239.41\ lbf$

Moment Arm of E_v: $L_{Ev} := L_{Pb} = 1.84\ ft$

Moment due to E_v: $M_{Ev} := E_v \cdot L_{Ev} = 0.44\ ft \cdot kip$

STABILITY CHECK

Load	Description	kips	Arm (ft)	Moment (k-ft)
D	DC (Structure)	1.23	1.84	2.25
D	DC (Pot)	4.76	1.84	8.74
L	LL (Lean)	0.30	4.00	1.20
Lr	LL (Hang)	0.30	3.17	0.95
Lr	LL (Roof)	0.20	0.67	0.13
W_h	Wind (Column)	0.26	5.00	1.31
W_h	Wind (Roof)	0.09	10.00	0.88
W_v	Wind (Uplift)	0.93	1.84	1.70
E_h	Seismic (Struc.)	0.20	8.00	1.57
E_h	Seismic (Pot)	0.76	1.50	1.14
E_v	Seismic (Total)	0.24	1.84	0.44

F.O.S = Resisting Moment/ Overturning Moment

For Overturning:
Resisting Moment: Dead Load
Overturning Moment: Live Load/Wind Load/Seismic Load

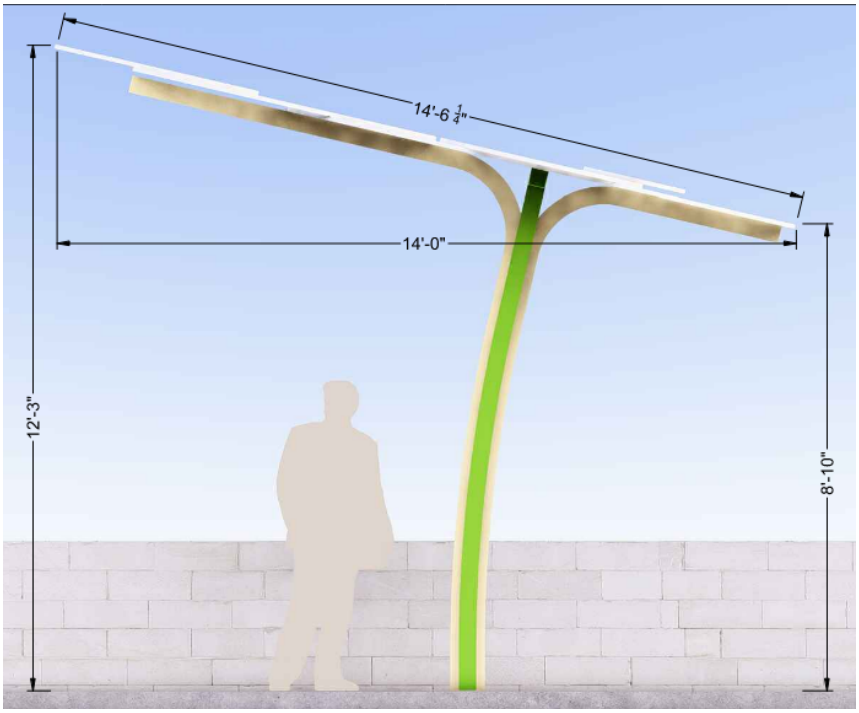
For Sliding:
Resisting Force: (Vertical Reaction) * 0.2
Sliding Force: Horizontal Forces

Overturning Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment
D	DC (Structure)	1.0	2.25	1.0	2.25	1.0	2.25	1.0	2.25	1.0	2.25	1.0	2.25
D	DC (Pot)	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74
L	LL (Lean)	0.0	0.00	1.0	1.20	0.0	0.00	0.75	0.90	0.5	0.60	0.0	0.00
Lr	LL (Hang)	0.0	0.00	0.0	0.00	1.0	0.95	0.75	0.71	0.5	0.47	0.0	0.00
Lr	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.13	0.75	0.10	0.5	0.07	0.0	0.00
W_h	Wind (Column)	1.0	1.31	0.0	0.00	0.0	0.00	0.0	0.00	1.0	1.31	0.0	0.00
W_h	Wind (Roof)	1.0	0.88	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.88	0.0	0.00
W_v	Wind (Uplift)	1.0	1.70	0.0	0.00	0.0	0.00	0.0	0.00	1.0	1.70	0.0	0.00
E_h	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	1.10
E_h	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.80
E_v	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.31
		Resistance	10.98	Resistance	10.98	Resistance	10.98	Resistance	10.98	Resistance	10.98	Resistance	10.98
		Demand	3.89	Demand	1.20	Demand	1.08	Demand	1.71	Demand	5.03	Demand	2.21
		FOS	2.82	FOS	9.15	FOS	10.17	FOS	6.42	FOS	2.18	FOS	4.98
			OK		OK		OK		OK		OK		OK

Sliding Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force
D ↓	DC (Structure)	1.0	1.23	1.0	1.23	1.0	1.23	1.0	1.23	1.0	1.23	1.0	1.23
D ↓	DC (Pot)	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76
L →	LL (Lean)	0.0	0.00	1.0	0.30	0.0	0.00	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Hang)	0.0	0.00	0.0	0.00	1.0	0.30	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.20	0.75	0.15	0.5	0.10	0.0	0.00
W_h →	Wind (Column)	1.0	0.26	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.26	0.0	0.00
W_h →	Wind (Roof)	1.0	0.09	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.09	0.0	0.00
W_v ↑	Wind (Uplift)	1.0	0.93	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.93	0.0	0.00
E_h →	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.14
E_h →	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.53
E_v ↑	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.17
		Resistance	1.01	Resistance	1.20	Resistance	1.30	Resistance	1.27	Resistance	1.06	Resistance	1.16
		Demand	0.35	Demand	0.30	Demand	0.00	Demand	0.23	Demand	0.50	Demand	0.67
		FOS	2.89	FOS	3.99	FOS	-	FOS	5.65	FOS	2.12	FOS	1.73
			OK		OK		OK		OK		OK		OK

BLOSSOM VARIEGATED DESIGN

Table of Contents



01 - Loads

Design Wind Pressure

For freestanding support, use Chapter 29.4 - Wind Load: Solid Freestanding Walls and Solid Freestanding Signs to determine the wind loads.

Cf factor for support member:

Force Coefficients, C_f

Cross Section	Type of Surface	h/D = 1	h/D = 7	h/D = 25
Square (wind normal to face)	All	1.3	1.4	2.0
Square (wind along diagonal)	All	1.0	1.1	1.5
Hexagonal or octagonal	All	1.0	1.2	1.4
Round, $D\sqrt{q_z} > 2.5$	Moderately smooth ($D'/D < 0.02$)	0.5	0.6	0.7
$D\sqrt{q_z} > 5.3$ (in SI)	Rough ($0.02 \le D'/D < 0.08$)	0.7	0.8	0.9
	Very rough ($D'/D = 0.08$)	0.8	1.0	1.2
Round, $D\sqrt{q_z} \le 2.5$	All	0.7	0.8	1.2
$D\sqrt{q_z} \le 5.3$ (in SI)				

For vertical post, similar with chimneys: Use Figure 29.4-1

The maximum structure height, h $h := 12.25\ ft$

Least horizontal dimension, D $D := 10\ in$

$$\frac{h}{D} = 14.7$$

For square member (wind normal to face): $C_f := 1.66$

29.3 DESIGN WIND LOADS: SOLID FREESTANDING WALLS AND SOLID SIGNS

29.3.1 Solid Freestanding Walls and Solid Freestanding Signs The design wind force for solid freestanding walls and solid freestanding signs shall be determined by the following formula:

$$F = q_h K_d G C_f A_s \text{ (lb)} \qquad (29.3\text{-}1)$$

$$F = q_h K_d G C_f A_s \text{ (N)} \qquad (29.3\text{-}1.\text{SI})$$

where

q_h = Velocity pressure evaluated at height h (defined in Figure 29.3-1) as determined in accordance with Section 26.10;
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11;
C_f = Net force coefficient from Figure 29.3-1; and
A_s = Gross area of the solid freestanding wall or freestanding solid sign, ft^2 (m^2).

$q_z := 23.03\ \frac{lbf}{ft^2}$

$K_d := 0.85$

$G := 0.85$

Design Wind Pressure on Vertical Member:

$$F := q_z \cdot K_d \cdot G \cdot C_f = 27.62\ \frac{lbf}{ft^2}$$

For roof, use Chapter 30 - Wind Load: Components and Cladding to determine the roof wind loads. Consider the shade structure is open structure, use Section 30.5 and Figure 30.5-1.

30.5 BUILDING TYPES

The provisions of Section 30.5 are applicable to an open building of all heights that has a pitched free roof, monosloped free roof, or troughed free roof. The steps required for the determination of wind loads on C&C for these building types is shown in Table 30.5-1.

30.5.1 Conditions For the determination of the design wind pressures on C&Cs using the provisions of Section 30.5.2, the conditions indicated on the selected figure(s) shall be applicable to the building under consideration.

30.5.2 Design Wind Pressures The net design wind pressure for component and cladding elements of open buildings of all heights with monoslope, pitched, and troughed roofs shall be determined by the following equation:

$$p = q_h K_d G C_N \quad (30.5\text{-}1)$$

where

q_h = Velocity pressure evaluated at mean roof height h using the exposure as defined in Section 26.7.3 that results in the highest wind loads for any wind direction at the site; and
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11; and
C_N = Net pressure coefficient given in

- Figure 30.5-1 for monosloped roof,
- Figure 30.5-2 for pitched roof, and
- Figure 30.5-3 for troughed roof.

Net pressure coefficients, C_N, include contributions from top and bottom surfaces. All load cases shown for each roof angle shall be investigated. Plus and minus signs signify pressure acting toward and away from the top surface of the roof, respectively.

See Appendix B for Net Pressure Coefficient Calculation

For roof at slope 15°:

Minus signs: wind pressure acting away from the top roof surface:

$$C_{Naway} := -1.9$$

$$p_{away} := q_z \cdot K_d \cdot G \cdot C_{Naway} = -31.61 \ \frac{lbf}{ft^2}$$

Plus signs: wind pressure acting towards from the top roof surface:

$$C_{Ntowards} := 1.8$$

$$p_{towards} := q_z \cdot K_d \cdot G \cdot C_{Ntowards} = 29.95 \ \frac{lbf}{ft^2}$$

Use 32 psf for both direction.

Wind Load in LARSA:

For Vertical Post and Roof Member: $F = 27.62 \ \frac{lbf}{ft^2}$

Wind Load on vertical post and roof member - Applied in horizontal

Effective Width of Vertical Post: $b_{vp} := 15 \ in$

Vertical Post wind load: $WS_{vp} := F \cdot b_{vp} = 0.0345 \ \frac{kip}{ft}$

Effective Width of Roof Member: $b_{rm} := 5 \ in$

Roof Member wind load: $WS_{rm} := F \cdot b_{rm} = 0.0115 \ \frac{kip}{ft}$

Wind Load on Roof - Normal to the Roof:

Wind pressure acting away from roof surface: $p_{away} := -32 \ \frac{lbf}{ft^2}$

Wind pressure acting towards roof surface: $p_{towards} := 32 \ \frac{lbf}{ft^2}$

Seismic Loads:

Estimated Effective Weight
(Result from LARSA Model)

$W := 2.5521 \cdot kip$

Seismic Response Coefficient
(Appendix C)

$C_s := 0.16$

Base Shear

$V_{base} := C_s \cdot W = 0.41\ kip$

Redundancy Factor

12.3.4.1 Conditions Where Value of ρ is 1.0
The value of ρ is permitted to equal 1.0 for the following:

1. Structures assigned to Seismic Design Category B or C.

$\rho := 1.0$

Horizontal Seismic Load Effect

12.4.2.1 Horizontal Seismic Load Effect
The horizontal seismic load effect, E_h, shall be determined in accordance with Eq. 12.4-3 as follows:

$$E_h = \rho Q_E \qquad (12.4\text{-}3)$$

$E_h := \rho \cdot V_{base} = 0.41\ kip$

Vertical Seismic Load Effect

12.4.2.2 Vertical Seismic Load Effect
The vertical seismic load effect, E_v, shall be determined in accordance with Eq. 12.4-4 as follows:

$$E_v = 0.2 S_{DS} D \qquad (12.4\text{-}4)$$

$S_{DS} := 0.19 \cdot g$

$E_v := 0.2 \cdot \frac{S_{DS}}{g} \cdot W = 0.1\ kip$

Direction of Loading

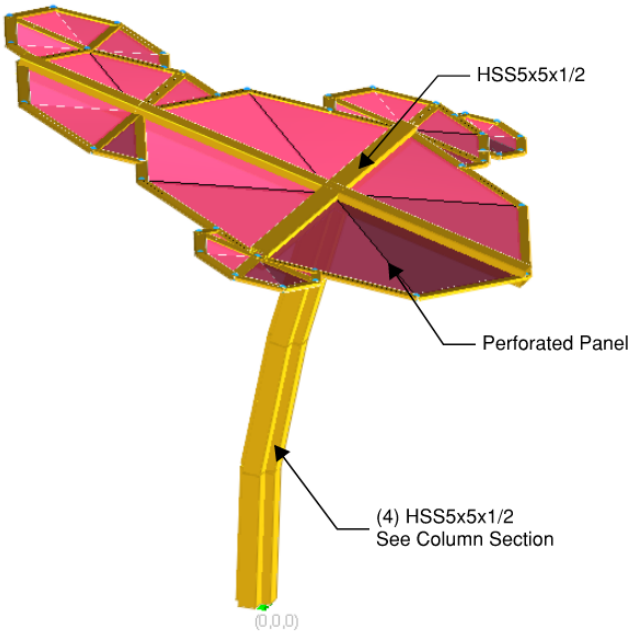
12.5.2 Seismic Design Category B. For structures assigned to Seismic Design Category B, the design seismic forces are permitted to be applied independently in each of two orthogonal directions, and orthogonal interaction effects are permitted to be neglected.

No orthogonal interaction is needed.

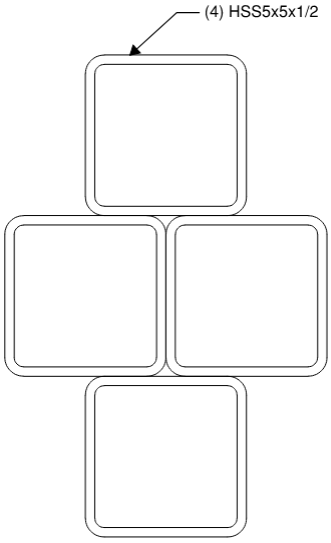
02 - Loads Application & Results

LARSA Model

Below is an orthographic view of the Blossom Variegated Shade Structure as modeled in LARSA, with the HSS and Plate members shown in yellow, and the shells used for the roof shown in red. The column is made up of 4 HSS members, also seen below.



Orthographic view of LARSA Model

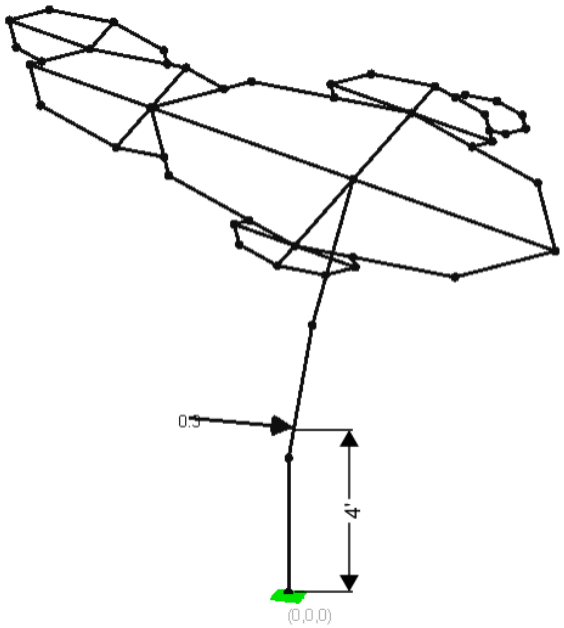


Column Section

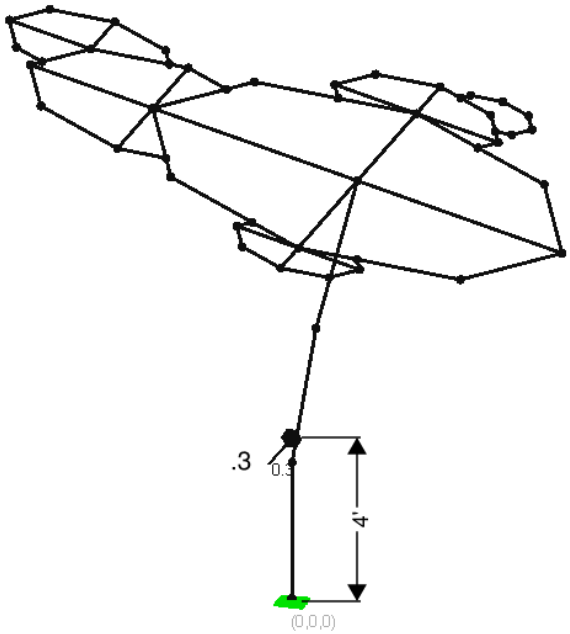
In the below simple renderings of the shade structure, the roof shell members are hidden for clarity. There is a 300 lb live load applied horizontally to the column 4ft above the ground. This load is applied seperately in the x and y axis, in both positive & negative directions for 4 total load cases. Only the positive directions are shown. This is the Live Load Lean load case.

The Live Load Hang load case is also shown. This is a 300 lb load meant to simulate a person hanging from the rim of the structure. The load is distributed over 1 foot, and is applied seperately at several locations, to provide maximum loading effects. This hanging load is not applied anywhere above 10ft from the ground, as it is assumed to be too high for someone to reasonably hang from.

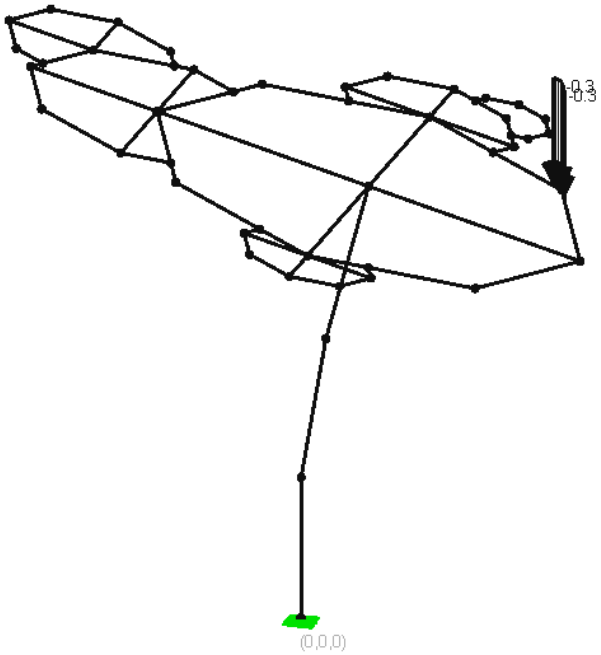
The Wind Loading is shown, with the horizontal and vertical loading shown separately for clarity, although the horizontal will be combined with downward and upward roof wind load as two different cases. The roof loading is applied as a distributed force on the shell members for the roof.



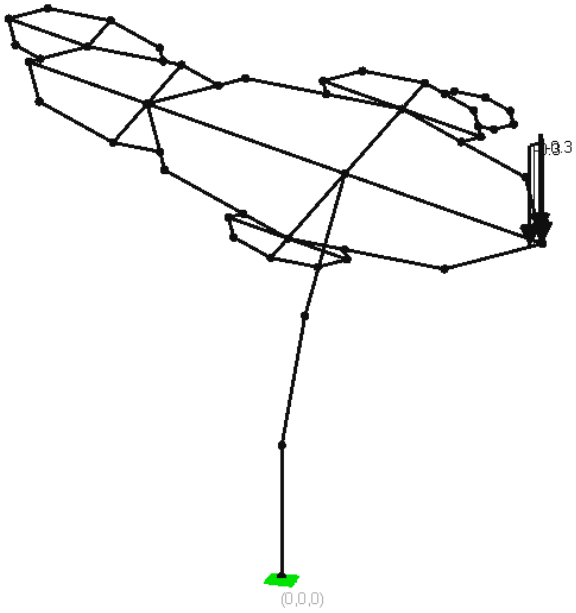
Live Load Lean in +X Direction
(Also applied in -X Direction)



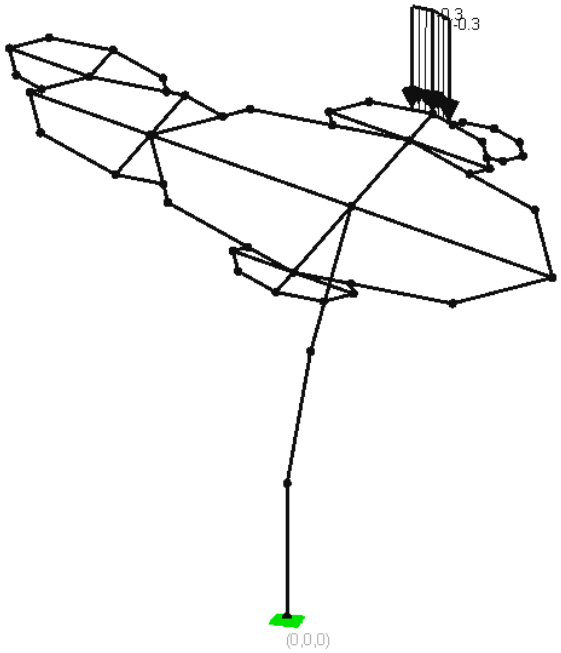
Live Load Lean in +Y Direction
(Also applied in -Y Direction)



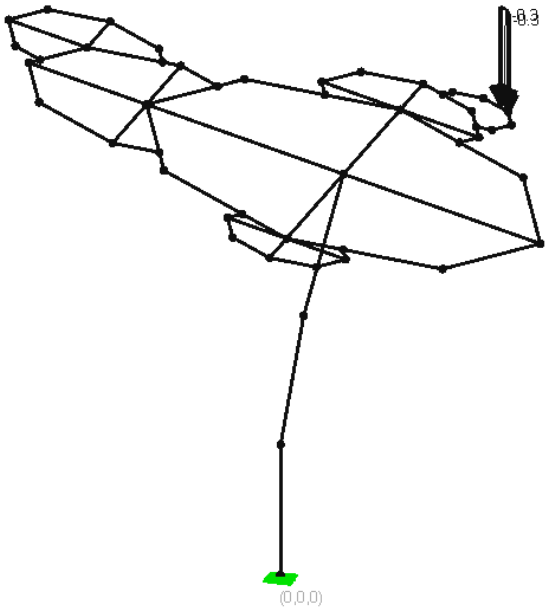
Live Load Hang 1



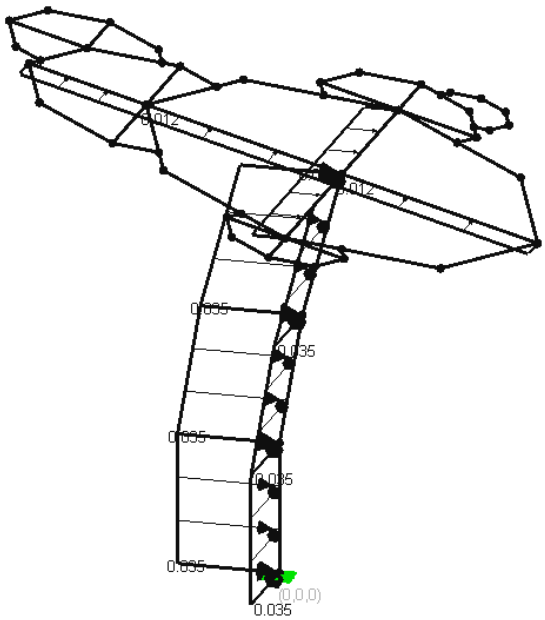
Live Load Hang 2



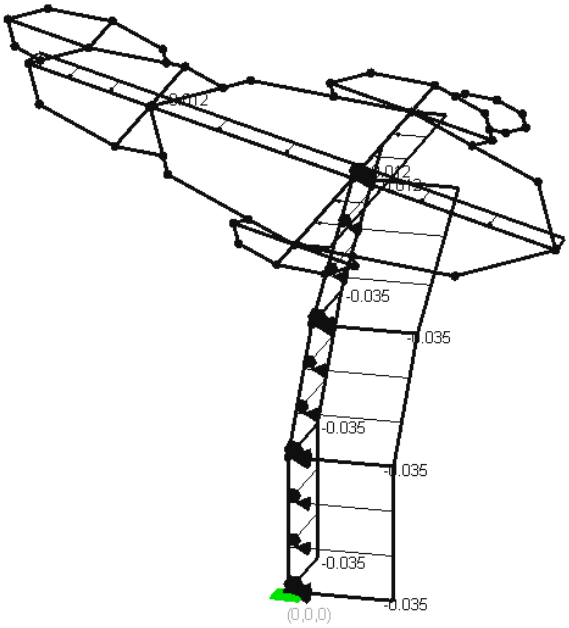
Live Load Hang 3



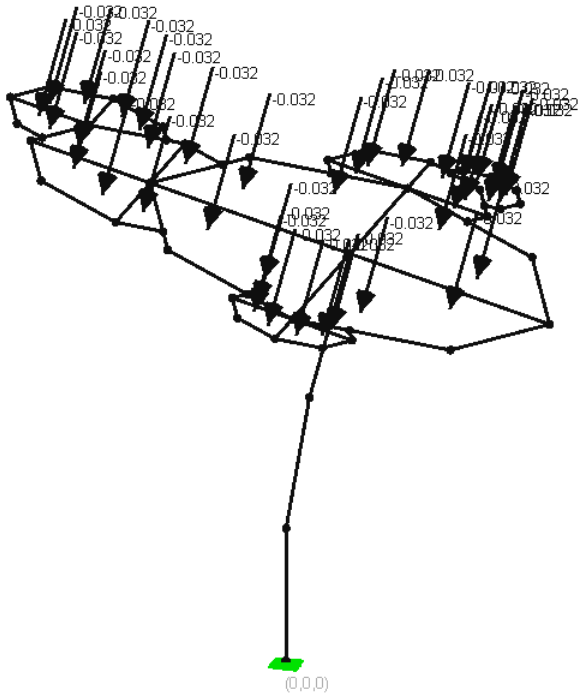
Live Load Hang 4



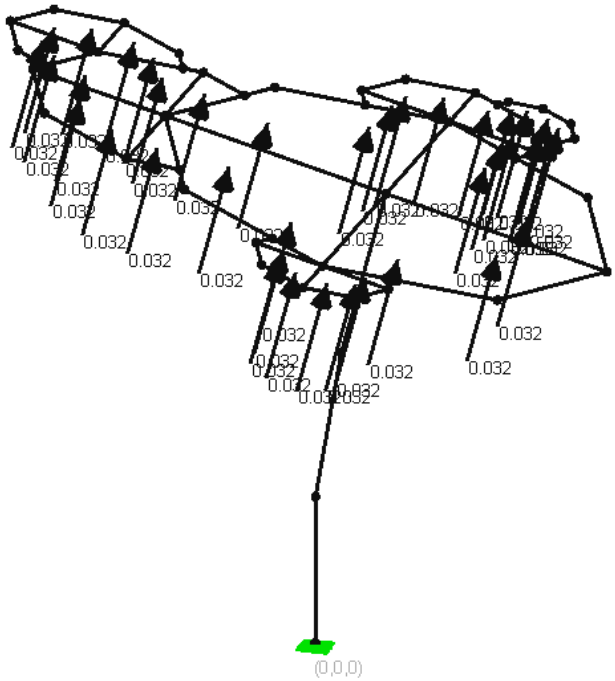
Horizontal Wind Load
(+X & +Y Directions)



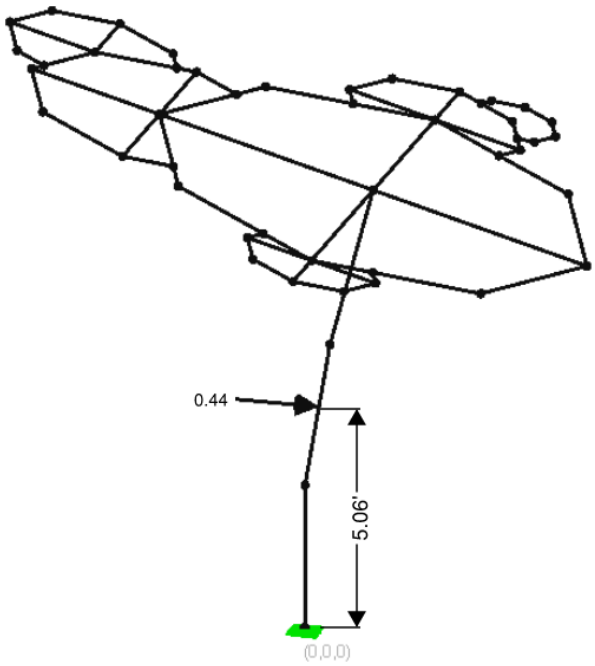
Horizontal Wind Load
(-X & -Y Directions)



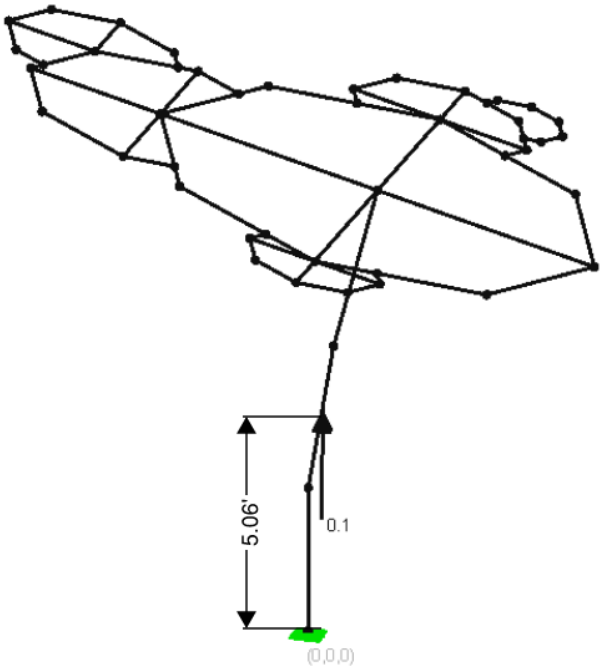
Vertical Wind Load
(Downward)



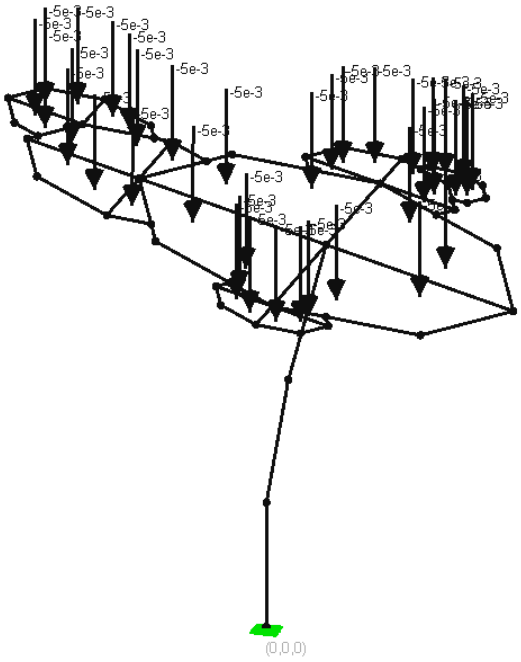
Vertical Wind Load
(Upward)



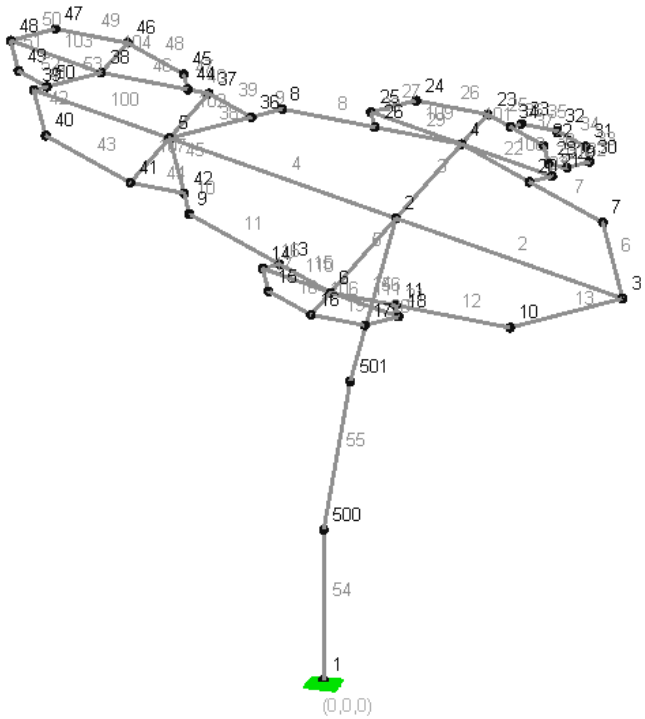
Horizontal Seismic Load +X
(Also applied in -X, +Y, & -Y)



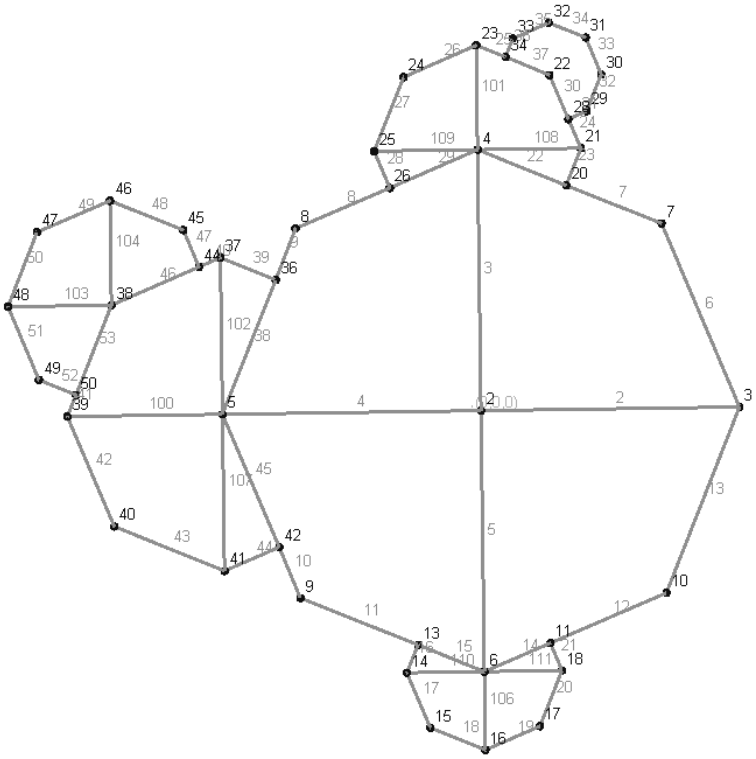
Vertical Seismic Load +Z
(Also applied in -Z)



Roof Live Load



Shade Structure with Beams & Joints numbered



Shade Structure Roof with Beams & Joints numbered

Results:

Critical Resulted Forces are shown based on LARSA Analysis Result. To be conservative, the maximum values for each direction of moment & shear are taken, even if they do not occur simultaneously. The load cases listed are the load combinations, where the extreme effect of any load directionality is taken.

Column:	**Load Case**	
$M_y := 11.53\ kip \cdot ft$	LC-4	
$M_z := 7.32\ kip \cdot ft$	LC-4	
$V_y := 0.81\ kip$	LC-4	Base of column
$V_z := 1.344\ kip$	LC-4	Base of column
$P_{uMax} := 5.469\ kip$	LC-4	
$P_{uMin} := 0.1565\ kip$	LC-5	
$\delta_{hC} := 0.064\ in$	LC-9	Horizontal deflection
Roof Beams - HSS 5x5x1/2		
$M_{yR} := 7.61\ kip \cdot ft$	LC-4	
$M_{zR} := 1.26\ kip \cdot ft$	LC-3b	
$V_{uR} := 0.44\ kip$	LC-4	
$V_{zR} := 1.39\ kip$	LC-4	
$\delta_{vR1} := -0.10\ in$	LC-9	Vertical deflection of main circle
$\delta_{vR2} := -0.19\ in$	LC-9	Vertical deflection of outer circle
Roof Rim Plates		
$M_{uyRim} := 0.551\ kip \cdot ft$	LC-3b	
$M_{uzRim} := 1.073\ kip \cdot ft$	LC-4	
$V_{yRim} := 0.602\ kip$	LC-4	

$V_{zRim} := 0.381\ kip$	LC-3b	
$\delta_{vRimjt8} := -0.2404\ in$	LC-9	Vertical deflection, Joint 8
$\delta_{vRimjt47} := -0.5591\ in$	LC-9	Vertical deflection, Joint 47

03 - HSS Member Flexure and Shear Design

AISC - F7 HSS Member Flexure Analysis

Member: ***HSS5X5 X1/2.*** A500 Gr. C

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 50 \cdot ksi$

Member Properties based on AISC Manual:

Width: $b := 5 \cdot in$

Design thickness: $t := 0.465 \cdot in$

b/t ratio: $bt := 7.75$

Plastic section modulus: $Z := 13.1 \cdot in^3$

Gross area: $A_g := 7.88 \cdot in^2$

Radius of gyration: $r := 1.82 \cdot in$

Torsional MOI: $J := 44.6 \cdot in^4$

a. Check if section is compact:

nts	17 Flanges of rectangular HSS	b/t	$1.12\sqrt{\frac{E}{F_y}}$	$1.40\sqrt{\frac{E}{F_y}}$	

Compact or noncompact limit (Table b4.1b): $\lambda_p := 1.12 \cdot \sqrt{\frac{E}{F_y}} = 26.97$

Compactness: $\text{if}\left(bt < \lambda_p, \text{“Compact”}, \text{“N.G”}\right) = \text{“Compact”}$

b. Check Yielding, Flange Local Buckling, and Web Local Buckling

For compact sections, the limit state of flange local buckling and web local buckling does not apply.

Yielding strength:

$M_n := F_y \cdot Z = 54.58\ kip \cdot ft$

c. Check Lateral-Torsional Buckling

Unbraced Length $L_b := 13\ ft$

Plastic Moment $M_p := M_n = 54.58\ kip \cdot ft$

The limiting laterally unbraced length for the limit state of yielding:

$$L_p := 0.13 \cdot E \cdot r \cdot \frac{\sqrt{J \cdot A_g}}{M_p} = 16.37\ ft$$

$$\text{if}\left(L_b < L_p, \text{“LTB does not apply”}, \text{“N.G”}\right) = \text{“LTB does not apply”}$$

Flexural Demand in Column: $M_y := 11.53\ kip \cdot ft$

$M_z := 7.32\ kip \cdot ft$

Flexural Demand per HSS Member: $M_{y4} := \frac{M_y}{4} = 2.88\ kip \cdot ft$

$M_{z4} := \frac{M_z}{4} = 1.83\ kip \cdot ft$

Flexural Demand for Roof HSS Member: $M_{yR} := 7.61\ kip \cdot ft$

$M_{zR} := 1.26\ kip \cdot ft$

Demand to Capacity Ratios $\phi := 0.9$

Roof: $\frac{M_{yR} + M_{zR}}{\phi \cdot M_n} = 0.18$

Column: $\frac{M_{y4} + M_{z4}}{\phi \cdot M_n} = 0.1$

AISC G4 - HSS Shear Analysis:

Member: ***HSS5X5 X1/2.*** A500 Gr. C

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 50 \cdot ksi$

Width: $b := 5 \cdot in$

Design thickness: $t := 0.465 \cdot in$

b/t ratio: $bt := 7.75$

Plastic section modulus: $Z := 13.1 \cdot in^3$

Gross area: $A_g := 7.88 \cdot in^2$

Radius of gyration: $r := 1.82 \cdot in$

Torsional MOI: $J := 44.6 \cdot in^4$

Shear Resistance

Width resisting shear force: $h := b - 3 \cdot t = 3.61\ in$

Area $A_w := 2 \cdot h \cdot t = 3.35\ in^2$

$\frac{h}{t} = 7.75$ $k_v := 5$

Web Shear Buckling Strength Coefficient $1.1 \sqrt{k_v \cdot \frac{E}{F_y}} = 59.24$

$C_{v2} := 1$

Nominal Shear Strength: $V_n := 0.6 \cdot F_y \cdot A_w \cdot C_{v2} = 100.58\ kip$

Column Shear Demand: $V_{yC} := 0.81\ kip$

$V_{zC} := 1.344\ kip$

Column Shear Demand of 1 Member:

$$V_{yC1} := \frac{V_{yC}}{4} = 0.2025 \ \textit{kip}$$

$$V_{zC1} := \frac{V_{zC}}{4} = 0.336 \ \textit{kip}$$

Roof Member Shear Demand:

$$V_{yR} := 0.44 \ \textit{kip}$$

$$V_{zR} := 1.39 \ \textit{kip}$$

Shear Demand/Capacity Ratios:

$$\phi := 0.9$$

Roof: $\frac{V_{yR} + V_{zR}}{\phi \cdot V_n} = 0.02$

Column: $\frac{V_{yC1} + V_{zC1}}{\phi \cdot V_n} = 5.95 \cdot 10^{-3}$

04 - Roof Rim Design

Plate Flexure

The rim is considered as a rectangular bar, the flexure is checked based on AISC F11.1

Moment about local y (major) axis

Modulus of Elasticity: $E := 29000\ ksi$

Plate Yield Stress: $F_{yPlate} := 36\ ksi$

Plate width: $b_p := 3\ in$

Plate depth: $h_p := .625\ in$

Plate length of a quarter section: $L_b := \frac{(\pi \cdot 10\ ft)}{4} = 7.85\ ft$

Yielding limit requirement when bent about major axis:

$$\frac{L_b \cdot h_p}{b_p^{\ 2}} = 6.54$$

$$\frac{0.08 \cdot E}{F_{yPlate}} = 64.44$$

$$\text{if}\left(\frac{L_b \cdot h_p}{b_p^{\ 2}} \le \frac{0.08 \cdot E}{F_{yPlate}}, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$$

Plastic Section Modulus: $Z_P := \frac{b_p \cdot h_p^{\ 2}}{4} = 0.29\ in^3$

Section Modulus: $S_p := \frac{b_p \cdot h_p^{\ 2}}{6} = 0.2\ in^3$

Moment Capacity minimum of:

$M_{nP11} := 1.6 \cdot F_{yPlate} \cdot S_p = 0.94\ kip \cdot ft$

$M_{nP12} := F_{yPlate} \cdot Z_P = 0.88\ kip \cdot ft$

$M_{nP1} := min\left(M_{nP11}, M_{nP12}\right) = 0.88\ kip \cdot ft$

$\phi := 0.90 \qquad \phi M_{nP1} := \phi \cdot M_{nP1} = 0.79\ kip \cdot ft$

Lateral torsional buckling limit state does not apply when yielding requirement is met

Moment Demand: $M_{yP} := 0.55\ kip \cdot ft$

Demand/Capacity Ratio: $DC1 := \frac{M_{yP}}{\phi M_{nP1}} = 0.7$

Moment about local z (minor) axis

Modulus of Elasticity: $E := 29000\ ksi$

Plate Yield Stress: $F_{yPlate} := 36\ ksi$

Plate width: $b_{p2} := .625\ in$

Plate depth: $h_{p2} := 3\ in$

Plate length of a quarter section: $L_b := \frac{(\pi \cdot 10\ ft)}{4} = 7.85\ ft$

Yielding limit requirement not necessary when bent about minor axis

Plastic Section Modulus: $Z_{P2} := \frac{b_{p2} \cdot {h_{p2}}^2}{4} = 1.41\ in^3$

Section Modulus: $S_{p2} := \frac{b_{p2} \cdot {h_{p2}}^2}{6} = 0.94\ in^3$

Moment Capacity minimum of: $M_{nP12} := 1.6 \cdot F_{yPlate} \cdot S_{p2} = 4.5\ kip \cdot ft$

$M_{nP22} := F_{yPlate} \cdot Z_{P2} = 4.22\ kip \cdot ft$

$M_{nP2} := min\left(M_{nP12}, M_{nP22}\right) = 4.22\ kip \cdot ft$

$\phi := 0.90 \qquad \phi M_{nP2} := \phi \cdot M_{nP2} = 3.8\ kip \cdot ft$

Lateral torsional buckling need not be considered for bars bent about their minor axis

Moment Demand: $M_{uP2} := 1.073\ kip \cdot ft$

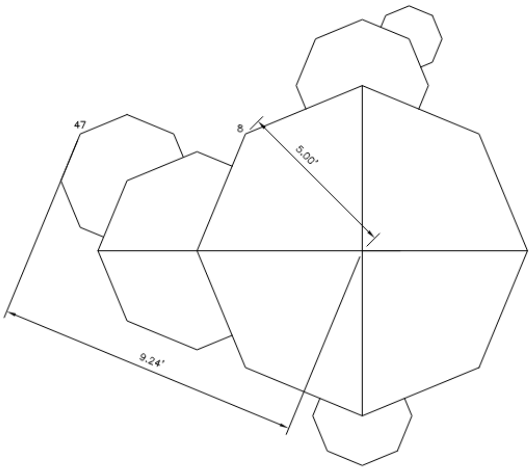
Demand/Capacity Ratio: $DC2 := \frac{M_{uP2}}{\phi M_{nP2}} = 0.28$

Overall D/C $DC := DC1 + DC2 = 0.98$

05 - Deflection Check

Deflection

The maximum deflection in the outer rim of the main roof was checked. Then, any deflections at other points were checked if their deflection was greater than the allowable deflection of the outer rim, as the allowable deflection would be greater as the cantilever arm length increases as the points further from the center are investigated, so any deflections less than the allowable in the main roof's rim will be acceptable. Joints 8 and 47 were investigated.



Cantilever Arm

$I_{jt8} := 5\ ft$

$I_{jt47} := 9.24\ ft$

Max Allowable:

$\delta_{maxjt8} := \frac{I_{jt8}}{150} = 0.4\ in$

$\delta_{maxjt47} := \frac{I_{jt47}}{150} = 0.74\ in$

Deflection per LARSA Service Combinations & Ratios:

$\delta_{jt8} := 0.2404\ in$ $\quad \frac{\delta_{jt8}}{\delta_{maxjt8}} = 0.601$

LC-9 controls for both points

$\delta_{jt47} := 0.5591\ in$ $\quad \frac{\delta_{jt47}}{\delta_{maxjt47}} = 0.756$

06 - Welding Design

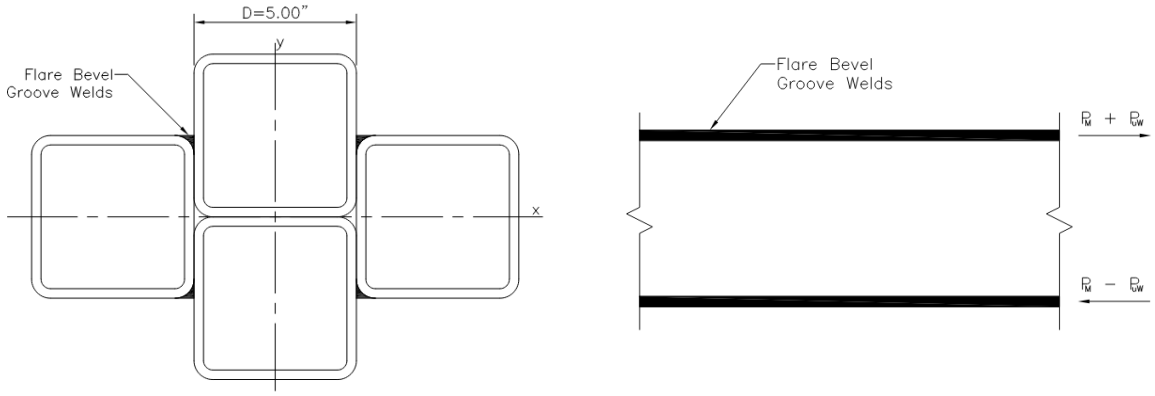
HSS Welding

Design Code: ASIC Manual 15th & AWS D1.1

1 - Vertical HSS Member Welding Design - Flare Bevel Weld

Vertical HSS 5x5x1/2

The 4 vertical HSS members are welded together using 4 flare bevel groove welds to create the column.



HSS Width: $D := 5\ in$

HSS Design Thickness: $t := 0.465 \cdot in$

HSS Inside Dimension: $d_v := D - 2 \cdot t = 4.07\ in$

HSS Corner Radius: $R := 2 \cdot t = 0.93\ in$

Weld Data:

Specified minimum yield strength: $F_y := 50 \cdot ksi$

Filler metal classification strength: $F_{E70} := 70 \cdot ksi$

Effective throat of weld per AISC Table J2.2: $t_w := R \cdot \frac{5}{16} = 0.291\ in$

Minimum effective throat per AISC Table J2.3: $t_{wmin} := \frac{3}{16}\ in = 0.19\ in$

Effective throat size is ok

TABLE J2.2 Effective Throat of Flare Groove Welds		
Welding Process	**Flare Bevel Groove[a]**	**Flare V-Groove**
GMAW and FCAW-G	$^5/_8R$	$^3/_4R$
SMAW and FCAW-S	$^5/_{16}R$	$^5/_8R$
SAW	$^5/_{16}R$	$^1/_2R$

[a] For flare bevel groove with $R < {}^3/_8$ in. (10 mm), use only reinforcing fillet weld on filled flush joint.
General note: R = radius of joint surface (is permitted to be $2t$ for HSS), in. (mm)

Welding

Flare-bevel welds made with E70XX electrodes.

Weld strength per in:
(AISC J2-4)

$$\phi R_n := 0.75 \cdot 0.6 \cdot F_{E70} \cdot t_w = 9.15 \ \frac{kip}{in}$$

LARSA Results

Max. axial force at bottom of column - LC-4

$P_u := 5.47 \cdot kip$

Shear negligible for welding in column

Max Moment at bottom of column - LC-4
Combined in both directions

$M_u := 13.66 \ kip \cdot ft$

No Torsion Present in column

Required Weld Strength Vertical Members

Axial

Axial Force per weld:

$$P_{uW} := \frac{P_u}{4} = 1.37 \ kip$$

Moment

Axial Force from moment couple:

$$P_{uC} := \frac{M_u}{D} = 32.78 \ kip$$

Per Weld

$$P_{uCW} := \frac{P_{uC}}{2} = 16.39 \ kip$$

Total Axial Force per Weld: $P_{TW} := P_{uW} + P_{uCW} = 17.76\ kip$

Per inch of weld:
(Assuming 7ft before bend in column members begins) $P_{uInch} := \frac{P_{TW}}{7\ ft} = 0.21\ \frac{kip}{in}$

Demand to capacity ratio: $DC_{Column} := \frac{P_{uInch}}{\phi R_n} = 0.02$

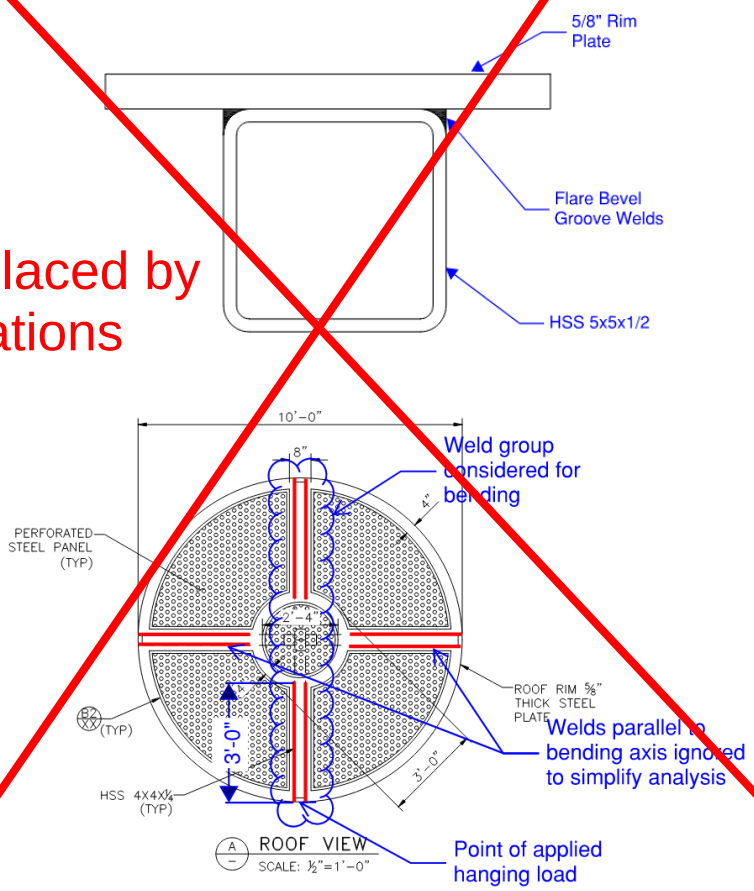
2 - Roof Member Welding Design - Flare Bevel Weld

2.1 - Roof HSS Welded to Roof Plate

2.1.1 - Welding Demand Due to 300lb Hanging Live Load

Weld Location - Roof Rim Plate to HSS Members

Canopy weld replaced by bolts, see calculations next section



Hanging Live load: $LL_{Hang} := 300\ lbf$

Moment arm about support $L_{Hang} := 8\ ft$

Moment from live load hang: $M_{Hang} := LL_{Hang} \cdot L_{Hang} = 2.4\ kip \cdot ft$

The throat of the weld was used for the width for moment of inertia calculation: $t_w = 0.29\ in$

Moment of inertia of weld group $I_{Weld} := 78444\ in^4$

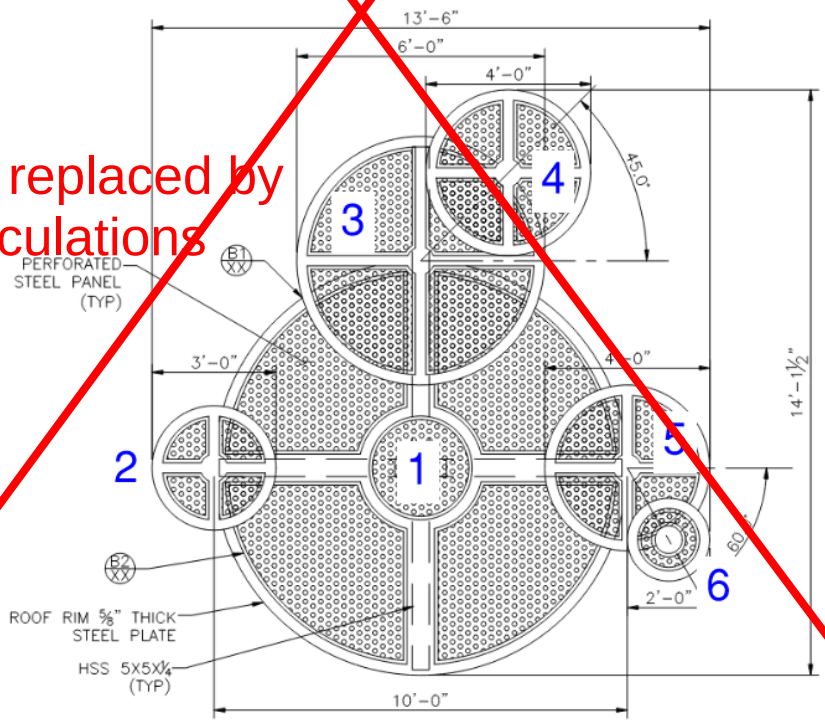
Distance from centroid to extreme end of weld: $c := 5\ ft$

Moment stress: $f_{moment} := \frac{M_{Hang} \cdot c}{I_{Weld}} = 22.03\ psi$

Force per inch: $F_{LL} := f_{moment} \cdot t_w = \left(6.4 \cdot 10^{-3}\right) \frac{kip}{in}$

2.1.2 - Welding Demand Due to Wind Uplift

Weld Location - Roof Rim Plate to HSS Members



Canopy weld replaced by bolts, see calculations next section

Areas of each circle:

$A_1 := \pi \cdot (5\ ft)^2 = 78.54\ ft^2$

$A_2 := \pi \cdot (1.5\ ft^2) = 4.71\ ft^2$

$A_3 := \pi \cdot (3\ ft^2) = 9.42\ ft^2$

$A_4 := \pi \cdot (2\ ft^2) = 6.28\ ft^2$

$A_5 := A_4 = 6.28\ ft^2$

$A_6 := \pi \cdot (1\ ft^2) = 3.14\ ft^2$

Demand due Tensile Force

Total area of roof no overlap: $A_R := 114\ ft^2$

Uplift wind pressure: $w_p := 32\ psf$

Total uplift wind force on entire roof: $W := A_R \cdot w_p = 3.65\ kip$

Assume 3 feet of welding along each side of main roof HSS members $L_w := 3\ ft$

Number of welds (2 each side of HSS) $N_{Welds} := 8$

Total length of welding $L_{wT} := L_w \cdot N_{Welds} = 24\ ft$

Uplift force per inch of weld $F_a := \frac{W}{L_{wT}} = 0.01\ \frac{kip}{in}$

Demand Due to Bending Effect

Canopy weld replaced by bolts, see calculations next section

To be conservative, the entire wind load is taken to be acting at the same point as a hanging live load, to create a large moment arm and moment.

Moment arm about support $L_{Wind} := L_{Hang} = 8\ ft$

Moment from wind uplift: $M_{Wind} := W \cdot L_{Wind} = 29.18\ kip \cdot ft$

The throat of the weld was used for the width for moment of inertia calculation: $t_w = 0.29\ in$

Moment of inertia of weld group $I_{Weld} = (7.84 \cdot 10^4)\ in^4$

Distance from centroid to extreme end of weld: $c = 5\ ft$

Moment stress: $f_{momentW} := \frac{M_{Wind} \cdot c}{I_{Weld}} = 267.87\ psi$

Force per inch: $F_b := f_{momentW} \cdot t_w = 0.08 \ \frac{kip}{in}$

Combined Forces: $F_{Wind} := F_a + F_b = 0.09 \ \frac{kip}{in}$

Load combinations to consider:

1) 1.6Lr + 0.5W $LC1_{Roof} := 1.6 \cdot F_{LL} + 0.5 \cdot F_{Wind} = 0.06 \ \frac{kip}{in}$

2) 0.5Lr + 1.0W $LC2_{Roof} := 0.5 \cdot F_{LL} + 1 \cdot F_{Wind} = 0.09 \ \frac{kip}{in}$

Maximum force case for roof: $F_{MaxR} := \max\left(LC1_{Roof}, LC2_{Roof}\right) = 0.09 \ \frac{kip}{in}$

Demand to Capacity ratio: $DC_{Roof} := \frac{F_{MaxR}}{\phi R_n} = 0.01$

2.2 - Roof Rim to Roof Rim Welding Design - Fillet Weld

Fillet welds are used to connect rim plates to each other for each roof circle

Plate thickness: $t_p := \frac{5}{8} \ in = 0.63 \ in$

Minimum Fillet Weld size $w_{min} := \frac{1}{4} \ in = 0.25 \ in$

Maximum Fillet weld size $w_{max} := t_p - \frac{1}{16} \ in = 0.56 \ in$
AISC J2b-b

TABLE J2.4
Minimum Size of Fillet Welds

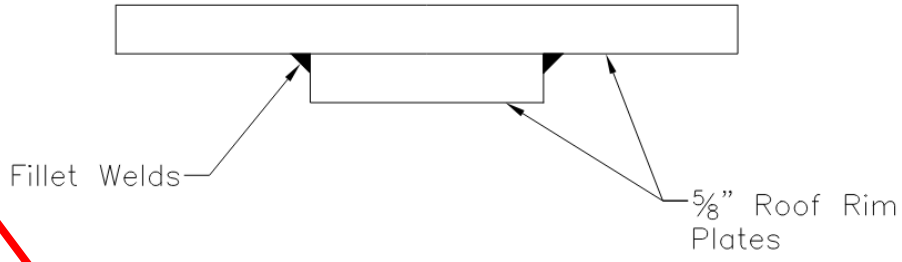
Material Thickness of Thinner Part Joined, in. (mm)	Minimum Size of Fillet Weld,[a] in. (mm)
To 1/4 (6) inclusive	1/8 (3)
Over 1/4 (6) to 1/2 (13)	3/16 (5)
Over 1/2 (13) to 3/4 (19)	1/4 (6)
Over 3/4 (19)	5/16 (8)

[a] Leg dimension of fillet welds. Single pass welds must be used.
Note: See Section J2.2b for maximum size of fillet welds.

Canopy weld replaced by bolts, see calculations next section

Minimum weld strength per inch:

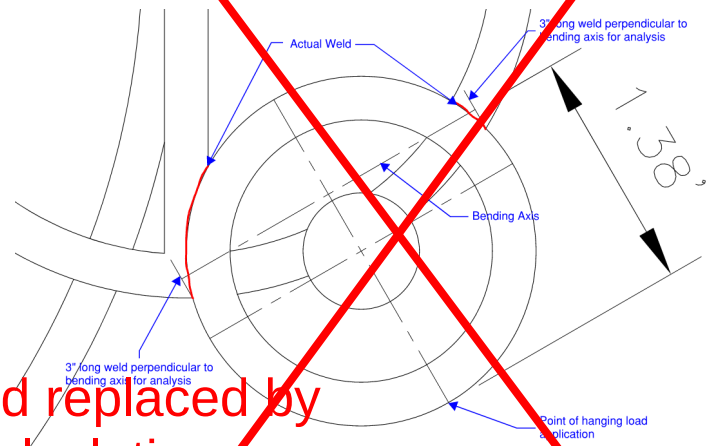
$\phi R_{nF} := 0.75 \cdot 0.6 \cdot F_{E70} \cdot .707 \cdot w_{min} = 5.57 \ \frac{kip}{in}$



2.2.1 - Welding Demand Due to 300lb Hanging Live Load
Weld Location: Roof Rim to Roof Rim

Hanging on Roof 6: Rim 6 to Rim 5 Weld

The welding is analyzed as if it is 3 inches long perpendicular to the bending axis. The actual weld will be slightly longer along the curve of roof plate 6, and can extend along the support plate of roof 5.



Canopy weld replaced by bolts, see calculations next section

Moment arm: $L_{H65} := 1\ ft + 4.5\ in = 1.38\ ft$

Moment about center: $M_{Hang6} := LL_{Hang} \cdot L_{H65} = 0.41\ kip \cdot ft$

Weld length: $L_{w65} := 3\ in$

Moment of Inertia of weld $I_{w65} := \frac{w_{min} \cdot {L_{w65}}^3}{12} = 0.56\ in^4$

Two Welds: $I_{w65t} := I_{w65} \cdot 2 = 1.13\ in^4$

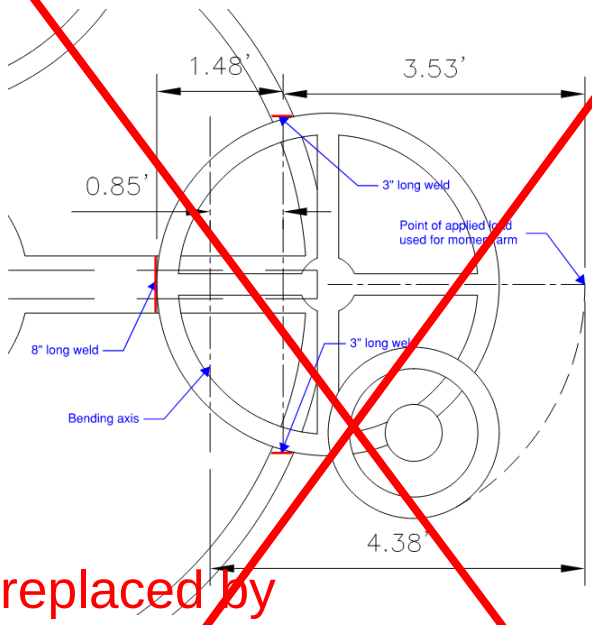
Distance to far end of weld from bending axis: $c_{65} := \frac{L_{w65}}{2} = 1.5\ in$

Bending stress: $f_{bending56} := \frac{M_{Hang6} \cdot c_{65}}{I_{w65t}} = (6.6 \cdot 10^3)\ psi$

Force per inch of weld $R_{Weld56} := f_{bending56} \cdot w_{min} = 1.65\ \frac{kip}{in}$

Hanging on Roof 5: Rim 5 to Rim 1 Weld

The welding group of three welds is analyzed, assuming bending is about the center of the weld group. The moment arm is taken as the distance of the hanging load on circle 6 from circle 5's center, but applied at a location perpendicular to the 8" weld. The distance is then taken from the center of the weld group.



Canopy weld replaced by bolts, see calculations next section

Moment arm: $L_{H51} := 4.38\ ft$

Moment about center: $M_{Hang5} := LL_{Hang} \cdot L_{H51} = 1.31\ kip \cdot ft$

Moment of Inertia of weld group
As shown above in red $I_{w51} := 275\ in^4$

Distance to far end of weld from bending axis: $c_{51} := 1.48\ ft - 0.85\ ft = 0.63\ ft$

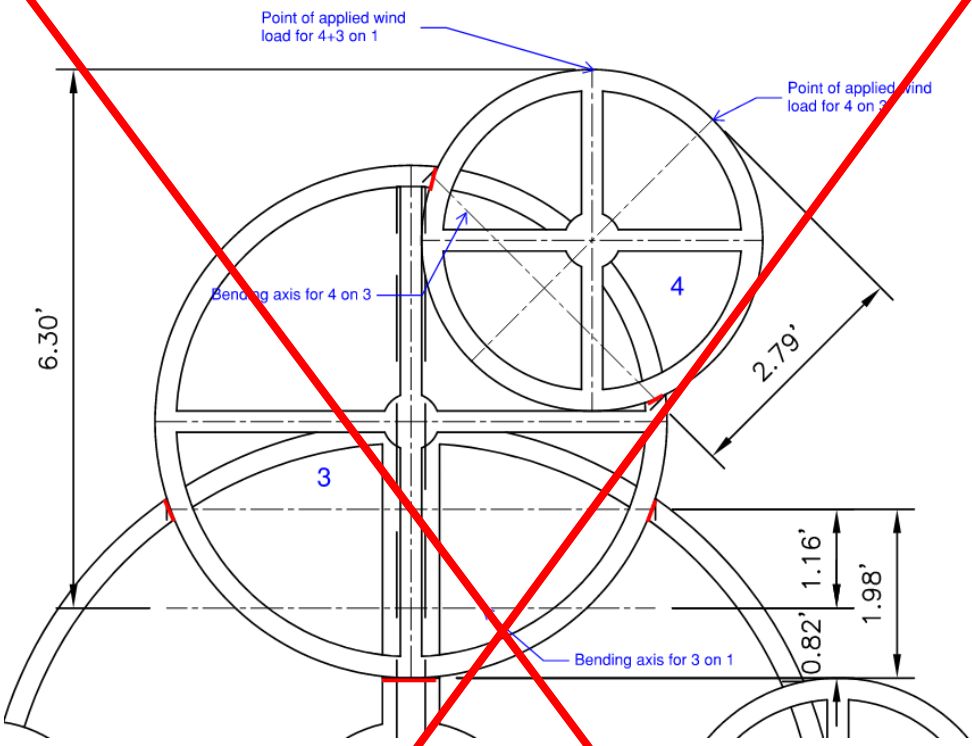
Bending stress: $f_{bending51} := \frac{M_{Hang5} \cdot c_{51}}{I_{w51}} = 433.48\ psi$

Force per inch of weld $R_{Weld51} := f_{bending51} \cdot w_{min} = 0.11\ \frac{kip}{in}$

Maximum effect from Live Load: $F_{LLF} := \max\left(R_{Weld56}, R_{Weld51}\right) = 1.65\ \frac{kip}{in}$

2.2.2 - Welding Demand Due to Wind Uplift

Weld Location - Roof Rim to Roof Rim



Canopy weld replaced by bolts, see calculations next section

Rim Plate 4 to Rim Plate 3:

Uplift of Roof 4 acting on connection to roof 3: $W_4 := A_4 \cdot w_p = 0.2\ kip$

Length of weld connecting roof 4 to roof 3: $L_{w43} := 6\ in$

Uplift force per inch of weld: $F_{a43} := \frac{W_4}{L_{w43}} = 0.03\ \frac{kip}{in}$

Moment arm: $L_{H43} := 2.79\ ft$

Moment from Wind: $M_{Wind43} := W_4 \cdot L_{H43} = 0.56\ kip \cdot ft$

Since the welding is the same connecting plate 4 to plate 3 as the weld connecting plate 6 to plate 5, with regards to size and length perpendicular to the axis of bending, the moment of inertia will be the same. They are both 3 inch long welds with a total width of twice the weld size, bending about their centers.

Moment of Inertia of weld connecting plate 4 to 3: $I_{w43} := I_{w65t} = 1.13\ in^4$

Distance to extreme end of weld: $c_{43} := \frac{3\ in}{2} = 1.5\ in$

Bending Stress: $f_{b43} := \frac{M_{Wind43} \cdot c_{43}}{I_{w43}} = \left(8.98 \cdot 10^3\right)\ psi$

Force per inch of weld: $F_{b43} := f_{b43} \cdot w_{min} = 2.24\ \frac{kip}{in}$

Total force per inch due to wind: $F_{43Wind} := F_{a43} + F_{b43} = 2.28\ \frac{kip}{in}$

Rim Plate 3 to Rim Plate 1:

Uplift of Roof 3 acting on connection to roof 1 $W_{43} := \left(A_3 + A_4\right) \cdot w_p = 0.5\ kip$

Length of weld connecting roof 3 to roof 1: $L_{w31} := 14\ in$

Canopy weld replaced by bolts, see calculations next section

Per inch of weld: $F_{a31} := \frac{W_{43}}{L_{w31}} = 0.04\ \frac{kip}{in}$

Moment arm: $L_{H31} := 6.3\ ft$

Moment from wind: $M_{Wind31} := W_{43} \cdot L_{H31} = 3.17\ kip \cdot ft$

Distance to extreme end of weld: $c_{31} := 0.82\ ft$

Moment of Inertia of weld group: $I_{31} := 490.13\ in^4$

Bending Stress: $f_{b31} := \frac{M_{Wind31} \cdot c_{31}}{I_{31}} = 762.91\ psi$

Force per inch of weld from bending: $F_{b31} := f_{b31} \cdot w_{min} = 0.19 \ \frac{kip}{in}$

Total force per inch from wind: $F_{31Wind} := F_{a31} + F_{b31} = 0.23 \ \frac{kip}{in}$

Rim Plate 6 to Rim Plate 5:

Uplift of Roof 6 acting on connection to roof 5: $W_6 := A_6 \cdot w_p = 0.1 \ kip$

Total length of welds connecting roof 6 to roof 5: $L_{w65} := 6 \ in$

Uplift force per inch of weld: $F_{a65} := \frac{W_6}{L_{w65}} = 0.02 \ \frac{kip}{in}$

Moment from Wind: $M_{Wind65} := W_6 \cdot L_{H65} = 0.14 \ kip \cdot ft$

Bending Stress: $f_{b65} := \frac{M_{Wind65} \cdot c_{65}}{I_{w65t}} = \left(2.21 \cdot 10^3\right) \ psi$

Force per inch of weld: $F_{b65} := f_{b65} \cdot w_{min} = 0.55 \ \frac{kip}{in}$

Canopy weld replaced by bolts, see calculations next section

Total force per inch due to wind: $F_{65Wind} := F_{a65} + F_{b65} = 0.57 \ \frac{kip}{in}$

Rim Plate 5 to Rim Plate 1:

Uplift of Roof 5 acting on connection to roof 1: $W_5 := \left(A_6 + A_5\right) \cdot w_p = 0.3 \ kip$

Total length of welds connecting roof 6 to roof 5: $L_{w51} := 14 \ in$

Uplift force per inch of weld: $F_{a51} := \frac{W_5}{L_{w51}} = 0.02 \ \frac{kip}{in}$

Moment from Wind: $M_{Wind51} := W_5 \cdot L_{H51} = 1.32\ kip \cdot ft$

Bending Stress: $f_{b51} := \frac{M_{Wind51} \cdot c_{51}}{I_{w51}} = 435.78\ psi$

Force per inch of weld: $F_{b51} := f_{b51} \cdot w_{min} = 0.11\ \frac{kip}{in}$

Total force per inch due to wind: $F_{51Wind} := F_{a51} + F_{b51} = 0.13\ \frac{kip}{in}$

Extreme load from wind:

$F_{WindF} := \max\left(F_{43Wind}, F_{31Wind}, F_{65Wind}, F_{51Wind}\right) = 2.28\ \frac{kip}{in}$ $F_{LLF} = 1.65\ \frac{kip}{in}$

Load combinations to consider:

1) 1.6Lr + 0.5W $LC1_F := 1.6 \cdot F_{LLF} + 0.5 \cdot F_{WindF} = 3.78\ \frac{kip}{in}$

2) 0.5Lr + 1.0W $LC2_F := 0.5 \cdot F_{LLF} + 1 \cdot F_{WindF} = 3.1\ \frac{kip}{in}$

Maximum force case for roof: $F_{MaxF} := \max\left(LC1_F, LC2_F\right) = 3.78\ \frac{kip}{in}$

Demand to Capacity ratio: $DC_{Roof} := \frac{F_{MaxF}}{\phi R_n} = 0.41$

Canopy weld replaced by bolts, see calculations next section

Based on these checks, continuous groove welding on the HSS members is sufficient. Fillet welds must be used on the rim plates' connections to each other. Continuous welds where applicable with a minimum weld size of 1/4 inch is sufficient.

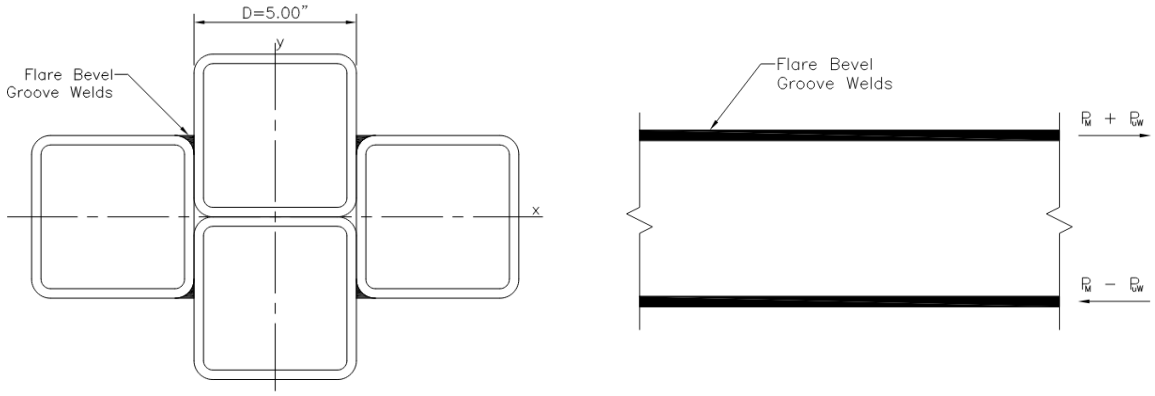
HSS Welding

Design Code: ASIC Manual 15th & AWS D1.1

1 - Vertical HSS Member Welding Design - Flare Bevel Weld

Vertical HSS 5x5x1/2

The 4 vertical HSS members are welded together using 4 flare bevel groove welds to create the column.



HSS Width: $D := 5\ in$

HSS Design Thickness: $t := 0.465 \cdot in$

HSS Inside Dimension: $d_v := D - 2 \cdot t = 4.07\ in$

HSS Corner Radius: $R := 2 \cdot t = 0.93\ in$

Weld Data:

Specified minimum yield strength: $F_y := 50 \cdot ksi$

Filler metal classification strength: $F_{E70} := 70 \cdot ksi$

Effective throat of weld per AISC Table J2.2: $t_w := R \cdot \frac{5}{16} = 0.291\ in$

Minimum effective throat per AISC Table J2.3: $t_{wmin} := \frac{3}{16}\ in = 0.19\ in$

Effective throat size is ok

TABLE J2.2 Effective Throat of Flare Groove Welds		
Welding Process	**Flare Bevel Groove[a]**	**Flare V-Groove**
GMAW and FCAW-G	$^5/_8R$	$^3/_4R$
SMAW and FCAW-S	$^5/_{16}R$	$^5/_8R$
SAW	$^5/_{16}R$	$^1/_2R$

[a] For flare bevel groove with $R < {}^3/_8$ in. (10 mm), use only reinforcing fillet weld on filled flush joint.
General note: R = radius of joint surface (is permitted to be $2t$ for HSS), in. (mm)

Welding

Flare-bevel welds made with E70XX electrodes.

Weld strength per in:
(AISC J2-4)

$$\phi R_n := 0.75 \cdot 0.6 \cdot F_{E70} \cdot t_w = 9.15 \ \frac{kip}{in}$$

LARSA Results

Max. axial force at bottom of column - LC-4

$P_u := 5.47 \cdot kip$

Shear negligible for welding in column

Max Moment at bottom of column - LC-4
Combined in both directions

$M_u := 13.66 \ kip \cdot ft$

No Torsion Present in column

Required Weld Strength Vertical Members

Axial

Axial Force per weld:

$$P_{uW} := \frac{P_u}{4} = 1.37 \ kip$$

Moment

Axial Force from moment couple:

$$P_{uC} := \frac{M_u}{D} = 32.78 \ kip$$

Per Weld

$$P_{uCW} := \frac{P_{uC}}{2} = 16.39 \ kip$$

Total Axial Force per Weld: $P_{TW} := P_{uW} + P_{uCW} = 17.76\ kip$

Per inch of weld:
(Assuming 7ft before bend in column members begins): $P_{uInch} := \frac{P_{TW}}{7\ ft} = 0.21\ \frac{kip}{in}$

Demand to capacity ratio: $DC_{Column} := \frac{P_{uInch}}{\phi R_n} = 0.02$

2 - Roof Member Bolt Design - Grade 8, 150 ksi

2.1 - Roof HSS Bolted to Roof Plate

2.1.1 - Demand Due to 300lb Hanging Live Load

Bolt Location - Roof Rim Plate to HSS Members

Bolt Details

Diameter of Bolt: $D_{Bolt} := \frac{1}{2}\ in$

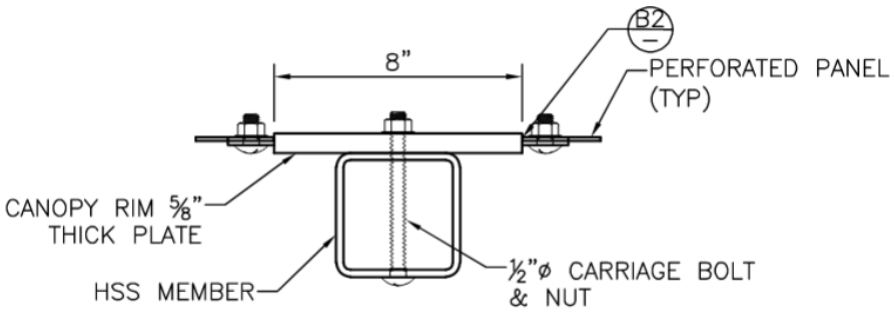
Area of Bolt: $A_{Bolt} := \pi \cdot \left(\frac{D_{Bolt}}{2}\right)^2 = 0.2\ in^2$

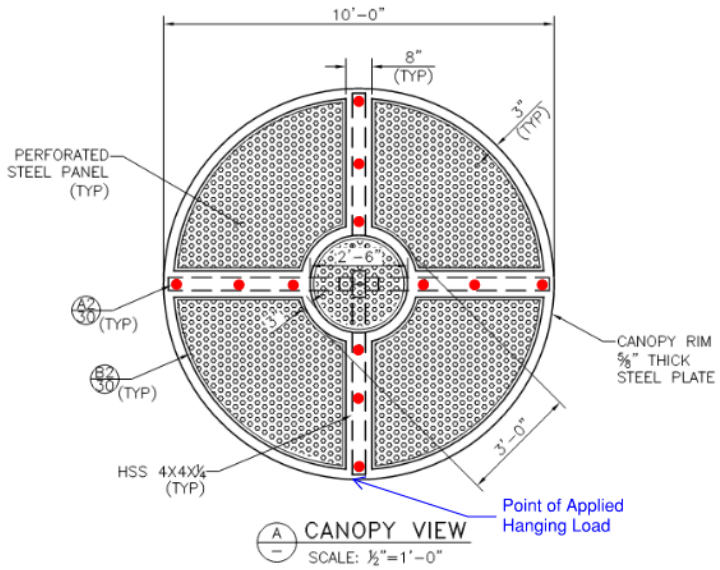
Bolt tensile strength: $f_{Bolt} := 150\ ksi$

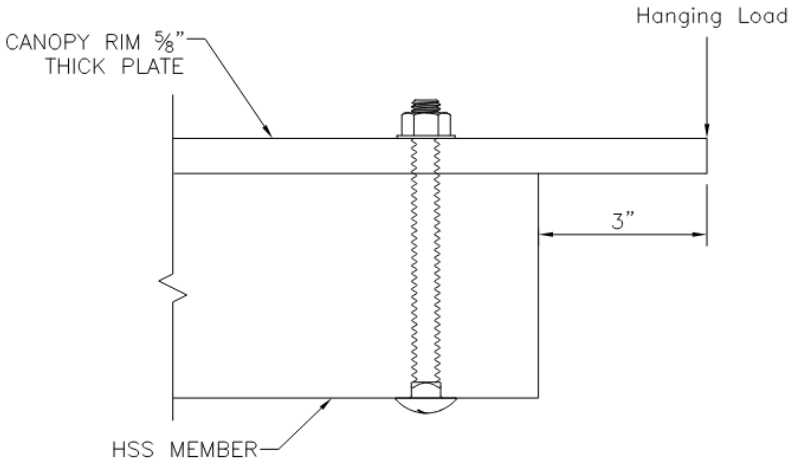
$\phi := 0.75$

Bolt capacity:

$B := \phi \cdot A_{Bolt} \cdot f_{Bolt} = 22.09\ kip$







Hanging Live load: $LL_{Hang} := 300\ \boldsymbol{lbf}$

Moment arm about center of support: $L_{Hang} := 8\ \boldsymbol{ft}$

Moment from live load hang: $M_{Hang} := LL_{Hang} \cdot L_{Hang} = 2.4\ \boldsymbol{kip \cdot ft}$

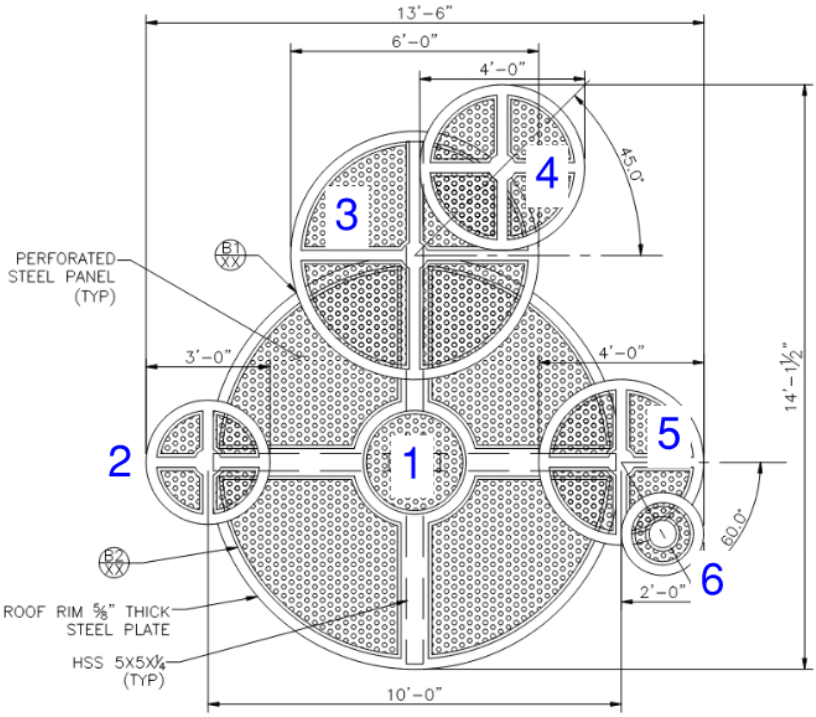
Divide by strength of 1 bolt to get distance needed for 1 bolt to resist moment.

$$L_{Req} := \frac{M_{Hang}}{B} = 1.3\ \boldsymbol{in}$$

The bolts used to connect the other rims to the main panel/rim will be sufficient for the hanging load.

2.1.2 - Demand Due to Wind Uplift

Location - Roof Rim Plate to HSS Members



Areas of each circle:

$A_1 := \pi \cdot (5\ ft)^2 = 78.54\ ft^2$

$A_2 := \pi \cdot (1.5\ ft^2) = 4.71\ ft^2$

$A_3 := \pi \cdot (3\ ft^2) = 9.42\ ft^2$

$A_4 := \pi \cdot (2\ ft^2) = 6.28\ ft^2$

$A_5 := A_4 = 6.28\ ft^2$

$A_6 := \pi \cdot (1\ ft^2) = 3.14\ ft^2$

Demand due Tensile Force

Total area of roof no overlap: $A_R := 114\ ft^2$

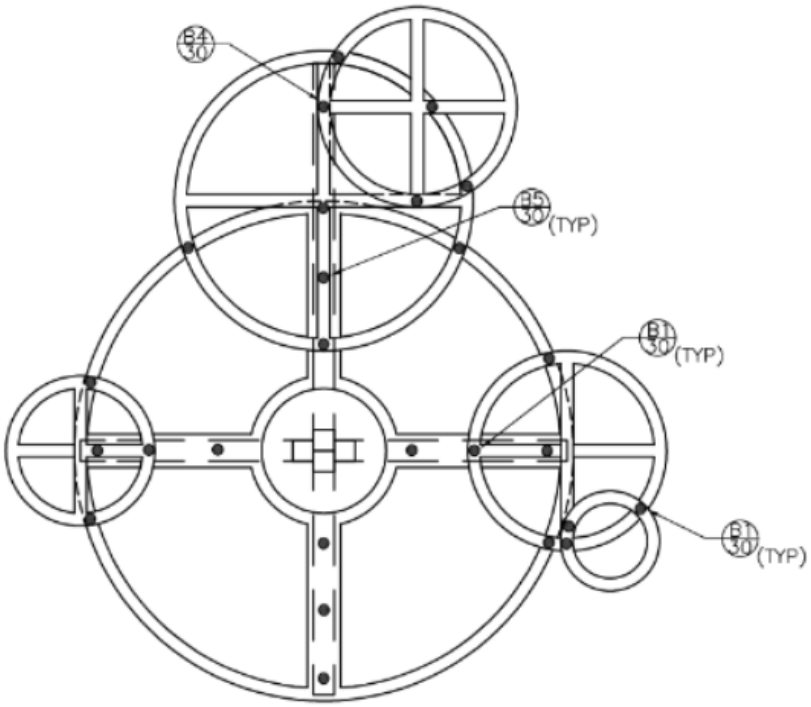
Uplift wind pressure: $w_p := 32\ psf$

Total uplift wind force on entire roof: $W := A_R \cdot w_p = 3.65\ kip$

Number of bolts connecting to HSS: $N_{Bolts} := 12$

Total Capacity from bolts: $B_T := B \cdot N_{Bolts} = 265.07\ \textbf{\textit{kip}}$

Capacity/Demand $FS := \frac{B_T}{W} = 72.66$



Demand Due to Bending Effect

To be conservative, the entire wind load is taken to be acting at the same point as a hanging live load, to create a large moment arm and moment.

Moment arm about support $L_{Wind} := L_{Hang} = 8\ \textbf{\textit{ft}}$

Moment from wind uplift: $M_{Wind} := W \cdot L_{Wind} = 29.18\ \textbf{\textit{kip}} \cdot \textbf{\textit{ft}}$

Moment of inertia of two bolts on opposite ends of canopy: $I_{Bolt} := 1269.4\ \textbf{\textit{in}}^4$

Distance from centroid to extreme bolt: $c := 4.5\ \textbf{\textit{ft}}$

Moment stress: $f_{momentW} := \frac{M_{Wind} \cdot c}{I_{Bolt}} = 14.9\ \textbf{\textit{ksi}}$

Strength of Bolt $f_{Bolt} = 150\ \textbf{\textit{ksi}}$ OK

Bolt arrangement and size sufficient

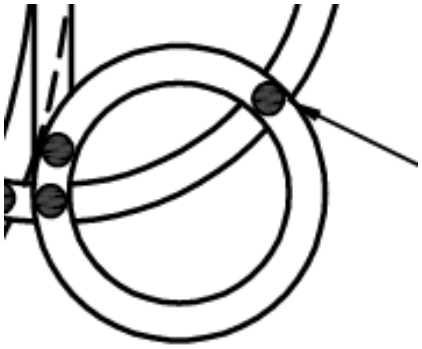
2.2 - Roof Rim to Roof Rim Bolt Design

2.2.1 - Demand Due to 300lb Hanging Live Load

Bolt Location: Roof Rim to Roof Rim

Hanging on Roof 6: Rim 6 to Rim 5

The bolt group was modeled in LARSA section composer to get the moment of inertia of the bolt group.



The moment arm is assumed to be the same as in the previous welding calculation

Moment arm: $L_{H65} := 1\ ft + 4.5\ in = 1.38\ ft$

Moment about center: $M_{Hang6} := LL_{Hang} \cdot L_{H65} = 0.41\ kip \cdot ft$

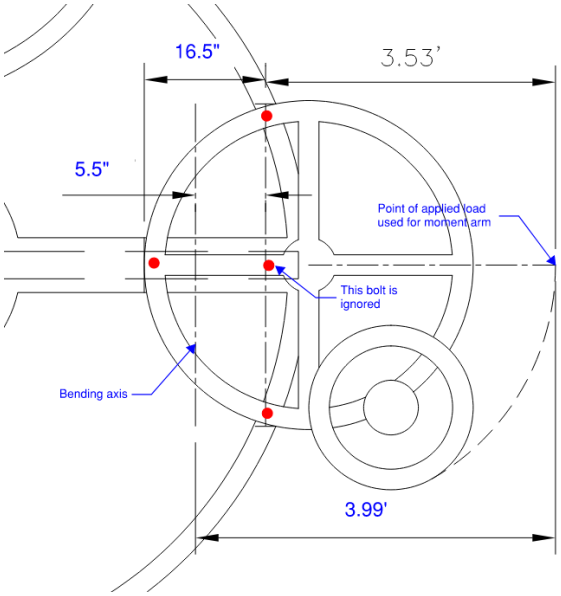
Moment of Inertia of bolt group: $I_{w65} := 1.09\ in^4$

Distance to far end of bolt from bending axis: $c_{65} := 3.25\ in$

Bending stress: $f_{bending56} := \frac{M_{Hang6} \cdot c_{65}}{I_{w65}} = 14.76\ ksi$

Hanging on Roof 5: Rim 5 to Rim 1

The welding group of three bolts is analyzed, assuming bending is about the center of the bolt group. The moment arm is taken as the distance of the hanging load on circle 6 from circle 5's center, but applied at a location perpendicular to centroidal axis of the bolt group. The distance is then taken from the center of the bolt group.



Moment arm: $L_{H51} := 4\ ft$

Moment about center: $M_{Hang5} := LL_{Hang} \cdot L_{H51} = 1.2\ kip \cdot ft$

Moment of Inertia of bot group
As shown above in red: $I_{w51} := 35.47\ in^4$

Distance to far end of weld from bending axis: $c_{51} := 16.5\ in - 5.5\ in = 11\ in$

Bending stress: $f_{bending51} := \frac{M_{Hang5} \cdot c_{51}}{I_{w51}} = 4.47\ ksi$

Previous Weld Calculation Strength

The previous method of attachment, fillet welds, had a strength of 5.57 kips per inch, with welds ranging form 3in to 8in. Since bolts are replacing welds at each location, the strength can be compared.

Weld Strength: $\phi R_{nF} := 5.57 \ \frac{kip}{in}$

Weld Sizes

$L_{W1} := 3 \ in$

$L_{W2} := 8 \ in$

Total Capacity of welds: $R_{W1} := \phi R_{nF} \cdot L_{W1} = 16.71 \ kip$

$R_{W2} := \phi R_{nF} \cdot L_{W2} = 44.56 \ kip$

Strength of Bolts: $B = 22.09 \ kip$

Based on the above, a bolt replacing the three inch welds is sufficient, while two bolts would be needed to replace the 8 inch welds. Based on previous weld calculations, there was sufficient extra capacity for the reduction in connection strength to be ok, especially since there are additional bolts added, so there is more than 1 bolt replacing the 8inch weld.

07 - Drilled Shaft Design

Shaft Length Calculation:

The shaft length is determined based on the Section 13.6.1 from "LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals".

Per the project location, assuming the foundation is sand as cohesionless soils. The properties of the soil are estimated per engineering adjustment for lacking of Geotech information.

Angle of internal friction: $\phi := 30°$

Effective unit weight of soil: $\gamma := 0.11$ k/ft^3

Max Moment at groundline: Stability 5: D+0.5(L+Lr)+Wa

$M_x := 6.60$ k-ft $M_y := 10.78$ k-ft $M := \sqrt{M_x^2 + M_y^2} = 12.64$

Max Shear at groundline: Stability 5: D+0.5(L+Lr)+Wa

$V_x := 1.19$ k-ft $V_y := 0.66$ k-ft $V := \sqrt{V_x^2 + V_y^2} = 1.36$

Diameter of shaft: $D := 2$ ft

Overload Factor: $w := \frac{3}{0.7} = 4.29$

Factored Shear: $V_F := w \cdot V = 5.83$ kip

Factored Moment: $M_F := w \cdot M = 54.17$ k-ft

Broms' Equation for Cohesionless Soil:

$$K_p := \left(\tan\left(45° + \frac{\phi}{2}\right)\right)^2 = 3$$

$$L^3 = \frac{2\ V_F \cdot L}{K_p \cdot \gamma \cdot D} + \frac{2\ M_F}{K_p \cdot \gamma \cdot D} \xrightarrow[assume, L = real]{solve, float, 3} 6.54 \quad \text{Use:} \quad L := 7\ ft$$

Maximum moment in the shaft: $M_u := V_F \cdot \left(\frac{M_F}{V_F} + 0.54 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}}\right) = 63.53$ k-ft

Maximum moment is located at (below groundline):

$$0.82 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}} = 2.44 \quad \text{ft}$$

Loading for Shaft Reinforcement Design:

Shear at groundline from LARSA Strength LC-4:

$V_{xG} := 1.34\ kip$ $V_{yG} := 0.81\ kip$ $V_{uG} := \sqrt{V_{xG}^2 + V_{yG}^2} = 1.57\ kip$

Moment at groundline from LARSA Strength LC-4:

$M_{xG} := 7.32\ kip \cdot ft$ $M_{yG} := 11.53\ kip \cdot ft$ $M_{uG} := \sqrt{M_{xG}^2 + M_{yG}^2} = 13.66\ ft \cdot kip$

Shear from Moment couple: $V_{MC} := \frac{M_{uG}}{L} = 1.95\ kip$

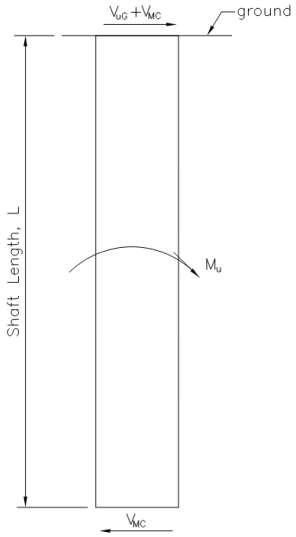
Total Shear for shaft shear design: $V_{uT} := V_{uG} + V_{MC} = 3.52\ kip$

Total Moment for shaft design: $M_u := M_u \cdot 1\ kip \cdot ft = 63.53\ kip \cdot ft$

Axial Force for shaft design, from LARSA Strength:

$P_{uMax} := 5.469\ kip$ LC-4

$P_{uMin} := 0.1565\ kip$ LC-5



Drilled Shaft Diagram

See Appendix D for drilled shaft reinforcement design.

BUTTERFLY DESIGN

Table of Contents

01 - Loads

WIND LOADS:

Design Wind Pressure:

For vertical 8" column (freestanding support), use Chapter 29.4 - Wind Load: Solid Freestanding Walls and Solid Freestanding Signs to determine the wind loads.

C_f factor for support member:

Force Coefficients, C_f

Cross Section	Type of Surface	h/D = 1	h/D = 7	h/D = 25
Square (wind normal to face)	All	1.3	1.4	2.0
Square (wind along diagonal)	All	1.0	1.1	1.5
Hexagonal or octagonal	All	1.0	1.2	1.4
Round, $D\sqrt{q_z} > 2.5$	Moderately smooth ($D'/D < 0.02$)	0.5	0.6	0.7
$D\sqrt{q_z} > 5.3$ (in SI)	Rough ($0.02 \le D'/D < 0.08$)	0.7	0.8	0.9
	Very rough ($D'/D = 0.08$)	0.8	1.0	1.2
Round, $D\sqrt{q_z} \le 2.5$	All	0.7	0.8	1.2
$D\sqrt{q_z} \le 5.3$ (in SI)				

$K_d = 0.85$

$G = 0.85$

For vertical post, similar with chimneys: Use Figure 29.4-1

The maximum structure height, $h := 11\ \boldsymbol{ft}$

Cross-section diameter, $D := 0.719\ \boldsymbol{ft}$

$\frac{h}{D} = 15.3$

$D \cdot \sqrt{q_z} = 3.45\ \boldsymbol{lbf}^{0.5}$ > 2.5 and Very rough surface

$C_f := \frac{(1.2-1)}{(25-7)} \cdot (15.31-7) + 1 = 1.09$

29.3 DESIGN WIND LOADS: SOLID FREESTANDING WALLS AND SOLID SIGNS

29.3.1 Solid Freestanding Walls and Solid Freestanding Signs The design wind force for solid freestanding walls and solid freestanding signs shall be determined by the following formula:

$$F = q_h K_d G C_f A_s \text{ (lb)} \qquad (29.3\text{-}1)$$

$$F = q_h K_d G C_f A_s \text{ (N)} \qquad (29.3\text{-}1.\text{SI})$$

where

q_h = Velocity pressure evaluated at height h (defined in Figure 29.3-1) as determined in accordance with Section 26.10;
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11;
C_f = Net force coefficient from Figure 29.3-1; and
A_s = Gross area of the solid freestanding wall or freestanding solid sign, ft^2 (m^2).

Design Wind Pressure on Vertical Member:

$F_H := q_z \cdot K_d \cdot G \cdot C_f = 18.18\ \boldsymbol{psf}$

(See Appendix - A for q_z calculation)

For roof, use Chapter 30 - Wind Load: Components and Cladding to determine the roof wind loads. Consider the shade structure is open structure, use Section 30.5.

30.5 BUILDING TYPES

The provisions of Section 30.5 are applicable to an open building of all heights that has a pitched free roof, monosloped free roof, or troughed free roof. The steps required for the determination of wind loads on C&C for these building types is shown in Table 30.5-1.

30.5.1 Conditions For the determination of the design wind pressures on C&Cs using the provisions of Section 30.5.2, the conditions indicated on the selected figure(s) shall be applicable to the building under consideration.

30.5.2 Design Wind Pressures The net design wind pressure for component and cladding elements of open buildings of all heights with monoslope, pitched, and troughed roofs shall be determined by the following equation:

$$p = q_h K_d G C_N \quad (30.5\text{-}1)$$

where

q_h = Velocity pressure evaluated at mean roof height h using the exposure as defined in Section 26.7.3 that results in the highest wind loads for any wind direction at the site; and
K_d = Wind directionality factor, see Section 26.6;
G = Gust-effect factor from Section 26.11; and
C_N = Net pressure coefficient given in

- Figure 30.5-1 for monosloped roof,
- Figure 30.5-2 for pitched roof, and
- Figure 30.5-3 for troughed roof.

Net pressure coefficients, C_N, include contributions from top and bottom surfaces. All load cases shown for each roof angle shall be investigated. Plus and minus signs signify pressure acting toward and away from the top surface of the roof, respectively.

See Appendix B for Net Pressure Coefficient Calculation

Minus signs: wind pressure acting away from the top roof surface:

$C_{Naway} := -1.8$

$p_{away} := q_z \cdot K_d \cdot G \cdot C_{Naway} = -29.95$ ***psf***

Plus signs: wind pressure acting towards from the top roof surface:

$C_{Ntoward} := 1.7$

$p_{toward} := q_z \cdot K_d \cdot G \cdot C_{Ntoward} = 28.29$ ***psf***

Use 30psf for both roof in both directions.

Wind Load applied in LARSA:

Horizontal Wind:

For post and roof beam (8" Pipes) $F := 18.18\ psf$

Diameter of 8" Pipe: $d := 8.625\ in$

Applied wind load on post and rood beam (8" Pipes): $W_H := F \cdot d = 13.07\ plf$

Wind normal to roof:

For roof:
Wind pressure acting away from roof surface $p_{Away} := -30\ psf$

Wind pressure acting towards the roof surface $p_{Toward} := 30\ psf$

Roof perforation % $A_p := 43$

Effective wind pressure on roof surface $p_{EAway} := p_{Away} \cdot \left(1 - \frac{A_p}{100}\right) = -17.1\ psf$

$p_{EToward} := p_{Toward} \cdot \left(1 - \frac{A_p}{100}\right) = 17.1\ psf$

SEISMIC LOADS:

Estimated Effective Weight of Steel Structure:
(Result from LARSA Model)

$W := 1.2526 \cdot kip$

Seismic Response Coefficient (See appendix C):

$C_s = 0.16$

Base Shear:

$V_{base} := C_s \cdot W = 0.2\ kip$

Redundancy Factor:

$\rho := 1.0$

12.3.4.1 Conditions Where Value of ρ is 1.0

The value of ρ is permitted to equal 1.0 for the following:

1. Structures assigned to Seismic Design Category B or C.

12.4.2.1 Horizontal Seismic Load Effect

The horizontal seismic load effect, E_h, shall be determined in accordance with Eq. 12.4-3 as follows:

$$E_h = \rho Q_E \qquad (12.4\text{-}3)$$

Horizontal Seismic Load Effect due to steel shade structure:

$E_h := \rho \cdot V_{base} = 0.2\ kip$

Horizontal Seismic Load Effect due to concrete pot:

$W_{Pot} := 4.76\ kip$

$E_{hpot} := \rho \cdot C_s \cdot W_{Pot} = 0.76\ kip$

12.4.2.2 Vertical Seismic Load Effect

The vertical seismic load effect, E_v, shall be determined in accordance with Eq. 12.4-4 as follows:

$$E_v = 0.2 S_{DS} D \qquad (12.4\text{-}4)$$

Design spectral response acceleration for short periods:
(See appendix C)

$S_{DS} = 0.2\ g$

Vertical Seismic Load Effect due to steel shade structure:

$E_v := 0.2 \cdot \frac{S_{DS}}{g} \cdot W = 0.05\ kip$

Vertical Seismic Load Effect due to concrete pot:

$E_{vpot} := 0.2 \cdot \frac{S_{DS}}{g} \cdot W_{Pot} = 0.19\ kip$

Direction of Loading

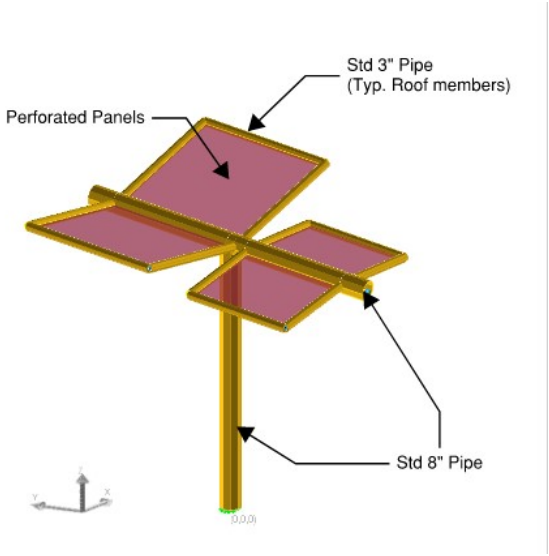
12.5.2 Seismic Design Category B. For structures assigned to Seismic Design Category B, the design seismic forces are permitted to be applied independently in each of two orthogonal directions, and orthogonal interaction effects are permitted to be neglected.

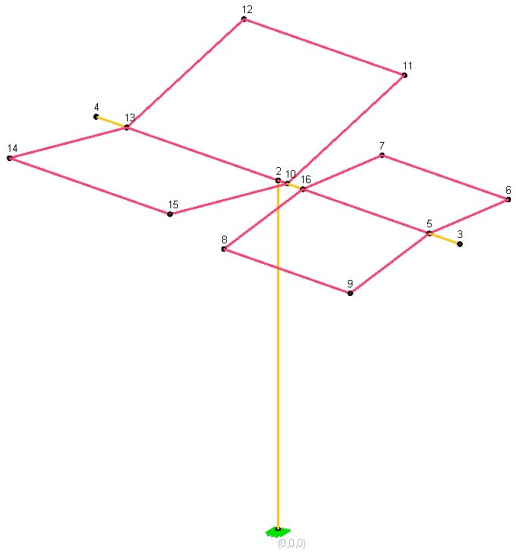
No orthogonal interaction is needed.

02 - Loads Application & Results

LARSA Model

Below is an isometric view of the Butterlfy Shade Structure as modeled in LARSA. Perforated panels in roof are modelled as 0.125" thick sheel members with 57% reduction in steel's unit weight (due to 43% perforation). Shell members are supported by Std 3" Pipes which is connected to the main Std 8" Pipe roof beam. Roof beam is supported by Std 8" vertical post as shown below.





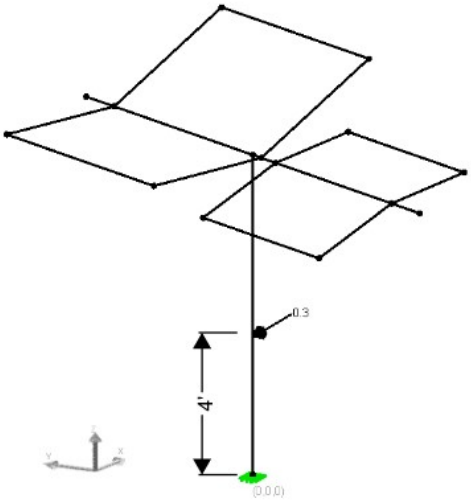
Isometric view of LARSA Model

Simple rendering showing joint locations

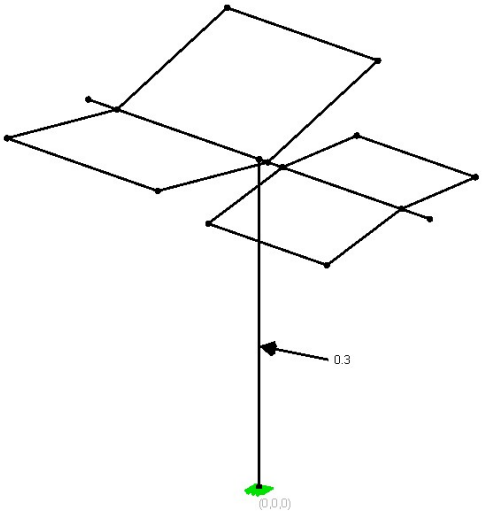
Image above showing simple rendering of LARSA model with joint locations. Origin is at Joint 1, calculation of joint coordinates is shown in the table below.

Joint	x(ft)	y(ft)	z(ft)
1	0.000	0.000	0.000
2	0.000	0.000	9.337
3	0.000	-5.281	8.594
4	0.000	5.281	10.079
5	0.000	-4.394	8.719
6	3.979	-4.394	8.371
7	3.979	-0.722	8.887
8	-3.979	-0.722	8.887
9	-3.979	-4.394	8.371
10	0.000	-0.268	9.299
11	5.896	-0.268	10.339
12	5.896	4.394	10.994
13	0.000	4.394	9.954
14	-5.896	4.394	10.994
15	-5.896	-0.268	10.339
16	0.000	-0.722	9.235

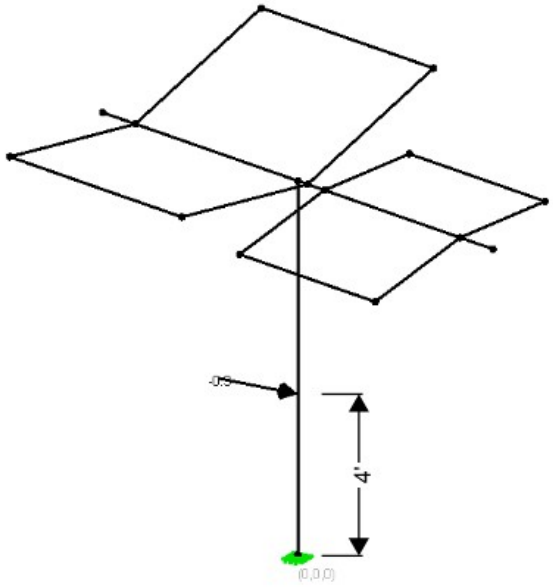
In the below simple rendering of the shade structure, the roof shell members are hidden for clarity. There is a 300 lb live load applied horizontally to the column 4ft above the ground. Shade structure is symmetric about Y-axis but is asymmetric about X-axis. So all the horizontal are applied along -ve X-Axis, +ve Y-Axis and -ve Y-Axis. This is the Live Load Lean load case.



Live Load Lean in -ve X direction

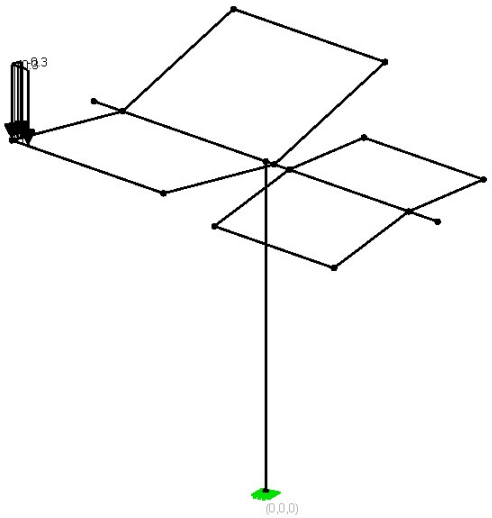


Live Load Lean in +ve Y direction

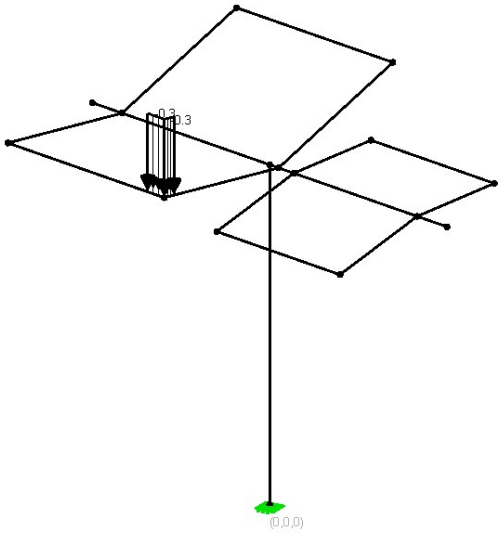


Live Load Lean in -ve Y direction

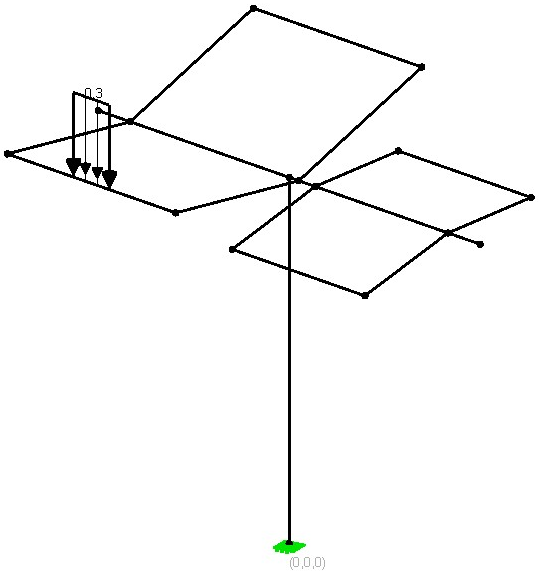
The Live Load Hang load case is also shown. This is a 300 lb load meant to simulate a person hanging from the roof of the structure. The load is distributed over a foot, and is applied seperately at six different locations.



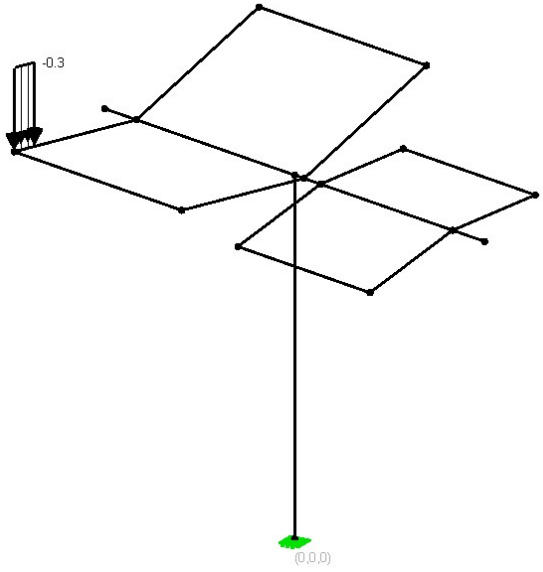
Live Load Hang1 on corner of large wing



Live Load Hang2 on corner of large wing

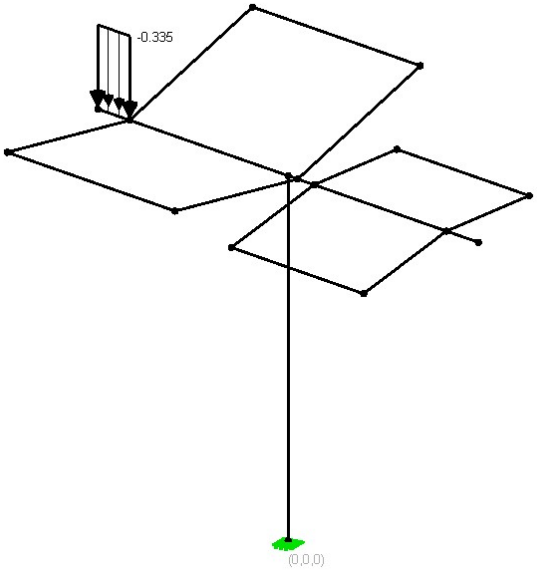


Live Load Hang3 on edge of large wing

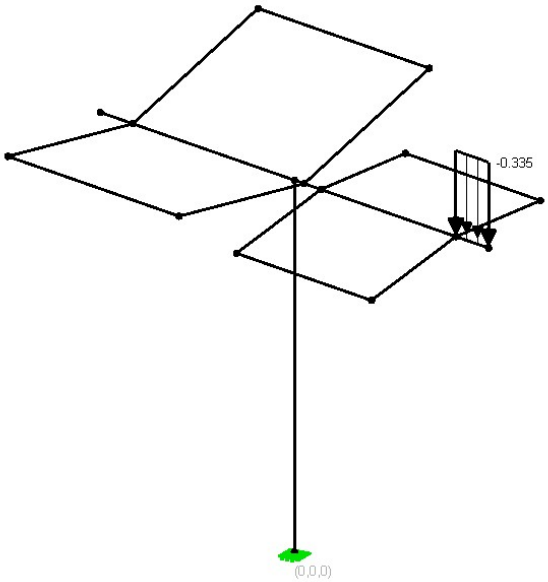


Live Load Hang4 on edge of large wing

LL hang on large will create higher moment because of greater lever arm so no need to check LL hang on short wing.



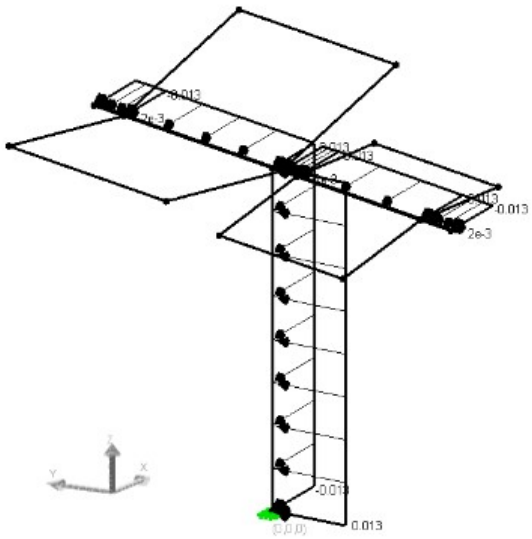
Live Load Hang5 on ends of roof beam



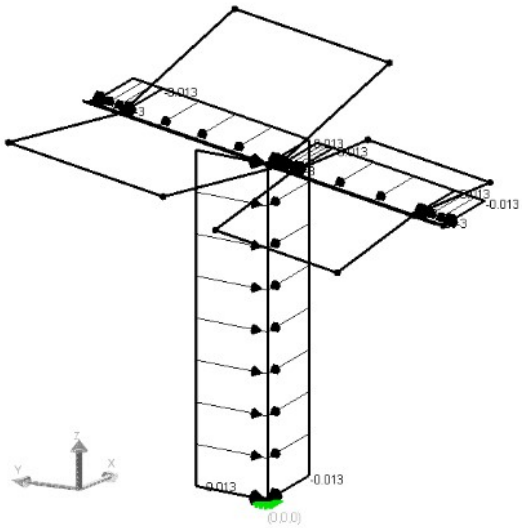
Live Load Hang6 on ends of roof beam

LL hang is checked at the ends of roof beam as well.

Horizontal wind loads are applied on the post and roof beam (Std 8" Pipe). Two load cases are considered, one when wind in acting in +Y and -X direction and second when wind is acting in -Y and -X direction. Both load cases are shown in the images below.

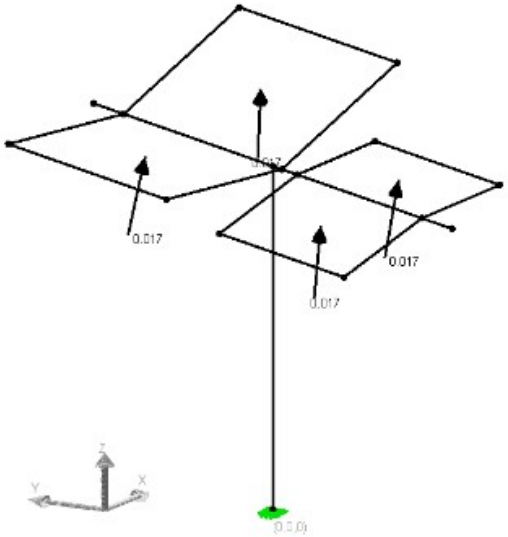


Wind acting in -X and +Y direction

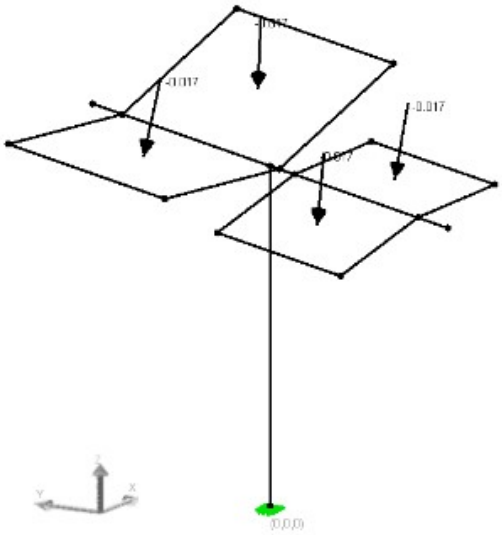


Wind acting in -X and -Y direction

Two cases are considered when applying wind load on roof. Wind load is acting perpendicular to the face of the roofs, one case when wind load is acting away from the face of roof and second when the roof is acting towards the face of the roof.

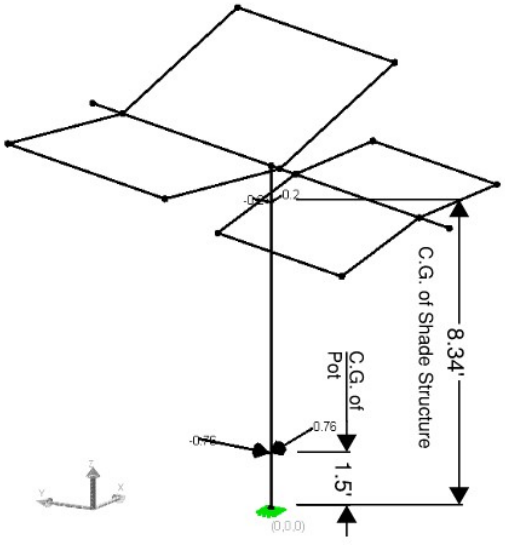


Wind acting away from the face of roof

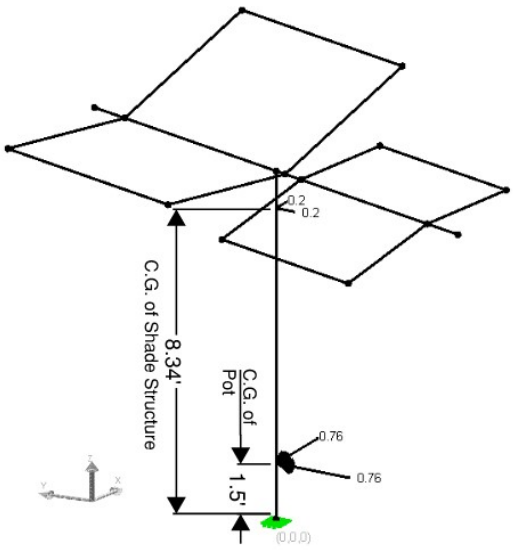


Wind acting towards the face of roof

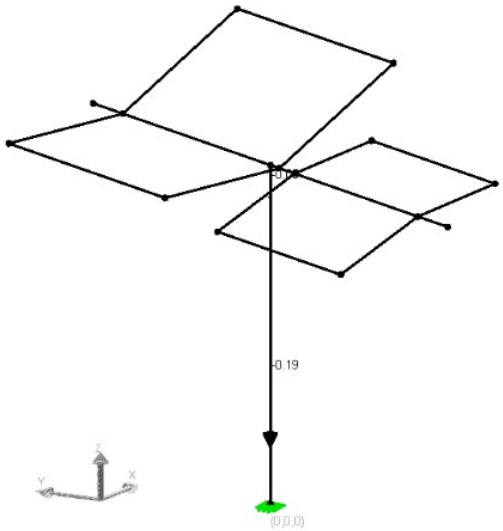
Seismic load due to weight of pot and weight of shade strucutre are applied separately at their respective C.G. Two cases of horizontal loads are considered, one case when seismic loads are applied in -X and -Y direction and second case when loads are acting in -X and +Y direction. Vertical seismic loads are applied in just -Z direction. To consider seismic load in +Z direction, load factor of -1.0 is used in load combination.



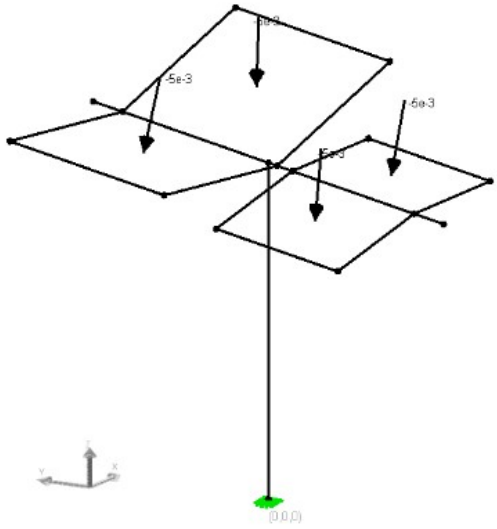
Seismic load in -X and -Y direction



Seismic load in -X and +Y direction



Vertical seismic load



Roof Live Load

Roof live load is applied on the roof in downwards direction as shown in image above.

Results:

Critical Resulted Forces are shown based on LARSA Analysis Result

Std 8 Pipe - Column (Member 1 - Sta 0)	**Load Case**	
$M_z := 5.52\ kip \cdot ft$	LC-4	
$M_y := 3.93\ kip \cdot ft$	LC-4	
$M_u := \sqrt{M_z^{\,2} + M_y^{\,2}} = 6.78\ kip \cdot ft$		
$V_y := 1.11\ kip$	LC-6	
$V_x := 1.11\ kip$	LC-6	
$V_u := \sqrt{V_x^{\,2} + V_y^{\,2}} = 1.57\ kip$		
$P_u := 3.15\ kip$	LC-4	
$\delta_{hC} := 0.08\ in$	LC-9	Lateral deflection
Std 8 Pipe - Roof Beam		
$M_{zr} := 0.36\ kip \cdot ft$	LC-3b	Member - 5 : Sta 0
$M_{yr} := 4.75\ kip \cdot ft$	LC-3b	Member - 5 : Sta 0
$M_{ur} := \sqrt{M_{zr}^{\,2} + M_{yr}^{\,2}} = 4.76\ kip \cdot ft$		
$V_{zr} := 1.87\ kip$	LC-4	Member - 4 : Sta 10
$V_{yr} := 0.09\ kip$	LC-4	Member - 5 : Sta 0
$V_{ur} := \sqrt{V_{zr}^{\,2} + V_{yr}^{\,2}} = 1.87\ kip$		
$\delta_{vR} := -0.08\ in$	LC-9	Vertical deflection - Joint 4

Std 3 Pipe - Roof Member

$M_{yp} := 2.59\ kip \cdot ft$	LC-3b	Member - 18 : Sta 10
$M_{zp} := 0.22\ kip \cdot ft$	LC-3b	Member - 18 : Sta 10
$M_{up} := \sqrt{M_{zp}^{\ 2} + M_{yp}^{\ 2}} = 2.6\ kip \cdot ft$		
$V_{uz} := 0.53\ kip$	LC-3b	Member - 16 : Sta 0
V_{uy} negligible		
$V_{up} := V_{uz} = 0.53\ kip$		
$\delta_{vRim} := -0.2\ in$	LC-9	Vertical deflection - Joint 14

03 - Pipe Member Flexure and Shear Design

AISC - F8 Pipe Member Flexure Analysis

Member: ***Pipe 8 Std*** A53 Gr.B

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 35 \cdot ksi$

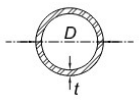
Diameter: $D := 8.625 \cdot in$

Design thickness: $t := 0.3 \cdot in$

D/t ratio: $Dt := \frac{D}{t} = 28.75$

Plastic section modulus: $Z := 20.8 \cdot in^3$

a. Check if section is compact:

20	Round HSS	D/t	$0.07\frac{E}{F_y}$	$0.31\frac{E}{F_y}$	

Compact or noncompact limit (Table b4.1b): $\lambda_p := 0.07 \cdot \frac{E}{F_y} = 58$

Compactness: $\text{if}\left(Dt < \lambda_p, \text{“Compact”}, \text{“N.G”}\right) = \text{“Compact”}$

For compact sections, the limit state of flange local buckling and web local buckling does not apply.

Yielding strength: $M_n := F_y \cdot Z = 60.67\ kip \cdot ft$

Flexural Demand Column: $M_{uc} := 6.78\ kip \cdot ft$

Flexural Demand Roof Beam: $M_{ub} := 4.76\ kip \cdot ft$

Demand to capacity ratios

Column: $\frac{M_{uc}}{0.9 \cdot M_n} = 0.12$

Roof beam: $\frac{M_{ub}}{0.9 \cdot M_n} = 0.09$

AISC G5 - Pipe Shear Analysis:

Member: ***Pipe 8 Std.*** A53 Gr.B

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 35 \cdot ksi$

Outside Diameter: $D := 8.625 \cdot in$

Design wall thickness: $t := 0.3 \cdot in$

Gross area: $A_g := 7.85 \cdot in^2$

Distance from max to zero shear force: $L_v := 9.3366 \cdot ft = 112.04\ in$

Shear Resistance:

$$F_{cr1} := \max\left(\frac{1.6\ E}{\left(\sqrt{\frac{L_v}{D}} \cdot \left(\frac{D}{t}\right)^{\frac{5}{4}}\right)}, \frac{0.78 \cdot E}{\left(\frac{D}{t}\right)^{\frac{3}{2}}}\right) \qquad F_{cr} := min\left(F_{cr1}, 0.6 \cdot F_y\right)$$

$F_{cr} = 21\ ksi$

Nominal Shear Strength: $V_n := F_{cr} \cdot \frac{A_g}{2} = 82.43\ kip$

Column Shear Demand: $V_{uC} := 1.11\ kip$

Roof Member Shear Demand: $V_{uR} := 1.71\ kip$

Shear Demand/Capacity Ratios: $\phi := 0.9$

Roof: $\frac{V_{uR}}{\phi \cdot V_n} = 0.02$ Column: $\frac{V_{uC}}{\phi \cdot V_n} = 0.01$

AISC - F8 Pipe Member Flexure Analysis

Member: ***Pipe 3 Std*** A53 Gr.B

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 35 \cdot ksi$

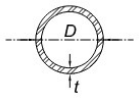
Diameter: $D := 3.5 \cdot in$

Design thickness: $t := 0.201 \cdot in$

D/t ratio: $Dt := \frac{D}{t} = 17.41$

Plastic section modulus: $Z := 2.19 \cdot in^3$

a. Check if section is compact:

20	Round HSS	D/t	$0.07\frac{E}{F_y}$	$0.31\frac{E}{F_y}$	

Compact or noncompact limit (Table b4.1b): $\lambda_p := 0.07 \cdot \frac{E}{F_y} = 58$

Compactness: $\text{if}\left(Dt < \lambda_p, \text{“Compact”}, \text{“N.G”}\right) = \text{“Compact”}$

For compact sections, the limit state of flange local buckling and web local buckling does not apply.

Yielding strength: $M_n := F_y \cdot Z = 6.39\ kip \cdot ft$

Flexural Demand: $M_u := 2.6\ kip \cdot ft$

Demand to capacity ratio: $\frac{M_u}{0.9 \cdot M_n} = 0.45$

AISC G5 - Pipe Shear Analysis:

Member: ***Pipe 3 Std.*** A53 Gr.B

Modulus of elasticity: $E := 29000 \cdot ksi$

Specified minimum yield stress: $F_y := 35 \cdot ksi$

Outside Diameter: $D := 3.5 \cdot in$

Design wall thickness: $t := 0.201 \cdot in$

Gross area: $A_g := 2.07 \cdot in^2$

Distance from max to zero shear force: $L_v := 5.9868 \cdot ft = 71.84\ in$

Shear Resistance:

$$F_{cr1} := \max\left(\frac{1.6\ E}{\left(\sqrt{\frac{L_v}{D}} \cdot \left(\frac{D}{t}\right)^{\frac{5}{4}}\right)}, \frac{0.78 \cdot E}{\left(\frac{D}{t}\right)^{\frac{3}{2}}}\right)$$

$$F_{cr} := min\left(F_{cr1}, 0.6 \cdot F_y\right)$$

$$F_{cr} = 21\ ksi$$

Nominal Shear Strength: $V_n := F_{cr} \cdot \frac{A_g}{2} = 21.74\ kip$

Shear Demand: $V_{uC} := 0.53\ kip$

Shear Demand/Capacity Ratio: $\frac{V_{uC}}{0.9 \cdot V_n} = 0.03$

04 - Deflection Check

Deflection - Std 3 Pipe

Cantilever Arm $I := 5.9868\ ft$

Max Allowable: $\delta_{max} := \frac{I}{150} = 0.48\ in$

Max deflection: $\delta := 0.20\ in$ (Jt 14 : LC-9)

Ratio: $\frac{\delta}{\delta_{max}} = 0.42$

05 - Welding Design

Pipe Moment Connections

Design Code: AISC Manual 15th ASTM Designation: A53 Gr. B

Outside diameter of main member: $D := 8.625 \cdot in$

Outside diameter of branch member: $D_b := 8.625 \cdot in$

Design main thickness: $t := 0.3 \cdot in$

Design branch thickness: $t_b := 0.3 \cdot in$

Section modulus: $S := 15.8 \cdot in^3$

Section area: $A_g := 7.85 \cdot in^2$

Specified minimum yield strength: $F_y := 35 \cdot ksi$

Angle between main member and branch member: $\theta := 82 \cdot °$

Available stress: $F_c := F_y = 35\ ksi$

Chord slenderness ratio: $\gamma := \frac{D}{2 \cdot t} = 14.38$

Width ratio: $\beta := \frac{D_b}{D} = 1$

Moment of Inertia: $I := 68.1\ in^4$

LARSA Results

Max. axial force

$P_u := 2.83 \cdot kip$

Max. in-plane moment :

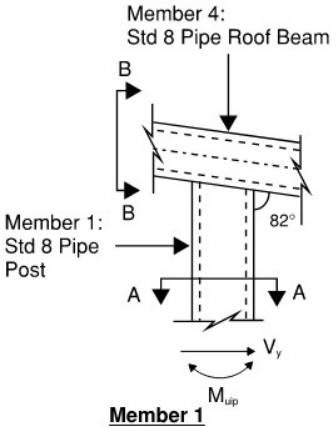
$M_{uip} := 2.91 \cdot kip \cdot ft$

Max out of plane moment:

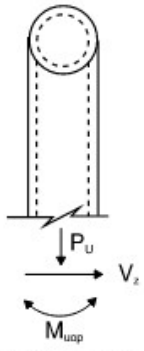
$M_{uop} := 2.83\ kip \cdot ft$

Shear Force

$V_z := 0.14\ kip$ $V_y := 0.25\ kip$



Member 1
M_{uip} = M_z - 2.91 k-ft LC-3b
V_y = F_Y - 0.25 kips LC-4
Torsion = M_x - 0 k-ft



SECTION B-B

Member 1
M_{uop} = M_Y - 2.83 k-ft - LC-3b
P_u = F_X - 2.83 kips - LC-4
V_z = F_z - 0.1362 - LC-4

Branch under in-plane bending (Table K4.1):

Plastification parameter:
(Eq. K2-3, K2-4)

$$U_{ip} := \left| \frac{P_u}{F_c \cdot A_g} + \frac{M_{uip}}{F_c \cdot S} \right| = 0.07$$

$$Q_{fip} := 1.0 - 0.3 \cdot U_{ip} \cdot \left(1 + U_{ip}\right) = 0.98$$

Chord Plastification:
(Eq. K4-1)

$$M_{n1} := 0.9 \cdot 5.39 \cdot F_y \cdot t^2 \cdot \gamma^{0.5} \cdot \beta \cdot D_b \cdot \frac{Q_{fip}}{\sin(\theta)} = 41.06 \ kip \cdot ft$$

Shear Yielding:
(Eq. K4-2)

$$M_{n2} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot {D_b}^2 \cdot \left(\frac{1 + 3 \cdot \sin(\theta)}{4 \cdot \sin(\theta)^2} \right) = 37.56 \ kip \cdot ft$$

In Plane Connection flexural strength:

$$\phi M_{nip} := min\left(M_{n1}, M_{n2}\right) = 37.56 \ kip \cdot ft$$

$$\textbf{if}\left(\phi M_{nip} > M_{uip}, \text{“O.K.”}, \text{“N.G”}\right) = \text{“O.K.”}$$

Branch under out-of-plane bending (Table K4.1):

Plastification parameter:
(Eq. K2-3, K2-4)

$$U_{op} := \left| \frac{P_u}{F_c \cdot A_g} + \frac{M_{uop}}{F_c \cdot S} \right| = 0.07$$

$$Q_{fop} := 1.0 - 0.3 \cdot U_{op} \cdot \left(1 + U_{op}\right) = 0.98$$

Chord Plastification:
(Eq. K3-3)

$$M_{n3} := 0.9 \cdot F_y \cdot t^2 \cdot D_b \cdot \left(\frac{3.0}{1 - 0.81 \cdot \beta} \right) \cdot \frac{Q_{fop}}{\sin(\theta)} = 31.74 \ kip \cdot ft$$

Shear Yielding:
(Eq. K3-4)

$$M_{n4} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot {D_b}^2 \cdot \left(\frac{3 + \sin(\theta)}{4 \cdot \sin(\theta)^2} \right) = 37.74 \ kip \cdot ft$$

Connection flexural strength:

$$\phi M_{nop} := min\left(M_{n3}, M_{n4}\right) = 31.74 \ kip \cdot ft$$

$$\textbf{if}\left(\phi M_{nop} > M_{uop}, \text{“O.K.”}, \text{“N.G”}\right) = \text{“O.K.”}$$

Design axial strength from Table K3.1:

General Check - Shear Yielding: (Eq. K3-1)

$$P_{n1} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot \pi \cdot D_b \cdot \left(\frac{1 + \sin(\theta)}{2 \cdot \sin(\theta)^2} \right) = 164.57 \ kip$$

$$Q_f := min\left(Q_{fip}, Q_{fop}\right)$$

T or Y Connection - Chord Plastification: (Eq. K3-2)

$$P_{n2} := F_y \cdot t^2 \cdot \left(3.1 + 15.6 \cdot \beta^2\right) \cdot \gamma^{0.2} \cdot \frac{Q_f}{\sin(\theta)} = 98.97 \ kip$$

Cross-Connection - Chord Plastification: (Eq. K3-3)

$$P_{n3} := F_y \cdot t^2 \cdot \left(\frac{5.7}{1 - 0.81 \cdot \beta} \right) \cdot \frac{Q_f}{\sin(\theta)} = 93.17 \ kip$$

Axial strength:

$$\phi P_n := min\left(P_{n1}, P_{n2}, P_{n3}\right) = 93.17 \ kip$$

Combination Ratio:

$$\omega := \frac{P_u}{\phi P_n} + \left(\frac{M_{uip}}{\phi M_{nip}} \right)^2 + \left(\frac{M_{uop}}{\phi M_{nop}} \right)^2 = 0.04$$

$$\textbf{if}\left(\omega < 1, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$$

Welding

3/16" flare-bevel welds made with E70XX electrodes.

The Ka parameter and effective length equation are from AWS D1.1:2000, Section 2.39.4

Ka axial load:

$$K_{a1} := \frac{1 + \frac{1}{\sin(\theta)}}{2} = 1$$

Ka in-plane bending:

$$K_{a2} := \frac{3 + \frac{1}{\sin(\theta)}}{4 \cdot \sin(\theta)} = 1.01$$

Ka out-plane bending:

$$K_{a3} := \frac{1 + \frac{3}{\sin(\theta)}}{4} = 1.01$$

$$K_a := min\left(K_{a1}, K_{a2}, K_{a3}\right) = 1$$

Effective length:

$$L_{eff} := \pi \cdot D_b \cdot K_a = 27.23 \ \textbf{\textit{in}}$$

AWS Table 2.1

Table 2.1
Effective Weld Sizes of Flare Groove Welds
(see 2.3.3.2)

Flare-Bevel-Groove Welds	Flare-V-Groove Welds
5/16 R	1/2 R*

Note: R = radius of outside surface

*Use 3/8 R for GMAW (except short circuiting transfer) process when R is 1/2 in. (12 mm) or greater.

Radius of joint surface:
(Table J2.2 AISC)

$R := 2 \cdot t_b = 0.6$ ***in***

Effective throat of weld:

$t_w := R \cdot \frac{5}{16} = 0.19$ ***in***

Filler metal classification strength:

$F_{EXX} := 70 \cdot$ ***ksi***

Weld strength:
(AISC J2-4)

$\phi R_n := 0.75 \cdot 0.6 \cdot F_{EXX} \cdot t_w \cdot L_{eff} = 160.82$ ***kip***

Bending stress due to M_{uop} :

$f_{Muop} := \frac{M_{uop}}{S} = 2.15$ ***ksi***

Axial stress due to P_u :

$f_{Pu} := \frac{P_u}{A_g} = 0.36$ ***ksi***

Bending stress due to M_{uip} :

$f_{Muip} := \frac{M_{uip}}{S} = 2.21$ ***ksi***

Shear stress due to V_y :

$f_{Vy} := \frac{2\ V_y}{A_g} = 0.06$ ***ksi***

Shear stress due to V_z :

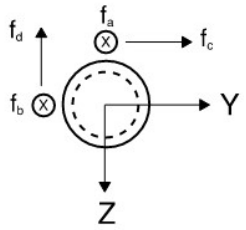
$f_{Vz} := \frac{2 \cdot V_z}{A_g} = 0.04$ ***ksi***

f_a - Stresses due to M_{uop} , P_u : $f_a := f_{Muop} + f_{Pu} = 2.51$ ***ksi***

f_b - Stresses due to M_{uip} , P_u : $f_b := f_{Muip} + f_{Pu} = 2.57$ ***ksi***

f_c - Stresses due to F_y : $f_c := f_{Vy} = 0.06$ ***ksi***

f_d - Stresses due to F_z : $f_d := f_{Vz} = 0.04$ ***ksi***



SECTION A-A

Resultant Stress:

$f_r := \max\left(\sqrt{f_a^2 + f_c^2}\ , \sqrt{f_b^2 + f_d^2}\right) = 2.57$ ***ksi***

Weld Demand:

$P_{ut} := f_r \cdot A_g = 20.18$ ***kip***

if $\left(P_{ut} < \phi R_n\ , \text{“O.K”}\ , \text{“N.G.”}\right) = \text{“O.K”}$

Summary

For STD 8" pipe connection, use 3/16" flared bevel weld.

Pipe Moment Connections

Design Code: AISC Manual 15th ASTM Designation: A53 Gr. B

Outside diameter of main member: $D := 8.625 \cdot in$

Outside diameter of branch member: $D_b := 3.5 \cdot in$

Design main thickness: $t := 0.3 \cdot in$

Design branch thickness: $t_b := 0.201 \cdot in$

Section modulus: $S := 1.63 \cdot in^3$

Polar Moment of Inertia: $J := 5.69\ in^4$

Section area: $A_g := 2.07 \cdot in^2$

Specified minimum yield strength: $F_y := 35 \cdot ksi$

Angle between main member and branch member: $\theta := 90 \cdot °$

Available stress: $F_c := F_y = 35\ ksi$

Chord slenderness ratio: $\gamma := \frac{D}{2 \cdot t} = 14.38$

Width ratio: $\beta := \frac{D_b}{D} = 0.41$

LARSA Results

Max. axial force

$P_u := 0.14 \cdot kip$

Max. in-plane moment :

$M_{uip} := 0.21 \cdot kip \cdot ft$

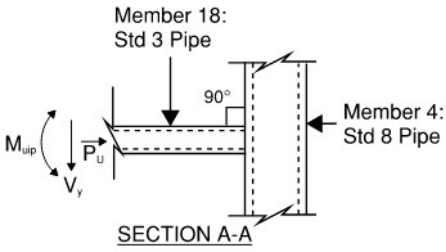
Max out of plane moment:

$M_{uop} := 2.59\ kip \cdot ft$

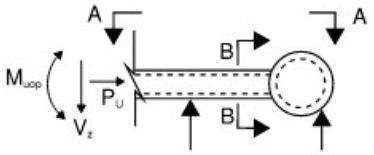
Shear Forces

$V_y := 0.025\ kip$ $V_z := 0.53\ kip$

Torsion: $M_x := 0.28\ kip \cdot ft$



Member 18 - LC-3b
$M_{uip} = M_z$ - 0.21 k-ft
$P_u = F_x$ - 0.14 kips
$V_y = F_y$ - 0.025 kips
Torsion = M_x - 0.28 k-ft



Member 18 - LC-3b
$M_{uop} = M_y$ - 2.59 k-ft
$P_u = F_x$ - 0.14 kips
$V_z = F_z$ - 0.53 kips

Branch under in-plane bending (Table K4.1):

Plastification parameter:
(Eq. K2-3, K2-4)

$$U_{ip} := \left| \frac{P_u}{F_c \cdot A_g} + \frac{M_{uip}}{F_c \cdot S} \right| = 0.05$$

$$Q_{fip} := 1.0 - 0.3 \cdot U_{ip} \cdot \left(1 + U_{ip}\right) = 0.99$$

Chord Plastification:
(Eq. K4-1)

$$M_{n1} := 0.9 \cdot 5.39 \cdot F_y \cdot t^2 \cdot \gamma^{0.5} \cdot \beta \cdot D_b \cdot \frac{Q_{fip}}{\sin(\theta)} = 6.76 \ kip \cdot ft$$

Shear Yielding:
(Eq. K4-2)

$$M_{n2} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot {D_b}^2 \cdot \left(\frac{1 + 3 \cdot \sin(\theta)}{4 \cdot \sin(\theta)^2} \right) = 6.11 \ kip \cdot ft$$

In Plane Connection flexural strength:

$$\phi M_{nip} := min\left(M_{n1}, M_{n2}\right) = 6.11 \ kip \cdot ft$$

$$\textbf{if}\left(\phi M_{nip} > M_{uip}, \text{“O.K.”}, \text{“N.G”}\right) = \text{“O.K.”}$$

Branch under out-of-plane bending (Table K4.1):

Plastification parameter:
(Eq. K2-3, K2-4)

$$U_{op} := \left| \frac{P_u}{F_c \cdot A_g} + \frac{M_{uop}}{F_c \cdot S} \right| = 0.55$$

$$Q_{fop} := 1.0 - 0.3 \cdot U_{op} \cdot \left(1 + U_{op}\right) = 0.75$$

Chord Plastification:
(Eq. K3-3)

$$M_{n3} := 0.9 \cdot F_y \cdot t^2 \cdot D_b \cdot \left(\frac{3.0}{1 - 0.81 \cdot \beta} \right) \cdot \frac{Q_{fop}}{\sin(\theta)} = 2.76 \ kip \cdot ft$$

Shear Yielding:
(Eq. K3-4)

$$M_{n4} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot {D_b}^2 \cdot \left(\frac{3 + \sin(\theta)}{4 \cdot \sin(\theta)^2} \right) = 6.11 \ kip \cdot ft$$

Connection flexural strength:

$$\phi M_{nop} := min\left(M_{n3}, M_{n4}\right) = 2.76 \ kip \cdot ft$$

$$\textbf{if}\left(\phi M_{nop} > M_{uop}, \text{“O.K.”}, \text{“N.G”}\right) = \text{“O.K.”}$$

Design axial strength from Table K3.1:

General Check - Shear Yielding: (Eq. K3-1)

$$P_{n1} := 0.95 \cdot 0.6 \cdot F_y \cdot t \cdot \pi \cdot D_b \cdot \left(\frac{1 + \sin(\theta)}{2 \cdot \sin(\theta)^2} \right) = 65.81 \ kip$$

$$Q_f := min\left(Q_{fip}, Q_{fop}\right)$$

T or Y Connection - Chord Plastification: (Eq. K3-2)

$$P_{n2} := F_y \cdot t^2 \cdot \left(3.1 + 15.6 \cdot \beta^2\right) \cdot \gamma^{0.2} \cdot \frac{Q_f}{\sin(\theta)} = 22.71 \ kip$$

Cross-Connection - Chord Plastification: (Eq. K3-3)

$$P_{n3} := F_y \cdot t^2 \cdot \left(\frac{5.7}{1 - 0.81 \cdot \beta} \right) \cdot \frac{Q_f}{\sin(\theta)} = 19.96 \ kip$$

Axial strength:

$$\phi P_n := min\left(P_{n1}, P_{n2}, P_{n3}\right) = 19.96 \ kip$$

Combination Ratio:

$$\omega := \frac{P_u}{\phi P_n} + \left(\frac{M_{uip}}{\phi M_{nip}} \right)^2 + \left(\frac{M_{uop}}{\phi M_{nop}} \right)^2 = 0.89$$

$$\textbf{if}\left(\omega < 1, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$$

Welding

1/8" flare-bevel welds made with E70XX electrodes.

The Ka parameter and effective length equation are from AWS D1.1:2000, Section 2.39.4

Ka axial load:

$$K_{a1} := \frac{1 + \frac{1}{\sin(\theta)}}{2} = 1$$

Ka in-plane bending:

$$K_{a2} := \frac{3 + \frac{1}{\sin(\theta)}}{4 \cdot \sin(\theta)} = 1$$

Ka out-plane bending:

$$K_{a3} := \frac{1 + \frac{3}{\sin(\theta)}}{4} = 1$$

$$K_a := min\left(K_{a1}, K_{a2}, K_{a3}\right) = 1$$

Effective length:

$$L_{eff} := \pi \cdot D_b \cdot K_a = 11 \ in$$

AWS Table 2.1

Table 2.1
Effective Weld Sizes of Flare Groove Welds
(see 2.3.3.2)

Flare-Bevel-Groove Welds	Flare-V-Groove Welds
5/16 R	1/2 R*

Note: R = radius of outside surface

*Use 3/8 R for GMAW (except short circuiting transfer) process when R is 1/2 in. (12 mm) or greater.

Radius of joint surface:
(Table J2.2 AISC)

$R := 2 \cdot t_b = 0.4$ ***in***

Effective throat of weld:

$t_w := R \cdot \frac{5}{16} = 0.1256$ ***in***

Filler metal classification strength:

$F_{EXX} := 70 \cdot$ ***ksi***

Weld strength:
(AISC J2-4)

$\phi R_n := 0.75 \cdot 0.6 \cdot F_{EXX} \cdot t_w \cdot L_{eff} = 43.51$ ***kip***

Bending stress due to M_{uop} :

$f_{Muop} := \frac{M_{uop}}{S} = 19.07$ ***ksi***

Bending stress due to M_{uip} :

$f_{Muip} := \frac{M_{uip}}{S} = 1.55$ ***ksi***

Axial stress due to P_u :

$f_{Pu} := \frac{P_u}{A_g} = 0.07$ ***ksi***

Torsional stress due to M_x :

$f_{Mx} := \frac{M_x \cdot D_b}{2 \cdot J} = 1.03$ ***ksi***

Shear stress due to V_y :

$f_{Vy} := \frac{2\ V_y}{A_g} = 0.02$ ***ksi***

Shear stress due to V_z :

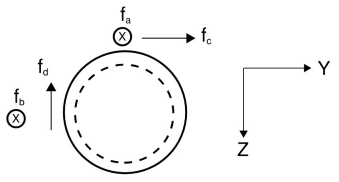
$f_{Vz} := \frac{2 \cdot V_z}{A_g} = 0.51$ ***ksi***

f_a - Stresses due to M_{uop}, P_u : $f_a := f_{Muop} + f_{Pu} = 19.14$ ***ksi***

f_b - Stresses due to M_{uip}, P_u : $f_b := f_{Muip} + f_{Pu} = 1.61$ ***ksi***

f_c - Stresses due to M_x, V_y : $f_c := f_{Mx} + f_{Vy} = 1.06$ ***ksi***

f_d - Stresses due to V_z, M_x : $f_d := f_{Mx} + f_{Vz} = 1.55$ ***ksi***



Section B-B
Member-18: Cross section

Resultant Stress:

$f_r := \max\left(\sqrt{f_a^2 + f_c^2}, \sqrt{f_b^2 + f_d^2}\right) = 19.16$ ***ksi***

Weld Demand:

$P_{ut} := f_r \cdot A_g = 39.67$ ***kip***

if $\left(P_{ut} < \phi R_n, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$

Summary

For STD 3" pipe connection, use 1/8" flared bevel weld.

Pipe Moment Connections

Design Code: AISC Manual 15th ASTM Designation: A53 Gr B.

LARSA Results Member 16:

$M_y := 0.33\ ft \cdot kip$ $F_y := 0.02\ kip$

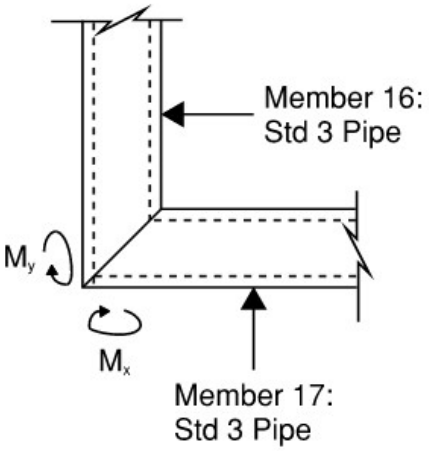
$M_x := 0.25\ ft \cdot kip$ $F_x := 0.03\ kip$

$M_z := 0.14\ ft \cdot kip$ $F_z := 0.34\ kip$

$S := 1.63 \cdot in^3$ $J := 5.69 \cdot in^4$

$d_o := 3.5\ in$ $d_i := 3.07\ in$

$t_b := 0.201\ in$ $A := 2.07 \cdot in^2$



Bending stress due to M_y: $f_{My} := \frac{M_y}{S} = 2.43\ ksi$

Bending stress due to M_z: $f_{Mz} := \frac{M_z}{S} = 1.03\ ksi$

Axial stress due to F_x: $f_{Fx} := \frac{F_x}{A} = 0.01\ ksi$

Torsional stress due to M_x: $f_{Mx} := \frac{M_x \cdot d_o}{2 \cdot J} = 0.92\ ksi$

Shear stress due to F_y: $f_{Fy} := \frac{2\ F_y}{A} = 0.02\ ksi$

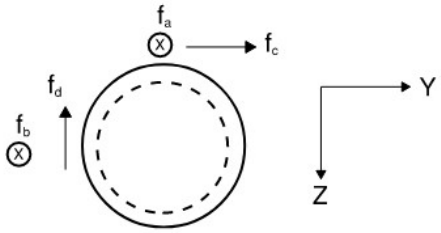
Shear stress due to F_z: $f_{Fz} := \frac{2\ F_z}{A} = 0.33\ ksi$

f_a - Stresses due to M_y, F_x: $f_a := f_{My} + f_{Fx} = 2.44\ ksi$

f_b - Stresses due to M_z, F_x: $f_b := f_{Mz} + f_{Fx} = 1.05\ ksi$

f_c - Stresses due to M_x, F_y: $f_c := f_{Mx} + f_{Fy} = 0.94\ ksi$

f_d - Stresses due to M_x, F_z: $f_d := f_{Mx} + f_{Fz} = 1.25\ ksi$



Member-16: Cross section

Resultant Stress: $f_r := \max\left(\sqrt{f_a^2 + f_c^2}, \sqrt{f_b^2 + f_d^2}\right) = 2.62\ ksi$

Weld Demand: $P_u := f_r \cdot \frac{A}{\sin(45\ °)} = 7.67\ \textit{kip}$

AWS Table 2.1

Table 2.1
Effective Weld Sizes of Flare Groove Welds
(see 2.3.3.2)

Flare-Bevel-Groove Welds	Flare-V-Groove Welds
5/16 R	1/2 R*

Note: R = radius of outside surface

*Use 3/8 R for GMAW (except short circuiting transfer) process when R is 1/2 in. (12 mm) or greater.

Radius of joint surface: (Table J2.2 AISC) $R := 2 \cdot t_b = 0.4\ \textit{in}$

Effective throat of weld: $t_w := R \cdot \frac{1}{2} = 0.201\ \textit{in}$

Filler metal classification strength: $F_{EXX} := 70\ \textit{ksi}$

Effective weld length: $L_{eff} := \pi \cdot d_o = 11\ \textit{in}$

Weld strength: (AISC J2-4) $\phi R_n := 0.75 \cdot 0.6 \cdot F_{EXX} \cdot t_w \cdot L_{eff} = 69.62\ \textit{kip}$

$\textbf{if}\left(P_u < \phi R_n, \text{“O.K”}, \text{“N.G.”}\right) = \text{“O.K”}$

Summary

For STD 3" pipe connection, use 3/16" flare V-Groove weld.

06 - Drilled Shaft Design

Shaft Length Calculation:

The shaft length is determined based on the Section 13.6.1 from "LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals".

Per the project location, assuming the foundation is sand as cohesionless soils. The properties of the soil are estimated per engineering adjustment for lacking of Geotech information.

Angle of internal friction: $\phi := 30°$

Effective unit weight of soil: $\gamma := 0.11$ k/ft^3

Max Moment at groundline: (LC - $D + 0.5\ (L + L_r) + W$)

$M_y := 3.33$ k-ft $M_z := 4.88$ k-ft $M := \sqrt{M_y^{\,2} + M_z^{\,2}} = 5.91$ k-ft

Max Shear at groundline: (LC - $D + 0.5\ (L + L_r) + W$)

$V_y := 0.52$ kip $V_z := 0.42$ kip $V := \sqrt{V_z^{\,2} + V_y^{\,2}} = 0.67$ kip

Diameter of shaft: $D := 2$ ft

Overload Factor: $w := \frac{3}{0.7} = 4.29$

Factored Shear: $V_F := w \cdot V = 2.86$ kip

Factored Moment: $M_F := w \cdot M = 25.32$ k-ft

Broms' Equation for Cohesionless Soil: $K_p := \left(\tan\left(45° + \frac{\phi}{2}\right)\right)^2 = 3$

$$L^3 = \frac{2\ V_F \cdot L}{K_p \cdot \gamma \cdot D} + \frac{2\ M_F}{K_p \cdot \gamma \cdot D} \xrightarrow{solve, assume, L = real\ float, 3} 4.93 \qquad \text{Use} \qquad L := 5\ ft$$

Maximum moment in the shaft: $M_u := V_F \cdot \left(\frac{M_F}{V_F} + 0.54 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}}\right) = 28.54$ k-ft

Maximum moment is located at (below groundline):

$0.82 \cdot \sqrt{\frac{V_F}{\gamma \cdot D \cdot K_p}} = 1.71$ ft

Loading for Shaft Reinforcement Design:

Shear at groundline LC-4: $V_{uG} := \sqrt{0.67^2 + 0.64^2}\ kip = 0.93\ kip$

Moment at groundline LC-4: $M_{uG} := 6.78\ kip \cdot ft$

Shear from Moment couple: $V_{MC} := \frac{M_{uG}}{L} = 1.36\ kip$

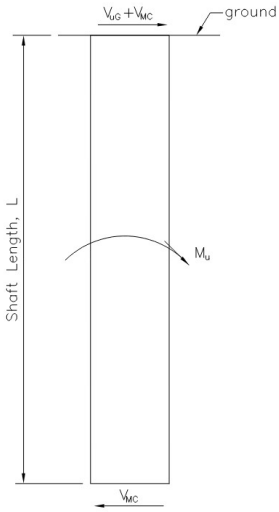
Total Shear for shaft design: $V_{uT} := V_{uG} + V_{MC} = 2.28\ kip$

Total Moment for shaft design: $M_u := M_u \cdot 1\ kip \cdot ft = 28.54\ kip \cdot ft$

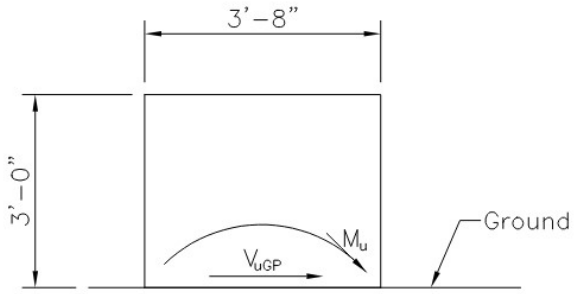
Axial Force for shaft design, from LARSA Strength:

$P_{uMax} := 3.15\ kip$ LC-4

$P_{uMin} := 0.06\ kip$ LC-5



Drilled Shaft Diagram



Pot Diagram

Loading for Pot Reinforcement Design:

Shear at groundline from LARSA Strength: $V_{uGP} := \sqrt{1.11^2 + 1.11^2}\ kip = 1.57\ kip$ LC-6

Moment at groundline from LARSA Strength: $M_{uGP} := M_{uG} = 6.78\ kip \cdot ft$ LC-4

Weight of Pot: (Overturn Calculation) $P_{Pot} := 4.76\ kip$

The weight of the pot is added to the axial load with a 1.2 factor in line with the controlling load case.

Axial Force for shaft design, from LARSA Strength, with pot: $P_{uMaxPot} := P_{uMax} + 1.2 \cdot P_{Pot} = 8.86\ kip$ LC-4

$P_{uMinPot} := P_{uMin} + 1.2 \cdot P_{Pot} = 5.77\ kip$ LC-5

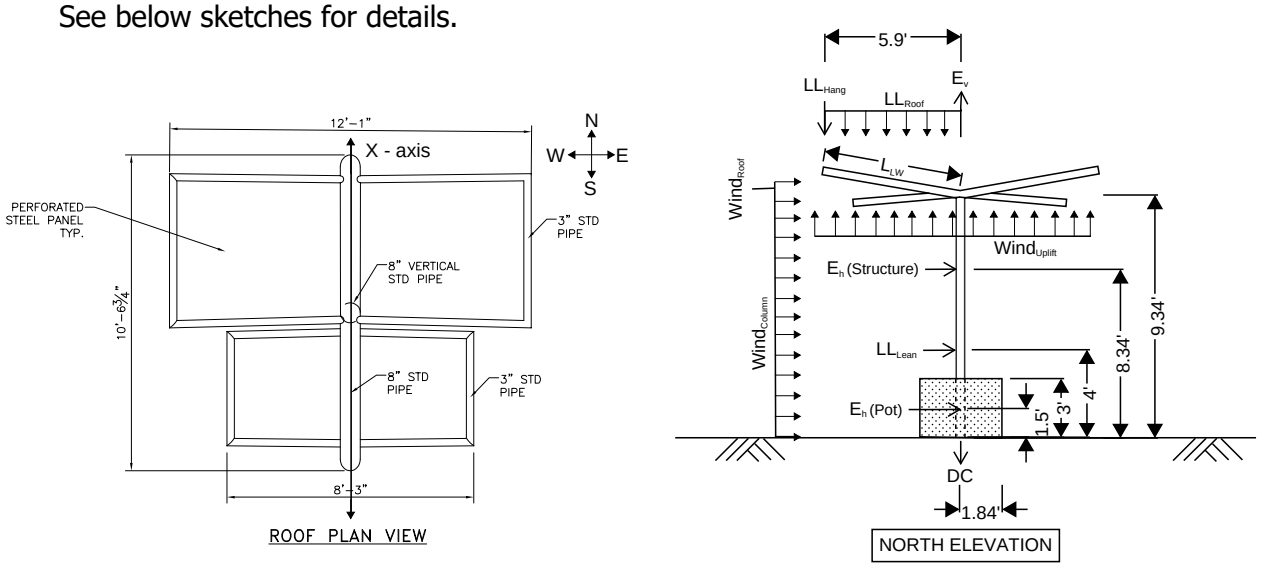
See Appendix D for drilled shaft and pot reinforcement design

07 - Concrete Pot Stability Check

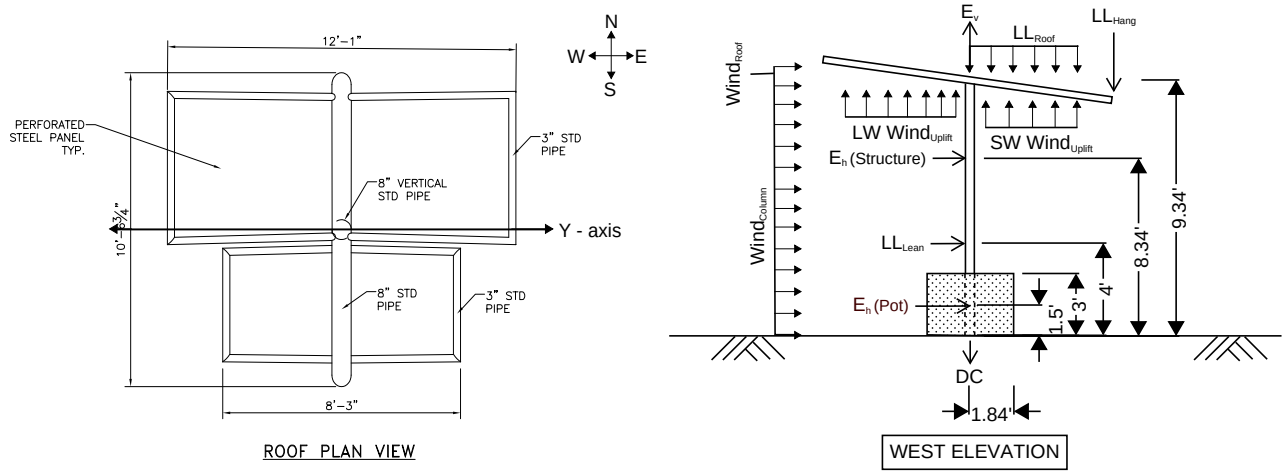
INTRODUCTION

The potted option must be checked for overturning and sliding. The weight of the concrete pot and the steel structure will provide a moment about the bottom outer edge of the pot that will resist overturn moment due to applied wind, seismic and live loads. Friction forces between concrete pot and grade will resist sliding (assume $\mu = 0.2$). The resisting forces shall provide a minimum factor of safety of 1.5 for the load combinations specified in design criteria. All the loads applied on the structure are shown in the sketch below.

Because of asymmetric geometry, stability is checked about both X-axis and Y-axis separately. See below sketches for details.



LOAD APPLICATION - STABILITY CHECK ABOUT X-AXIS



LOAD APPLICATION - STABILITY CHECK ABOUT Y-AXIS

STABILITY CHECK ABOUT X-AXIS

Overturning Resistance:

Resistance from Pot:

Top Diameter: $D_T := 3.67\ ft$

Bottom Diameter: $D_B := 3.67\ ft$

Average Diameter: $D_P := \frac{(D_T + D_B)}{2} = 3.67\ ft$

Height of pot: $H_P := 3\ ft$

Volume of pot: $V_P := H_P \cdot \pi \cdot \left(\frac{D_P}{2}\right)^2 = 31.74\ ft^3$

Density: $\rho_{Conc} := 0.15\ \frac{kip}{ft^3}$

Total Weight: $P_P := V_P \cdot \rho_{Conc} = 4.76\ kip$

Moment Arm to resist overturn: $L_{Pb} := \frac{D_B}{2} = 1.84\ ft$

Moment to resist overturn: $M_{ORP} := P_P \cdot L_{Pb} = 8.74\ kip \cdot ft$

Resistance from Shade Structure:

DC Axial Force (from LARSA): $P_{Shade} := 1.2526\ kip$

Moment Resistance: $M_{Shade} := P_{Shade} \cdot L_{Pb} = 2.3\ kip \cdot ft$

Total Overturn Resistance: $M_{OR} := M_{ORP} + M_{Shade} = 11.03\ kip \cdot ft$

Overturn Moment from Loading:

Geometry:

Length from center of 8" Pipe to center of 3" Pipe (Large Wing): $L_{LW} := 5.9868\ ft$

Vertical 8" Pipe Height: $H_{Vert} := 9.3366\ ft$

Vertical 8" Pipe Width: $H_{Width} := 8.625\ in$

Horizontal 8" Pipe Length: $H_{Length} := 10.67\ ft$

% Perforation on Roof: $A_P := 43$

Live Load:

Leaning Force: $F_{Lean} := 300\ lbf$

Leaning Force Moment Arm: $L_{Lean} := 4\ ft$

Leaning Moment: $M_{Lean} := F_{Lean} \cdot L_{Lean} = 1.2\ kip \cdot ft$

Roof Live Load:

Hanging Load:

Hanging Force:
Applied at the center of 3" pipe $F_{Hang} := 300\ lbf$

Hanging Moment Arm: $L_{Hang} := L_{LW} \cdot \cos(10\ °) - L_{Pb} = 4.06\ ft$

Hanging Moment: $M_{Hang} := F_{Hang} \cdot L_{Hang} = 1.22\ kip \cdot ft$

Distributed Load:

Roof Distributed Loading: $p_{Roof} := 5\ psf$

Joint Reactions form LARSA: $F_{ZR} := 0.2105\ kip$ $M_{YR} := 0.7402\ kip \cdot ft$

Roof Live Load Moment: $M_{Roof} := M_{YR} - F_{ZR} \cdot L_{Pb} = 0.35\ ft \cdot kip$

Wind Loads:

Wind Pressure Uplift: $P_z := 30\ psf$

Effective Wind Pressure Uplift: $P_{zu} := P_z \cdot \left(1 - \frac{A_P}{100}\right) = 17.1\ psf$

Wind Pressure on Column: $F := 18.18\ psf$

Wind Load on Column:

Horizontal Force on Vertical Member: $F_{WH} := F \cdot H_{Vert} \cdot H_{Width} = 0.12\ kip$

Horizontal Force Moment Arm: $L_{WH} := \frac{H_{Vert}}{2} = 4.67\ ft$

Horizontal Wind Moment: $M_{WH} := F_{WH} \cdot L_{WH} = 0.57\ kip \cdot ft$

Wind Load 8" Pipe Roof Beam:

Horizontal Force: $F_{WHR} := F \cdot H_{Length} \cdot H_{Width} = 0.14\ kip$

Moment Arm: $L_{WHR} := H_{Vert} = 9.34\ ft$

Horizontal Wind Moment: $M_{WHR} := F_{WHR} \cdot L_{WHR} = 1.3\ kip \cdot ft$

Wind Load on Roof:

Effective Uplift Pressure: $P_{zu} = 17.1\ psf$

Joint Reactions form LARSA: $F_{ZUp} := 1.44\ kip$ $M_{YUp} := 0\ kip \cdot ft$

Moment due to Uplift: $M_{Up} := F_{ZUp} \cdot L_{Pb} = 2.64\ ft{\cdot}kip$

Seismic Loads:

Seismic Response Coefficient: $C_S := 0.16$

Redundancy Factor: $\rho := 1$

Horizontal Seismic Loads:

Horizontal Load on Steel Structure: $E_{hs} := \rho \cdot C_S \cdot P_{Shade} = 200.42\ lbf$

Moment Arm for E_{hs} (C.G. of steel structure): $L_{Ehs} := 8.34\ ft$

Horizontal Load on Pot: $E_{hp} := \rho \cdot C_S \cdot P_P = 761.65\ lbf$

Moment Arm for E_{hp}: $L_{Ehp} := \frac{H_P}{2} = 1.5\ ft$

Moment due to E_{hs}: $M_{Ehs} := L_{Ehs} \cdot E_{hs} = 1.67\ ft \cdot kip$

Moment due to E_{hp}: $M_{Ehp} := L_{Ehp} \cdot E_{hp} = 1.14\ ft \cdot kip$

Vertical Seismic Loads:

Short Period Response Acceleration Paramater: $S_{DS} := 0.2\ g$

Vertical Load: $E_v := 0.2 \cdot \frac{S_{DS}}{g} \cdot \left(P_{Shade} + P_P\right) = 240.52\ lbf$

Moment Arm of E_v: $L_{Ev} := L_{Pb} = 1.84\ ft$

Moment due to E_v: $M_{Ev} := E_v \cdot L_{Ev} = 0.44\ ft \cdot kip$

STABILITY CHECK

Butterfly - Overturning about X-axis

Load	Description	kips	Arm (ft)	Moment (k-ft)
D	DC (Structure)	1.25	1.84	2.30
D	DC (Pot)	4.76	1.84	8.74
L	LL (Lean)	0.30	4.00	1.20
Lr	LL (Hang)	0.30	4.06	1.22
Lr	LL (Roof)	0.21	-	0.35
W_h	Wind (Roof Beam)	0.14	9.34	1.30
W_h	Wind (Column)	0.12	4.67	0.57
W_v	Wind (Uplift)	1.44	1.84	2.64
E_h	Seismic (Struc.)	0.20	8.34	1.67
E_h	Seismic (Pot)	0.76	1.50	1.14
E_v	Seismic (Total)	0.24	1.84	0.44

F.O.S = Resisting Moment/ Overturning Moment

For Overturning:
Resisting Moment: Dead Load
Overturning Moment: Live Load/Wind Load/Seismic Load

For Sliding:
Resisting Force: (Vertical Reaction) * 0.2
Sliding Force: Horizontal Forces

Overturning Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment
D	DC (Structure)	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30
D	DC (Pot)	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74
L	LL (Lean)	0.0	0.00	1.0	1.20	0.0	0.00	0.75	0.90	0.5	0.60	0.0	0.00
Lr	LL (Hang)	0.0	0.00	0.0	0.00	1.0	1.22	0.75	0.91	0.5	0.61	0.0	0.00
Lr	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.35	0.75	0.26	0.5	0.18	0.0	0.00
W_h	Wind (Roof Beam)	1.0	1.30	0.0	0.00	0.0	0.00	0.00	0.00	1.0	1.30	0.0	0.00
W_h	Wind (Column)	1.0	0.57	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.57	0.0	0.00
W_v	Wind (Uplift)	1.0	2.64	0.0	0.00	0.0	0.00	0.0	0.00	1.0	2.64	0.0	0.00
E_h	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	1.17
E_h	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.80
E_v	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.31
		Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03
		Demand	4.51	Demand	1.20	Demand	1.57	Demand	2.08	Demand	5.90	Demand	2.28
		FOS	2.44	FOS	9.19	FOS	7.04	FOS	5.31	FOS	1.87	FOS	4.84
			OK		OK		OK		OK		OK		OK

Sliding Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force
D ↓	DC (Structure)	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25
D ↓	DC (Pot)	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76
L →	LL (Lean)	0.0	0.00	1.0	0.30	0.0	0.00	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Hang)	0.0	0.00	0.0	0.00	1.0	0.30	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.21	0.75	0.16	0.5	0.11	0.0	0.00
W_h →	Wind (Roof Beam)	1.0	0.14	0.0	0.00	1.0	0.14	0.00	0.00	1.0	0.14	0.0	0.00
W_h →	Wind (Column)	1.0	0.12	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.12	0.0	0.00
W_v ↑	Wind (Uplift)	1.0	1.44	0.0	0.00	0.0	0.00	0.0	0.00	1.0	1.44	0.0	0.00
E_h →	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.14
E_h →	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.53
E_v ↑	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.17
		Resistance	0.91	Resistance	1.20	Resistance	1.33	Resistance	1.28	Resistance	0.97	Resistance	1.17
		Demand	0.12	Demand	0.30	Demand	0.00	Demand	0.23	Demand	0.41	Demand	0.67
		FOS	7.50	FOS	4.01	FOS	-	FOS	5.69	FOS	2.35	FOS	1.74
			OK		OK		OK		OK		OK		OK

STABILITY CHECK ABOUT Y-AXIS

Bottom Diameter of Pot: $D_B := 3.67\ ft$

Moment Arm to resist overturn: $L_{Pb} := \frac{D_B}{2} = 1.84\ ft$

Overturn Moment from Loading:

Geometry:

Vertical Member Height $H_{Vert} := 9.3366\ ft$

Vertcial Member Width $H_{Width} := 8.625\ in$

Horizontal Member Length $H_{Length} := 10.67\ ft$

% Perforation on Roof: $A_P := 43$

Roof Live Load:

Hanging Load:

Hanging Force: $F_{Hang} := 300\ lbf$

Hanging Moment Arm: $L_{Hang} := \frac{H_{Length}}{2} \cdot \cos(8\ °) - L_{Pb} = 3.45\ ft$

Hanging Moment: $M_{Hang} := F_{Hang} \cdot L_{Hang} = 1.03\ kip \cdot ft$

Distributed Load:

Roof Distributed Loading: $p_{Roof} := 5\ psf$

Joint Reactions form LARSA: $F_{ZR} := 0.1461\ kip$ $M_{XR} := 0.1930\ kip \cdot ft$

Roof Live Load Moment $M_{Roof} := M_{XR} - F_{ZR} \cdot L_{Pb} = -0.08\ ft \cdot kip$
(Use zero for the live load, as its absence can result in a more severe impact.)

Wind Loads:

Wind Pressure Uplift: $P_z := 30\ psf$

Effective Wind Pressure Uplift: $P_{zu} := P_z \cdot \left(1 - \frac{A_P}{100}\right) = 17.1\ psf$

Wind Pressure on Column: $F := 18.18\ psf$

Wind Load 8" Pipe Roof Beam:

Horizontal Force: $F_{WHR} := F \cdot H_{Length} \cdot \sin(8\ °) \cdot H_{Width} = 0.02\ kip$

Moment Arm: $L_{WHR} := H_{Vert} = 9.34\ ft$

Horizontal Wind Moment: $M_{WHR} := F_{WHR} \cdot L_{WHR} = 0.18\ kip \cdot ft$

Wind Load on Roof:

Effective Uplift Pressure: $P_{zu} = 17.1\ psf$

Joint Reactions form LARSA: $F_{ZUp} := 1.4399\ kip$ $M_{XUp} := 2.62\ kip \cdot ft$

Moment due to Uplift: $M_{Up} := F_{ZUp} \cdot L_{Pb} + M_{XUp} = 5.26\ ft \cdot kip$

STABILITY CHECK

Butterfly - Overturning about Y-axis

Load	Description	kips	Arm (ft)	Moment (k-ft)
D	DC (Structure)	1.25	1.84	2.30
D	DC (Pot)	4.76	1.84	8.74
L	LL (Lean)	0.30	4.00	1.20
Lr	LL (Hang)	0.30	3.45	1.03
Lr	LL (Roof)	0.15	-	0.00
W_h	Wind (Roof Beam)	0.02	9.34	0.18
W_h	Wind (Column)	0.12	4.67	0.57
W_v	Wind (Uplift)	1.44	-	5.26
E_h	Seismic (Struc.)	0.20	8.34	1.67
E_h	Seismic (Pot)	0.76	1.50	1.14
E_v	Seismic (Total)	0.24	1.84	0.44

F.O.S = Resisting Moment/ Overturning Moment

For Overturning:
Resisting Moment: Dead Load
Overturning Moment: Live Load/Wind Load/Seismic Load

For Sliding:
Resisting Force: (Vertical Reaction) * 0.2
Sliding Force: Horizontal Forces

Overturning Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment	Factor	Moment
D	DC (Structure)	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30	1.0	2.30
D	DC (Pot)	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74	1.0	8.74
L	LL (Lean)	0.0	0.00	1.0	1.20	0.0	0.00	0.75	0.90	0.5	0.60	0.0	0.00
Lr	LL (Hang)	0.0	0.00	0.0	0.00	1.0	1.03	0.75	0.78	0.5	0.52	0.0	0.00
Lr	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.00	0.75	0.00	0.5	0.00	0.0	0.00
W_h	Wind (Roof Beam)	1.0	0.18	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.18	0.0	0.00
W_h	Wind (Column)	1.0	0.57	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.57	0.0	0.00
W_v	Wind (Uplift)	1.0	5.26	0.0	0.00	0.0	0.00	0.0	0.00	1.0	5.26	0.0	0.00
E_h	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	1.17
E_h	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.80
E_v	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.31
		Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03	Resistance	11.03
		Demand	6.01	Demand	1.20	Demand	1.03	Demand	1.68	Demand	7.13	Demand	2.28
		FOS	1.84	FOS	9.19	FOS	10.67	FOS	6.58	FOS	1.55	FOS	4.84
			OK		OK		OK		OK		OK		OK

Sliding Check													
Load Combinations		D + W		D + L		D + Lr		D + 0.75(L + Lr)		D + 0.5(L + Lr) + W		D - 0.7Ev + 0.7Eh	
Load	Description	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force	Factor	Force
D ↓	DC (Structure)	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25	1.0	1.25
D ↓	DC (Pot)	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76	1.0	4.76
L →	LL (Lean)	0.0	0.00	1.0	0.30	0.0	0.00	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Hang)	0.0	0.00	0.0	0.00	1.0	0.30	0.75	0.23	0.5	0.15	0.0	0.00
Lr ↓	LL (Roof)	0.0	0.00	0.0	0.00	1.0	0.15	0.75	0.11	0.5	0.07	0.0	0.00
W_h →	Wind (Roof Beam)	1.0	0.02	0.0	0.00	1.0	0.02	0.0	0.00	1.0	0.02	0.0	0.00
W_h →	Wind (Column)	1.0	0.12	0.0	0.00	0.0	0.00	0.0	0.00	1.0	0.12	0.0	0.00
W_v ↑	Wind (Uplift)	1.0	1.44	0.0	0.00	0.0	0.00	0.0	0.00	1.0	1.44	0.0	0.00
E_h →	Seismic (Struc.)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.14
E_h →	Seismic (Pot)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.53
E_v ↑	Seismic (Total)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.7	0.17
		Resistance	0.91	Resistance	1.20	Resistance	1.30	Resistance	1.27	Resistance	0.96	Resistance	1.17
		Demand	0.12	Demand	0.30	Demand	0.00	Demand	0.23	Demand	0.29	Demand	0.67
		FOS	7.50	FOS	4.01	FOS	-	FOS	5.64	FOS	3.29	FOS	1.74
			OK		OK		OK		OK		OK		OK

Appendix A - Wind Velocity Pressure

Wind Velocity Pressure - ASCE7-22 Chapter 26.10:

$$q_z = 0.00256 K_z K_{zt} K_e V^2 (\text{lb/ft}^2); V, \text{mi/h} \qquad (26.10\text{-}1)$$

$$q_z = 0.613 K_z K_{zt} K_e V^2 (\text{N/m}^2); V, \text{m/s} \qquad (26.10\text{-}1.\text{SI})$$

where

K_z = Velocity pressure exposure coefficient, see Section 26.10.1;
K_{zt} = Topographic factor, see Section 26.8.2;
K_e = Ground elevation factor, see Section 26.9;
V = Basic wind speed, see Section 26.5; and
q_z = Velocity pressure at height z.

$K_z := 0.85$ Exposure C, Height 0-15ft

$K_{zt} := 1.0$ Flat terrain, not at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography.

$K_e := 0.96$ Ground elevation above sea level - 1020'

$V := 105$ (mph, based on Figure 26.5-1B for Risk Category II)

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_e \cdot V^2 \ \frac{lbf}{ft^2} = 23.03 \ \frac{lbf}{ft^2}$$

Table 26.6-1. Wind Directionality Factor, K_d.

Structure Type	Directionality Factor K_d
Buildings	
Main wind force resisting system	0.85
Components and cladding	0.85
Arched roofs	0.85
Circular domes	1.0*
Chimneys, tanks, and similar structures	
Square	0.90
Hexagonal	0.95
Octagonal	1.0*
Round	1.0*
Solid freestanding walls, roof top equipment, and solid freestanding and attached signs	0.85
Open signs and single-plane open frames	0.85
Trussed towers	
Triangular, square, or rectangular	0.85
All other cross sections	0.95

$K_d := 0.85$ (Solid freestanding)

26.11 GUST EFFECTS

26.11.1 Gust-Effect Factor The gust-effect factor for a rigid building or other structure is permitted to be taken as 0.85.

$G := 0.85$

Appendix B - Net Pressure Coefficient

Table of Contents

ASSUMPTION:

The net pressure coefficients of the following shade structures are calculated per ASCE 7-22 Chapter 30, Wind Loads: Components and Cladding. The procedure for open buildings, as shown in Section 30.5, is used. Locations of the shade structures meets requirements for clear wind flow.

Cactus Blossom

The cactus blossom shade structure is determined to be a monosloped roof at 0° from the horizontal. Calculations are completed per ASCE 7-22 Figure 30.5-1 using an equivalent square area. The circular roof area of the structure is used to determine the side dimensions of the equivalent square area roof. The resulting side dimensions are used to determine the value of *a*.

Cactus Blossom Variegated

The cactus blossom variegated shade structure is determined to be a monosloped roof at 15° from the horizontal. Calculations are completed per ASCE 7-22 Figure 30.5-1. The roof is approximated by a rectangular area, where the horizontal dimension measured in the along-wind direction is 10 ft. The perpendicular horizontal dimension is the total roof area divided by 10.

Butterfly

The coefficient of the butterfly shade structure is calculated using two methods:

a. Global Analysis: Assuming all the wings acting as one large monosloped roof at 8° from the horizontal per ASCE 7-22 Figure 30.5-1.

b. Local Analysis: The small wings are treated as a pitched roof at 5° from the horizontal based on Figure 30.5-2, and the large wings are treated as a troughed roof at 10° from the horizontal based on Figure 30.5-3, separately.

To simplify the design and be conservative, use the larger values of net pressure coefficients from the above analysis for the design.

SUMMARY:

Net Pressure Coefficient (C_N)		
	Load Case	
	A	B
Cactus Blossom	1.2	-1.1
Cactus Blossom Variegated	1.8	-1.9
Butterfly	1.7	-1.8

TYLin

Net Pressure Coefficient - Component & Cladding for Open Buildings

Cactus Blossom

Open Building, Monoslope Roof

Roof Diameter (d) =	10	ft	
Mean Roof Height (h) =	10	ft	
Horizontal Dimension (L) =	10	ft	
Roof Angle (θ) =	0	°	
Roof Area (A) =	78.54	ft^2	Circular area
Side Dimension (s) =	8.86		Using equivalent square area

Following calculations are per ASCE 7-22 Figure 30.5-1

Minimum a value:			
4% of least side dim. =	0.35	ft	Larger is the
or	3	ft	minimum value
10% of least side dim. =	0.89	ft	
0.4h =	4	ft	
a =	3	ft	Smaller of the 10% and 0.4h but not less than 3 feet
a^2 =	9	ft^2	
$4a^2$ =	36	ft^2	

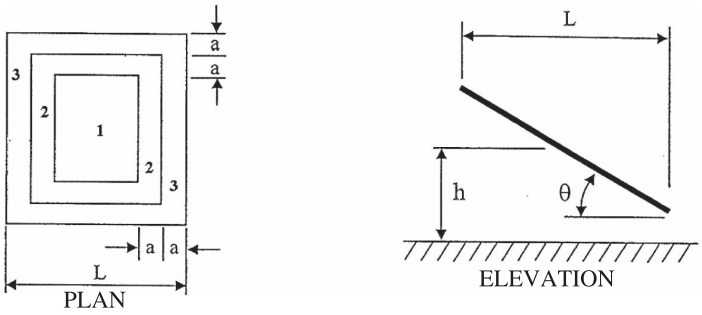
$A > 4a^2$, $\theta = 0°$

Load Case	Effective Wind Area (ft^2)	Net Pressure Coefficient (C_N)		
		Zone 1	Zone 2	Zone 3
A	78.54	1.2	1.2	1.2
B	78.54	-1.1	-1.1	-1.1

Shade structure location meets requirements for clear wind flow

Positive values signify pressure acting toward the surface of the roof

Diagrams



Notation

a = 10% of least horizontal dimension or 0.4h, whichever is smaller but not less than 4% of least horizontal dimension or 3 ft (0.9 m).

h = Mean roof height, ft (m).

L = Horizontal dimension of building, measured in along-wind direction, ft (m).

θ = Angle of plane of roof from horizontal, degrees.

Net Pressure Coefficients, C_N

Roof Angle, θ	Effective Wind Area	Clear Wind Flow					
		Zone 3		Zone 2		Zone 1	
0°	$\le a^2$	2.4	−3.3	1.8	−1.7	1.2	−1.1
	$> a^2, \le 4.0a^2$	1.8	−1.7	1.8	−1.7	1.2	−1.1
	$> 4.0a^2$	1.2	−1.1	1.2	−1.1	1.2	−1.1
7.5°	$\le a^2$	3.2	−4.2	2.4	−2.1	1.6	−1.4
	$> a^2, \le 4.0a^2$	2.4	−2.1	2.4	−2.1	1.6	−1.4
	$> 4.0a^2$	1.6	−1.4	1.6	−1.4	1.6	−1.4
15°	$\le a^2$	3.6	−3.8	2.7	−2.9	1.8	−1.9
	$> a^2, \le 4.0a^2$	2.7	−2.9	2.7	−2.9	1.8	−1.9
	$> 4.0a^2$	1.8	−1.9	1.8	−1.9	1.8	−1.9
30°	$\le a^2$	5.2	−5	3.9	−3.8	2.6	−2.5
	$> a^2, \le 4.0a^2$	3.9	−3.8	3.9	−3.8	2.6	−2.5
	$> 4.0a^2$	2.6	−2.5	2.6	−2.5	2.6	−2.5
45°	$\le a^2$	5.2	−4.6	3.9	−3.5	2.6	−2.3
	$> a^2, \le 4.0a^2$	3.9	−3.5	3.9	−3.5	2.6	−2.3
	$> 4.0a^2$	2.6	−2.3	2.6	−2.3	2.6	−2.3
		Obstructed Wind Flow					
		Zone 3		Zone 2		Zone 1	
0°	$\le a^2$	1	−3.6	0.8	−1.8	0.5	−1.2
	$> a^2, \le 4.0a^2$	0.8	−1.8	0.8	−1.8	0.5	−1.2
	$> 4.0a^2$	0.5	−1.2	0.5	−1.2	0.5	−1.2
7.5°	$\le a^2$	1.6	−5.1	1.2	−2.6	0.8	−1.7
	$> a^2, \le 4.0a^2$	1.2	−2.6	1.2	−2.6	0.8	−1.7
	$> 4.0a^2$	0.8	−1.7	0.8	−1.7	0.8	−1.7
15°	$\le a^2$	2.4	−4.2	1.8	−3.2	1.2	−2.1
	$> a^2, \le 4.0a^2$	1.8	−3.2	1.8	−3.2	1.2	−2.1
	$> 4.0a^2$	1.2	−2.1	1.2	−2.1	1.2	−2.1
30°	$\le a^2$	3.2	−4.6	2.4	−3.5	1.6	−2.3
	$> a^2, \le 4.0a^2$	2.4	−3.5	2.4	−3.5	1.6	−2.3
	$> 4.0a^2$	1.6	−2.3	1.6	−2.3	1.6	−2.3
45°	$\le a^2$	4.2	−3.8	3.2	−2.9	2.1	−1.9
	$> a^2, \le 4.0a^2$	3.2	−2.9	3.2	−2.9	2.1	−1.9
	$> 4.0a^2$	2.1	−1.9	2.1	−1.9	2.1	−1.9

Notes

1. C_N denotes net pressures (contributions from top and bottom surfaces).
2. Clear wind flow denotes relatively unobstructed wind flow with blockage less than or equal to 50%. Obstructed wind flow denotes objects below roof inhibiting wind flow (>50% blockage).
3. For values of θ other than those shown, linear interpolation is permitted.
4. Plus and minus signs signify pressures acting toward and away from the top roof surface, respectively.
5. Components and cladding elements shall be designed for positive and negative pressure coefficients shown.

Figure 30.5-1. Components and cladding ($0.25 \le h/L \le 1.0$): net pressure coefficient, C_N, for open buildings—monoslope free roofs, $\theta \le 45°$.

TYLin

Net Pressure Coefficient - Component & Cladding for Open Buildings

Cactus Blossom Variegated

Open Building, Monoslope Roof

Roof Area (A) =	114	ft^2	
Horizontal dimension (B) =	10	ft	Perpendicular wind direction
Horizontal dimension (L) =	11.4	ft	Along-wind direction
Roof Angle (θ) =	15	°	
Eave Height =	8.83	ft	
Top Height =	12.66	ft	
Mean Roof Height (h) =	10.74	ft	

Following calculations are per ASCE 7-22 Figure 30.5-1

Minimum a value:			
4% of least horizontal dim. =	0.40	ft	Larger is the
or	3	ft	minimum value
10% of least horizontal dim. =	1.00	ft	
0.4h =	4.30	ft	
a =	3	ft	Smaller of the 10% and 0.4h but not less than 3 feet
a^2 =	9	ft^2	
$4a^2$ =	36	ft^2	

$A > 4a^2$, θ = 15°

Load Case	Effective Wind Area (ft^2)	Net Pressure Coefficient (C_N)		
		Zone 1	Zone 2	Zone 3
A	114.00	1.8	1.8	1.8
B	114.00	-1.9	-1.9	-1.9

Shade structure location meets requirements for clear wind flow

Positive values signify pressure acting toward the surface of the roof

TYLin

Net Pressure Coefficient - Component & Cladding for Open Buildings

Butterfly - Global Analysis

Open Building, Monoslope Roof

Roof Area (A) =	93.42	ft^2	
Horizontal dimension (B) =	12.08	ft	Perpendicular wind direction
Horizontal dimension (L) =	10.56	ft	Along-wind direction
Roof Angle (θ) =	8	°	
Eave Height =	8.93	ft	
Top Height =	10.41	ft	
Mean Roof Height (h) =	9.67	ft	

Following calculations are per ASCE 7-22 Figure 30.5-1

Minimum a value:			
4% of least horizontal dim. =	0.42	ft	Larger is the
or	3	ft	minimum value
10% of least horizontal dim. =	1.06	ft	
0.4h =	3.87	ft	
a =	3	ft	Smaller of the 10% and 0.4h but not less than 3 feet
a^2 =	9	ft^2	
$4a^2$ =	36	ft^2	

$A > 4a^2$, θ = 8°

Load Case	Effective Wind Area (ft^2)	Net Pressure Coefficient (C_N)		
		Zone 1	Zone 2	Zone 3
A	93.42	1.6	1.6	1.6
B	93.42	-1.4	-1.4	-1.4

Shade structure location meets requirements for clear wind flow

Positive values signify pressure acting toward the surface of the roof

TYLin

Net Pressure Coefficient - Component & Cladding for Open Buildings

Butterfly - Local Analysis (Small Wing)

Open Building, Pitched Roof

Roof Area (A) =	33	ft^2	
Horizontal dimension (B) =	4	ft	Perpendicular wind direction
Horizontal dimension (L) =	8.25	ft	Along-wind direction
Roof Angle (θ) =	5	°	
Eave Height =	8.90	ft	
Top Height =	9.26	ft	
Mean Roof Height (h) =	9.08	ft	

Following calculations are per ASCE 7-22 Figure 30.5-2

Minimum a value:			
4% of least horizontal dim. =	0.16	ft	Larger is the
or	3	ft	minimum value
10% of least horizontal dim. =	0.40	ft	
0.4h =	3.63	ft	
a =	3	ft	Smaller of the 10% and 0.4h but not less than 3 feet
a^2 =	9	ft^2	
$4a^2$ =	36	ft^2	

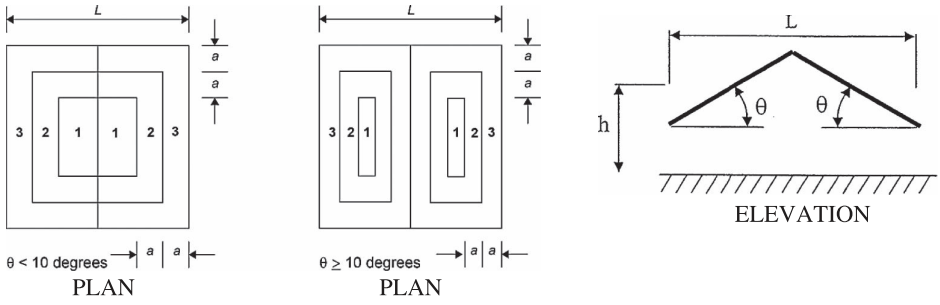
$a^2 < A < 4a^2$, θ = 5°

Load Case	Effective Wind Area (ft^2)	Net Pressure Coefficient (C_N)		
		Zone 1	Zone 2	Zone 3
A	33.00	1.1	1.7	1.7
B	33.00	-1.2	-1.8	-1.8

Shade structure location meets requirements for clear wind flow

Positive values signify pressure acting toward the surface of the roof

Diagrams



Notation

a = 10% of least horizontal dimension or $0.4h$, whichever is smaller, but not less than 4% of least horizontal dimension or 3 ft (0.9 m). Dimension a is as shown in Fig. 30.7-1.

h = Mean roof height, ft (m).

L = Horizontal dimension of building, measured in along-wind direction, ft (m).

θ = Angle of plane of roof from horizontal, degrees.

Net Pressure Coefficients, C_N

Roof Angle, θ	Effective Wind Area	Clear Wind Flow Zone 3		Zone 2		Zone 1	
0°	$\le a^2$	2.4	–3.3	1.8	–1.7	1.2	–1.1
	$> a^2, \le 4.0a^2$	1.8	–1.7	1.8	–1.7	1.2	–1.1
	$> 4.0a^2$	1.2	–1.1	1.2	–1.1	1.2	–1.1
7.5°	$\le a^2$	2.2	–3.6	1.7	–1.8	1.1	–1.2
	$> a^2, \le 4.0a^2$	1.7	–1.8	1.7	–1.8	1.1	–1.2
	$> 4.0a^2$	1.1	–1.2	1.1	–1.2	1.1	–1.2
15°	$\le a^2$	2.2	–2.2	1.7	–1.7	1.1	–1.1
	$> a^2, \le 4.0a^2$	1.7	–1.7	1.7	–1.7	1.1	–1.1
	$> 4.0a^2$	1.1	–1.1	1.1	–1.1	1.1	–1.1
30°	$\le a^2$	2.6	–1.8	2	–1.4	1.3	–0.9
	$> a^2, \le 4.0a^2$	2	–1.4	2	–1.4	1.3	–0.9
	$> 4.0a^2$	1.3	–0.9	1.3	–0.9	1.3	–0.9
45°	$\le a^2$	2.2	–1.6	1.7	–1.2	1.1	–0.8
	$> a^2, \le 4.0a^2$	1.7	–1.2	1.7	–1.2	1.1	–0.8
	$> 4.0a^2$	1.1	–0.8	1.1	–0.8	1.1	–0.8
		Obstructed Wind Flow					
		Zone 3		**Zone 2**		**Zone 1**	
0°	$\le a^2$	1	–3.6	0.8	–1.8	0.5	–1.2
	$> a^2, \le 4.0a^2$	0.8	–1.8	0.8	–1.8	0.5	–1.2
	$> 4.0a^2$	0.5	–1.2	0.5	–1.2	0.5	–1.2
7.5°	$\le a^2$	1	–5.1	0.8	–2.6	0.5	–1.7
	$> a^2, \le 4.0a^2$	0.8	–2.6	0.8	–2.6	0.5	–1.7
	$> 4.0a^2$	0.5	–1.7	0.5	–1.7	0.5	–1.7
15°	$\le a^2$	1	–3.2	0.8	–2.4	0.5	–1.6
	$> a^2, \le 4.0a^2$	0.8	–2.4	0.8	–2.4	0.5	–1.6
	$> 4.0a^2$	0.5	–1.6	0.5	–1.6	0.5	–1.6
30°	$\le a^2$	1	–2.4	0.8	–1.8	0.5	–1.2
	$> a^2, \le 4.0a^2$	0.8	–1.8	0.8	–1.8	0.5	–1.2
	$> 4.0a^2$	0.5	–1.2	0.5	–1.2	0.5	–1.2
45°	$\le a^2$	1	–2.4	0.8	–1.8	0.5	–1.2
	$> a^2, \le 4.0a^2$	0.8	–1.8	0.8	–1.8	0.5	–1.2
	$> 4.0a^2$	0.5	–1.2	0.5	–1.2	0.5	–1.2

Notes

1. C_N denotes net pressures (contributions from top and bottom surfaces).
2. Clear wind flow denotes relatively unobstructed wind flow with blockage less than or equal to 50%. Obstructed wind flow denotes objects below roof inhibiting wind flow (>50% blockage).
3. For values of θ other than those shown, linear interpolation is permitted.
4. Plus and minus signs signify pressures acting toward and away from the top roof surface, respectively.
5. Components and cladding elements shall be designed for positive and negative pressure coefficients shown.

Figure 30.5-2. Components and cladding ($0.25 \le h/L \le 1.0$): net pressure coefficient, C_N, for open buildings—pitched free roofs, $\theta \le 45°$.

TYLin

Net Pressure Coefficient - Component & Cladding for Open Buildings

Butterfly - Local Analysis (Large Wing)

Open Building, Troughed Roof

Roof Area (A) =	60.42	ft^2	
Horizontal dimension (B) =	5	ft	Perpendicular wind direction
Horizontal dimension (L) =	12.08	ft	Along-wind direction
Roof Angle (θ) =	10	°	
Top Height =	11.04	ft	
Center Height =	9.98	ft	
Mean Roof Height (h) =	10.51	ft	

Following calculations are per ASCE 7-22 Figure 30.5-3

Minimum a value:			
4% of least horizontal dim. =	0.20	ft	Larger is the
or	3	ft	minimum value
10% of least horizontal dim. =	0.50	ft	
0.4h =	4.20	ft	
a =	3	ft	Smaller of the 10% and 0.4h but not less than 3 feet
a^2 =	9	ft^2	
$4a^2$ =	36	ft^2	

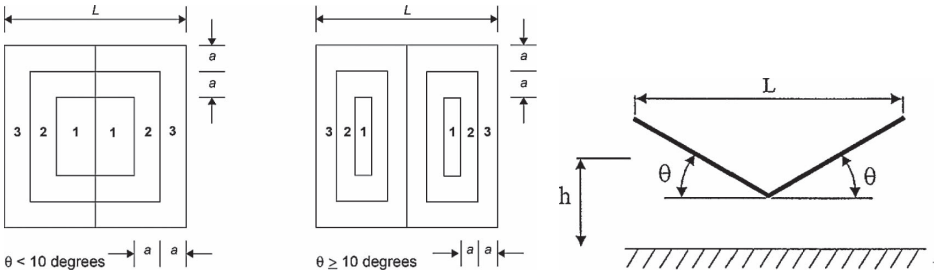
$A > 4a^2$, θ = 10°

Load Case	Effective Wind Area (ft^2)	Net Pressure Coefficient (C_N)		
		Zone 1	Zone 2	Zone 3
A	60.42	1.2	1.2	1.2
B	60.42	-1.1	-1.1	-1.1

Shade structure location meets requirements for clear wind flow

Positive values signify pressure acting toward the surface of the roof

Diagrams



Notation

a = 10% of least horizontal dimension or 0.4h, whichever is smaller, but not less than 4% of least horizontal dimension or 3 ft (0.9 m). Dimension a is as shown in Fig. 30.7-1.

h = Mean roof height, ft (m).

L = Horizontal dimension of building, measured in along-wind direction, ft (m).

θ = Angle of plane of roof from horizontal, degrees.

Net Pressure Coefficients, C_N

Roof Angle, θ	Effective Wind Area	Clear Wind Flow					
		Zone 3		Zone 2		Zone 1	
0°	$\le a^2$	2.4	−3.3	1.8	−1.7	1.2	−1.1
	$> a^2, \le 4.0a^2$	1.8	−1.7	1.8	−1.7	1.2	−1.1
	$> 4.0a^2$	1.2	−1.1	1.2	−1.1	1.2	−1.1
7.5°	$\le a^2$	2.4	−3.3	1.8	−1.7	1.2	−1.1
	$> a^2, \le 4.0a^2$	1.8	−1.7	1.8	−1.7	1.2	−1.1
	$> 4.0a^2$	1.2	−1.1	1.2	−1.1	1.2	−1.1
15°	$\le a^2$	2.2	−2.2	1.7	−1.7	1.1	−1.1
	$> a^2, \le 4.0a^2$	1.7	−1.7	1.7	−1.7	1.1	−1.1
	$> 4.0a^2$	1.1	−1.1	1.1	−1.1	1.1	−1.1
30°	$\le a^2$	1.8	−2.6	1.4	−2	0.9	−1.3
	$> a^2, \le 4.0a^2$	1.4	−2	1.4	−2	0.9	−1.3
	$> 4.0a^2$	0.9	−1.3	0.9	−1.3	0.9	−1.3
45°	$\le a^2$	1.6	−2.2	1.2	−1.7	0.8	−1.1
	$> a^2, \le 4.0a^2$	1.2	−1.7	1.2	−1.7	0.8	−1.1
	$> 4.0a^2$	0.8	−1.1	0.8	−1.1	0.8	−1.1
		Obstructed Wind Flow					
		Zone 3		Zone 2		Zone 1	
0°	$\le a^2$	1	−3.6	0.8	−1.8	0.5	−1.2
	$> a^2, \le 4.0a^2$	0.8	−1.8	0.8	−1.8	0.5	−1.2
	$> 4.0a^2$	0.5	−1.2	0.5	−1.2	0.5	−1.2
7.5°	$\le a^2$	1	−4.8	0.8	−2.4	0.5	−1.6
	$> a^2, \le 4.0a^2$	0.8	−2.4	0.8	−2.4	0.5	−1.6
	$> 4.0a^2$	0.5	−1.6	0.5	−1.6	0.5	−1.6
15°	$\le a^2$	1	−2.4	0.8	−1.8	0.5	−1.2
	$> a^2, \le 4.0a^2$	0.8	−1.8	0.8	−1.8	0.5	−1.2
	$> 4.0a^2$	0.5	−1.2	0.5	−1.2	0.5	−1.2
30°	$\le a^2$	1	−2.8	0.8	−2.1	0.5	−1.4
	$> a^2, \le 4.0a^2$	0.8	−2.1	0.8	−2.1	0.5	−1.4
	$> 4.0a^2$	0.5	−1.4	0.5	−1.4	0.5	−1.4
45°	$\le a^2$	1	−2.4	0.8	−1.8	0.5	−1.2
	$> a^2, \le 4.0a^2$	0.8	−1.8	0.8	−1.8	0.5	−1.2
	$> 4.0a^2$	0.5	−1.2	0.5	−1.2	0.5	−1.2

Notes

1. C_N denotes net pressures (contributions from top and bottom surfaces).
2. Clear wind flow denotes relatively unobstructed wind flow with blockage less than or equal to 50%. Obstructed wind flow denotes objects below roof inhibiting wind flow (>50% blockage).
3. For values of θ other than those shown, linear interpolation is permitted.
4. Plus and minus signs signify pressures acting toward and away from the top roof surface, respectively.
5. Components and cladding elements shall be designed for positive and negative pressure coefficients shown.

Figure 30.5-3. Components and cladding ($0.25 \le h/L \le 1.0$): net pressure coefficient, C_N, for open buildings—troughed free roofs, $\theta \le 45°$.

Appendix C - Seismic Response Coefficient

Seismic Loads:

The shade structure is designed as an nonbuilding structure. Nonbuilding structure type is assumed as "All other self-supporting structures" from Table 15.4-2. The structural analysis procedure is "Equivalent Lateral Force" based on Section 12.8.
The Seismic Response Coefficient Cs shown herein are applicable to the three options of shade strcutures becuse of the similar geometric.

Structure Mean Height $H := 10.5\ ft$

STRUCTURAL HEIGHT: The vertical distance from the base to the highest level of the seismic force-resisting system of the structure. For pitched or sloped roofs, the structural height is from the base to the average height of the roof.

Table 15.4-2 Seismic Coefficients for Nonbuilding Structures Not Similar to Buildings

Nonbuilding Structure Type	Detailing Requirements[c]	R	Ω_0	C_d	Structural System and Structural Height, h_n, Limits (ft)[a,b] Seismic Design Category B	C	D	E	F
Ground-supported cantilever walls or fences	15.6.8	1.25	2	2.5	NL	NL	NL	NL	NL
Signs and billboards		3.0	1.75	3	NL	NL	NL	NL	NL
Steel lighting system support pole structures	15.6.10	1.5	1.5	1.5	NL	NL	NL	NL	NL
All other self-supporting structures, tanks, or vessels not covered above or by reference standards that are not similar to buildings		1.25	2	2.5	NL	NL	50	50	50

Response Modification Factor $R := 1.25$

Overstrength Factor $\Omega_0 := 2$

Importance Factor

$I_e := 1$

Table 1.5-1

Risk Category from Table 1.5-1	Seismic Importance Factor, I_e
I	1.00
II	1.00
III	1.25
IV	1.50

The seismic ground motion values shown below are based on ASCE Hazards Tool - ASCE 7-22. See attached for the details.

$S_s := 0.180 \cdot g$ $S_1 := 0.057 \cdot g$ $S_{DS} := 0.2 \cdot g$ $S_{D1} := 0.11 \cdot g$

Long-Period Transition Period (s) $T_L := 6$

$$Seismic_{zone1} := \left\| \begin{array}{l} \text{if } S_{DS} \le 0.167 \cdot g \\ \quad \| \text{“A”} \\ \text{if } 0.167 \cdot g < S_{DS} \le 0.33 \cdot g \\ \quad \| \text{“B”} \\ \text{if } 0.33 \cdot g < S_{D1} \le 0.5 \cdot g \\ \quad \| \text{“C”} \\ \text{if } S_{D1} > 0.5 \cdot g \\ \quad \| \text{“D”} \end{array} \right\| = \text{“B”}$$

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

	Risk Category	
Value of S_{DS}	I or II or III	IV
$S_{DS} < 0.167$	A	A
$0.167 \le S_{DS} < 0.33$	B	C
$0.33 \le S_{DS} < 0.50$	C	D
$0.50 \le S_{DS}$	D	D

$$Seismic_{zone2} := \left\| \begin{array}{l} \text{if } S_{D1} \le 0.067 \cdot g \\ \quad \| \text{“A”} \\ \text{if } 0.067 \cdot g < S_{D1} \le 0.133 \cdot g \\ \quad \| \text{“B”} \\ \text{if } 0.133 \cdot g < S_{D1} \le 0.20 \cdot g \\ \quad \| \text{“C”} \\ \text{if } S_{D1} > 0.20 \cdot g \\ \quad \| \text{“D”} \end{array} \right\| = \text{“B”}$$

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

	Risk Category	
Value of S_{D1}	I or II or III	IV
$S_{D1} < 0.067$	A	A
$0.067 \le S_{D1} < 0.133$	B	C
$0.133 \le S_{D1} < 0.20$	C	D
$0.20 \le S_{D1}$	D	D

The Seismic Category is B

Approximate Fundamental Period - ASCE Eq-12.8-7

$C_t := 0.02$

$x := 0.75$

$T_a := C_t \cdot \left(\frac{H}{ft}\right)^x = 0.12$

Table 12.8-2 Values of Approximate Period Parameters C_t and x

Structure Type	C_t	x
Moment-resisting frame systems in which the frames resist 100% of the required seismic force and are not enclosed or adjoined by components that are more rigid and will prevent the frames from deflecting where subjected to seismic forces:		
Steel moment-resisting frames	0.028 (0.0724)[a]	0.8
Concrete moment-resisting frames	0.016 (0.0466)[a]	0.9
Steel eccentrically braced frames in accordance with Table 12.2-1 lines B1 or D1	0.03 (0.0731)[a]	0.75
Steel buckling-restrained braced frames	0.03 (0.0731)[a]	0.75
All other structural systems	0.02 (0.0488)[a]	0.75

[a]Metric equivalents are shown in parentheses.

Maximum Seismic Response Coefficient

$$C_{smax} := \left\| \begin{array}{l} \text{if } T_a \le T_L \\ \quad \left\| \frac{S_{D1}}{T_a \cdot \frac{R \cdot g}{I_e}} \right\| \\ \text{if } T_a > T_L \\ \quad \left\| \frac{S_{D1} \cdot T_L}{T_a^{\,2} \cdot \frac{R \cdot g}{I_e}} \right\| \end{array} \right\| = 0.75$$

Minimum Seismic Response Coefficient

$$C_{smin} := \left\| \begin{array}{l} \text{if } S_1 < 0.6 \cdot g \\ \quad \left\| \frac{0.044 \cdot S_{DS} \cdot I_e}{g} \right\| \\ \text{if } S_1 \ge 0.6 \cdot g \\ \quad \left\| \frac{0.5 \cdot S_1}{\frac{R \cdot g}{I_e}} \right\| \end{array} \right\| = 0.01$$

Seismic Response Coefficient

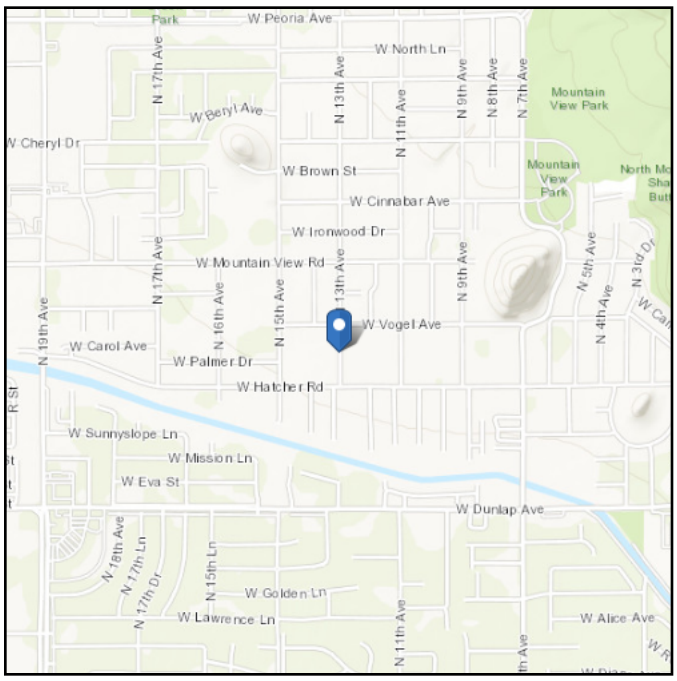
$$C_s := \max\left(C_{smin}, min\left(\frac{S_{DS}}{\frac{R \cdot g}{I_e}}, C_{smax}\right)\right) = 0.16$$

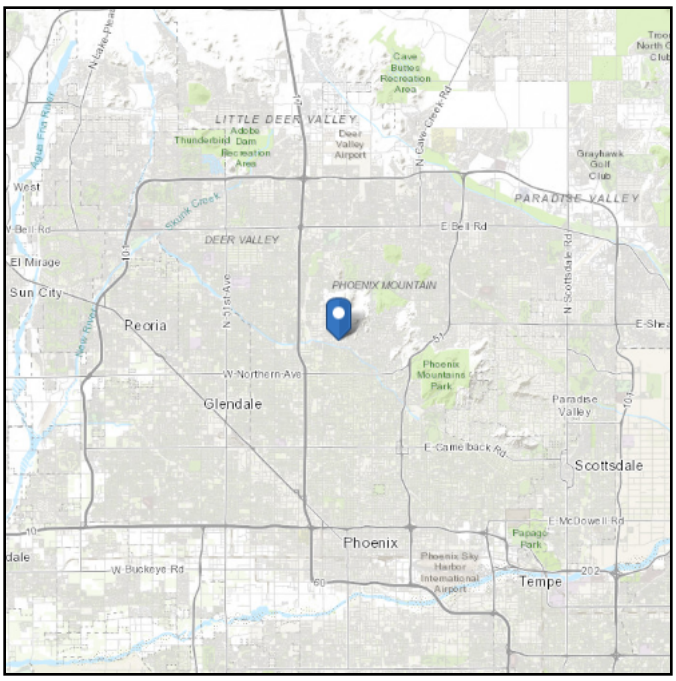
$C_s = 0.16$

ASCE Hazards Report

Address:
City of Phoenix
Arizona,

Standard:	ASCE/SEI 7-22	**Latitude:**	33.57222
Risk Category:	II	**Longitude:**	-112.0891
Soil Class:	Default	**Elevation:**	1244.0005522784888 ft (NAVD 88)





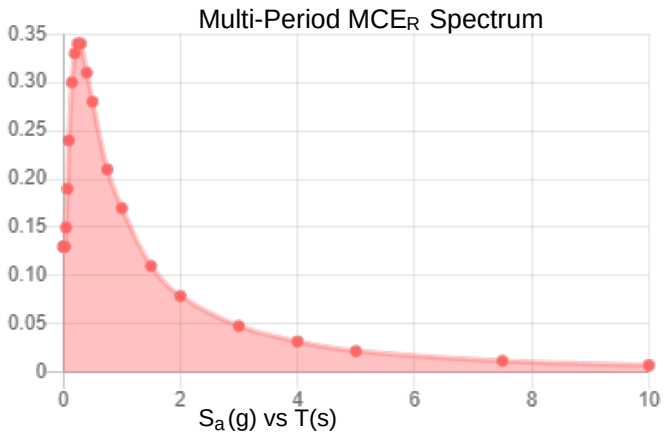
Seismic

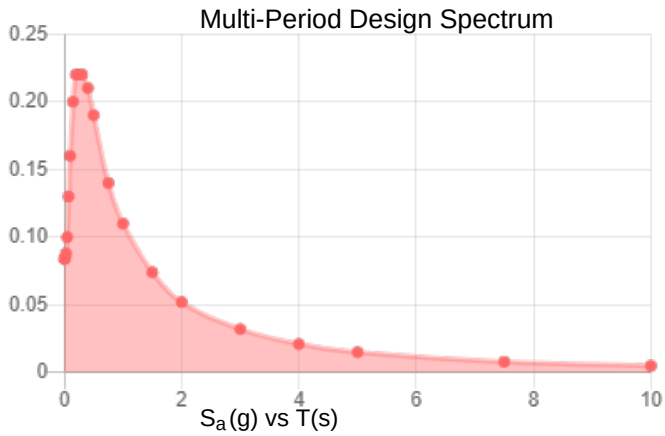
Site Soil Class: Site Class D

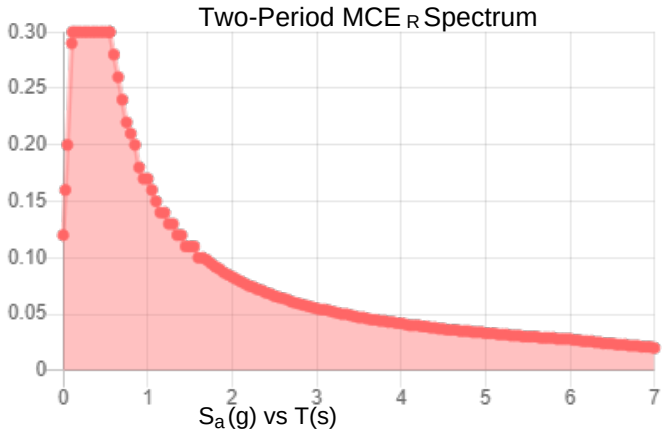
Results:

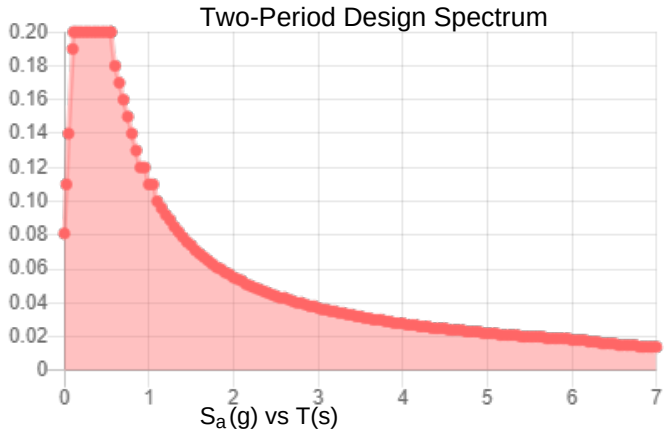
PGA_M :	0.12	T_L :	6
S_{MS} :	0.3	S_S :	0.2
S_{M1} :	0.17	S_1 :	0.059
S_{DS} :	0.2	V_{S30} :	260
S_{D1} :	0.11		

Seismic Design Category: B









MCER Vertical Response Spectrum

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

Design Vertical Response Spectrum

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

Data Accessed: **Mon Mar 04 2024**

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

Snow

Results:

Ground Snow Load, p_g :	1 lb/ft^2
20-year MRI Value:	1.01 lb/ft^2
Winter Wind Parameter:	0.25
Mapped Elevation:	1289.1 ft
Data Source:	ASCE/SEI 7-22, Figures 7.6-1 and 7.6-2 A-D
Date Accessed:	Mon Mar 04 2024
	Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.
	Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.
Ground Snow Loads for IRC only, $p_{g(asd)}$:	0.7 lb/ft^2

Appendix D - Foundation Design

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Drilled Shaft Design Summary:

The same drilled shaft length is used for Butterfly and Blossom, and a longer length is used for Blossom Variegated. The reinforcement is design based on the worst case from all three options, so the longitudinal and shear reinforcement will be the same for each case.

Butterfly & Blossom Length:	$L_B := 5.5\ ft$
Variegated Length:	$L_V := 7.0\ ft$
Longitudinal Reinforcement:	6 #5
Shear Reinforcement:	#4 loops @ 12"

Pot Design Summary:

The pot is an option for the butterfly and blossom case, and is designed using the worst case from the two.

Pot Diameter:	$D_P := 3\ ft + 8\ in = 3.67\ ft$
Pot Height:	$L_P := 3\ ft$
Longitudinal Reinforcement:	8 #5
Shear Reinforcement:	#4 loops @ 12"

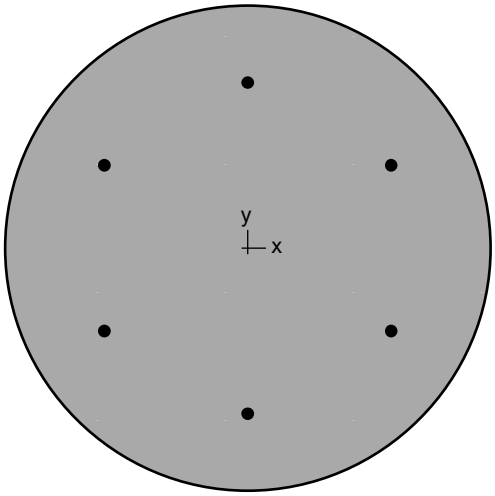
Drilled Shaft Design

Drilled Shaft Loading Summary:

The blossom variegated provided the controlling case for the drilled shaft reinforcement design. Below are the six load cases that were analyzed for reinforcement design. Cases 1 & 2 are from the Butterfly, cases 3 & 4 are from Cactus Blossom, and cases 5 & 6 are from the Blossom Variegated. The load cases were based on the loading provided previously, using the maximum bending moment and shear combined with the minimum and maximum axial force, giving two cases for each shade structure option.

Drilled Shaft Loading Summary				
Shade Structure	Load No	Pu	Mu	Vu
		kip	k-ft	kip
Butterfly	1	3.15	28.54	2.93
	2	0.06	28.54	2.93
Blossom	3	3.11	26.83	2.63
	4	-0.28	26.83	2.63
Blossom Variegated	5	5.50	63.53	3.52
	6	0.16	63.53	3.52

spColumn v10.00 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections



Contents

List of Figures

1. General Information

File Name	T:\O\TYLin-PHX\P\3010.01007...\Drilled Shaft.colx
Project	Shade Structures
Column	Drilled Shaft
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

2. Material Properties

2.1. Concrete

Type	Standard	
f'_c	3.5	ksi
E_c	3372.17	ksi
f_c	2.975	ksi
ε_u	0.003	in/in
β_1	0.85	

2.2. Steel

Type	Standard	
f_y	60	ksi
E_s	29000	ksi
ε_{ty}	0.00206897	in/in

3. Section

3.1. Shape and Properties

Type	Circular	
Diameter	24	in
A_g	452.389	in^2
I_x	16286	in^4
I_y	16286	in^4
r_x	6	in
r_y	6	in
X_o	0	in
Y_o	0	in

3.2. Section Figure

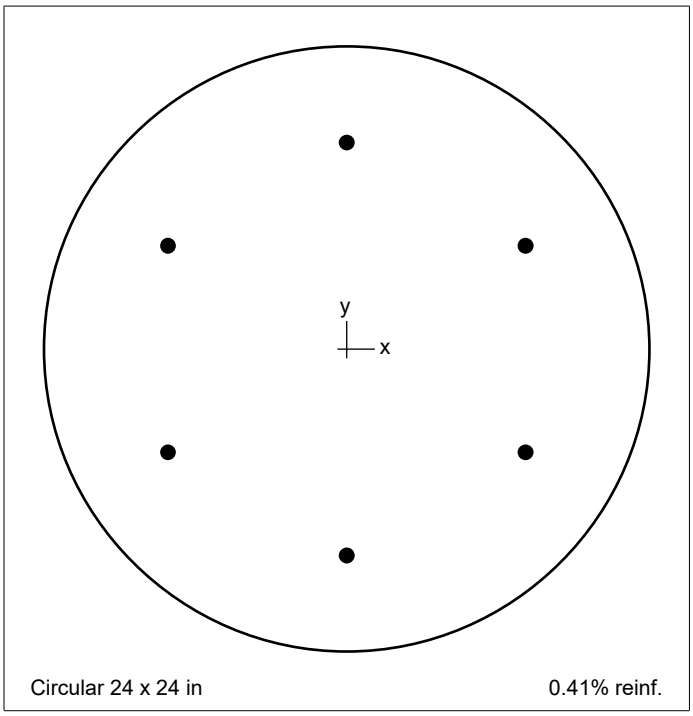


Figure 1: Column section

4. Reinforcement

4.1. Bar Set: ASTM A615

Bar	Diameter in	Area in²	Bar	Diameter in	Area in²	Bar	Diameter in	Area in²
#3	0.38	0.11	#4	0.50	0.20	#5	0.63	0.31
#6	0.75	0.44	#7	0.88	0.60	#8	1.00	0.79
#9	1.13	1.00	#10	1.27	1.27	#11	1.41	1.56
#14	1.69	2.25	#18	2.26	4.00			

4.2. Confinement and Factors

Confinement type	Tied
For #10 bars or less	#4 ties
For larger bars	#4 ties
Capacity Reduction Factors	
Axial compression, (a)	0.8
Tension controlled ϕ, (b)	0.9
Compression controlled ϕ, (c)	0.65

4.3. Arrangement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	3 in
Bars	6 #5

Total steel area, A_s	1.86 in^2
Rho	0.41 %
Minimum clear spacing	7.56 in

(Note: Rho < 0.50%)

5. Control Points

About	Point	P	X-Moment	Y-Moment	NA Depth	d_t Depth	ε_t	ϕ
		kip	k-ft	k-ft	in	in		
X	@ Max compression	430.7	0.00	0.00	65.05	20.19	-0.00207	0.65000
X	@ Allowable comp.	344.6	54.11	0.00	22.09	20.19	-0.00026	0.65000
X	@ f_s = 0.0	312.7	68.86	0.00	20.19	20.19	0.00000	0.65000
X	@ f_s = 0.5 f_y	212.6	93.95	0.00	15.01	20.19	0.00103	0.65000
X	@ Balanced point	142.5	97.41	0.00	11.95	20.19	0.00207	0.65000
X	@ Tension control	64.4	102.43	0.00	7.51	20.19	0.00507	0.90000
X	@ Pure bending	0.0	70.86	0.00	5.40	20.19	0.00822	0.90000
X	@ Max tension	-100.4	0.00	0.00	0.00	20.19	9.99999	0.90000
-X	@ Max compression	430.7	0.00	0.00	65.05	20.19	-0.00207	0.65000
-X	@ Allowable comp.	344.6	-54.11	0.00	22.09	20.19	-0.00026	0.65000
-X	@ f_s = 0.0	312.7	-68.86	0.00	20.19	20.19	0.00000	0.65000
-X	@ f_s = 0.5 f_y	212.6	-93.95	0.00	15.01	20.19	0.00103	0.65000
-X	@ Balanced point	142.5	-97.41	0.00	11.95	20.19	0.00207	0.65000
-X	@ Tension control	64.4	-102.43	0.00	7.51	20.19	0.00507	0.90000
-X	@ Pure bending	0.0	-70.86	0.00	5.40	20.19	0.00822	0.90000
-X	@ Max tension	-100.4	0.00	0.00	0.00	20.19	9.99999	0.90000

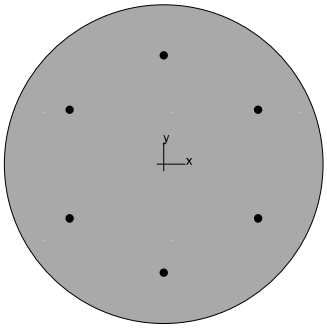
6. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

No.	Demand		Capacity		Parameters at Capacity			Capacity
	P_u	M_{ux}	ϕP_n	ϕM_{nx}	NA Depth	ε_t	ϕ	Ratio
	kip	k-ft	kip	k-ft	in			
1	3.15	28.54	0.00	70.86	5.40	0.00822	0.900	0.59
2	0.06	28.54	0.00	70.86	5.40	0.00822	0.900	0.59
3	3.11	26.63	0.00	70.86	5.40	0.00822	0.900	0.58
4	-0.28	26.63	-17.30	61.88	4.91	0.00934	0.900	0.62
5	5.47	63.53	0.00	70.86	5.40	0.00822	0.900	0.93
6	0.16	63.53	0.00	70.86	5.40	0.00822	0.900	0.93

7. Diagrams

7.1. PM at θ=0 [deg]



24.00 in diam.

General Information

Project	Shade Structures
Column	Drilled Shaft
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

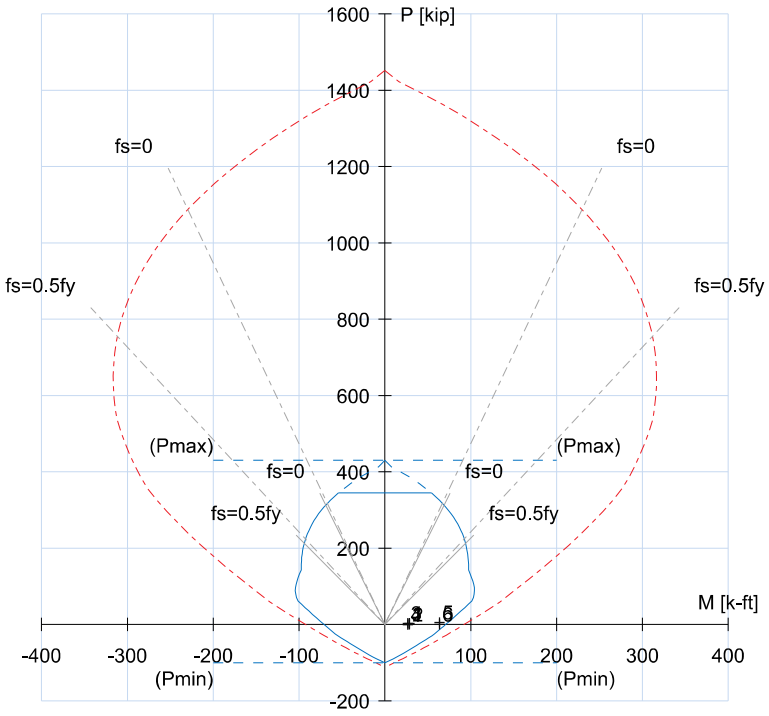
f'_c	3.5 ksi
E_c	3372.17 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Circular
Diameter	24 in
A_g	452.389 in²
I_x	16286 in⁴
I_y	16286 in⁴

Reinforcement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	3 in
Bars	6 #5
Confinement type	Tied
Total steel area, A_s	1.86 in²
Rho	0.41 %
Min. clear spacing	7.56 in



PM at 0.0 [deg]

No.	P_u kip	M_{ux} k-ft	ϕP_n kip	ϕM_{nx} k-ft	Capacity Ratio
5	5.5	63.5	0.00	70.86	0.93
6	0.2	63.5	0.00	70.86	0.93
4	-0.3	26.6	-17.30	61.88	0.62
1	3.2	28.5	0.00	70.86	0.59
2	0.1	28.5	0.00	70.86	0.59
3	3.1	26.6	0.00	70.86	0.58

Max. Capacity Ratio: 0.93

TYLin

T. Y. Lin International

Tempe, AZ

Date 6/10/2024
Brg. No. Shade
Calculations By BR

For: Drilled Shaft

Determine the shear capacity of a RC member (Circular Column Only)

Comments

	Member Diameter, D =	2.00	ft	ag=	1.00	in	
	Eff H =	1.57	ft	E_s=	29000	ksi	
c5.7.2.8-2	de=	1.43	ft	Sx=	15.46	in	
	dv=	1.29	ft	Sxe=	13.08	in	
				f'c=	3.50	ksi	
	Vu =	3.52	kips	fy=	60.00	ksi	
	Mu =	63.53	kft				
	Nu =	0.00	kips	α =	90.00	degree	
	Shear bar size = #	4		A=	0.20	in^2	Transverse Reinf.
	Shear bar spacing, s =	12.00	in	Av=	0.40	in^2	
	Shear bar legs number, n =	2					
c5.7.2.8-2	As=	1.86	in^2				Longitudinal Reinf.
One Section Reinforcing							
	ε_s=	0.000980					
	θ =	32.43	degree				
	β =	2.77					
	Vc =	60.67	kips				
	Vs =	48.65	kips				
	Vp =	0.00	kips				
	Vn =	109.33	kips	ϕ =	0.90		
	ϕVn =	98.39	>=	Vu=	3.52	OK!	
							Not PS Member

Minimum Stirrup 5.7.2.5-1

Av >= 0.0316(f'c^0.5)(bv*S)/fy

Av > = 0.28 in^2 ok

bv =	24.00	in	
S =	12.00	in	
fy =	60.00	ksi	
f'c =	3.50	ksi	

Maximum Spacing 5.7.2.6

If vu < 0.125 f'c Then S max = 0.8dv <= 24.0 in

If vu >= 0.125 f'c Then S max = 0.4dv <= 24.0 in

0.125 f'c = 0.44 ksi

Shear Stress vu = 0.01 ksi

S max = 12.36 in ok

Sheet

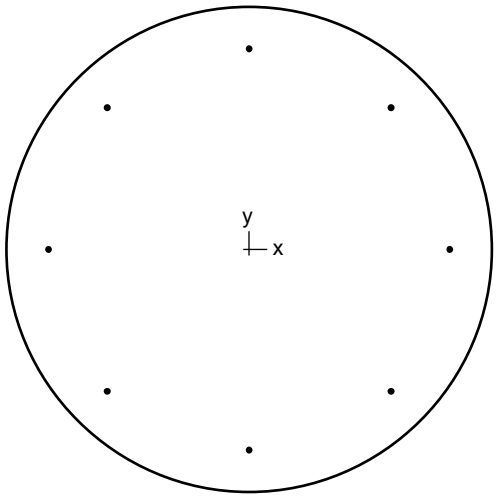
Pot Design

Pot Loading Summary:

Only the Cactus Blossom and Butterfly structures have the pot options, and their loading cases are provided below.

Pot Loading Summary				
Shade Structure	Load No	Pu	Mu	Vu
		kip	k-ft	kip
Butterfly	1	8.86	6.78	1.57
	2	5.77	6.78	1.57
Blossom	3	8.82	5.84	1.57
	4	5.43	5.84	1.57

spColumn v10.00 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections



Contents

List of Figures

1. General Information

File Name	T:\O\TYLin-PHX\P\3010.0100761.004\500...\Pot.colx
Project	Shade Structure
Column	Pot Base
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

2. Material Properties

2.1. Concrete

Type	Standard	
f'_c	3.5	ksi
E_c	3372.17	ksi
f_c	2.975	ksi
ε_u	0.003	in/in
β_1	0.85	

2.2. Steel

Type	Standard	
f_y	60	ksi
E_s	29000	ksi
ε_{ty}	0.00206897	in/in

3. Section

3.1. Shape and Properties

Type	Circular	
Diameter	44	in
A_g	1520.53	in^2
I_x	183984	in^4
I_y	183984	in^4
r_x	11	in
r_y	11	in
X_o	0	in
Y_o	0	in

3.2. Section Figure

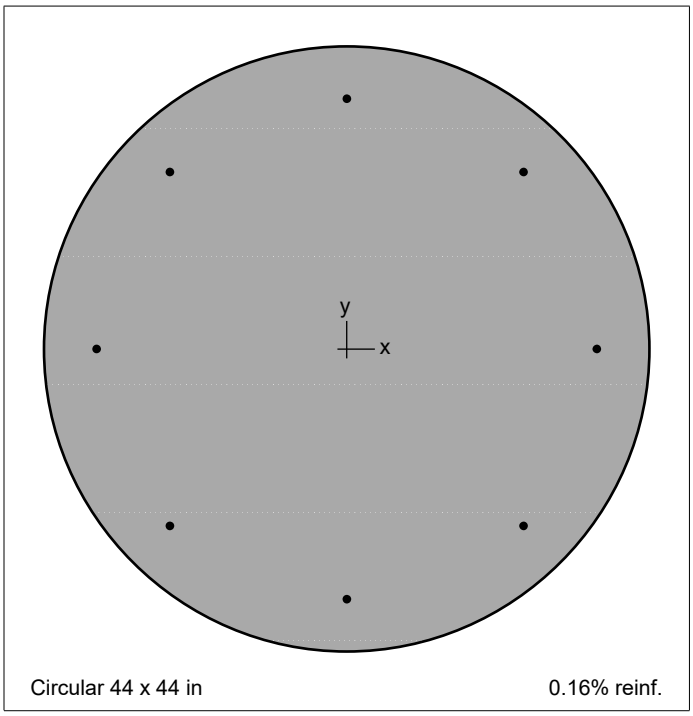


Figure 1: Column section

4. Reinforcement

4.1. Bar Set: ASTM A615

Bar	Diameter in	Area in²	Bar	Diameter in	Area in²	Bar	Diameter in	Area in²
#3	0.38	0.11	#4	0.50	0.20	#5	0.63	0.31
#6	0.75	0.44	#7	0.88	0.60	#8	1.00	0.79
#9	1.13	1.00	#10	1.27	1.27	#11	1.41	1.56
#14	1.69	2.25	#18	2.26	4.00			

4.2. Confinement and Factors

Confinement type	Tied
For #10 bars or less	#4 ties
For larger bars	#4 ties
Capacity Reduction Factors	
Axial compression, (a)	0.8
Tension controlled ϕ, (b)	0.9
Compression controlled ϕ, (c)	0.65

4.3. Arrangement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	3 in
Bars	8 #5

Total steel area, A_s	2.48 in^2
Rho	0.16 %
Minimum clear spacing	13.30 in

(Note: Rho < 0.50%)

5. Control Points

About	Point	P	X-Moment	Y-Moment	NA Depth	d_t Depth	ε_t	ϕ
		kip	k-ft	k-ft	in	in		
X	@ Max compression	575.5	0.00	0.00	129.49	40.19	-0.00207	0.65000
X	@ Allowable comp.	460.4	137.82	0.00	40.81	40.19	-0.00005	0.65000
X	@ f_s = 0.0	453.3	145.05	0.00	40.19	40.19	0.00000	0.65000
X	@ f_s = 0.5 f_y	317.4	237.39	0.00	29.88	40.19	0.00103	0.65000
X	@ Balanced point	221.2	259.83	0.00	23.78	40.19	0.00207	0.65000
X	@ Tension control	118.7	296.07	0.00	14.94	40.19	0.00507	0.90000
X	@ Pure bending	0.0	185.75	0.00	8.69	40.19	0.01088	0.90000
X	@ Max tension	-133.9	0.00	0.00	0.00	40.19	9.99999	0.90000
-X	@ Max compression	575.5	0.00	0.00	129.49	40.19	-0.00207	0.65000
-X	@ Allowable comp.	460.4	-137.82	0.00	40.81	40.19	-0.00005	0.65000
-X	@ f_s = 0.0	453.3	-145.05	0.00	40.19	40.19	0.00000	0.65000
-X	@ f_s = 0.5 f_y	317.4	-237.39	0.00	29.88	40.19	0.00103	0.65000
-X	@ Balanced point	221.2	-259.83	0.00	23.78	40.19	0.00207	0.65000
-X	@ Tension control	118.7	-296.07	0.00	14.94	40.19	0.00507	0.90000
-X	@ Pure bending	0.0	-185.75	0.00	8.69	40.19	0.01088	0.90000
-X	@ Max tension	-133.9	0.00	0.00	0.00	40.19	9.99999	0.90000

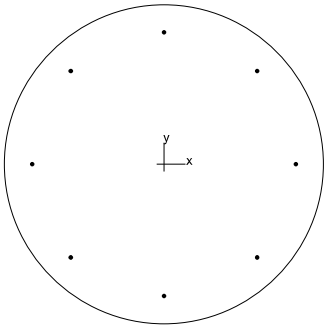
6. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

No.	Demand		Capacity		Parameters at Capacity			Capacity
	P_u	M_{ux}	ϕP_n	ϕM_{nx}	NA Depth	ε_t	ϕ	Ratio
	kip	k-ft	kip	k-ft	in			
1	8.86	6.78	0.00	185.75	8.69	0.01088	0.900	0.39
2	5.77	6.78	0.00	185.75	8.69	0.01088	0.900	0.39
3	8.82	5.84	0.00	185.75	8.69	0.01088	0.900	0.39
4	5.43	5.84	0.00	185.75	8.69	0.01088	0.900	0.39

7. Diagrams

7.1. PM at θ=0 [deg]



General Information

Project	Shade Structure
Column	Pot Base
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

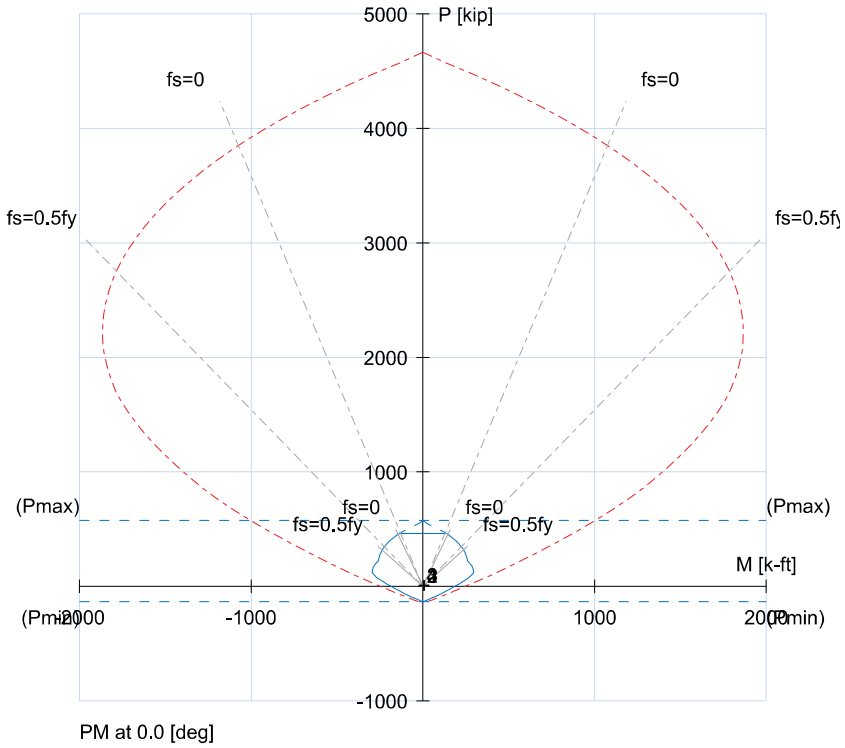
f'_c	3.5 ksi
E_c	3372.17 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Circular
Diameter	44 in
A_g	1520.53 in²
I_x	183984 in⁴
I_y	183984 in⁴

Reinforcement

Pattern	All sides equal
Bar layout	Circular
Cover to	Transverse bars
Clear cover	3 in
Bars	8 #5
Confinement type	Tied
Total steel area, A_s	2.48 in²
Rho	0.16 %
Min. clear spacing	13.30 in



PM at 0.0 [deg]

No.	P_u kip	M_{ux} k-ft	ϕP_n kip	ϕM_{nx} k-ft	Capacity Ratio
1	8.9	6.8	0.00	185.75	0.39
2	5.8	6.8	0.00	185.75	0.39
3	8.8	5.8	0.00	185.75	0.39
4	5.4	5.8	0.00	185.75	0.39

Max. Capacity Ratio: 0.39

TYLin

T. Y. Lin International

Tempe, AZ

Date 6/10/2024
Brg. No. Shade
Calculations By BR

For: Pot

Determine the shear capacity of a RC member (Circular Column Only)

Comments

Member Diameter, D =	3.67	ft	ag=	1.00	in	
Eff H =	2.88	ft	E_s=	29000	ksi	
c5.7.2.8-2 de=	2.80	ft	Sx=	30.26	in	
dv=	2.52	ft	Sxe=	25.62	in	
			f'c=	3.50	ksi	
Vu =	1.57	kips	fy=	60.00	ksi	
Mu =	6.78	kft				
Nu =	0.00	kips	α =	90.00	degree	
Shear bar size = #	4		A=	0.20	in^2	Transverse Reinf.
Shear bar spacing, s =	12.00	in	Av=	0.40	in^2	
Shear bar legs number, n =	2					
c5.7.2.8-2 As=	2.48	in^2				Longitudinal Reinf.

One Section Reinforcing

ε_s=	0.000059				
θ =	29.21	degree			
β =	4.60				
Vc =	361.71	kips			
Vs =	108.24	kips			
Vp =	0.00	kips			
Vn =	469.95	kips	ϕ =	0.90	

ϕVn = 422.96 >= Vu= 1.57 OK!

Not PS Member

Minimum Stirrup 5.7.2.5-1

Av >= 0.0316(f'c^0.5)(bv*S)/fy

			bv =	44.00	in
			S =	12.00	in
Av <	0.52	in^2	fy =	60.00	ksi
	NG		f'c =	3.50	ksi

Maximum Spacing 5.7.2.6

If vu < 0.125 f'c Then S max = 0.8dv <= 24.0 in

If vu >= 0.125 f'c Then S max = 0.4dv <= 24.0 in

0.125 f'c = 0.44 ksi
Shear Stress vu = 0.00 ksi

S max = 24.00 in ok

Sheet

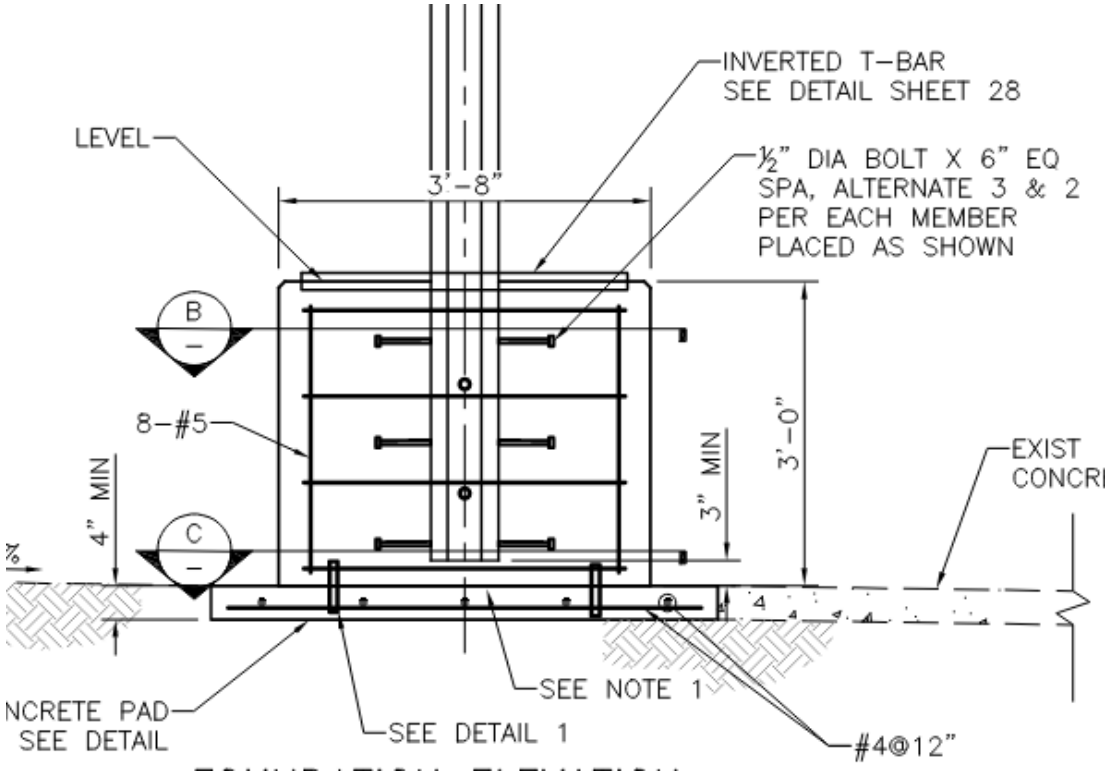
Technical Summary:
Pad Thickness: 4" F'c = 3.5ksi

Top Clear Cover: 2"
Bot Clear Cover: 1"

Reinforcing in both directions: #4 @ 12"

Design Load:

For Shear Check: Self weight of steel structure and concrete pot
6.02 kips over a circular area with a diameter of 3'-8"



Punch Shear Design - Self Weight:

The punch shear check is based on AASTHO 5.8.4.3.4-3.

Diameter of Pot: $D := 3\ ft + 8\ in = 3.67\ ft$

Distance from top of pad to center of bottom rebar: $d_f := 4\ in - 1\ in - \frac{0.5\ in}{2} = 2.75\ in$

Perimeter of Critical Section: $b_o := \frac{\pi}{2} \cdot (D + d_f) + D = 9.79\ ft$

Concrete Strength: $f'_c := 3.5 \quad ksi$

Resistance Factor: $\phi := 0.9$

Design Punch Shear Resistance: $\phi V_n := \phi \cdot 0.125\ ksi \cdot \sqrt{f'_c} \cdot b_o \cdot d_f = 67.97\ kip$

Demand Shear (1.75LL): $V_u := 1.75 \cdot 6.02\ kip = 10.54\ kip$

$\text{if}\left(\phi V_n > V_u, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Based on the above analysis, the 6 inch new concrete pad will be sufficient for punching shear, as it will result in an increased df and bo.

Appendix E - Perforated Panel Design

Perforated Panel Design

Member Strength

Equivalent solid material is widely used for design analyses of perforated materials. Based on "Designers, Specifiers and Buyers Handbook for Perforated Metals" from IPA (Industrial Perforators Association), determine the equivalent modulus of elastic and yielding strength.

Perforated panel: IPA#113 1/8" holes spa @ 3/16". Opening = 40%

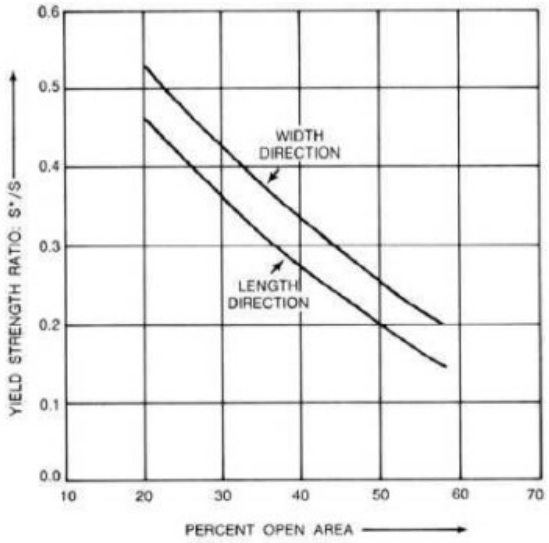
Strength of materials perforated with round holes in a standard staggered pattern:

IPA #	Perforations	Centers	Holes Per sq.in.	Open Area	S*/S= Strength[1] Width Direction	S*/S= Strength[1] Length Direction
100	.020"	-	625	20%	.530	.465
106	1/16"	1/8"	-	23%	.500	.435
107	5/64"	7/64"	-	46%	.286	.225
108	5/64"	1/8"	-	36%	.375	.310
109	3/32"	5/32"	-	32%	.400	.334
110	3/32"	3/16"	-	23%	.500	.435
112	1/10"	5/32"	-	36%	.360	.296
113	1/8"	3/16"	-	40%	.333	.270
114	1/8"	7/32"	-	29%	.428	.363
115	1/8"	1/4"	-	23%	.500	.435
116	5/32"	7/32"	-	46%	.288	.225
117	5/32"	1/4"	-	36%	.375	.310
118	3/16"	1/4"	-	51%	.250	.192
119	3/16"	5/16"	-	33%	.400	.334
120	1/4"	5/16"	-	58%	.200	.147
121	1/4"	3/8"	-	40%	.333	.270
122	1/4"	7/16"	-	30%	.428	.363
123	1/4"	1/2"	-	23%	.500	.435
124	3/8"	1/2"	-	51%	.250	.192
125	3/8"	9/16"	-	40%	.333	.270
126	3/8"	5/8"	-	33%	.400	.334
127	7/16"	5/8"	-	45%	.300	.239
128	1/2"	11/16"	-	47%	.273	.214
129	9/16"	3/4"	-	51%	.250	.192
130	5/8"	13/16"	-	53%	.231	.175
131	3/4"	1"	-	51%	.250	.192

[1]Notes: S* = Yield strength of perforated material
S* = Yield strength of unperforated material

Length Direction = parallel to straight row of closely spaced holes (see Fig. 1)

Width Direction = direction of stagger



Effective Elastic Properties for IPA Standard Perforations

IPA #	Perforations	Centers	Holes Per sq. in.	Open Area	E*/E
100	.020"	-	625	20%	.565
106	1/16"	1/8"	-	23%	.529
107	5/64"	7/64"	-	46%	.246
108	5/64"	1/8"	-	36%	.362
109	3/32"	5/32"	-	32%	.395
110	3/32"	3/16"	-	23%	.529
112	1/10"	5/32"	-	36%	.342
113	1/8"	3/16"	-	40%	.310
114	1/8"	7/32"	-	29%	.436
115	1/8"	1/4"	-	23%	.529
116	5/32"	7/32"	-	46%	.249
117	5/32"	1/4"	-	36%	.362
118	3/16"	1/4"	-	51%	.205
119	3/16"	5/16"	-	33%	.395
120	1/4"	5/16"	-	58%	.146
121	1/4"	3/8"	-	40%	.310
122	1/4"	7/16"	-	30%	.436
123	1/4"	1/2"	-	23%	.529
124	3/8"	1/2"	-	51%	.205
125	3/8"	9/16"	-	40%	.310
126	3/8"	5/8"	-	33%	.395
127	7/16"	5/8"	-	45%	.265
128	1/2"	11/16"	-	47%	.230
129	9/16"	3/4"	-	51%	.205
130	5/8"	13/16"	-	53%	.178
131	3/4"	1"	-	51%	.205

Panel Material: *A36*

Yielding Strength: $F_y := 36\ ksi \cdot 0.27 = 9.72\ ksi$

Elastic modulus: $E := 29000\ ksi \cdot 0.31 = \left(8.99 \cdot 10^3\right)\ ksi$

Area open: $ao := 0.4$

Butterfly Panel Check:

Panel width: $B := 2.125 \cdot ft$ (Worst Case : Large Wing in Butterfly)

Panel depth: $D := 5.46 \cdot ft$

Thickness of panel: $t := 0.1196 \cdot in$

LARSA Analsyis Output

Von Mises Stress @ center :-

$DC := 4.75\ ksf$ $Lr := 16.5\ ksf$ (Live Load Hang 1)

$W := 8.35\ ksf$ (Wind Load) $LL := 0\ ksf$ (Live Load Lean)

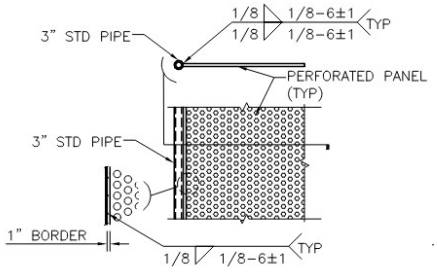
Critical Load Case:

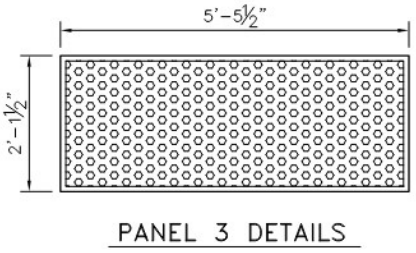
LC-3b: $\sigma := 1.2 \cdot DC + 1.6 \cdot Lr + 0.5 \cdot W = 36.275\ ksf$

$$\text{if}\left(0.9 \cdot F_y > 1.5 \cdot \sigma, \text{“O.K.”}, \text{“N.G.”}\right) = \text{“O.K.”}$$

Welding Design

Weld perforated panel to the std pipe as shown. Welding size = 1/8", welding length = 0.125" per 6".





PANEL 3 DETAILS

Thickness of part jointed 1: (3 pipe) $t_1 := 0.201 \cdot in$

Thickness of part jointed 2: (Panel) $t_2 := 0.125 \cdot in$

Thinner part jointed: $t_{min} := min\left(t_1, t_2\right) = 0.125\ in$

Minimum size of fillet welds

$$w_{min} := \left\| \begin{array}{l} \text{if } t_{min} \le \frac{1}{4} \cdot in \\ \quad \left\| \frac{1}{8} \cdot in \right. \\ \text{if } \frac{1}{4} \cdot in < t_{min} \le \frac{1}{2} \cdot in \\ \quad \left\| \frac{3}{16} \cdot in \right. \end{array} \right. = 0.125\ in$$

Used welding size

$$w := \frac{1}{8} \cdot in$$

$$\text{if}\left(w_{min} \le w, \text{“okay”}, \text{“fail.”}\right) = \text{“okay”}$$

Ultimate strength:

$$F_u := 58 \cdot ksi$$

Yielding strength:

$$F_y := 36 \cdot ksi$$

Filler metal strength:

$$F_{E70} := 70 \cdot ksi$$

Nominal weld stress:

$$F_{nw} := 0.6 \cdot F_{E70} \cdot \left(1 + 0.5 \cdot \sin\left(0\right)^{1.5}\right) = 42\ ksi$$

Welding length of each weld point:

$$l := 0.125 \cdot in$$

Minimum welding check:

$$\text{if}\left(l < 4 \cdot w, \text{“New effective weld size”}, \text{“okay”}\right) = \text{“New effective weld size”}$$

Effective weld size:

$$w := 0.25 \cdot w = 0.031\ in$$

Total Welding Points:

$$n := \left(\frac{D + B}{6 \cdot in} - 2\right) \cdot 2 = 26.34$$

Total effective welding length:

$$l := 0.125 \cdot in \cdot n = 0.274\ ft$$

Effective throat:

$$w_{eff} := 0.707 \cdot w = 0.022\ in$$

Strength reduction factor

$$\Phi_w := 0.75$$

Weld Metal Strength: $PhiRn\_weld := \Phi_w \cdot F_{nw} \cdot l \cdot w_{eff} = 2.291$ ***kip***

Base Metal Yielding: $PhiRn\_yield := 1 \cdot 0.6 \cdot F_y \cdot l \cdot w_{eff} = 1.571$ ***kip***

Base Metal Fracture: $PhiRn\_frac := \Phi_w \cdot 0.6 \cdot F_u \cdot l \cdot w_{eff} = 1.899$ ***kip***

Design weld strength: $\Phi R_n := min\left(PhiRn\_weld, PhiRn\_yield, PhiRn\_frac\right) = 1.571\ kip$

Forces Applied:

Unit weight of Steel: $\gamma_w := 490$ ***pcf***

Self Weight of Panel: $DC_{Panel} := B \cdot D \cdot t \cdot \left(1 - ao\right) \cdot \gamma_w = 0.034$ ***kip***

Wind Pressure: $W_P := 30$ ***psf***

Wind Load: $W_{Panel} := W_P \cdot B \cdot D \cdot \left(1 - ao\right) = 0.209$ ***kip***

Live Load Roof: $LR_{Roof} := 0.3$ ***kip***

Required force (LC-3b): $R_u := 1.2 \cdot DC_{Panel} + 1.6 \cdot LR_{Roof} + 0.5 \cdot W_{Panel} = 0.625$ ***kip***

$$\textbf{if}\left(R_u < \Phi R_n, \text{“okay”}, \text{“fail.”}\right) = \text{“okay”}$$

Blossom Panel Check (Shell 1 in LARSA model):

Panel width (arc length): $B := \frac{6.79}{2} \cdot ft$ (Shell 1 in LARSA model)

Panel depth (Radius): $D := 3.27 \cdot ft$

Thickness of panel: $t := 0.1196 \cdot in$

LARSA Analsyis Output

Von Mises Stress @ center :-

$DC := 32\ ksf$ $Lr := 211\ ksf$ (Live Load Hang)

$W := 64\ ksf$ (Wind Load) $LL := 0\ ksf$ (Live Load Lean)

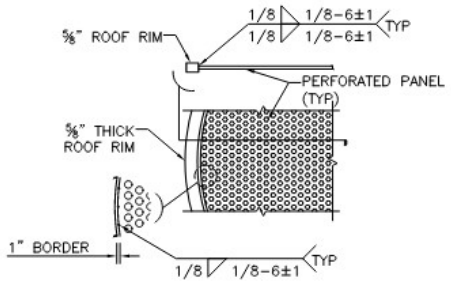
Critical Load Case:

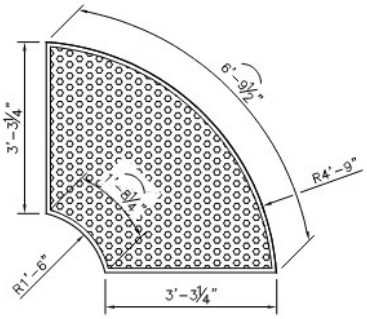
LC-3b: $\sigma := 1.2 \cdot DC + 1.6 \cdot Lr + 0.5 \cdot W = 2.833\ ksi$

$$\text{if}\left(0.9 \cdot F_y > 1.5 \cdot \sigma, \text{“O.K.”}, \text{“N.G.”}\right) = \text{“O.K.”}$$

Welding Design

Weld perforated panel to the roof rim as shown. Welding size = 1/8", welding length = 0.125" per 6".





Thickness of part jointed 1: (Roof Rim) $t_1 := 0.625 \cdot in$

Thickness of part jointed 2: (Panel) $t_2 := 0.125 \cdot in$

Thinner part jointed: $t_{min} := min\left(t_1, t_2\right) = 0.125\ in$

Perimeter of Panel: $P_p := \frac{\pi}{2} \cdot 4.75\ ft + \frac{\pi}{2} \cdot 1.5\ ft + 3.27\ ft \cdot 2 = 16.357\ ft$

Area of Panel: $A_p := \pi \cdot \frac{\left(4.75^2 - 1.5^2\right)}{4} \cdot 1\ ft^2 = 15.953\ ft^2$

Minimum size of fillet welds

$$w_{min} := \left\| \begin{array}{l} \text{if } t_{min} \le \frac{1}{4} \cdot in \\ \quad \left\| \frac{1}{8} \cdot in \right. \\ \text{if } \frac{1}{4} \cdot in < t_{min} \le \frac{1}{2} \cdot in \\ \quad \left\| \frac{3}{16} \cdot in \right. \end{array} \right. = 0.125\ in$$

Used welding size

$$w := \frac{1}{8} \cdot in$$

$$\text{if}\left(w_{min} \le w, \text{“okay”}, \text{“fail.”}\right) = \text{“okay”}$$

Ultimate strength:

$$F_u := 58 \cdot ksi$$

Yielding strength:

$$F_y := 36 \cdot ksi$$

Filler metal strength:

$$F_{E70} := 70 \cdot ksi$$

Nominal weld stress:

$$F_{nw} := 0.6 \cdot F_{E70} \cdot \left(1 + 0.5 \cdot \sin\left(0\right)^{1.5}\right) = 42\ ksi$$

Welding length of each weld point:

$$l := 0.125 \cdot in$$

Minimum welding check:

$$\text{if}\left(l < 4 \cdot w, \text{“New effective weld size”}, \text{“okay”}\right) = \text{“New effective weld size”}$$

Effective weld size:

$$w := 0.25 \cdot w = 0.031\ in$$

Total Welding Points:

$$n := \left(\frac{P_p}{6 \cdot in} - 2\right) = 30.715$$

Total effective welding length:

$$l := 0.125 \cdot in \cdot n = 0.32\ ft$$

Effective throat:

$$w_{eff} := 0.707 \cdot w = 0.022\ in$$

Strength reduction factor $\Phi_w := 0.75$

Weld Metal Strength: $PhiRn\_weld := \Phi_w \cdot F_{nw} \cdot l \cdot w_{eff} = 2.672$ ***kip***

Base Metal Yielding: $PhiRn\_yield := 1 \cdot 0.6 \cdot F_y \cdot l \cdot w_{eff} = 1.832$ ***kip***

Base Metal Fracture: $PhiRn\_frac := \Phi_w \cdot 0.6 \cdot F_u \cdot l \cdot w_{eff} = 2.214$ ***kip***

Design weld strength: $\Phi R_n := min\left(PhiRn\_weld, PhiRn\_yield, PhiRn\_frac\right) = 1.832\ kip$

Forces Applied:

Unit weight of Steel: $\gamma_w := 490$ ***pcf***

Self Weight of Panel: $DC_{Panel} := A_p \cdot t \cdot \left(1 - ao\right) \cdot \gamma_w = 0.047$ ***kip***

Wind Pressure: $W_P := 30$ ***psf***

Wind Load: $W_{Panel} := W_P \cdot A_p \cdot \left(1 - ao\right) = 0.287$ ***kip***

Live Load Roof: $LR_{Roof} := 0.3$ ***kip***

Required force (LC-3b): $R_u := 1.2 \cdot DC_{Panel} + 1.6 \cdot LR_{Roof} + 0.5 \cdot W_{Panel} = 0.68$ ***kip***

$$\mathbf{if}\left(R_u < \Phi R_n, \text{“okay”}, \text{“fail.”}\right) = \text{“okay”}$$

Variegated Panel Check

The largest panel (critical panel) in the variegated design is the same size as the one in the blossom design. Since the loads are similar, engineering judgment suggests there's no need to check the variegated panel, as its capacity should also be quite similar.

Appendix E - LARSA Reports

Table of Contents

Blossom Report

Friday, June 14, 2024	**brandon.rudolph**	**Tel:**

PROJECT SUMMARY

INPUT PROPERTIES	Count
Universal Restraints	NONE
Materials	3
Sections	3
User Coordinate System	NONE
Spring Curves	NONE
Isolater Property	NONE
Creep Definitions	NONE

INPUT GEOMETRY	Count
Joints	10
Members	13
Shells	8
Springs	NONE
Isolaters	NONE
Mass Elements	NONE
DOF Constraints	NONE
Tendons	NONE

Load Cases	Count
Load Cases	14
Combination Cases	NONE
Construction Stages	NONE
Linked Databases	1

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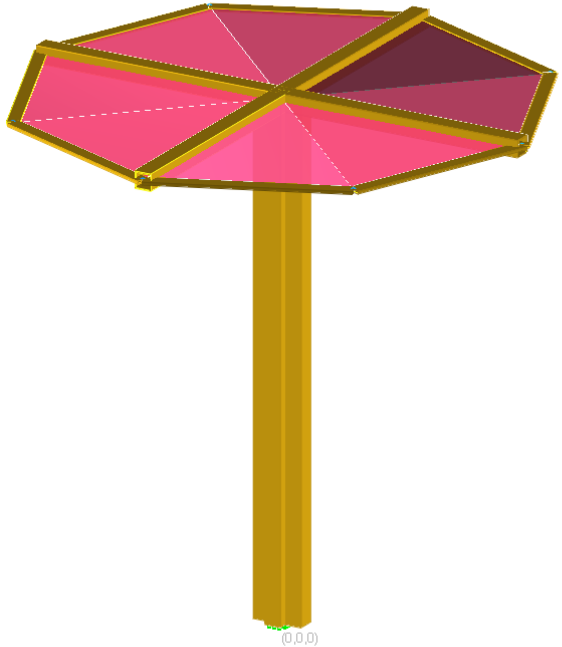
Graphics View 1

Zoom 0.640X



Local/UCS Axes

INPUT : Material Properties

Name	Modulus of Elasticity (E) (kips/in²)	Poisson's Ratio	Shear Modulus (G) (kips/in²)	Unit Weight (kips/in³)	Thermal Expansion (1/ °F *10^-6)	Assigned
A53	29,000.00	0.2946	11,200.00	0.0003	6.500000	Yes
A500 Grade C	29,000.00	0.2946	11,200.00	0.0003	6.500000	Yes
A36	29,000.00	0.2946	11,200.00	0.0003	6.500000	Yes

INPUT : Sections

Name	Section Area (in²)	Shear Area in yy (in²)	Shear Area in zz (in²)	Torsion Constant (in^4)	Inertia Izz (in^4)	Inertia Iyy (in^4)	Plastic Modulus Zyy (in³)	Plastic Modulus Zzz (in³)	Perimeter (in)	Material Time-Effect	Ductility	Residual Strength (%)	Assigned
Rim Plates	1.8750	1.5625	1.5625	0.2111	1.4063	0.0610	0.0000	0.0000	7.2500	(NONE)	0.	0.	Yes
HSS4x4x1/4	3.3700	3.3700	3.3700	0.0000	7.8000	7.8000	0.0000	0.0000	16.0000	(NONE)	0.	0.	Yes
Column HSS4x4x1/4	14.0434	14.0434	14.0434	90.1155	###	61.4271	23.9750	38.0184	40.0000	(NONE)	0.	0.	Yes

INPUT : Section Stress Points

Name	Point 1 Y (in)	Point 1 Z (in)	Point 2 Y (in)	Point 2 Z (in)	Point 3 Y (in)	Point 3 Z (in)	Point 4 Y (in)	Point 4 Z (in)	Point 5 Y (in)	Point 5 Z (in)	Point 6 Y (in)	Point 6 Z (in)
Rim Plates	1.5000	0.3125	1.5000	-0.3125	-1.5000	-0.3125	-1.5000	0.3125	(NONE)	(NONE)	(NONE)	(NONE)
HSS4x4x1/4	2.0000	2.0000	2.0000	-2.0000	-2.0000	-2.0000	-2.0000	2.0000	(NONE)	(NONE)	(NONE)	(NONE)
Column	2.0000	2.0000	2.0000	-2.0000	-2.0000	-2.0000	-2.0000	2.0000	(NONE)	(NONE)	(NONE)	(NONE)

INPUT : Section Dimensions

Name	Shape	Dimension D1	Dimension D2	Dimension D3	Dimension D4	Dimension D5	Dimension D6
Rim Plates	Rectangle	3.0000	0.6250				
HSS4x4x1/4	Parametric						
Column HSS4x4x1/4	Parametric						

INPUT : Joints

ID	X (ft)	Y (ft)	Z (ft)	Translation DOF	Rotation DOF	Displacement UCS	Assigned
1	0.0000	0.0000	0.0000	all fixed	all fixed	Global	Yes
2	0.0000	0.0000	10.0000	all free	all free	Global	Yes
3	5.0000	0.0000	10.0000	all free	all free	Global	Yes
4	0.0000	5.0000	10.0000	all free	all free	Global	Yes
5	-5.0000	0.0000	10.0000	all free	all free	Global	Yes
6	0.0000	-5.0000	10.0000	all free	all free	Global	Yes
7	3.5400	3.5400	10.0000	all free	all free	Global	Yes
8	-3.5400	3.5400	10.0000	all free	all free	Global	Yes
9	-3.5400	-3.5400	10.0000	all free	all free	Global	Yes
10	3.5400	-3.5400	10.0000	all free	all free	Global	Yes

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force	Length (ft)	Rigid Zone from	Rigid Zone from	Orientation Angle	Casting (day	Structure Group
1	1	2	-	Beam	Column HSS4x4x1/4	(same as	A500	0.0000	10	0.0000	0.0000	0.0000	0	(none)
2	2	3	-	Beam	HSS4x4x1/4	(same as	A500	0.0000	5	0.0000	0.0000	0.0000	0	(none)

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force	Length (ft)	Rigid Zone from	Rigid Zone from	Orientation Angle	Casting (day	Structure Group
3	2	4	-	Beam	HSS4x4x1/4	(same as	A500	0.0000	5	0.0000	0.0000	0.0000	0	(none)
4	2	5	-	Beam	HSS4x4x1/4	(same as	A500	0.0000	5	0.0000	0.0000	0.0000	0	(none)
5	2	6	-	Beam	HSS4x4x1/4	(same as	A500	0.0000	5	0.0000	0.0000	0.0000	0	(none)
6	3	7	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
7	7	4	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
8	4	8	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
9	8	5	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
10	5	9	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
11	9	6	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
12	6	10	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
13	10	3	-	Beam	Rim Plates	(same as	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)

INPUT : Member End Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Shells

ID	Bending Type	Membrane Type	I-Joint	J-Joint	K-Joint	L-Joint	Material	Thickness (in)	Casting (day)	Structure Group	Area (ft²)	Material Angle (°)
1	Thin Plate	Inactive	2	3	7	(non	A53	0.1250	0	(none)	8.85	
2	Thin Plate	Inactive	2	7	4	(non	A53	0.1250	0	(none)	8.85	
3	Thin Plate	Inactive	2	4	8	(non	A53	0.1250	0	(none)	8.85	
4	Thin Plate	Inactive	2	8	5	(non	A53	0.1250	0	(none)	8.85	
5	Thin Plate	Inactive	2	5	9	(non	A53	0.1250	0	(none)	8.85	
6	Thin Plate	Inactive	2	9	6	(non	A53	0.1250	0	(none)	8.85	
7	Thin Plate	Inactive	2	6	10	(non	A53	0.1250	0	(none)	8.85	
8	Thin Plate	Inactive	2	10	3	(non	A53	0.1250	0	(none)	8.85	

INPUT : More Material Properties

Name	Yield Stress (kips/in²)	Post-yield to Initial Slope Ratio	Concrete Strength Specimen	Concrete Fck or Steel Fu (kips/in²)	Concrete Cement Hardening Type	Tendon GUTS (kips/in²)	Material Time-Effect	Assigned
A53	35.00	0.020	Cylinder	58.00	Not Concrete	0.00	(NONE)	Yes
A500 Grade C	50.00	0.020	Cylinder	62.00	Not Concrete	0.00	(NONE)	Yes
A36	36.00	0.020	Cylinder	58.00	Not Concrete	0.00	(NONE)	Yes

INPUT : Shell Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)	K-Offset X (ft)	K-Offset Y (ft)	K-Offset Z (ft)	L-Offset X (ft)	L-Offset Y (ft)	L-Offset Z (ft)
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Orthotropic Material Properties

Name	Anisotropy	Material UCS	Modulus of Elasticity E11 (kips/in²)	Modulus of Elasticity E22 (kips/in²)	Poisson's Ratio m12	Shear Modulus G12 (kips/in²)	Shear Modulus G13 (kips/in²)	Shear Modulus G23 (kips/in²)	Assigned
A53	Isotropic	(NONE)							Yes
A500 Grade C	Isotropic	(NONE)							Yes
A36	Isotropic	(NONE)							Yes

Load Cases

ID	Name	Analysis Type	Class	Status	Weight Factor	Weight Factor	Weight Factor	Is Dynamic	Assigned	# of Joint Load	# of Support	# of Member	# of Member	# of Shell Load	# of Solid Load	# of Moving	# of THA Load	# of THA Initia
2	WS_Stre	Static	None	Act	###	###	###	No	No	0	0	6	0	0	0	0	0	0
3	Self	Static	None	Act	###	###	###	No	No	0	0	0	0	0	0	0	0	0
4	LL_Hang	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
7	LL_Hang	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
10	LL_Lean	Static	None	Act	###	###	###	No	No	0	0	1	0	0	0	0	0	0
11	LL_Lean	Static	None	Act	###	###	###	No	No	0	0	1	0	0	0	0	0	0
16	LL_Hang	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
18	WS_Stre	Static	None	Act	###	###	###	No	No	0	0	0	0	8	0	0	0	0
19	WS_Stre	Static	None	Act	###	###	###	No	No	0	0	0	0	8	0	0	0	0
20	LL_Roof	Static	None	Act	###	###	###	No	No	0	0	0	0	8	0	0	0	0
21	Eh +X	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
22	Ev +Z	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
23	Eh +Y	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0
24	Ev -Z	Static	None	Act	###	###	###	No	No	0	0	2	0	0	0	0	0	0

Load Case WS_Strength_H, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Uniform Force	Global X	0.0263		0.0000	1.0000
1	Uniform Force	Global Y	0.0263		0.0000	1.0000
3	Uniform Force	Global X	0.0088		0.0000	1.0000
5	Uniform Force	Global X	0.0088		0.0000	1.0000
2	Uniform Force	Global Y	0.0088		0.0000	1.0000
4	Uniform Force	Global Y	0.0088		0.0000	1.0000

Load Case LL_Hang, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Z	-0.3000		0.8694	1.0000
7	Uniform Force	Global Z	-0.3000		0.0000	0.1306

Load Case LL_Hang Main Member, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Z	-0.3000		0.0000	0.1306
13	Uniform Force	Global Z	-0.3000		0.8694	1.0000

Load Case LL_Lean +X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global X	0.3000		0.4000	

Load Case LL_Lean +Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	0.3000		0.4000	

Load Case LL_Hang Main Member Overturn X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
8	Uniform Force	Global Z	-0.3000		0.0000	0.1306
7	Uniform Force	Global Z	-0.3000		0.8694	1.0000

Load Case WS_Strength R Uplift, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change	Temperature Gradient (°F/ft)
1	Uniform Force	Global Z	0.0200			0.0000	0.0000
2	Uniform Force	Global Z	0.0200			0.0000	0.0000
3	Uniform Force	Global Z	0.0200			0.0000	0.0000
4	Uniform Force	Global Z	0.0200			0.0000	0.0000
5	Uniform Force	Global Z	0.0200			0.0000	0.0000
6	Uniform Force	Global Z	0.0200			0.0000	0.0000
7	Uniform Force	Global Z	0.0200			0.0000	0.0000
8	Uniform Force	Global Z	0.0200			0.0000	0.0000

Load Case WS_Strength R Down, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change	Temperature Gradient (°F/ft)
1	Uniform Force	Global Z	-0.0200			0.0000	0.0000
2	Uniform Force	Global Z	-0.0200			0.0000	0.0000
3	Uniform Force	Global Z	-0.0200			0.0000	0.0000
4	Uniform Force	Global Z	-0.0200			0.0000	0.0000

Load Case WS Strength R Down, Shell Loads

Shell	Type	Direction	Load (kips/ft²)	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change	Temperature Gradient (°F/ft)
5	Uniform Force	Global Z	-0.0200			0.0000	0.0000
6	Uniform Force	Global Z	-0.0200			0.0000	0.0000
7	Uniform Force	Global Z	-0.0200			0.0000	0.0000
8	Uniform Force	Global Z	-0.0200			0.0000	0.0000

Load Case LL Roof, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change	Temperature Gradient (°F/ft)
1	Uniform Force	Global Z	-0.0050			0.0000	0.0000
2	Uniform Force	Global Z	-0.0050			0.0000	0.0000
3	Uniform Force	Global Z	-0.0050			0.0000	0.0000
4	Uniform Force	Global Z	-0.0050			0.0000	0.0000
5	Uniform Force	Global Z	-0.0050			0.0000	0.0000
6	Uniform Force	Global Z	-0.0050			0.0000	0.0000
7	Uniform Force	Global Z	-0.0050			0.0000	0.0000
8	Uniform Force	Global Z	-0.0050			0.0000	0.0000

Load Case Eh +X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global X	0.2000		0.8000	
1	Point Force	Global X	0.7600		0.1500	

Load Case Ev +Z, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Z	0.0500		0.8000	
1	Point Force	Global Z	0.1800		0.1500	

Load Case Eh +Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	0.2000		0.8000	
1	Point Force	Global Y	0.7600		0.1500	

Load Case Ev -Z, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Z	-0.0500		0.8000	
1	Point Force	Global Z	-0.1800		0.1500	

POST-COMPUTED RESULT CASES SUMMARY

Linear Result Combination: LC-1: 1.4D			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.4	None	No
Linear Result Combination: LC-2: 1.2D+1.6L +0.5Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL_Lean Group	1.6	None	No
LL_Hang/Roof Group	0.5	None	No
Linear Result Combination: LC-3a: 1.2D+1.6Lr+0.5L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL_Hang/Roof Group	1.6	None	No
LL_Lean Group	0.5	None	No
Linear Result Combination: LC-3b: 1.2D+1.6Lr+0.5W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL_Hang/Roof Group	1.6	None	No
Wind	0.5	None	No
Linear Result Combination: LC-4: 1.2D+1.0W+1.0L+0.5Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
Wind	1	None	No
LL_Lean Group	1	None	No
LL_Hang/Roof Group	0.5	None	No
Linear Result Combination: Wind Up			
Load Class	None		
Case	Factor	Load Class	Incremental
WS_Strength_H	1	None	No
WS_Strength R Uplift	1	None	No
Linear Result Combination: Wind Down			
Load Class	None		
Case	Factor	Load Class	Incremental
WS_Strength_H	1	None	No
WS_Strength R Down	1	None	No
Linear Result Combination: LC-5: 0.9D+1.0W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	0.9	None	No
Wind	1	None	No
Linear Result Combination: LC-6: 1.2D+1.0Eh+1.0Ev+0.5L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
Eh	1	None	No

Ev	1	None	No
LL_Lean Group	0.5	None	No
Linear Result Combination: LC-7: 0.9D+1.0Eh-1.0Ev			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	0.9	None	No
Eh	1	None	No
Ev	-1	None	No
Linear Result Combination: LC-8: 1.0L+Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean Group	1	None	No
LL_Roof	1	None	No
Linear Result Combination: LC-9: 0.5(L+Lr)+Wa			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean Group	0.5	None	No
LL_Roof	0.5	None	No
Wind	0.7	None	No
Linear Result Combination: Stability-1: D+W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
Wind	1	None	No
Linear Result Combination: Stability-2: D+L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL_Lean Group	1	None	No
Linear Result Combination: Stability-3: D+Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL_Hang/Roof Group	1	None	No
Linear Result Combination: Stability-4: D+ 0.75(L+Lr)			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Hang/Roof Group	0.75	None	No
LL_Lean Group	0.75	None	No
Self Weight	1	None	No
Linear Result Combination: Stability-5: D+0.5(L+Lr) + Wa			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Hang/Roof Group	0.5	None	No
LL_Lean Group	0.5	None	No
Wind	1	None	No
Self Weight	1	None	No
Linear Result Combination: Stability-6: D+0.7Ev+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No

Eh	0.7	None	No
Ev -Z	0.7	None	No
Linear Result Combination: Stability-7: D-0.7Ev+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
Eh	0.7	None	No
Ev +Z	0.7	None	No
Extreme Effect Group: Wind			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Wind Up	1	None	No
Wind Down	1	None	No
Extreme Effect Group: LL_Hang/Roof Group			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Hang	1	None	No
LL_Hang Main Member	1	None	No
LL_Hang Main Member Overturn X	1	None	No
LL_Roof	1	None	No
Extreme Effect Group: LL_Lean Group			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean +X	1	None	No
LL_Lean +Y	1	None	No
Extreme Effect Group: Hang or Lean			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean Group	1	None	No
LL_Hang/Roof Group	1	None	No
Extreme Effect Group: Stength			
Allow Positive Minimum/Negative	Yes		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-1: 1.4D	1	None	No
LC-2: 1.2D+1.6L +0.5Lr	1	None	No
LC-3a: 1.2D+1.6Lr+0.5L	1	None	No
LC-3b: 1.2D+1.6Lr+0.5W	1	None	No
LC-4: 1.2D+1.0W+1.0L+0.5Lr	1	None	No
LC-5: 0.9D+1.0W	1	None	No
LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	1	None	No
LC-7: 0.9D+1.0Eh-1.0Ev	1	None	No
Extreme Effect Group: Deflection			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-8: 1.0L+Lr	1	None	No

LC-9: 0.5(L+Lr)+Wa	1	None	No
Extreme Effect Group: Eh			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Eh +X	1	None	No
Eh +Y	1	None	No
Extreme Effect Group: Ev			
Allow Positive Minimum/Negative	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Ev +Z	1	None	No
Ev -Z	1	None	No
Extreme Effect Group: Seismic			
Allow Positive Minimum/Negative	Yes		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	1	None	No
LC-7: 0.9D+1.0Eh-1.0Ev	1	None	No
Extreme Effect Group: Stability			
Allow Positive Minimum/Negative	Yes		
Load Class	None		
Case	Factor	Load Class	Incremental
Stability-1: D+W	1	None	No
Stability-2: D+L	1	None	No
Stability-3: D+Lr	1	None	No
Stability-4: D+ 0.75(L+Lr)	1	None	No
Stability-5: D+0.5(L+Lr) + Wa	1	None	No
Stability-6: D+0.7Ev+0.7Eh	1	None	No
Stability-7: D-0.7Ev+0.7Eh	1	None	No

Result Cases Summary

Extreme Effect Groups: Deflection

Linear Combinations: LC-8: 1.0L+Lr

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-9: 0.5(L+Lr)+Wa

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof * 0.5

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind * 0.7

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Stength

Linear Combinations: LC-1: 1.4D

Load Cases: Self Weight * 1.4

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-2: 1.2D+1.6L +0.5Lr

Load Cases: Self Weight * 1.2

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 1.6

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Hang/Roof Group * 0.5

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-3a: 1.2D+1.6Lr+0.5L

Load Cases: Self Weight * 1.2

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Hang/Roof Group * 1.6

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-3b: 1.2D+1.6Lr+0.5W

Load Cases: Self Weight * 1.2

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Hang/Roof Group * 1.6

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind * 0.5

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-4: 1.2D+1.0W+1.0L+0.5Lr

Load Cases: Self Weight * 1.2

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Hang/Roof Group * 0.5

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-5: 0.9D+1.0W

Load Cases: Self Weight * 0.9

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-6: 1.2D+1.0Eh+1.0Ev+0.5L

Load Cases: Self Weight * 1.2

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Eh

Load Cases: Eh +X

Solved: 6/6/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Ev

Load Cases: Ev +Z

Solved: 6/6/2024

Load Class: None

Load Cases: Ev -Z

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Linear Combinations: LC-7: 0.9D+1.0Eh-1.0Ev

Load Cases: Self Weight * 0.9

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Eh

Load Cases: Eh +X

Solved: 6/6/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Ev * -1

Load Cases: Ev +Z

Solved: 6/6/2024

Load Class: None

Load Cases: Ev -Z

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Stability

Linear Combinations: Stability-1: D+W

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-2: D+L

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-3: D+Lr

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Hang/Roof Group

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-4: D+ 0.75(L+Lr)

Extreme Effect Groups: LL_Hang/Roof Group * 0.75

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.75

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-5: D+0.5(L+Lr) + Wa

Extreme Effect Groups: LL_Hang/Roof Group * 0.5

Load Cases: LL_Hang

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Hang Main Member Overturn X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean +X

Solved: 6/6/2024

Load Class: None

Load Cases: LL_Lean +Y

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Wind

Linear Combinations: Wind Up

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Uplift

Solved: 6/6/2024

Load Class: None

Linear Combinations: Wind Down

Load Cases: WS_Strength_H

Solved: 6/6/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/6/2024

Load Class: None

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-6: D+0.7Ev+0.7Eh

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Eh * 0.7

Load Cases: Eh +X

Solved: 6/6/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/6/2024

Load Class: None

Load Cases: Ev -Z * 0.7

Solved: 6/6/2024

Load Class: None

Linear Combinations: Stability-7: D-0.7Ev+0.7Eh

Load Cases: Self Weight

Solved: 6/6/2024

Load Class: None

Extreme Effect Groups: Eh * 0.7

Load Cases: Eh +X

Solved: 6/6/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/6/2024

Load Class: None

Load Cases: Ev +Z * 0.7

Solved: 6/6/2024

Load Class: None

RESULT ENVELOPE :Joint Displacements @ Translation Z (in) Result Cases

Deflection		

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
1	LC-8: 1.0L+Lr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	LC-8: 1.0L+Lr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	LC-9: 0.5(L+Lr)+Wa	0.0424	0.0222	-0.0003	-0.0003	0.0005	0.0000
2	LC-9: 0.5(L+Lr)+Wa	0.0525	0.0179	0.0002	-0.0002	0.0006	0.0000
3	LC-9: 0.5(L+Lr)+Wa	0.0525	0.0184	-0.0828	-0.0002	0.0016	0.0000
3	LC-9: 0.5(L+Lr)+Wa	0.0424	0.0227	0.0031	-0.0003	-0.0002	0.0000

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
4	LC-9: 0.5(L+Lr)+Wa	0.0429	0.0222	-0.0622	-0.0013	0.0005	0.0000
4	LC-9: 0.5(L+Lr)+Wa	0.0429	0.0179	0.0203	0.0005	0.0005	0.0000
5	LC-9: 0.5(L+Lr)+Wa	0.0424	0.0227	-0.0174	-0.0003	-0.0005	0.0000
5	LC-9: 0.5(L+Lr)+Wa	0.0525	0.0184	0.0685	-0.0002	0.0013	0.0000
6	LC-9: 0.5(L+Lr)+Wa	0.0429	0.0179	-0.0346	0.0008	0.0005	0.0000
6	LC-9: 0.5(L+Lr)+Wa	0.0429	0.0222	0.0479	-0.0010	0.0005	0.0000
7	LC-9: 0.5(L+Lr)+Wa	0.0533	0.0188	-0.2791	-0.0004	0.0007	0.0000
7	LC-9: 0.5(L+Lr)+Wa	0.0432	0.0188	0.1407	-0.0001	0.0004	0.0000
8	LC-9: 0.5(L+Lr)+Wa	0.0427	0.0226	-0.2345	-0.0004	0.0004	0.0000
8	LC-9: 0.5(L+Lr)+Wa	0.0528	0.0183	0.1870	-0.0001	0.0007	0.0000
9	LC-9: 0.5(L+Lr)+Wa	0.0432	0.0188	-0.2149	-0.0001	0.0004	0.0000
9	LC-9: 0.5(L+Lr)+Wa	0.0533	0.0188	0.2048	-0.0003	0.0007	0.0000
10	LC-9: 0.5(L+Lr)+Wa	0.0528	0.0183	-0.2613	-0.0001	0.0007	0.0000
10	LC-9: 0.5(L+Lr)+Wa	0.0427	0.0226	0.1602	-0.0003	0.0004	0.0000

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	-1.1100	0.0000	1.7469	0.0000	-3.3400	0.0000
1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	-0.1500	1.9970	2.9547	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	-1.1100	1.7469	3.3400	0.0000	0.0000
1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	1.9970	2.3547	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-5: 0.9D+1.0W	-0.3510	-0.3510	-0.2783	2.1950	-2.1950	0.0000
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3510	-0.6510	3.1099	3.3950	-2.1950	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Self Weight	0.0000	0.0000	1.1377	0.0000	0.0000	0.0000
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3510	-0.6510	3.0829	4.1308	-2.1950	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6510	-0.3510	3.0829	2.1950	-4.1308	0.0000
1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	-0.1500	1.9970	2.9547	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	-0.1500	1.9970	2.9547	0.0000	0.0000
1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1755	-0.1755	1.2890	1.0975	-3.4522	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-3.1099	-0.6510	0.3510	0.0000	-2.1950	3.3950
1	0	LC-5: 0.9D+1.0W	0.2783	-0.3510	0.3510	0.0000	-2.1950	2.1950
1	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-2.5364	-0.0880	0.0880	0.0000	0.0000	0.0000
1	1	LC-5: 0.9D+1.0W	0.7084	-0.0880	0.0880	0.0000	0.0000	0.0000
2	0	Load Cases: Self Weight	0.0000	0.0000	0.2315	0.0000	-0.8677	0.0000
2	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0321	0.5068	-0.1575	-2.0790	0.0427
2	1	Load Cases: Self Weight	0.0000	0.0000	0.1512	0.0000	0.0892	0.0000
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0119	0.4379	-0.1575	0.2828	-0.0080
3	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.4390	0.5039	-1.8830	0.0000
3	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0321	-0.0338	0.0045	0.2325	-0.0427
3	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.3702	0.5039	0.1400	0.0000
3	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0119	-0.1027	0.0045	-0.1088	0.0080
4	0	LC-5: 0.9D+1.0W	-0.0119	0.0321	0.3820	0.0000	-1.5370	-0.0427
4	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1964	-0.0028	-0.7332	0.0000
4	1	LC-5: 0.9D+1.0W	-0.0119	-0.0119	0.3304	0.0000	0.2438	0.0080
4	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1276	-0.0028	0.0767	0.0000
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0321	-0.0338	-0.0045	0.2325	0.0427

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
5	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1964	0.0028	-0.7332	0.0000
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0119	-0.1027	-0.0045	-0.1088	-0.0080
5	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1276	0.0028	0.0767	0.0000
6	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.1001	0.0014	-0.1815	-0.0114
6	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2687	0.1487	-0.5398	0.0000
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.0708	0.0014	0.1456	0.0119
6	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0007	0.1487	0.3729	0.0000
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	-0.0708	-0.0014	0.1456	0.0119
7	0	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	0.0000	-0.0156	-0.0049	0.0447	0.0000
7	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	-0.1001	-0.0014	-0.1815	-0.0114
7	1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	0.0000	-0.0449	-0.0049	-0.0712	0.0000
8	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2820	0.0008	-0.1219	0.0000
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.0999	0.0001	-0.1809	-0.0034
8	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0126	0.0008	0.0427	0.0000
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.0706	0.0001	0.1457	0.0000
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	0.0388	-0.0090	-0.0577	0.0000
9	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0137	-0.0036	0.0397	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	0.0095	-0.0090	0.0348	0.0034
9	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0430	-0.0036	-0.0688	0.0000
10	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0450	0.0049	-0.0716	0.0000
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0993	0.0009	-0.1772	0.0114
10	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0157	0.0049	0.0446	0.0000
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0700	0.0009	0.1470	-0.0119
11	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0157	-0.0049	0.0446	0.0000
11	0	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0661	0.0003	0.1358	-0.0119
11	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0450	-0.0049	-0.0716	0.0000
11	1	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0881	0.0003	-0.1594	0.0114
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.0987	0.0005	-0.1764	0.0034
12	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0474	0.0067	-0.0850	0.0000
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.0694	0.0005	0.1454	0.0000
12	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0181	0.0067	0.0403	0.0000
13	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0176	-0.0024	0.0405	0.0000
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	0.0388	-0.0090	-0.0577	0.0000
13	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0469	-0.0024	-0.0829	0.0000
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	0.0095	-0.0090	0.0348	-0.0034

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	-1.7469	-1.1100	0.0000	0.0000	0.0000	3.3400
1	0	LC-3a: 1.2D+1.6Lr+0.5L	-1.9970	0.0000	0.0000	0.0000	0.0000	2.3547
1	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-2.5095	-0.0880	0.0880	0.0000	-0.7358	0.0000
1	1	LC-3a: 1.2D+1.6Lr+0.5L	-1.4235	0.0000	0.0000	0.0000	0.0000	2.3547
2	0	LC-5: 0.9D+1.0W	0.0119	-0.0321	0.3820	0.0000	-1.5370	0.0427
2	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.4390	-0.5039	-1.8830	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	1	Load Cases: Self Weight	0.0000	0.0000	0.0972	0.0000	0.0573	0.0000
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0119	-0.0283	-0.1575	-0.0902	-0.0080
3	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.6722	0.0000	-3.0660	0.0000
3	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0321	-0.0347	0.0000	0.2355	-0.0427
3	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0119	0.5108	0.0000	0.2774	0.0080
3	1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	0.0000	0.1296	0.0000	0.0765	0.0000
4	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2012	0.0142	-0.7535	0.0000
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0321	-0.0348	0.0000	0.2358	-0.0427
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0119	0.3636	0.0045	0.2642	0.0080
4	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1295	0.0000	0.0764	0.0000
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0321	0.4315	0.0000	-1.7227	0.0427
5	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2012	-0.0142	-0.7535	0.0000
5	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1295	0.0000	0.0764	0.0000
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0119	-0.1027	-0.0045	-0.1088	-0.0080
6	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2687	0.1487	-0.5398	0.0000
6	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.1734	-0.0004	-0.1930	-0.0114
6	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0007	0.1487	0.3729	0.0000
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.0691	-0.0004	0.1463	0.0119
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	0.0320	-0.0085	-0.0449	0.0119
7	0	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	0.0000	-0.0156	-0.0049	0.0447	0.0000
7	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	0.0027	-0.0085	0.0215	-0.0114
7	1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	0.0000	0.0000	-0.0449	-0.0049	-0.0712	0.0000
8	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0469	0.0024	-0.0829	0.0000
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	-0.0095	0.0090	0.0347	-0.0034
8	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0176	0.0024	0.0405	0.0000
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	-0.0388	0.0090	-0.0577	0.0000
9	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0155	-0.0049	0.0446	0.0000
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.0708	-0.0014	0.1456	0.0000
9	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0448	-0.0049	-0.0710	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.1001	-0.0014	-0.1815	0.0034
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0993	0.0009	-0.1771	0.0114
10	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0449	0.0050	-0.0711	0.0000
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0700	0.0009	0.1469	-0.0119
10	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0156	0.0050	0.0447	0.0000
11	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0156	-0.0050	0.0447	0.0000
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.0768	-0.0004	0.1597	-0.0119
11	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0449	-0.0050	-0.0711	0.0000
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.1061	-0.0004	-0.1904	0.0114
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	-0.0101	0.0086	0.0355	0.0034
12	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0474	0.0067	-0.0850	0.0000
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	-0.0394	0.0086	-0.0592	0.0000
12	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0181	0.0067	0.0403	0.0000
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.0700	-0.0009	0.1469	0.0000
13	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0176	-0.0024	0.0405	0.0000
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.0993	-0.0009	-0.1773	-0.0034
13	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0469	-0.0024	-0.0829	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-3a: 1.2D+1.6Lr+0.5L	-1.9970	-0.1500	0.0000	0.0000	0.0000	2.9547
1	0	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	-1.7469	0.0000	1.1100	0.0000	-3.3400	0.0000
1	1	LC-3a: 1.2D+1.6Lr+0.5L	-1.4235	0.0000	0.0000	0.0000	0.0000	2.3547
1	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-2.5095	-0.0880	0.0880	0.0000	-0.7358	0.0000
2	0	LC-5: 0.9D+1.0W	0.0119	-0.0321	-0.0843	0.0000	0.4215	0.0427
2	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	-0.0161	0.7887	0.0000	-3.5556	0.0213
2	1	LC-5: 0.9D+1.0W	0.0119	0.0119	-0.1359	0.0000	-0.1291	-0.0080
2	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	0.0059	0.7199	0.0000	0.2161	-0.0040
3	0	LC-5: 0.9D+1.0W	0.0119	0.0321	-0.0843	0.0000	0.4215	-0.0427
3	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	0.0161	0.7887	0.0000	-3.5556	-0.0213
3	1	LC-5: 0.9D+1.0W	0.0119	-0.0119	-0.1359	0.0000	-0.1291	0.0080
3	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	-0.0059	0.7199	0.0000	0.2161	0.0040
4	0	LC-5: 0.9D+1.0W	-0.0119	0.0321	-0.0843	0.0000	0.4215	-0.0427
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0321	0.4607	0.0000	-1.8453	-0.0427
4	1	LC-5: 0.9D+1.0W	-0.0119	-0.0119	-0.1359	0.0000	-0.1291	0.0080
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0119	0.3919	0.0000	0.2862	0.0080
5	0	LC-5: 0.9D+1.0W	-0.0119	-0.0321	-0.0843	0.0000	0.4215	0.0427
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0321	0.4607	0.0000	-1.8453	0.0427
5	1	LC-5: 0.9D+1.0W	-0.0119	0.0119	-0.1359	0.0000	-0.1291	-0.0080
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0119	0.3919	0.0000	0.2862	-0.0080
6	0	LC-5: 0.9D+1.0W	-0.0146	0.0061	-0.0207	0.0078	0.0526	-0.0114
6	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.3092	-0.0013	-0.1749	-0.0057
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	-0.0439	0.0539	0.0449	0.0119
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.0768	0.0004	0.1597	0.0119
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	-0.0768	-0.0004	0.1597	0.0119
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	0.0439	-0.0539	0.0449	0.0119
7	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.3092	0.0013	-0.1749	-0.0057
7	1	LC-5: 0.9D+1.0W	-0.0146	-0.0061	0.0207	-0.0078	0.0526	-0.0114
8	0	LC-5: 0.9D+1.0W	0.0004	0.0009	-0.0207	0.0078	0.0526	-0.0034
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	0.0004	0.3092	-0.0013	-0.1749	-0.0017
8	1	LC-5: 0.9D+1.0W	0.0004	0.0009	-0.0427	0.0078	-0.0688	0.0000
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.0768	0.0004	0.1597	0.0000
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.0768	-0.0004	0.1597	0.0000
9	0	LC-5: 0.9D+1.0W	-0.0004	0.0009	0.0427	-0.0078	-0.0688	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.1061	-0.0004	-0.1904	0.0034
9	1	LC-5: 0.9D+1.0W	-0.0004	0.0009	0.0207	-0.0078	0.0526	0.0034
10	0	LC-5: 0.9D+1.0W	0.0146	-0.0061	-0.0207	0.0078	0.0526	0.0114
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.1061	0.0004	-0.1904	0.0114
10	1	LC-5: 0.9D+1.0W	0.0146	-0.0061	-0.0427	0.0078	-0.0688	-0.0119
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0768	0.0004	0.1597	-0.0119
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.0768	-0.0004	0.1597	-0.0119
11	0	LC-5: 0.9D+1.0W	0.0146	0.0061	0.0427	-0.0078	-0.0688	-0.0119
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.1061	-0.0004	-0.1904	0.0114
11	1	LC-5: 0.9D+1.0W	0.0146	0.0061	0.0207	-0.0078	0.0526	0.0114

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
12	0	LC-5: 0.9D+1.0W	-0.0004	-0.0009	-0.0207	0.0078	0.0526	0.0034
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.1061	0.0004	-0.1904	0.0034
12	1	LC-5: 0.9D+1.0W	-0.0004	-0.0009	-0.0427	0.0078	-0.0688	0.0000
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.0768	0.0004	0.1597	0.0000
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.0768	-0.0004	0.1597	0.0000
13	0	LC-5: 0.9D+1.0W	0.0004	-0.0009	0.0427	-0.0078	-0.0688	0.0000
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0004	-0.3092	0.0013	-0.1749	-0.0017
13	1	LC-5: 0.9D+1.0W	0.0004	-0.0009	0.0207	-0.0078	0.0526	-0.0034

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-3b: 1.2D+1.6Lr+0.5W	-1.2890	-0.1755	0.1755	0.0000	-3.4522	1.0975
1	0	LC-3a: 1.2D+1.6Lr+0.5L	-1.9970	-0.1500	0.0000	0.0000	0.0000	2.9547
1	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.7155	-0.0440	0.0440	0.0000	-2.3547	0.0000
1	1	LC-3a: 1.2D+1.6Lr+0.5L	-1.4235	0.0000	0.0000	0.0000	0.0000	2.3547
2	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.4390	-0.5039	-1.8830	0.0000
2	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0321	0.4607	0.0000	-1.8453	0.0427
2	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.3702	-0.5039	0.1400	0.0000
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0119	0.3919	0.0000	0.2862	-0.0080
3	0	LC-5: 0.9D+1.0W	0.0119	0.0321	-0.0843	0.0000	0.4215	-0.0427
3	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.4390	0.5039	-1.8830	0.0000
3	1	LC-5: 0.9D+1.0W	0.0119	-0.0119	-0.1359	0.0000	-0.1291	0.0080
3	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.3702	0.5039	0.1400	0.0000
4	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	0.0161	0.0798	-0.0028	-0.2436	-0.0213
4	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	0.0161	0.3178	0.0142	-1.2431	-0.0213
4	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	-0.0059	0.0110	-0.0028	-0.0166	0.0040
4	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	-0.0059	0.2490	0.0142	0.1737	0.0040
5	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	-0.0161	0.3178	-0.0142	-1.2431	0.0213
5	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	-0.0161	0.0798	0.0028	-0.2436	0.0213
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	0.0059	0.2490	-0.0142	0.1737	-0.0040
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0059	0.0059	0.0110	0.0028	-0.0166	-0.0040
6	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.3092	-0.0013	-0.1749	-0.0057
6	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.2415	0.1507	-0.4868	-0.0057
6	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.0398	-0.0013	0.0938	0.0059
6	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	-0.0279	0.1507	0.3218	0.0059
7	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	0.0279	-0.1507	0.3218	0.0059
7	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.0398	0.0013	0.0938	0.0059
7	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.2415	-0.1507	-0.4868	-0.0057
7	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.3092	0.0013	-0.1749	-0.0057
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	0.0004	0.3092	-0.0013	-0.1749	-0.0017
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	-0.0095	0.0090	0.0348	-0.0034
8	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	0.0004	0.0398	-0.0013	0.0938	0.0000
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	-0.0388	0.0090	-0.0577	0.0000
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	0.0380	-0.0095	-0.0590	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
9	0	LC-5: 0.9D+1.0W	-0.0004	0.0009	-0.0661	0.0003	0.1358	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	0.0087	-0.0095	0.0305	0.0034
9	1	LC-5: 0.9D+1.0W	-0.0004	0.0009	-0.0881	0.0003	-0.1594	0.0034
10	0	LC-5: 0.9D+1.0W	0.0146	-0.0061	0.0881	-0.0003	-0.1594	0.0114
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	-0.0095	0.0090	0.0348	0.0114
10	1	LC-5: 0.9D+1.0W	0.0146	-0.0061	0.0661	-0.0003	0.1358	-0.0119
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	-0.0388	0.0090	-0.0576	-0.0119
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	0.0388	-0.0090	-0.0576	-0.0119
11	0	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0661	0.0003	0.1358	-0.0119
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	0.0095	-0.0090	0.0348	0.0114
11	1	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0881	0.0003	-0.1594	0.0114
12	0	LC-5: 0.9D+1.0W	-0.0004	-0.0009	0.0881	-0.0003	-0.1594	0.0034
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	-0.0087	0.0095	0.0305	0.0034
12	1	LC-5: 0.9D+1.0W	-0.0004	-0.0009	0.0661	-0.0003	0.1358	0.0000
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	-0.0380	0.0095	-0.0590	0.0000
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	0.0388	-0.0090	-0.0577	0.0000
13	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0004	-0.0398	0.0013	0.0938	0.0000
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	0.0095	-0.0090	0.0348	-0.0034
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0004	-0.3092	0.0013	-0.1749	-0.0017

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-3.0829	-0.3510	0.6510	0.0000	-4.1308	2.1950
1	0	LC-3a: 1.2D+1.6Lr+0.5L	-1.9970	-0.1500	0.0000	0.0000	0.0000	2.9547
1	1	LC-3a: 1.2D+1.6Lr+0.5L	-1.4235	0.0000	0.0000	0.0000	-2.3547	0.0000
1	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4726	-0.0880	0.0880	0.0000	0.0000	0.0000
2	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	-0.0161	0.7887	0.0000	-3.5556	0.0213
2	0	LC-5: 0.9D+1.0W	0.0119	-0.0321	-0.0843	0.0000	0.4215	0.0427
2	1	LC-5: 0.9D+1.0W	0.0119	0.0119	-0.1359	0.0000	-0.1291	-0.0080
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0119	0.3919	0.0000	0.2862	-0.0080
3	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0059	0.0161	0.7887	0.0000	-3.5556	-0.0213
3	0	LC-5: 0.9D+1.0W	0.0119	0.0321	-0.0843	0.0000	0.4215	-0.0427
3	1	LC-5: 0.9D+1.0W	0.0119	-0.0119	-0.1359	0.0000	-0.1291	0.0080
3	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0119	0.3919	0.0000	0.2862	0.0080
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0321	0.4607	0.0000	-1.8453	-0.0427
4	0	LC-5: 0.9D+1.0W	-0.0119	0.0321	-0.0843	0.0000	0.4215	-0.0427
4	1	LC-5: 0.9D+1.0W	-0.0119	-0.0119	-0.1359	0.0000	-0.1291	0.0080
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0119	0.3919	0.0000	0.2862	0.0080
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0321	0.4607	0.0000	-1.8453	0.0427
5	0	LC-5: 0.9D+1.0W	-0.0119	-0.0321	-0.0843	0.0000	0.4215	0.0427
5	1	LC-5: 0.9D+1.0W	-0.0119	0.0119	-0.1359	0.0000	-0.1291	-0.0080
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0119	0.3919	0.0000	0.2862	-0.0080
6	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.2959	0.1466	-0.5928	-0.0057
6	0	LC-5: 0.9D+1.0W	-0.0146	0.0061	-0.0207	0.0078	0.0526	-0.0114

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
6	1	LC-5: 0.9D+1.0W	-0.0146	0.0061	-0.0427	0.0078	-0.0688	0.0119
6	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	0.0030	0.0265	0.1466	0.4241	0.0059
7	0	LC-5: 0.9D+1.0W	-0.0146	-0.0061	0.0427	-0.0078	-0.0688	0.0119
7	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.0265	-0.1466	0.4241	0.0059
7	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0073	-0.0030	-0.2959	-0.1466	-0.5928	-0.0057
7	1	LC-5: 0.9D+1.0W	-0.0146	-0.0061	0.0207	-0.0078	0.0526	-0.0114
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.1734	-0.0004	-0.1930	-0.0034
8	0	LC-5: 0.9D+1.0W	0.0004	0.0009	-0.0207	0.0078	0.0526	-0.0034
8	1	LC-5: 0.9D+1.0W	0.0004	0.0009	-0.0427	0.0078	-0.0688	0.0000
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.0768	0.0004	0.1597	0.0000
9	0	LC-5: 0.9D+1.0W	-0.0004	0.0009	0.0427	-0.0078	-0.0688	0.0000
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.0768	-0.0004	0.1597	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.1061	-0.0004	-0.1904	0.0034
9	1	LC-5: 0.9D+1.0W	-0.0004	0.0009	0.0207	-0.0078	0.0526	0.0034
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.1061	0.0004	-0.1904	0.0114
10	0	LC-5: 0.9D+1.0W	0.0146	-0.0061	-0.0207	0.0078	0.0526	0.0114
10	1	LC-5: 0.9D+1.0W	0.0146	-0.0061	-0.0427	0.0078	-0.0688	-0.0119
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	-0.0061	0.0768	0.0004	0.1597	-0.0119
11	0	LC-5: 0.9D+1.0W	0.0146	0.0061	0.0427	-0.0078	-0.0688	-0.0119
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.0768	-0.0004	0.1597	-0.0119
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0146	0.0061	-0.1061	-0.0004	-0.1904	0.0114
11	1	LC-5: 0.9D+1.0W	0.0146	0.0061	0.0207	-0.0078	0.0526	0.0114
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.1061	0.0004	-0.1904	0.0034
12	0	LC-5: 0.9D+1.0W	-0.0004	-0.0009	-0.0207	0.0078	0.0526	0.0034
12	1	LC-5: 0.9D+1.0W	-0.0004	-0.0009	-0.0427	0.0078	-0.0688	0.0000
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	0.0768	0.0004	0.1597	0.0000
13	0	LC-5: 0.9D+1.0W	0.0004	-0.0009	0.0427	-0.0078	-0.0688	0.0000
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.0768	-0.0004	0.1597	0.0000
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.1734	0.0004	-0.1930	-0.0034
13	1	LC-5: 0.9D+1.0W	0.0004	-0.0009	0.0207	-0.0078	0.0526	-0.0034

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft) Result Cases

Stength		

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	Load Cases: Self Weight	-1.1377	0.0000	0.0000	0.0000	0.0000	0.0000
1	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-3.0829	-0.6510	0.3510	0.0000	-2.1950	4.1308
1	1	LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	-0.9434	0.0000	0.0000	0.0000	0.0000	0.0000
1	1	LC-3b: 1.2D+1.6Lr+0.5W	-2.1315	-0.0440	0.0440	0.0000	0.0000	2.3547
2	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.4390	-0.5039	-1.8830	0.0000
2	0	LC-5: 0.9D+1.0W	0.0119	-0.0321	0.3820	0.0000	-1.5370	0.0427
2	1	LC-5: 0.9D+1.0W	0.0119	0.0119	-0.1359	0.0000	-0.1291	-0.0080
2	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.3702	-0.5039	0.1400	0.0000
3	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	0.0321	-0.0338	0.0045	0.2325	-0.0427
3	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.6722	0.0000	-3.0660	0.0000
3	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.3702	0.5039	0.1400	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
3	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0119	-0.0119	-0.1035	0.0000	-0.1100	0.0080
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0321	-0.0348	0.0000	0.2358	-0.0427
4	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2012	0.0142	-0.7535	0.0000
4	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1324	0.0142	0.0805	0.0000
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0119	-0.1036	0.0000	-0.1100	0.0080
5	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2012	-0.0142	-0.7535	0.0000
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	-0.0321	0.4315	0.0000	-1.7227	0.0427
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0119	0.0119	0.3627	0.0000	0.2629	-0.0080
5	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.1276	0.0028	0.0767	0.0000
6	0	LC-5: 0.9D+1.0W	-0.0146	0.0061	0.0881	-0.0003	-0.1594	-0.0114
6	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2687	0.1487	-0.5398	0.0000
6	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0007	0.1487	0.3729	0.0000
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	0.0061	0.0768	0.0004	0.1597	0.0119
7	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0007	-0.1487	0.3729	0.0000
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	-0.0768	-0.0004	0.1597	0.0119
7	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0146	-0.0061	0.0095	-0.0090	0.0348	-0.0114
7	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.2820	-0.0008	-0.1219	0.0000
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	0.0009	0.0993	0.0009	-0.1773	-0.0034
8	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.2820	0.0008	-0.1219	0.0000
8	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0126	0.0008	0.0427	0.0000
8	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0157	0.0049	0.0446	0.0000
9	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0181	-0.0067	0.0403	0.0000
9	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0155	-0.0049	0.0446	0.0000
9	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0448	-0.0049	-0.0710	0.0000
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	0.0009	-0.1001	-0.0014	-0.1815	0.0034
10	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0450	0.0049	-0.0716	0.0000
10	0	LC-5: 0.9D+1.0W	0.0146	-0.0061	0.0881	-0.0003	-0.1594	0.0114
10	1	LC-5: 0.9D+1.0W	0.0146	-0.0061	0.0661	-0.0003	0.1358	-0.0119
10	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0157	0.0049	0.0446	0.0000
11	0	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0661	0.0003	0.1358	-0.0119
11	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0155	-0.0049	0.0446	0.0000
11	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0449	-0.0050	-0.0711	0.0000
11	1	LC-5: 0.9D+1.0W	0.0146	0.0061	-0.0881	0.0003	-0.1594	0.0114
12	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0448	0.0049	-0.0710	0.0000
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0004	-0.0009	-0.0087	0.0095	0.0305	0.0034
12	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	0.0181	0.0067	0.0403	0.0000
12	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0002	-0.0004	0.0427	0.0029	0.0957	0.0000
13	0	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.0126	-0.0008	0.0427	0.0000
13	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0004	-0.0429	-0.0029	0.0957	0.0000
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0004	-0.0009	-0.0993	-0.0009	-0.1773	-0.0034
13	1	LC-3a: 1.2D+1.6Lr+0.5L	0.0000	0.0000	-0.2820	-0.0008	-0.1219	0.0000

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-6: D+0.7Ev+0.7Eh	-0.6720	0.0000	1.4251	0.0000	-1.9180	0.0000
1	Stability-3: D+Lr	0.0000	0.0000	1.5641	1.4717	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-6: D+0.7Ev+0.7Eh	0.0000	-0.6720	1.4251	1.9180	0.0000	0.0000
1	Stability-3: D+Lr	0.0000	0.0000	1.5641	1.4717	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-1: D+W	-0.3510	-0.3510	-0.1519	2.1950	-2.1950	0.0000
1	Stability-5: D+0.5(L+Lr) + Wa	-0.3510	-0.5010	2.8571	2.7950	-2.1950	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-7: D-0.7Ev+0.7Eh	0.0000	0.0000	1.1031	0.0000	0.0000	0.0000
1	Stability-5: D+0.5(L+Lr) + Wa	-0.3510	-0.5010	2.8301	3.5308	-2.1950	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-5: D+0.5(L+Lr) + Wa	-0.5010	-0.3510	2.8301	2.1950	-3.5308	0.0000
1	Stability-3: D+Lr	0.0000	0.0000	1.5641	1.4717	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability-3: D+Lr	0.0000	0.0000	1.5641	1.4717	0.0000	0.0000
1	Stability-5: D+0.5(L+Lr) + Wa	-0.5010	-0.3510	-0.0019	2.1950	-3.5308	0.0000

LARSA
Check: Brandon Rudolph 08/15/24
Check: Anson Ouyang 08/15/24
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Blossom Variegared Report

Friday, June 14, 2024	**brandon.rudolph**	**Tel:**

PROJECT SUMMARY

INPUT PROPERTIES	Count
Universal Restraints	NONE
Materials	4
Sections	3
User Coordinate System	NONE
Spring Curves	NONE
Isolater Property	NONE
Creep Definitions	NONE

INPUT GEOMETRY	Count
Joints	47
Members	66
Shells	38
Springs	NONE
Isolaters	NONE
Mass Elements	NONE
DOF Constraints	NONE
Tendons	NONE

Load Cases	Count
Load Cases	20
Combination Cases	NONE
Construction Stages	NONE
Linked Databases	1

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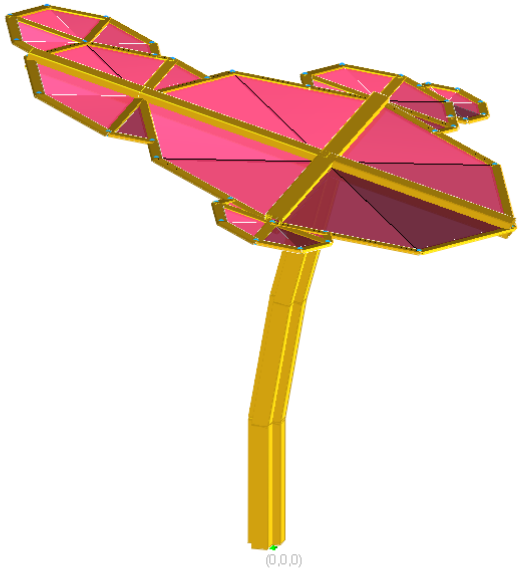
Graphics View 1

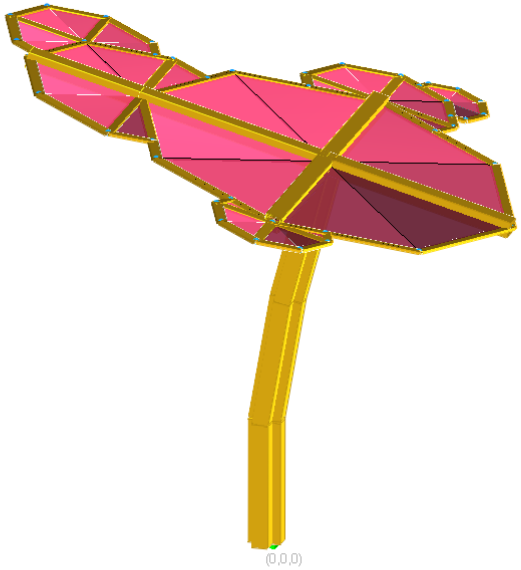
Graphics View 2

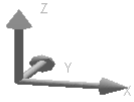
Zoom 0.640X
Load Case zWS Uplift -Y (units: kips, ft)



Graphics: Blossom Variegated

Zoom 0.640X
Load Case zWS Uplift -Y (units: kips, ft)





Local/UCS Axes

INPUT : Material Properties

Name	Modulus of Elasticity (E) (kips/in²)	Poisson's Ratio	Shear Modulus (G) (kips/in²)	Unit Weight (kips/in³)	Thermal Expansion (1/ °F *10^-6)	Assigned
A53	29,000.00	0.2946	11,200.00	0.0003	6.500000	No
A36	29,000.00	0.2946	11,200.00	0.0003	6.500000	Yes
A500 Grade C	29,000.00	0.2946	11,200.00	0.0003	6.500000	Yes
A53 Roof Plate	29,000.00	0.2946	11,200.00	0.0001	6.500000	Yes

INPUT : Sections

Name	Section Area (in²)	Shear Area in yy (in²)	Shear Area in zz (in²)	Torsion Constant (in^4)	Inertia Izz (in^4)	Inertia Iyy (in^4)	Plastic Modulus Zyy (in³)	Plastic Modulus Zzz (in³)	Perimeter (in)	Material Time-Effect	Ductility	Residual Strength (%)	Assigned
Rim Plates	1.8750	1.5625	1.5625	0.2111	1.4063	0.0610	0.0000	0.0000	7.2500	(NONE)	0.	0.	Yes
Column 5x5x1/2	31.5200	31.5200	31.5200	0.0000	498.0000	202.5000	0.0000	0.0000	80.0000	(NONE)	0.	0.	Yes
HSS 5x5x1/2	7.8800	7.8800	7.8800	45.6084	26.0000	26.0000	14.3952	14.3952	20.0000	(NONE)	0.	0.	Yes

INPUT : Section Stress Points

Name	Point 1 Y (in)	Point 1 Z (in)	Point 2 Y (in)	Point 2 Z (in)	Point 3 Y (in)	Point 3 Z (in)	Point 4 Y (in)	Point 4 Z (in)	Point 5 Y (in)	Point 5 Z (in)	Point 6 Y (in)	Point 6 Z (in)
Rim Plates	1.5000	0.3125	1.5000	-0.3125	-1.5000	-0.3125	-1.5000	0.3125	(NONE)	(NONE)	(NONE)	(NONE)
Column 5x5x1/2	2.5000	2.5000	2.5000	-2.5000	-2.5000	-2.5000	-2.5000	2.5000	(NONE)	(NONE)	(NONE)	(NONE)
HSS 5x5x1/2	2.5000	2.5000	2.5000	-2.5000	-2.5000	-2.5000	-2.5000	2.5000	(NONE)	(NONE)	(NONE)	(NONE)

INPUT : Section Dimensions

Name	Shape	Dimension D1	Dimension D2	Dimension D3	Dimension D4	Dimension D5	Dimension D6
Rim Plates	Rectangle	3.0000	0.6250				
Column 5x5x1/2	Parametric						
HSS 5x5x1/2	Parametric						

INPUT : Joints

ID	X (ft)	Y (ft)	Z (ft)	Translation DOF	Rotation DOF	Displacement UCS	Assigned
1	0.0000	0.0000	0.0000	all fixed	all fixed	Global	Yes

INPUT : Joints

ID	X (ft)	Y (ft)	Z (ft)	Translation DOF	Rotation DOF	Displacement UCS	Assigned
2	1.5300	0.0000	10.1300	all free	all free	Global	Yes
3	6.3596	0.0000	8.8359	all free	all free	Global	Yes
4	1.5300	5.0000	10.1300	all free	all free	Global	Yes
5	-3.2996	0.0000	11.4241	all free	all free	Global	Yes
6	1.5300	-5.0000	10.1300	all free	all free	Global	Yes
7	4.9494	3.5400	9.2138	all free	all free	Global	Yes
8	-1.8894	3.5400	11.0462	all free	all free	Global	Yes
9	-1.8894	-3.5400	11.0462	all free	all free	Global	Yes
10	4.9494	-3.5400	9.2138	all free	all free	Global	Yes
11	2.7702	-4.4700	9.7977	all free	all free	Global	Yes
13	0.2974	-4.4700	10.4603	all free	all free	Global	Yes
14	0.0811	-5.0000	10.5182	all free	all free	Global	Yes
15	0.5061	-6.0600	10.4043	all free	all free	Global	Yes
16	1.5300	-6.5000	10.1300	all free	all free	Global	Yes
17	2.5539	-6.0600	9.8557	all free	all free	Global	Yes
18	2.9789	-5.0000	9.7418	all free	all free	Global	Yes
20	3.1759	4.2900	9.6890	all free	all free	Global	Yes
21	3.4619	5.0000	9.6124	all free	all free	Global	Yes
22	2.8920	6.4100	9.7651	all free	all free	Global	Yes
23	1.5300	7.0000	10.1300	all free	all free	Global	Yes
24	0.1680	6.4100	10.4949	all free	all free	Global	Yes
25	-0.4019	5.0000	10.6476	all free	all free	Global	Yes
26	-0.1179	4.2900	10.5716	all free	all free	Global	Yes
28	3.2339	5.5600	9.6734	all free	all free	Global	Yes
29	3.5778	5.7100	9.5813	all free	all free	Global	Yes
30	3.8579	6.4100	9.5062	all free	all free	Global	Yes
31	3.5778	7.1200	9.5813	all free	all free	Global	Yes
32	2.8920	7.4100	9.7651	all free	all free	Global	Yes
33	2.2158	7.1200	9.9462	all free	all free	Global	Yes
34	2.0748	6.7700	9.9840	all free	all free	Global	Yes
36	-2.2719	2.5600	11.1487	all free	all free	Global	Yes
37	-3.2996	3.0000	11.4241	all free	all free	Global	Yes
38	-5.3474	2.1200	11.9728	all free	all free	Global	Yes
39	-6.1974	0.0000	12.2006	all free	all free	Global	Yes

INPUT : Joints

ID	X (ft)	Y (ft)	Z (ft)	Translation DOF	Rotation DOF	Displacement UCS	Assigned
40	-5.3474	-2.1200	11.9728	all free	all free	Global	Yes
41	-3.2996	-3.0000	11.4241	all free	all free	Global	Yes
42	-2.2719	-2.5600	11.1487	all free	all free	Global	Yes
44	-3.7015	2.8300	11.5318	all free	all free	Global	Yes
45	-3.9854	3.5400	11.6079	all free	all free	Global	Yes
46	-5.3474	4.1200	11.9728	all free	all free	Global	Yes
47	-6.7190	3.5400	12.3403	all free	all free	Global	Yes
48	-7.2792	2.1200	12.4904	all free	all free	Global	Yes
49	-6.7190	0.7100	12.3403	all free	all free	Global	Yes
50	-6.0294	0.4100	12.1555	all free	all free	Global	Yes
500	0.0000	0.0000	3.2500	all free	all free	Global	Yes
501	0.5600	0.0000	6.5100	all free	all free	Global	Yes

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force (kips)	Length (ft)	Rigid Zone from Start (x/L)	Rigid Zone from End (x/L)	Orientation Angle (deg)	Castin g (day)	Structure Group
2	2	3	-	Beam	HSS 5x5x1/2	(same as start)	A500 Grade C	0.0000	5.	0.0000	0.0000	0.0000	0	(none)
3	2	4	-	Beam	HSS 5x5x1/2	(same as start)	A500 Grade C	0.0000	5	0.0000	0.0000	15.0000	0	(none)
4	2	5	-	Beam	HSS 5x5x1/2	(same as start)	A500 Grade C	0.0000	5.	0.0000	0.0000	0.0000	0	(none)
5	2	6	-	Beam	HSS 5x5x1/2	(same as start)	A500 Grade C	0.0000	5	0.0000	0.0000	-15.0000	0	(none)
6	3	7	-	Beam	Rim Plates	(same as start)	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
7	7	20	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.9833	0.0000	0.0000	0.0000	0	(none)
8	26	8	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.9814	0.0000	0.0000	0.0000	0	(none)
9	8	36	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.057	0.0000	0.0000	0.0000	0	(none)
10	42	9	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.057	0.0000	0.0000	0.0000	0	(none)
11	9	13	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.4475	0.0000	0.0000	0.0000	0	(none)
12	11	10	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.4402	0.0000	0.0000	0.0000	0	(none)
13	10	3	-	Beam	Rim Plates	(same as start)	A36	0.0000	3.8293	0.0000	0.0000	0.0000	0	(none)
14	11	6	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.3891	0.0000	0.0000	0.0000	0	(none)
15	6	13	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.3817	0.0000	0.0000	0.0000	0	(none)
16	13	14	-	Beam	Rim Plates	(same as start)	A36	0.0000	.5754	0.0000	0.0000	0.0000	0	(none)
17	14	15	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1477	0.0000	0.0000	0.0000	0	(none)
18	15	16	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1477	0.0000	0.0000	0.0000	0	(none)

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force (kips)	Length (ft)	Rigid Zone from Start (x/L)	Rigid Zone from End (x/L)	Orientation Angle (deg)	Castin g (day)	Structure Group
19	16	17	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1477	0.0000	0.0000	0.0000	0	(none)
20	17	18	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1477	0.0000	0.0000	0.0000	0	(none)
21	18	11	-	Beam	Rim Plates	(same as start)	A36	0.0000	.5723	0.0000	0.0000	0.0000	0	(none)
22	4	20	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.846	0.0000	0.0000	0.0000	0	(none)
23	20	21	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7692	0.0000	0.0000	0.0000	0	(none)
24	21	28	-	Beam	Rim Plates	(same as start)	A36	0.0000	.6077	0.0000	0.0000	0.0000	0	(none)
25	34	23	-	Beam	Rim Plates	(same as start)	A36	0.0000	.6091	0.0000	0.0000	0.0000	0	(none)
26	23	24	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5285	0.0000	0.0000	0.0000	0	(none)
27	24	25	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5285	0.0000	0.0000	0.0000	0	(none)
28	25	26	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7685	0.0000	0.0000	0.0000	0	(none)
29	26	4	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.8479	0.0000	0.0000	0.0000	0	(none)
30	22	28	-	Beam	Rim Plates	(same as start)	A36	0.0000	.9208	0.0000	0.0000	0.0000	0	(none)
31	28	29	-	Beam	Rim Plates	(same as start)	A36	0.0000	.3863	0.0000	0.0000	0.0000	0	(none)
32	29	30	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7577	0.0000	0.0000	0.0000	0	(none)
33	30	31	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7669	0.0000	0.0000	0.0000	0	(none)
34	31	32	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7669	0.0000	0.0000	0.0000	0	(none)
35	32	33	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7577	0.0000	0.0000	0.0000	0	(none)
36	33	34	-	Beam	Rim Plates	(same as start)	A36	0.0000	.3792	0.0000	0.0000	0.0000	0	(none)
37	22	34	-	Beam	Rim Plates	(same as start)	A36	0.0000	.9194	0.0000	0.0000	0.0000	0	(none)
38	5	36	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.7723	0.0000	0.0000	0.0000	0	(none)
39	36	37	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1514	0.0000	0.0000	0.0000	0	(none)
40	37	44	-	Beam	Rim Plates	(same as start)	A36	0.0000	.4494	0.0000	0.0000	0.0000	0	(none)
41	50	39	-	Beam	Rim Plates	(same as start)	A36	0.0000	.4454	0.0000	0.0000	0.0000	0	(none)
42	39	40	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.2954	0.0000	0.0000	0.0000	0	(none)
43	40	41	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.2954	0.0000	0.0000	0.0000	0	(none)
44	41	42	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.1514	0.0000	0.0000	0.0000	0	(none)
45	42	5	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.7723	0.0000	0.0000	0.0000	0	(none)
46	38	44	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.846	0.0000	0.0000	0.0000	0	(none)
47	44	45	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7685	0.0000	0.0000	0.0000	0	(none)
48	45	46	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5246	0.0000	0.0000	0.0000	0	(none)
49	46	47	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5339	0.0000	0.0000	0.0000	0	(none)
50	47	48	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5339	0.0000	0.0000	0.0000	0	(none)
51	48	49	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5246	0.0000	0.0000	0.0000	0	(none)
52	49	50	-	Beam	Rim Plates	(same as start)	A36	0.0000	.7744	0.0000	0.0000	0.0000	0	(none)

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force (kips)	Length (ft)	Rigid Zone from Start (x/L)	Rigid Zone from End (x/L)	Orientation Angle (deg)	Castin g (day)	Structure Group
53	50	38	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.85	0.0000	0.0000	0.0000	0	(none)
54	1	500	-	Beam	Column 5x5x1/2	(same as start)	A500 Grade C	0.0000	3.25	0.0000	0.0000	0.0000	0	(none)
55	500	501	-	Beam	Column 5x5x1/2	(same as start)	A500 Grade C	0.0000	3.3077	0.0000	0.0000	0.0000	0	(none)
56	501	2	-	Beam	Column 5x5x1/2	(same as start)	A500 Grade C	0.0000	3.7477	0.0000	0.0000	0.0000	0	(none)
100	5	39	-	Beam	HSS 5x5x1/2	(same as start)	A500 Grade C	0.0000	3.	0.0000	0.0000	0.0000	0	(none)
101	4	23	-	Beam	Rim Plates	(same as start)	A36	0.0000	2	0.0000	0.0000	15.0000	0	(none)
102	5	37	-	Beam	Rim Plates	(same as start)	A36	0.0000	3	0.0000	0.0000	15.0000	0	(none)
103	38	48	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.	0.0000	0.0000	0.0000	0	(none)
104	38	46	-	Beam	Rim Plates	(same as start)	A36	0.0000	2	0.0000	0.0000	0.0000	0	(none)
107	5	41	-	Beam	Rim Plates	(same as start)	A36	0.0000	3	0.0000	0.0000	0.0000	0	(none)
106	6	16	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5	0.0000	0.0000	-15.0000	0	(none)
108	4	21	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.	0.0000	0.0000	0.0000	0	(none)
109	4	25	-	Beam	Rim Plates	(same as start)	A36	0.0000	2.	0.0000	0.0000	0.0000	0	(none)
110	6	14	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5	0.0000	0.0000	0.0000	0	(none)
111	6	18	-	Beam	Rim Plates	(same as start)	A36	0.0000	1.5	0.0000	0.0000	0.0000	0	(none)

INPUT : Member End Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Member End Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
32	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
34	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
39	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
41	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
45	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
47	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
48	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Member End Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
51	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
52	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
55	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
102	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
104	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
107	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
106	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
108	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
109	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Shells

ID	Bending Type	Membrane Type	I-Joint	J-Joint	K-Joint	L-Joint	Material	Thickness (in)	Casting (day)	Structure Group	Area (ft²)	Material Angle (°)
1	Thin Plate	Inactive	2	3	7	(none)	A53 Roof Plate	0.1250	0	(none)	8.85	
2	Thin Plate	Inactive	2	7	20	4	A53 Roof Plate	0.1250	0	(none)	8.8372	
3	Thin Plate	Inactive	2	4	26	8	A53 Roof Plate	0.1250	0	(none)	8.8387	
4	Thin Plate	Inactive	2	8	36	5	A53 Roof Plate	0.1250	0	(none)	8.8356	
5	Thin Plate	Inactive	2	5	42	9	A53 Roof Plate	0.1250	0	(none)	8.8356	
6	Thin Plate	Inactive	2	9	13	6	A53 Roof Plate	0.1250	0	(none)	8.8434	
7	Thin Plate	Inactive	2	6	11	10	A53 Roof Plate	0.1250	0	(none)	8.8492	
8	Thin Plate	Inactive	2	10	3	(none)	A53 Roof Plate	0.1250	0	(none)	8.85	
11	Thin Plate	Inactive	6	13	14	(none)	A53 Roof Plate	0.1250	0	(none)	.3975	
12	Thin Plate	Inactive	6	14	15	(none)	A53 Roof Plate	0.1250	0	(none)	.795	
13	Thin Plate	Inactive	6	15	16	(none)	A53 Roof Plate	0.1250	0	(none)	.795	

INPUT : Shells

ID	Bending Type	Membrane Type	I-Joint	J-Joint	K-Joint	L-Joint	Material	Thickness (in)	Casting (day)	Structure Group	Area (ft²)	Material Angle (°)
14	Thin Plate	Inactive	6	16	17	(none)	A53 Roof Plate	0.1250	0	(none)	.795	
15	Thin Plate	Inactive	6	17	18	(none)	A53 Roof Plate	0.1250	0	(none)	.795	
16	Thin Plate	Inactive	6	18	11	(none)	A53 Roof Plate	0.1250	0	(none)	.3975	
18	Thin Plate	Inactive	4	20	21	(none)	A53 Roof Plate	0.1250	0	(none)	.71	
19	Thin Plate	Inactive	4	21	28	22	A53 Roof Plate	0.1250	0	(none)	1.4088	
20	Thin Plate	Inactive	4	22	34	23	A53 Roof Plate	0.1250	0	(none)	1.4142	
21	Thin Plate	Inactive	4	23	24	(none)	A53 Roof Plate	0.1250	0	(none)	1.41	
22	Thin Plate	Inactive	4	24	25	(none)	A53 Roof Plate	0.1250	0	(none)	1.41	
23	Thin Plate	Inactive	4	25	26	(none)	A53 Roof Plate	0.1250	0	(none)	.71	
26	Thin Plate	Inactive	22	28	29	(none)	A53 Roof Plate	0.1250	0	(none)	.1779	
27	Thin Plate	Inactive	22	29	30	(none)	A53 Roof Plate	0.1250	0	(none)	.35	
28	Thin Plate	Inactive	22	30	31	(none)	A53 Roof Plate	0.1250	0	(none)	.355	
29	Thin Plate	Inactive	22	31	32	(none)	A53 Roof Plate	0.1250	0	(none)	.355	
30	Thin Plate	Inactive	22	32	33	(none)	A53 Roof Plate	0.1250	0	(none)	.35	
31	Thin Plate	Inactive	22	33	34	(none)	A53 Roof Plate	0.1250	0	(none)	.1743	
34	Thin Plate	Inactive	5	36	37	(none)	A53 Roof Plate	0.1250	0	(none)	1.596	
35	Thin Plate	Inactive	5	37	44	38	A53 Roof Plate	0.1250	0	(none)	3.1829	
36	Thin Plate	Inactive	5	38	50	39	A53 Roof Plate	0.1250	0	(none)	3.176	
37	Thin Plate	Inactive	5	39	40	(none)	A53 Roof Plate	0.1250	0	(none)	3.18	
38	Thin Plate	Inactive	5	40	41	(none)	A53 Roof Plate	0.1250	0	(none)	3.18	
39	Thin Plate	Inactive	5	41	42	(none)	A53 Roof Plate	0.1250	0	(none)	1.596	
42	Thin Plate	Inactive	38	44	45	(none)	A53 Roof Plate	0.1250	0	(none)	.7093	
43	Thin Plate	Inactive	38	45	46	(none)	A53 Roof Plate	0.1250	0	(none)	1.41	
44	Thin Plate	Inactive	38	46	47	(none)	A53 Roof Plate	0.1250	0	(none)	1.42	
45	Thin Plate	Inactive	38	47	48	(none)	A53 Roof Plate	0.1250	0	(none)	1.42	
46	Thin Plate	Inactive	38	48	49	(none)	A53 Roof Plate	0.1250	0	(none)	1.41	
47	Thin Plate	Inactive	38	49	50	(none)	A53 Roof Plate	0.1250	0	(none)	.7163	

INPUT : More Material Properties

Name	Yield Stress (kips/in²)	Post-yield to Initial Slope Ratio	Concrete Strength Specimen	Concrete Fck or Steel Fu (kips/in²)	Concrete Cement Hardening Type	Tendon GUTS (kips/in²)	Material Time-Effect	Assigned
A53	35.00	0.020	Cylinder	58.00	Not Concrete	0.00	(NONE)	No
A36	36.00	0.020	Cylinder	58.00	Not Concrete	0.00	(NONE)	Yes

INPUT : More Material Properties

Name	Yield Stress (kips/in²)	Post-yield to Initial Slope Ratio	Concrete Strength Specimen	Concrete Fck or Steel Fu (kips/in²)	Concrete Cement Hardening Type	Tendon GUTS (kips/in²)	Material Time-Effect	Assigned
A500 Grade C	50.00	0.020	Cylinder	62.00	Not Concrete	0.00	(NONE)	Yes
A53 Roof Plate	35.00	0.020	Cylinder	72.00	Not Concrete	0.00	(NONE)	Yes

INPUT : Shell Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)	K-Offset X (ft)	K-Offset Y (ft)	K-Offset Z (ft)	L-Offset X (ft)	L-Offset Y (ft)	L-Offset Z (ft)
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
34	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Shell Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)	K-Offset X (ft)	K-Offset Y (ft)	K-Offset Z (ft)	L-Offset X (ft)	L-Offset Y (ft)	L-Offset Z (ft)
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
39	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
43	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
45	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
47	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Orthotropic Material Properties

Name	Anisotropy	Material UCS	Modulus of Elasticity E11 (kips/in²)	Modulus of Elasticity E22 (kips/in²)	Poisson's Ratio m12	Shear Modulus G12 (kips/in²)	Shear Modulus G13 (kips/in²)	Shear Modulus G23 (kips/in²)	Assigned
A53	Isotropic	(NONE)							No
A36	Isotropic	(NONE)							Yes
A500 Grade C	Isotropic	(NONE)							Yes
A53 Roof Plate	Isotropic	(NONE)							Yes

Load Cases

ID	Name	Analysis Type	Class	Status	Weight Factor X	Weight Factor Y	Weight Factor Z	Is Dynamic Mass?	Assigned	# of Joint Loads	# of Support Loads	# of Member Loads	# of Member Therma	# of Shell Loads	# of Solid Loads	# of Moving Loads	# of THA Loading	# of THA Initial
2	WS_Strength_	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	11	0	0	0	0	0	0
3	Self Weight	Static	None	Activ	0.0000	0.0000	-1.0000	No	No	0	0	0	0	0	0	0	0	0
4	LL_Hang	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
6	LL_Lean	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
7	LL_Hang2	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
8	LL_Hang3	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
9	LL_Hang4	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
17	LL_Lean2	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
18	LL_Lean3	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
19	LL_Lean4	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0

Load Cases

ID	Name	Analysis Type	Class	Status	Weight Factor X	Weight Factor Y	Weight Factor Z	Is Dynamic Mass?	Assigned	# of Joint Loads	# of Support Loads	# of Member Loads	# of Member Therma	# of Shell Loads	# of Solid Loads	# of Moving Loads	# of THA Loading	# of THA Initial
20	LL_Roof	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	38	0	0	0	0
30	WS_Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	38	0	0	0	0
33	WS_Strength_	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	11	0	0	0	0	0	0
34	WS_Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	38	0	0	0	0
35	Eh +X	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
36	Eh +Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
41	Eh -X	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
42	Eh -Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
43	Ev +Z	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
44	Ev -Z	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0

Load Case WS_Strength_H1, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
54	Uniform Force	Global X	0.0345		0.0000	1.0000
55	Uniform Force	Global X	0.0345		0.0000	1.0000
56	Uniform Force	Global X	0.0345		0.0000	1.0000
54	Uniform Force	Global Y	0.0345		0.0000	1.0000
55	Uniform Force	Global Y	0.0345		0.0000	1.0000
56	Uniform Force	Global Y	0.0345		0.0000	1.0000
3	Uniform Force	Global X	0.0115		0.0000	1.0000
5	Uniform Force	Global X	0.0115		0.0000	1.0000
2	Uniform Force	Global Y	0.0115		0.0000	1.0000
4	Uniform Force	Global Y	0.0115		0.0000	1.0000
100	Uniform Force	Global Y	0.0115		0.0000	1.0000

Load Case LL_Hang, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Z	-0.3000		0.8694	1.0000
7	Uniform Force	Global Z	-0.3000		0.0000	0.1306

Load Case LL_Lean, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global X	0.3000		0.2298	

Load Case LL_Hang2, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Z	-0.3000		0.0000	0.1306
13	Uniform Force	Global Z	-0.3000		0.8694	1.0000

Load Case LL_Hang3, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
25	Uniform Force	Global Z	-0.3000		0.1790	1.0000
26	Uniform Force	Global Z	-0.3000		0.0000	0.3272

Load Case LL_Hang4, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
33	Uniform Force	Global Z	-0.3000		0.6519	1.0000
34	Uniform Force	Global Z	-0.3000		0.0000	0.3481

Load Case LL_Lean2, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global X	-0.3000		0.2298	

Load Case LL_Lean3, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Y	0.3000		0.2298	

Load Case LL_Lean4, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Y	-0.3000		0.2298	

Load Case LL_Roof, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
2	Uniform Force	Global Z	-0.0050			0.0000	0.0000
3	Uniform Force	Global Z	-0.0050			0.0000	0.0000
4	Uniform Force	Global Z	-0.0050			0.0000	0.0000
5	Uniform Force	Global Z	-0.0050			0.0000	0.0000
6	Uniform Force	Global Z	-0.0050			0.0000	0.0000
7	Uniform Force	Global Z	-0.0050			0.0000	0.0000
8	Uniform Force	Global Z	-0.0050			0.0000	0.0000
1	Uniform Force	Global Z	-0.0050			0.0000	0.0000
11	Uniform Force	Global Z	-0.0050			0.0000	0.0000
12	Uniform Force	Global Z	-0.0050			0.0000	0.0000
13	Uniform Force	Global Z	-0.0050			0.0000	0.0000
14	Uniform Force	Global Z	-0.0050			0.0000	0.0000
15	Uniform Force	Global Z	-0.0050			0.0000	0.0000
16	Uniform Force	Global Z	-0.0050			0.0000	0.0000
18	Uniform Force	Global Z	-0.0050			0.0000	0.0000
19	Uniform Force	Global Z	-0.0050			0.0000	0.0000
20	Uniform Force	Global Z	-0.0050			0.0000	0.0000
21	Uniform Force	Global Z	-0.0050			0.0000	0.0000
22	Uniform Force	Global Z	-0.0050			0.0000	0.0000
23	Uniform Force	Global Z	-0.0050			0.0000	0.0000
26	Uniform Force	Global Z	-0.0050			0.0000	0.0000
27	Uniform Force	Global Z	-0.0050			0.0000	0.0000
28	Uniform Force	Global Z	-0.0050			0.0000	0.0000
29	Uniform Force	Global Z	-0.0050			0.0000	0.0000
30	Uniform Force	Global Z	-0.0050			0.0000	0.0000
31	Uniform Force	Global Z	-0.0050			0.0000	0.0000
34	Uniform Force	Global Z	-0.0050			0.0000	0.0000

Load Case LL Roof, Shell Loads

Shell	Type	Direction	Load (kips/ft²)	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
35	Uniform Force	Global Z	-0.0050			0.0000	0.0000
36	Uniform Force	Global Z	-0.0050			0.0000	0.0000
37	Uniform Force	Global Z	-0.0050			0.0000	0.0000
38	Uniform Force	Global Z	-0.0050			0.0000	0.0000
39	Uniform Force	Global Z	-0.0050			0.0000	0.0000
42	Uniform Force	Global Z	-0.0050			0.0000	0.0000
43	Uniform Force	Global Z	-0.0050			0.0000	0.0000
44	Uniform Force	Global Z	-0.0050			0.0000	0.0000
45	Uniform Force	Global Z	-0.0050			0.0000	0.0000
46	Uniform Force	Global Z	-0.0050			0.0000	0.0000
47	Uniform Force	Global Z	-0.0050			0.0000	0.0000

Load Case WS_Strength R Up, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
1	Uniform Force	Local z	0.0320			0.0000	0.0000
2	Uniform Force	Local z	0.0320			0.0000	0.0000
3	Uniform Force	Local z	0.0320			0.0000	0.0000
4	Uniform Force	Local z	0.0320			0.0000	0.0000
5	Uniform Force	Local z	0.0320			0.0000	0.0000
6	Uniform Force	Local z	0.0320			0.0000	0.0000
7	Uniform Force	Local z	0.0320			0.0000	0.0000
8	Uniform Force	Local z	0.0320			0.0000	0.0000
11	Uniform Force	Local z	0.0320			0.0000	0.0000
12	Uniform Force	Local z	0.0320			0.0000	0.0000
13	Uniform Force	Local z	0.0320			0.0000	0.0000
14	Uniform Force	Local z	0.0320			0.0000	0.0000
15	Uniform Force	Local z	0.0320			0.0000	0.0000
16	Uniform Force	Local z	0.0320			0.0000	0.0000
18	Uniform Force	Local z	0.0320			0.0000	0.0000
19	Uniform Force	Local z	0.0320			0.0000	0.0000
20	Uniform Force	Local z	0.0320			0.0000	0.0000
21	Uniform Force	Local z	0.0320			0.0000	0.0000

Load Case WS Strength R Up, Shell Loads

Shell	Type	Direction	Load (kips/ft²)	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
22	Uniform Force	Local z	0.0320			0.0000	0.0000
23	Uniform Force	Local z	0.0320			0.0000	0.0000
26	Uniform Force	Local z	0.0320			0.0000	0.0000
27	Uniform Force	Local z	0.0320			0.0000	0.0000
28	Uniform Force	Local z	0.0320			0.0000	0.0000
29	Uniform Force	Local z	0.0320			0.0000	0.0000
30	Uniform Force	Local z	0.0320			0.0000	0.0000
31	Uniform Force	Local z	0.0320			0.0000	0.0000
34	Uniform Force	Local z	0.0320			0.0000	0.0000
35	Uniform Force	Local z	0.0320			0.0000	0.0000
36	Uniform Force	Local z	0.0320			0.0000	0.0000
37	Uniform Force	Local z	0.0320			0.0000	0.0000
38	Uniform Force	Local z	0.0320			0.0000	0.0000
39	Uniform Force	Local z	0.0320			0.0000	0.0000
42	Uniform Force	Local z	0.0320			0.0000	0.0000
43	Uniform Force	Local z	0.0320			0.0000	0.0000
44	Uniform Force	Local z	0.0320			0.0000	0.0000
45	Uniform Force	Local z	0.0320			0.0000	0.0000
46	Uniform Force	Local z	0.0320			0.0000	0.0000
47	Uniform Force	Local z	0.0320			0.0000	0.0000

Load Case WS_Strength_H2, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
54	Uniform Force	Global X	-0.0345		0.0000	1.0000
55	Uniform Force	Global X	-0.0345		0.0000	1.0000
56	Uniform Force	Global X	-0.0345		0.0000	1.0000
54	Uniform Force	Global Y	-0.0345		0.0000	1.0000
55	Uniform Force	Global Y	-0.0345		0.0000	1.0000
56	Uniform Force	Global Y	-0.0345		0.0000	1.0000
3	Uniform Force	Global X	-0.0115		0.0000	1.0000
5	Uniform Force	Global X	-0.0115		0.0000	1.0000
2	Uniform Force	Global Y	-0.0115		0.0000	1.0000

Load Case WS_Strength_H2, Member Loads

Member	Type	Direction	Magnitude at Start (kips)	Magnitude at End (kips)	Start Position (x/L)	End Position from start (x/L)
4	Uniform Force	Global Y	-0.0115		0.0000	1.0000
100	Uniform Force	Global Y	-0.0115		0.0000	1.0000

Load Case WS_Strength R Down, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
1	Uniform Force	Local z	-0.0320			0.0000	0.0000
2	Uniform Force	Local z	-0.0320			0.0000	0.0000
3	Uniform Force	Local z	-0.0320			0.0000	0.0000
4	Uniform Force	Local z	-0.0320			0.0000	0.0000
5	Uniform Force	Local z	-0.0320			0.0000	0.0000
6	Uniform Force	Local z	-0.0320			0.0000	0.0000
7	Uniform Force	Local z	-0.0320			0.0000	0.0000
8	Uniform Force	Local z	-0.0320			0.0000	0.0000
11	Uniform Force	Local z	-0.0320			0.0000	0.0000
12	Uniform Force	Local z	-0.0320			0.0000	0.0000
13	Uniform Force	Local z	-0.0320			0.0000	0.0000
14	Uniform Force	Local z	-0.0320			0.0000	0.0000
15	Uniform Force	Local z	-0.0320			0.0000	0.0000
16	Uniform Force	Local z	-0.0320			0.0000	0.0000
18	Uniform Force	Local z	-0.0320			0.0000	0.0000
19	Uniform Force	Local z	-0.0320			0.0000	0.0000
20	Uniform Force	Local z	-0.0320			0.0000	0.0000
21	Uniform Force	Local z	-0.0320			0.0000	0.0000
22	Uniform Force	Local z	-0.0320			0.0000	0.0000
23	Uniform Force	Local z	-0.0320			0.0000	0.0000
26	Uniform Force	Local z	-0.0320			0.0000	0.0000
27	Uniform Force	Local z	-0.0320			0.0000	0.0000
28	Uniform Force	Local z	-0.0320			0.0000	0.0000
29	Uniform Force	Local z	-0.0320			0.0000	0.0000
30	Uniform Force	Local z	-0.0320			0.0000	0.0000
31	Uniform Force	Local z	-0.0320			0.0000	0.0000
34	Uniform Force	Local z	-0.0320			0.0000	0.0000

Load Case WS Strength R Down, Shell Loads

Shell	Type	Direction	Load (kips/ft²)	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
35	Uniform Force	Local z	-0.0320			0.0000	0.0000
36	Uniform Force	Local z	-0.0320			0.0000	0.0000
37	Uniform Force	Local z	-0.0320			0.0000	0.0000
38	Uniform Force	Local z	-0.0320			0.0000	0.0000
39	Uniform Force	Local z	-0.0320			0.0000	0.0000
42	Uniform Force	Local z	-0.0320			0.0000	0.0000
43	Uniform Force	Local z	-0.0320			0.0000	0.0000
44	Uniform Force	Local z	-0.0320			0.0000	0.0000
45	Uniform Force	Local z	-0.0320			0.0000	0.0000
46	Uniform Force	Local z	-0.0320			0.0000	0.0000
47	Uniform Force	Local z	-0.0320			0.0000	0.0000

Load Case Eh +X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global X	0.4400		0.5576	

Load Case Eh +Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Y	0.4400		0.5576	

Load Case Eh -X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global X	-0.4400		0.5576	

Load Case Eh -Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Y	-0.4400		0.5576	

Load Case Ev +Z, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Z	0.1000		0.5576	

Load Case Ev -Z, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
55	Point Force	Global Z	-0.1000		0.5576	

POST-COMPUTED RESULT CASES SUMMARY

Linear Result Combination: Wind - Perf Red			
Load Class	None		
Case	Factor	Load Class	Incremental
Horizontal Wind Group	1	None	No
Roof Wind Group	0.65	None	No
Linear Result Combination: LC-1: 1.4D			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.4	None	No
Linear Result Combination: LC-2: 1.2D+1.6L+0.5Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL_Lean Group	1.6	None	No
LL Roof Group	0.5	None	No
Linear Result Combination: LC-3a: 1.2D+1.6Lr+0.5L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL Roof Group	1.6	None	No
LL_Lean Group	0.5	None	No
Linear Result Combination: LC-3b: 1.2D+1.6Lr+0.5W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
LL Roof Group	1.6	None	No
Wind - Perf Red	0.5	None	No
Linear Result Combination: LC-4: 1.2D+1.0W+1.0L+0.5Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
Wind - Perf Red	1	None	No
LL_Lean Group	1	None	No
LL Roof Group	0.5	None	No

Linear Result Combination: LC-5: 0.9D+1.0W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	0.9	None	No
Wind - Perf Red	1	None	No
Linear Result Combination: LC-6: 1.2D+1.0Eh+1.0Ev+0.5L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1.2	None	No
Eh	1	None	No
LL_Lean Group	0.5	None	No
Ev +Z	1	None	No
Linear Result Combination: LC-7: 0.9D+1.0Eh-1.0Ev			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	0.9	None	No
Eh	1	None	No
Ev -Z	1	None	No
Linear Result Combination: LC-8: 1.0L+Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean Group	1	None	No
LL_Roof	1	None	No
Linear Result Combination: LC-9: 0.5(L+Lr)+Wa			
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean Group	0.5	None	No
Wind - Perf Red	0.7	None	No
LL_Roof	0.5	None	No
Linear Result Combination: 0.7W			
Load Class	None		
Case	Factor	Load Class	Incremental
Horizontal Wind Group	0.7	None	No
Roof Wind Group	0.7	None	No
Linear Result Combination: Copy of LC-9: 0.5(L+Lr)+Wa : REDUCED WIND			
Load Class	None		

Case	Factor	Load Class	Incremental
LL_Lean Group	0.5	None	No
LL_Roof	0.5	None	No
Copy of 0.7W: 25% Roof Wind Reduction	1	None	No
Linear Result Combination: Copy of 0.7W: 25% Roof Wind Reduction			
Load Class	None		
Case	Factor	Load Class	Incremental
Horizontal Wind Group	0.7	None	No
Roof Wind Group	0.63	None	No
Linear Result Combination: Copy of Wind			
Load Class	None		
Case	Factor	Load Class	Incremental
Horizontal Wind Group	1	None	No
Roof Wind Group	1	None	No
Linear Result Combination: Stability 1: D+W			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
Wind - Perf Red	1	None	No
Linear Result Combination: Stability 2: D+L			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL_Lean Group	1	None	No
Linear Result Combination: Stability 3: D+Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL Roof Group	1	None	No
Linear Result Combination: Stability 4: D+0.75(L+Lr)			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL_Lean Group	0.75	None	No
LL Roof Group	0.75	None	No
Linear Result Combination: Stability 5: D+0.5(L+Lr)+Wa			

Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
LL_Lean Group	0.5	None	No
LL Roof Group	0.5	None	No
Wind - Perf Red	1	None	No
Linear Result Combination: Stability 6: D+0.7EV+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
Ev -Z	0.7	None	No
Eh	0.7	None	No
Linear Result Combination: Stability 7: D-0.7EV+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
Self Weight	1	None	No
Ev +Z	0.7	None	No
Eh	0.7	None	No
Extreme Effect Group: LL_Hang Group			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Hang	1	None	No
LL_Hang2	1	None	No
LL_Hang3	1	None	No
LL_Hang4	1	None	No
Extreme Effect Group: LL_Lean Group			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL_Lean	1	None	No
LL_Lean2	1	None	No
LL_Lean3	1	None	No
LL_Lean4	1	None	No
Extreme Effect Group: LL Roof Group			
Allow Positive Minimum/Negative Maximum	No		

Load Class	None		
Case	Factor	Load Class	Incremental
LL_Roof	1	None	No
LL_Hang Group	1	None	No
Extreme Effect Group: Horizontal Wind Group			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
WS_Strength_H1	1	None	No
WS_Strength_H2	1	None	No
Extreme Effect Group: Roof Wind Group			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
WS_Strength R Up	1	None	No
WS_Strength R Down	1	None	No
Extreme Effect Group: Strength			
Allow Positive Minimum/Negative Maximum	Yes		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-1: 1.4D	1	None	No
LC-2: 1.2D+1.6L+0.5Lr	1	None	No
LC-3a: 1.2D+1.6Lr+0.5L	1	None	No
LC-3b: 1.2D+1.6Lr+0.5W	1	None	No
LC-4: 1.2D+1.0W+1.0L+0.5Lr	1	None	No
LC-5: 0.9D+1.0W	1	None	No
LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	1	None	No
LC-7: 0.9D+1.0Eh-1.0Ev	1	None	No
Extreme Effect Group: Deflection			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-8: 1.0L+Lr	1	None	No
LC-9: 0.5(L+Lr)+Wa	1	None	No
Extreme Effect Group: Eh			
Allow Positive Minimum/Negative Maximum	No		

Load Class	None		
Case	Factor	Load Class	Incremental
Eh +X	1	None	No
Eh +Y	1	None	No
Eh -X	1	None	No
Eh -Y	1	None	No
Extreme Effect Group: Ev			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Ev +Z	1	None	No
Ev -Z	1	None	No
Extreme Effect Group: Seismic			
Allow Positive Minimum/Negative Maximum	Yes		
Load Class	None		
Case	Factor	Load Class	Incremental
LC-6: 1.2D+1.0Eh+1.0Ev+0.5L	1	None	No
LC-7: 0.9D+1.0Eh-1.0Ev	1	None	No
Extreme Effect Group: Stability			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Stability 1: D+W	1	None	No
Stability 2: D+L	1	None	No
Stability 3: D+Lr	1	None	No
Stability 4: D+0.75(L+Lr)	1	None	No
Stability 5: D+0.5(L+Lr)+Wa	1	None	No
Stability 6: D+0.7EV+0.7Eh	1	None	No
Stability 7: D-0.7EV+0.7Eh	1	None	No

Result Cases Summary

Extreme Effect Groups: Deflection

Linear Combinations: LC-8: 1.0L+Lr

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-9: 0.5(L+Lr)+Wa

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red * 0.7

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Roof * 0.5

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Stability

Linear Combinations: Stability 1: D+W

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 2: D+L

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 3: D+Lr

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 4: D+0.75(L+Lr)

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.75

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 0.75

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 5: D+0.5(L+Lr)+Wa

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 0.5

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 6: D+0.7EV+0.7Eh

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Load Cases: Ev -Z * 0.7

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Eh * 0.7

Load Cases: Eh +X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -Y

Solved: 6/14/2024

Load Class: None

Linear Combinations: Stability 7: D-0.7EV+0.7Eh

Load Cases: Self Weight

Solved: 6/14/2024

Load Class: None

Load Cases: Ev +Z * 0.7

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Eh * 0.7

Load Cases: Eh +X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Strength

Linear Combinations: LC-1: 1.4D

Load Cases: Self Weight * 1.4

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-2: 1.2D+1.6L+0.5Lr

Load Cases: Self Weight * 1.2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 1.6

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 0.5

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-3a: 1.2D+1.6Lr+0.5L

Load Cases: Self Weight * 1.2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 1.6

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-3b: 1.2D+1.6Lr+0.5W

Load Cases: Self Weight * 1.2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 1.6

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red * 0.5

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-4: 1.2D+1.0W+1.0L+0.5Lr

Load Cases: Self Weight * 1.2

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL Roof Group * 0.5

Load Cases: LL_Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Hang Group

Load Cases: LL_Hang

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Hang4

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-5: 0.9D+1.0W

Load Cases: Self Weight * 0.9

Solved: 6/14/2024

Load Class: None

Linear Combinations: Wind - Perf Red

Extreme Effect Groups: Horizontal Wind Group

Load Cases: WS_Strength_H1

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength_H2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Roof Wind Group * 0.65

Load Cases: WS_Strength R Up

Solved: 6/14/2024

Load Class: None

Load Cases: WS_Strength R Down

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-6: 1.2D+1.0Eh+1.0Ev+0.5L

Load Cases: Self Weight * 1.2

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Eh

Load Cases: Eh +X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: LL_Lean Group * 0.5

Load Cases: LL_Lean

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean2

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean3

Solved: 6/14/2024

Load Class: None

Load Cases: LL_Lean4

Solved: 6/14/2024

Load Class: None

Load Cases: Ev +Z

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-7: 0.9D+1.0Eh-1.0Ev

Load Cases: Self Weight * 0.9

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Eh

Load Cases: Eh +X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh +Y

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -X

Solved: 6/14/2024

Load Class: None

Load Cases: Eh -Y

Solved: 6/14/2024

Load Class: None

Load Cases: Ev -Z

Solved: 6/14/2024

Load Class: None

RESULT ENVELOPE :Joint Displacements @ Translation Z (in) Result Cases

Deflection		

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
1	LC-8: 1.0L+Lr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	LC-8: 1.0L+Lr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	LC-9: 0.5(L+Lr)+Wa	0.0641	0.0049	-0.0125	-0.0001	0.0009	-0.0001
2	LC-9: 0.5(L+Lr)+Wa	-0.0639	-0.0035	0.0125	0.0000	-0.0009	0.0000
3	LC-9: 0.5(L+Lr)+Wa	0.0534	0.0006	-0.0526	0.0000	0.0006	-0.0001

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
3	LC-9: 0.5(L+Lr)+Wa	-0.0537	-0.0005	0.0506	0.0000	-0.0006	0.0001
4	LC-9: 0.5(L+Lr)+Wa	-0.0276	0.0156	-0.0404	-0.0010	-0.0005	0.0000
4	LC-9: 0.5(L+Lr)+Wa	0.0284	-0.0142	0.0290	0.0008	0.0004	-0.0001
5	LC-9: 0.5(L+Lr)+Wa	-0.0947	-0.0059	-0.1027	-0.0003	-0.0026	0.0001
5	LC-9: 0.5(L+Lr)+Wa	0.0896	0.0091	0.0827	0.0002	0.0021	-0.0001
6	LC-9: 0.5(L+Lr)+Wa	-0.0573	-0.0048	-0.0132	0.0006	-0.0009	0.0001
6	LC-9: 0.5(L+Lr)+Wa	0.0572	0.0062	0.0084	-0.0004	0.0008	-0.0001
7	LC-9: 0.5(L+Lr)+Wa	-0.0484	0.0164	-0.1342	-0.0003	-0.0011	0.0003
7	LC-9: 0.5(L+Lr)+Wa	0.0411	-0.0148	0.0916	0.0002	0.0009	-0.0002
8	LC-9: 0.5(L+Lr)+Wa	-0.1275	-0.0075	-0.2404	-0.0018	-0.0039	0.0007
8	LC-9: 0.5(L+Lr)+Wa	0.1138	0.0094	0.1753	0.0012	0.0030	-0.0005
9	LC-9: 0.5(L+Lr)+Wa	-0.1039	-0.0016	-0.1778	-0.0006	-0.0008	0.0001
9	LC-9: 0.5(L+Lr)+Wa	0.0941	0.0057	0.1327	0.0004	0.0008	-0.0001
10	LC-9: 0.5(L+Lr)+Wa	-0.0421	0.0093	-0.0969	-0.0011	-0.0017	0.0000
10	LC-9: 0.5(L+Lr)+Wa	0.0350	-0.0101	0.0622	0.0008	0.0013	0.0000
11	LC-9: 0.5(L+Lr)+Wa	-0.0272	0.0149	-0.0320	-0.0014	0.0025	0.0003
11	LC-9: 0.5(L+Lr)+Wa	0.0248	-0.0134	0.0186	0.0010	-0.0017	-0.0003
13	LC-9: 0.5(L+Lr)+Wa	-0.0703	-0.0068	-0.0585	-0.0011	-0.0042	0.0004
13	LC-9: 0.5(L+Lr)+Wa	0.0675	0.0083	0.0435	0.0008	0.0032	-0.0003
14	LC-9: 0.5(L+Lr)+Wa	-0.0708	-0.0071	-0.0634	-0.0005	-0.0036	0.0003
14	LC-9: 0.5(L+Lr)+Wa	0.0678	0.0087	0.0478	0.0003	0.0028	-0.0002
15	LC-9: 0.5(L+Lr)+Wa	-0.0633	-0.0063	-0.0433	-0.0004	-0.0024	0.0002
15	LC-9: 0.5(L+Lr)+Wa	0.0618	0.0079	0.0329	0.0003	0.0019	-0.0002
16	LC-9: 0.5(L+Lr)+Wa	-0.0567	-0.0048	-0.0213	0.0000	-0.0009	0.0002
16	LC-9: 0.5(L+Lr)+Wa	0.0562	0.0062	0.0149	0.0000	0.0009	-0.0001
17	LC-9: 0.5(L+Lr)+Wa	-0.0538	-0.0017	-0.0195	-0.0004	0.0004	0.0003
17	LC-9: 0.5(L+Lr)+Wa	0.0527	0.0032	0.0107	0.0003	-0.0001	-0.0002
18	LC-9: 0.5(L+Lr)+Wa	-0.0267	0.0149	-0.0306	-0.0008	0.0020	0.0002
18	LC-9: 0.5(L+Lr)+Wa	0.0243	-0.0135	0.0172	0.0006	-0.0013	-0.0002
20	LC-9: 0.5(L+Lr)+Wa	-0.0378	0.0125	-0.0881	-0.0001	0.0037	0.0001
20	LC-9: 0.5(L+Lr)+Wa	0.0342	-0.0118	0.0611	0.0001	-0.0026	-0.0001
21	LC-9: 0.5(L+Lr)+Wa	-0.0421	0.0122	-0.1066	-0.0012	0.0035	0.0002
21	LC-9: 0.5(L+Lr)+Wa	0.0374	-0.0116	0.0743	0.0009	-0.0024	-0.0002
22	LC-9: 0.5(L+Lr)+Wa	-0.0426	0.0133	-0.1188	-0.0019	0.0023	0.0004

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
22	LC-9: 0.5(L+Lr)+Wa	0.0383	-0.0123	0.0840	0.0014	-0.0016	-0.0003
23	LC-9: 0.5(L+Lr)+Wa	-0.0425	0.0156	-0.1081	-0.0025	0.0001	0.0005
23	LC-9: 0.5(L+Lr)+Wa	0.0396	-0.0142	0.0781	0.0018	0.0000	-0.0004
24	LC-9: 0.5(L+Lr)+Wa	-0.0470	0.0174	-0.1220	-0.0009	-0.0029	0.0001
24	LC-9: 0.5(L+Lr)+Wa	0.0431	-0.0154	0.0893	0.0007	0.0022	-0.0001
25	LC-9: 0.5(L+Lr)+Wa	-0.0537	0.0184	-0.1376	-0.0003	-0.0052	0.0000
25	LC-9: 0.5(L+Lr)+Wa	0.0477	-0.0160	0.1006	0.0002	0.0038	0.0000
26	LC-9: 0.5(L+Lr)+Wa	-0.0497	0.0180	-0.1191	0.0003	-0.0059	-0.0002
26	LC-9: 0.5(L+Lr)+Wa	0.0446	-0.0157	0.0869	-0.0002	0.0043	0.0001
28	LC-9: 0.5(L+Lr)+Wa	-0.0416	0.0126	-0.1088	-0.0019	0.0029	0.0003
28	LC-9: 0.5(L+Lr)+Wa	0.0372	-0.0119	0.0762	0.0014	-0.0020	-0.0003
29	LC-9: 0.5(L+Lr)+Wa	-0.0455	0.0119	-0.1242	-0.0020	0.0028	0.0004
29	LC-9: 0.5(L+Lr)+Wa	0.0399	-0.0114	0.0870	0.0015	-0.0019	-0.0003
30	LC-9: 0.5(L+Lr)+Wa	-0.0514	0.0115	-0.1502	-0.0020	0.0027	0.0004
30	LC-9: 0.5(L+Lr)+Wa	0.0442	-0.0112	0.1055	0.0014	-0.0018	-0.0003
31	LC-9: 0.5(L+Lr)+Wa	-0.0527	0.0118	-0.1582	-0.0020	0.0026	0.0004
31	LC-9: 0.5(L+Lr)+Wa	0.0454	-0.0114	0.1117	0.0015	-0.0018	-0.0003
32	LC-9: 0.5(L+Lr)+Wa	-0.0520	0.0140	-0.1450	-0.0022	0.0023	0.0004
32	LC-9: 0.5(L+Lr)+Wa	0.0461	-0.0132	0.1030	0.0016	-0.0016	-0.0003
33	LC-9: 0.5(L+Lr)+Wa	-0.0456	0.0149	-0.1199	-0.0022	0.0019	0.0005
33	LC-9: 0.5(L+Lr)+Wa	0.0417	-0.0138	0.0858	0.0016	-0.0013	-0.0004
34	LC-9: 0.5(L+Lr)+Wa	-0.0427	0.0150	-0.1077	-0.0021	0.0016	0.0005
34	LC-9: 0.5(L+Lr)+Wa	0.0395	-0.0138	0.0771	0.0016	-0.0011	-0.0004
36	LC-9: 0.5(L+Lr)+Wa	-0.1206	-0.0073	-0.2125	-0.0055	-0.0040	0.0014
36	LC-9: 0.5(L+Lr)+Wa	0.1086	0.0095	0.1570	0.0039	0.0031	-0.0010
37	LC-9: 0.5(L+Lr)+Wa	-0.1451	-0.0062	-0.3057	-0.0074	-0.0051	0.0020
37	LC-9: 0.5(L+Lr)+Wa	0.1271	0.0094	0.2262	0.0053	0.0039	-0.0014
38	LC-9: 0.5(L+Lr)+Wa	-0.1535	-0.0069	-0.3375	-0.0090	-0.0038	0.0023
38	LC-9: 0.5(L+Lr)+Wa	0.1342	0.0111	0.2547	0.0064	0.0029	-0.0017
39	LC-9: 0.5(L+Lr)+Wa	-0.1198	-0.0056	-0.1967	-0.0005	-0.0027	0.0002
39	LC-9: 0.5(L+Lr)+Wa	0.1096	0.0107	0.1577	0.0003	0.0022	-0.0002
40	LC-9: 0.5(L+Lr)+Wa	-0.1155	-0.0010	-0.2244	0.0013	-0.0013	-0.0003
40	LC-9: 0.5(L+Lr)+Wa	0.1052	0.0072	0.1743	-0.0010	0.0011	0.0002
41	LC-9: 0.5(L+Lr)+Wa	-0.1095	-0.0057	-0.1949	0.0025	-0.0014	-0.0006

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
41	LC-9: 0.5(L+Lr)+Wa	0.0991	0.0090	0.1487	-0.0018	0.0012	0.0004
42	LC-9: 0.5(L+Lr)+Wa	-0.1034	-0.0025	-0.1672	0.0025	-0.0008	-0.0004
42	LC-9: 0.5(L+Lr)+Wa	0.0942	0.0064	0.1263	-0.0018	0.0008	0.0002
44	LC-9: 0.5(L+Lr)+Wa	-0.1478	-0.0065	-0.3160	-0.0080	-0.0055	0.0022
44	LC-9: 0.5(L+Lr)+Wa	0.1292	0.0098	0.2347	0.0057	0.0041	-0.0016
45	LC-9: 0.5(L+Lr)+Wa	-0.1716	-0.0062	-0.4074	-0.0086	-0.0057	0.0022
45	LC-9: 0.5(L+Lr)+Wa	0.1468	0.0098	0.3005	0.0061	0.0043	-0.0016
46	LC-9: 0.5(L+Lr)+Wa	-0.2110	-0.0068	-0.5542	-0.0090	-0.0048	0.0024
46	LC-9: 0.5(L+Lr)+Wa	0.1762	0.0109	0.4088	0.0064	0.0036	-0.0018
47	LC-9: 0.5(L+Lr)+Wa	-0.2133	-0.0041	-0.5591	-0.0094	-0.0039	0.0024
47	LC-9: 0.5(L+Lr)+Wa	0.1786	0.0100	0.4164	0.0067	0.0030	-0.0018
48	LC-9: 0.5(L+Lr)+Wa	-0.1786	-0.0041	-0.4306	-0.0092	-0.0039	0.0023
48	LC-9: 0.5(L+Lr)+Wa	0.1535	0.0103	0.3265	0.0065	0.0030	-0.0017
49	LC-9: 0.5(L+Lr)+Wa	-0.1353	-0.0053	-0.2566	-0.0072	-0.0041	0.0019
49	LC-9: 0.5(L+Lr)+Wa	0.1214	0.0108	0.2015	0.0051	0.0031	-0.0014
50	LC-9: 0.5(L+Lr)+Wa	-0.1215	-0.0057	-0.2044	-0.0047	-0.0032	0.0011
50	LC-9: 0.5(L+Lr)+Wa	0.1109	0.0107	0.1625	0.0033	0.0025	-0.0008
500	LC-9: 0.5(L+Lr)+Wa	-0.0087	-0.0008	-0.0001	0.0000	-0.0004	0.0000
500	LC-9: 0.5(L+Lr)+Wa	0.0089	0.0010	0.0001	0.0000	0.0004	0.0000
501	LC-9: 0.5(L+Lr)+Wa	0.0306	0.0029	-0.0036	-0.0001	0.0007	0.0000
501	LC-9: 0.5(L+Lr)+Wa	-0.0300	-0.0023	0.0035	0.0000	-0.0007	0.0000

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability 5: D+0.5(L+Lr)+Wa	-1.1941	-0.5050	0.5617	4.0889	-10.0698	0.0764
1	Stability 5: D+0.5(L+Lr)+Wa	1.1941	0.5050	4.7727	-1.2462	8.1052	-0.0764

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability 5: D+0.5(L+Lr)+Wa	-1.0441	-0.6550	0.5617	3.6530	-10.1807	0.0571
1	Stability 5: D+0.5(L+Lr)+Wa	1.0441	0.6550	4.7727	-1.8461	7.5054	-0.0571

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	Stability 5: D+0.5(L+Lr)+Wa	1.1941	0.5050	4.9589	-1.6949	8.3298	-0.0764

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability 5: D+0.5(L+Lr)+Wa	-0.1030	0.6550	0.4117	-4.3214	-3.2808	0.4541
1	Stability 5: D+0.5(L+Lr)+Wa	0.1030	-0.6550	4.8426	6.5968	1.5999	-0.4541

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability 5: D+0.5(L+Lr)+Wa	-1.1941	-0.5050	0.5617	3.0531	-10.7806	0.0764
1	Stability 5: D+0.5(L+Lr)+Wa	1.1941	0.5050	4.6926	-1.8136	8.3890	-0.0764

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

Stability		

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	Stability 5: D+0.5(L+Lr)+Wa	0.1030	-0.6550	4.9589	5.6796	1.7703	-0.4541
1	Stability 5: D+0.5(L+Lr)+Wa	-0.1030	0.6550	0.5617	-3.2856	-3.5104	0.4541

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.3441	-0.5050	1.0721	4.2129	-10.8148	0.0764
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.3441	0.5050	5.2831	-1.1223	8.5600	-0.0764

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0441	-0.8050	1.0722	4.3768	-10.3258	0.0378
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.0441	0.8050	5.2831	-2.3220	7.3602	-0.0378

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-5: 0.9D+1.0W	-1.0441	-0.5050	0.1565	2.9911	-9.1678	0.0764
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.3441	0.5050	5.4694	-1.5709	8.7845	-0.0764

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1030	0.8050	0.9221	-4.7973	-3.4259	0.4734
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1030	-0.8050	5.3530	7.3206	1.4548	-0.4734

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.3441	-0.5050	1.0722	3.1770	-11.5256	0.0764
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.3441	0.5050	5.2030	-1.6896	8.8437	-0.0764

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1030	-0.8050	5.4694	6.4034	1.6252	-0.4734
1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1030	0.8050	1.0721	-3.7615	-3.6555	0.4734

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.6818	-0.0102	0.5486	-0.3842	-2.1185	0.5518

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3015	-0.0287	0.1499	-0.0005	-0.4996	-0.0113
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.7235	-0.0390	0.3932	-0.3842	0.2362	0.4287
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2598	0.0288	-0.0055	-0.0005	-0.1385	-0.0109
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4971	0.2729	0.8210	0.4198	-3.6615	-1.1450
3	0	LC-5: 0.9D+1.0W	0.0937	0.0667	-0.1486	0.0084	0.8582	-0.0213
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4971	0.2590	0.6581	0.4198	0.0363	0.1845
3	1	LC-5: 0.9D+1.0W	0.0937	-0.0201	-0.2503	0.0084	-0.1389	0.0953
4	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.8430	-0.0039	0.9551	0.3708	-5.1557	-0.2775
4	0	LC-5: 0.9D+1.0W	-0.0459	-0.0434	-0.2465	-0.1263	1.5665	0.1244
4	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.8013	-0.0326	0.7997	0.3708	-0.7686	-0.3687
4	1	LC-5: 0.9D+1.0W	-0.0147	0.0141	-0.3631	-0.1263	0.0426	0.0513
5	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.5052	-0.0848	0.4901	0.0257	-1.9779	0.3395
5	0	LC-5: 0.9D+1.0W	0.1121	0.0505	-0.0618	-0.0009	0.4649	-0.2162
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.5052	-0.0154	0.3422	0.0257	0.1029	0.0889
5	1	LC-5: 0.9D+1.0W	0.1121	0.0262	-0.1933	-0.0009	-0.1729	-0.0245
6	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1636	0.0801	-0.0043	0.0178	0.0222	-0.1357
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4664	-0.3472	0.1565	0.0846	-0.2982	0.8646
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1607	0.0801	-0.0335	0.0178	-0.0501	0.1710
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4930	-0.3472	-0.1116	0.0846	0.1853	-0.4650
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1587	-0.0702	0.0289	-0.0021	-0.0519	0.1600
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.6091	0.1003	-0.0614	-0.0953	0.2351	-0.4327
7	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1551	-0.0702	0.0142	-0.0021	-0.0092	0.0208
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6425	0.1003	-0.1969	-0.0953	-0.1252	-0.2337
8	0	LC-5: 0.9D+1.0W	-0.0455	-0.0388	-0.0306	0.0017	0.0118	-0.0256
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4016	-0.0235	0.0679	0.0312	-0.0501	0.0546
8	1	LC-5: 0.9D+1.0W	-0.0428	-0.0388	-0.0417	0.0017	-0.0597	-0.1025
8	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4053	-0.0235	0.0531	0.0312	0.0697	0.0079
9	0	LC-5: 0.9D+1.0W	-0.0043	-0.0451	0.0359	-0.0240	-0.0485	-0.1110
9	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3046	0.2666	-0.0604	0.0248	0.0864	0.0224
9	1	LC-5: 0.9D+1.0W	-0.0037	-0.0451	0.0298	-0.0240	-0.0138	-0.1586
9	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3054	0.2666	-0.0684	0.0248	0.0184	0.3041
10	0	LC-5: 0.9D+1.0W	-0.0298	0.0299	-0.0330	0.0214	-0.0110	-0.1048
10	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3255	-0.2053	0.0750	-0.0110	0.0020	0.1744
10	1	LC-5: 0.9D+1.0W	-0.0304	0.0299	-0.0390	0.0214	-0.0491	-0.0733

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3247	-0.2053	0.0670	-0.0110	0.0771	-0.0426
11	0	LC-5: 0.9D+1.0W	-0.0511	0.0103	0.0412	-0.0101	-0.0629	-0.0660
11	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3778	0.0793	-0.0404	-0.0041	0.0705	-0.0531
11	1	LC-5: 0.9D+1.0W	-0.0545	0.0103	0.0276	-0.0101	0.0213	-0.0408
11	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3733	0.0793	-0.0586	-0.0041	-0.0507	0.1411
12	0	LC-5: 0.9D+1.0W	-0.1348	0.0536	-0.0246	0.0128	0.0157	0.0057
12	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3804	-0.1551	0.0294	-0.0030	-0.0077	0.1326
12	1	LC-5: 0.9D+1.0W	-0.1381	0.0536	-0.0382	0.0128	-0.0610	0.1365
12	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3760	-0.1551	0.0113	-0.0030	0.0420	-0.2459
13	0	LC-5: 0.9D+1.0W	-0.1336	-0.0764	0.0337	-0.0124	-0.0531	0.1466
13	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3720	0.1600	-0.0020	0.0039	0.0169	-0.2518
13	1	LC-5: 0.9D+1.0W	-0.1358	-0.0764	0.0118	-0.0124	0.0340	-0.1461
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3691	0.1600	-0.0312	0.0039	-0.0468	0.3610
14	0	LC-5: 0.9D+1.0W	-0.2183	0.0566	0.0270	0.0095	0.0070	-0.0040
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5241	-0.1097	-0.0563	-0.0040	-0.0169	0.0004
14	1	LC-5: 0.9D+1.0W	-0.2164	0.0566	0.0192	0.0095	0.0390	0.0747
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5267	-0.1097	-0.0667	-0.0040	-0.1023	-0.1520
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2364	-0.1031	0.0637	0.0003	-0.1079	0.1582
15	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2066	-0.0359	0.0024	-0.0073	-0.0012	0.0153
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2338	-0.1031	0.0534	0.0003	-0.0270	0.0158
15	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2091	-0.0359	-0.0078	-0.0073	-0.0050	-0.0343
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1854	-0.3041	0.0421	-0.0264	-0.0240	0.1117
16	1	LC-5: 0.9D+1.0W	-0.0406	0.1339	-0.0096	0.0177	0.0042	0.0397
16	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1858	-0.3041	0.0378	-0.0264	-0.0010	-0.0632
17	0	LC-5: 0.9D+1.0W	-0.0530	0.0133	-0.0049	0.0119	0.0077	0.0163
17	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2413	-0.0725	0.0315	-0.0195	-0.0239	-0.0111
17	1	LC-5: 0.9D+1.0W	-0.0537	0.0133	-0.0115	0.0119	-0.0017	0.0316
17	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2404	-0.0725	0.0228	-0.0195	0.0073	-0.0943
18	0	LC-5: 0.9D+1.0W	-0.0494	-0.0263	0.0042	0.0022	0.0088	0.0321
18	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2234	0.1156	-0.0118	-0.0020	-0.0149	-0.0953
18	1	LC-5: 0.9D+1.0W	-0.0510	-0.0263	-0.0022	0.0022	0.0099	0.0019
18	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2213	0.1156	-0.0204	-0.0020	-0.0334	0.0373
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0546	0.0288	0.0143	0.0020	-0.0390	0.0475

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1597	-0.0742	0.0010	-0.0016	0.0006	0.0507
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0567	0.0288	0.0057	0.0020	-0.0275	0.0805
19	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1576	-0.0742	-0.0076	-0.0016	-0.0031	-0.0345
20	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0611	-0.0174	-0.0133	0.0286	-0.0035	0.0805
20	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1641	0.0553	0.0178	-0.0023	-0.0096	-0.0334
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0620	-0.0174	-0.0221	0.0286	-0.0238	0.0605
20	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1632	0.0553	0.0091	-0.0023	0.0059	0.0302
21	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0501	-0.2713	-0.0128	0.0371	-0.0090	0.0958
21	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1415	0.2058	0.0467	-0.0063	-0.0038	-0.0202
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
21	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1419	0.2058	0.0423	-0.0063	0.0216	0.0976
22	0	LC-5: 0.9D+1.0W	-0.2048	-0.0642	-0.0244	-0.0051	0.0455	0.0913
22	0	LC-3b: 1.2D+1.6Lr+0.5W	1.2143	0.1978	0.1074	-0.0559	-0.2317	-0.3848
22	1	LC-5: 0.9D+1.0W	-0.2073	-0.0642	-0.0347	-0.0051	-0.0091	-0.0272
22	1	LC-3b: 1.2D+1.6Lr+0.5W	1.2109	0.1978	0.0937	-0.0559	-0.0461	-0.0197
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2680	0.3826	0.1281	0.0186	-0.1467	0.1896
23	0	LC-5: 0.9D+1.0W	0.0264	-0.0876	-0.0023	0.0129	0.0103	0.0123
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2686	0.3826	0.1223	0.0186	-0.0504	0.4839
23	1	LC-5: 0.9D+1.0W	0.0259	-0.0876	-0.0067	0.0129	0.0068	-0.0551
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3228	-0.0820	0.0774	0.0204	-0.1471	0.5319
24	0	LC-5: 0.9D+1.0W	0.0268	0.0049	-0.0092	0.0106	0.0132	-0.0348
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3223	-0.0820	0.0728	0.0204	-0.1014	0.4821
24	1	LC-5: 0.9D+1.0W	0.0272	0.0049	-0.0127	0.0106	0.0066	-0.0318
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1995	-0.1150	-0.0399	-0.0302	-0.0936	0.1109
25	0	LC-5: 0.9D+1.0W	0.0274	0.0157	0.0094	0.0020	0.0132	-0.0128
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1984	-0.1150	-0.0444	-0.0302	-0.1193	0.0409
25	1	LC-5: 0.9D+1.0W	0.0283	0.0157	0.0060	0.0020	0.0179	-0.0032
26	0	LC-5: 0.9D+1.0W	-0.0273	0.0144	0.0002	0.0003	0.0156	0.0131
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1886	-0.0895	0.0514	-0.0750	-0.1553	-0.1963
26	1	LC-5: 0.9D+1.0W	-0.0252	0.0144	-0.0083	0.0003	0.0094	0.0352
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1914	-0.0895	0.0400	-0.0750	-0.0855	-0.3331
27	0	LC-5: 0.9D+1.0W	-0.0284	-0.0038	0.0108	-0.0133	-0.0009	0.0348
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2813	-0.0808	-0.0476	0.0176	-0.0489	-0.3705
27	1	LC-5: 0.9D+1.0W	-0.0275	-0.0038	0.0021	-0.0133	0.0090	0.0290

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2825	-0.0808	-0.0592	0.0176	-0.1305	-0.4940
28	0	LC-5: 0.9D+1.0W	-0.0153	-0.0834	-0.0027	-0.0143	0.0059	0.0426
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1239	0.4599	-0.0534	0.0668	-0.0284	-0.4298
28	1	LC-5: 0.9D+1.0W	-0.0157	-0.0834	-0.0071	-0.0143	0.0022	-0.0215
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1233	0.4599	-0.0592	0.0668	-0.0717	-0.0764
29	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2877	0.1203	-0.0332	0.0760	-0.0068	-0.0706
29	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2015	-0.0783	0.0068	0.0010	-0.0077	0.0470
29	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2911	0.1203	-0.0470	0.0760	-0.0809	0.1517
29	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1981	-0.0783	-0.0070	0.0010	-0.0079	-0.0976
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3505	-0.0348	-0.0466	-0.0067	-0.0244	-0.2991
30	0	LC-5: 0.9D+1.0W	0.0317	0.0018	0.0161	0.0071	-0.0054	0.0253
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3512	-0.0348	-0.0536	-0.0067	-0.0705	-0.3311
30	1	LC-5: 0.9D+1.0W	0.0311	0.0018	0.0109	0.0071	0.0070	0.0270
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2361	-0.0794	0.1266	-0.0933	-0.1185	0.3142
31	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0045	0.0162	-0.0020	-0.0012	0.0128	-0.0040
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2368	-0.0794	0.1237	-0.0933	-0.0701	0.2836
31	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0038	0.0162	-0.0049	-0.0012	0.0114	0.0023
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1224	-0.2376	0.0754	0.0026	-0.0658	0.2983
32	0	LC-5: 0.9D+1.0W	-0.0006	0.0006	0.0040	0.0019	-0.0028	-0.0005
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1230	-0.2376	0.0696	0.0026	-0.0108	0.1182
32	1	LC-5: 0.9D+1.0W	-0.0010	0.0006	-0.0003	0.0019	-0.0014	-0.0001
33	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0149	0.0036	-0.0052	-0.0087	-0.0018	0.0141
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0643	-0.2635	0.0686	0.0267	0.0021	0.1153
33	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0143	0.0036	-0.0110	-0.0087	-0.0080	0.0169
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0774	-0.2635	-0.0648	0.0267	0.0355	-0.0868
34	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0105	-0.0088	-0.0094	0.0016	-0.0133	0.0159
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2481	-0.1352	-0.0024	-0.0235	0.0486	-0.0811
34	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0090	-0.0088	-0.0151	0.0016	-0.0227	0.0092
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2802	-0.1352	-0.1325	-0.0235	-0.0343	-0.1848
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0009	-0.0147	-0.0102	0.0172	-0.0164	0.0052
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3034	0.0800	-0.1228	-0.0071	-0.0102	-0.1893
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0023	-0.0147	-0.0158	0.0172	-0.0262	-0.0059
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3047	0.0800	-0.1284	-0.0071	-0.1054	-0.1287
36	0	LC-5: 0.9D+1.0W	0.0026	0.0037	0.0020	-0.0049	0.0005	-0.0025

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1511	0.2424	-0.1848	0.0786	-0.0586	-0.1362
36	1	LC-5: 0.9D+1.0W	0.0028	0.0037	-0.0002	-0.0049	0.0008	-0.0011
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1514	0.2424	-0.1876	0.0786	-0.1292	-0.0443
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3547	-0.1006	-0.0133	-0.0101	0.0026	0.1806
37	0	LC-5: 0.9D+1.0W	0.0249	0.0194	0.0092	0.0013	0.0018	-0.0262
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3530	-0.1006	-0.0201	-0.0101	-0.0127	0.0881
37	1	LC-5: 0.9D+1.0W	0.0261	0.0194	0.0041	0.0013	0.0079	-0.0084
38	0	LC-5: 0.9D+1.0W	0.0049	0.1314	-0.0186	0.0038	0.0445	-0.2432
38	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2579	-0.2074	0.0533	-0.0381	-0.0918	0.4184
38	1	LC-5: 0.9D+1.0W	0.0033	0.1314	-0.0344	0.0038	-0.0290	0.1211
38	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2558	-0.2074	0.0321	-0.0381	0.0266	-0.1566
39	0	LC-5: 0.9D+1.0W	-0.1691	0.0075	-0.0077	-0.0069	0.0207	-0.0424
39	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4933	-0.0136	0.0616	0.0481	-0.0687	0.1418
39	1	LC-5: 0.9D+1.0W	-0.1675	0.0075	-0.0141	-0.0069	0.0082	-0.0337
39	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4954	-0.0136	0.0530	0.0481	-0.0027	0.1261
40	0	LC-5: 0.9D+1.0W	-0.2083	0.1361	-0.0349	-0.0079	0.0157	-0.0506
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6651	-0.5841	0.1329	0.0596	-0.0317	0.2328
40	1	LC-5: 0.9D+1.0W	-0.2077	0.1361	-0.0374	-0.0079	-0.0005	0.0106
40	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6660	-0.5841	0.1295	0.0596	0.0273	-0.0297
41	0	LC-5: 0.9D+1.0W	-0.2342	-0.0036	0.0728	0.0282	0.0403	0.2491
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9117	-0.0030	-0.2865	-0.1926	-0.1704	-1.0718
41	1	LC-5: 0.9D+1.0W	-0.2340	-0.0036	0.0702	0.0282	0.0721	0.2475
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9121	-0.0030	-0.2899	-0.1926	-0.2988	-1.0732
42	0	LC-5: 0.9D+1.0W	-0.1501	0.0392	-0.0201	0.0056	0.0337	-0.0096
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4917	-0.1145	0.0922	-0.0055	-0.1249	-0.0215
42	1	LC-5: 0.9D+1.0W	-0.1514	0.0392	-0.0332	0.0056	-0.0274	0.0803
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4900	-0.1145	0.0747	-0.0055	0.0665	-0.2845
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4366	0.2540	-0.0245	0.0161	0.0324	-0.2903
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4324	0.2540	-0.0416	0.0161	-0.0435	0.2926
44	0	LC-5: 0.9D+1.0W	-0.1156	0.0766	0.0050	-0.0022	0.0071	-0.1003
44	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3358	-0.2205	-0.0155	0.0039	0.0067	0.2808
44	1	LC-5: 0.9D+1.0W	-0.1172	0.0766	-0.0014	-0.0022	0.0091	-0.0120

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3337	-0.2205	-0.0240	0.0039	-0.0160	0.0268
45	0	LC-5: 0.9D+1.0W	-0.1056	-0.0922	0.0323	0.0080	-0.0279	0.0976
45	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4696	0.1263	-0.0277	0.0045	0.0266	-0.1250
45	1	LC-5: 0.9D+1.0W	-0.1041	-0.0922	0.0165	0.0080	0.0398	-0.1581
45	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4717	0.1263	-0.0488	0.0045	-0.0795	0.2251
46	0	LC-5: 0.9D+1.0W	-0.2727	0.0038	0.0130	0.0003	-0.0167	0.0065
46	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9648	-0.0345	0.0044	0.0075	0.0270	0.0139
46	1	LC-5: 0.9D+1.0W	-0.2752	0.0038	0.0027	0.0003	-0.0022	0.0135
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9614	-0.0345	-0.0093	0.0075	0.0225	-0.0498
47	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5717	0.2805	0.1208	0.0029	-0.0728	-0.0654
47	0	LC-5: 0.9D+1.0W	0.1337	-0.0634	-0.0240	-0.0007	0.0131	0.0213
47	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5711	0.2805	0.1150	0.0029	0.0178	0.1502
47	1	LC-5: 0.9D+1.0W	0.1342	-0.0634	-0.0284	-0.0007	-0.0070	-0.0274
48	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6145	-0.1955	0.0073	0.0193	0.0076	0.1501
48	0	LC-5: 0.9D+1.0W	0.1435	0.0465	0.0053	-0.0035	-0.0061	-0.0278
48	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6117	-0.1955	-0.0040	0.0193	0.0102	-0.1479
48	1	LC-5: 0.9D+1.0W	0.1456	0.0465	-0.0032	-0.0035	-0.0046	0.0430
49	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5543	0.2169	-0.0151	0.0009	0.0308	-0.1720
49	0	LC-5: 0.9D+1.0W	0.1489	-0.0632	0.0098	0.0001	-0.0103	0.0471
49	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5515	0.2169	-0.0265	0.0009	-0.0012	0.1607
49	1	LC-5: 0.9D+1.0W	0.1510	-0.0632	0.0012	0.0001	-0.0019	-0.0498
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5416	-0.2397	0.0289	-0.0028	-0.0240	0.1589
50	0	LC-5: 0.9D+1.0W	0.1510	0.0654	-0.0032	-0.0002	0.0050	-0.0497
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5404	-0.2397	0.0172	-0.0028	0.0113	-0.2089
50	1	LC-5: 0.9D+1.0W	0.1518	0.0654	-0.0119	-0.0002	-0.0066	0.0506
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5052	0.0168	-0.0610	0.0213	0.0149	-0.1734
51	0	LC-5: 0.9D+1.0W	0.1514	-0.0167	0.0183	-0.0055	-0.0063	0.0368
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5063	0.0168	-0.0726	0.0213	-0.0870	-0.1477
51	1	LC-5: 0.9D+1.0W	0.1506	-0.0167	0.0096	-0.0055	0.0149	0.0112
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3837	-0.3398	-0.0516	0.1072	-0.0546	-0.1287
52	0	LC-5: 0.9D+1.0W	0.1195	0.0946	0.0091	-0.0207	0.0068	0.0081
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3852	-0.3398	-0.0574	0.1072	-0.0969	-0.3919
52	1	LC-5: 0.9D+1.0W	0.1184	0.0946	0.0047	-0.0207	0.0122	0.0814
53	0	LC-5: 0.9D+1.0W	-0.3286	0.1020	-0.0203	0.0064	0.0333	-0.1654

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2451	-0.3431	0.0977	-0.0519	-0.1458	0.6749
53	1	LC-5: 0.9D+1.0W	-0.3296	0.1020	-0.0309	0.0064	-0.0141	0.0233
53	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2437	-0.3431	0.0836	-0.0519	0.0218	0.0402
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.4694	0.5050	-1.3441	0.0764	8.7845	-1.5709
54	0	LC-5: 0.9D+1.0W	-0.1565	-0.5050	1.0441	-0.0764	-9.1678	2.9911
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.0511	0.3929	-1.2319	0.0764	4.5985	-0.1118
54	1	LC-5: 0.9D+1.0W	0.1572	-0.3929	0.9319	-0.0764	-5.9568	1.5319
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.1867	0.3929	-0.3590	0.0942	4.5985	-0.0972
55	0	LC-5: 0.9D+1.0W	0.3128	-0.3929	0.8919	-0.3347	-5.9568	1.4969
55	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.6970	0.2788	-0.0230	0.0942	4.2310	1.0137
55	1	LC-5: 0.9D+1.0W	0.6081	-0.2788	0.7253	-0.3347	-3.2821	0.3860
56	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.6794	0.2788	0.4072	0.0010	4.2310	1.0181
56	0	LC-5: 0.9D+1.0W	0.6720	-0.2788	0.6666	-0.3686	-3.2821	0.3537
56	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.1800	0.1495	0.4072	0.0010	5.7571	1.8207
56	1	LC-5: 0.9D+1.0W	0.9880	-0.1495	0.4481	-0.3686	-1.1933	-0.4489
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7610	0.4243	0.4786	0.4283	-1.1844	-0.3130
100	0	LC-5: 0.9D+1.0W	0.1795	-0.1105	-0.0447	-0.1009	0.1795	0.0411
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7360	0.3898	0.3854	0.4283	0.1116	0.9081
100	1	LC-5: 0.9D+1.0W	0.1982	-0.0760	-0.1147	-0.1009	-0.0597	-0.2388
101	0	LC-5: 0.9D+1.0W	-0.0181	0.0299	-0.0070	-0.0010	0.0081	-0.0342
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1805	0.0944	0.0387	-0.1079	0.2130
101	1	LC-5: 0.9D+1.0W	-0.0181	0.0269	-0.0181	-0.0010	-0.0171	0.0226
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1845	0.0797	0.0387	0.0662	-0.1519
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0763	0.0721	-0.0357	-0.1675	-0.1111
102	0	LC-5: 0.9D+1.0W	0.2659	-0.0117	-0.0121	0.0039	0.0415	0.0226
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0703	0.0499	-0.0357	0.0154	0.1087
102	1	LC-5: 0.9D+1.0W	0.2659	-0.0162	-0.0287	0.0039	-0.0197	-0.0193
103	0	LC-5: 0.9D+1.0W	-0.1991	-0.0167	0.0036	-0.0006	0.0000	0.0199
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6391	0.0446	0.0231	0.0040	-0.0209	-0.0556
103	1	LC-5: 0.9D+1.0W	-0.1961	-0.0167	-0.0075	-0.0006	-0.0039	-0.0136
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6431	0.0446	0.0083	0.0040	0.0105	0.0336
104	0	LC-5: 0.9D+1.0W	-0.2133	0.0055	0.0066	0.0044	-0.0036	-0.0046
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	0.0140	-0.0188	-0.0106	0.0922
104	1	LC-5: 0.9D+1.0W	-0.2133	0.0055	-0.0049	0.0044	-0.0018	0.0063

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	-0.0013	-0.0188	0.0022	-0.0296
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0632	-0.0110	-0.1097	-0.2915
107	0	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0080	0.0069	0.0273	0.0871
107	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0403	-0.0110	0.0456	0.0056
107	1	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0252	0.0069	-0.0225	-0.0221
106	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3012	0.0525	0.0366	0.0026	-0.0254	-0.0439
106	0	LC-5: 0.9D+1.0W	0.0434	-0.0375	0.0081	-0.0004	-0.0122	0.0353
106	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3012	0.0555	0.0255	0.0026	0.0212	0.0370
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3282	-0.1461	0.1803	0.0027	-0.2926	0.2166
108	0	LC-5: 0.9D+1.0W	0.0670	0.0196	-0.0237	-0.0082	0.0407	-0.0273
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3322	-0.1461	0.1655	0.0027	0.0533	-0.0756
108	1	LC-5: 0.9D+1.0W	0.0640	0.0196	-0.0347	-0.0082	-0.0177	0.0120
109	0	LC-5: 0.9D+1.0W	-0.0725	0.0206	-0.0253	0.0104	0.0465	-0.0298
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3302	-0.0045	0.1557	0.0789	-0.1962	0.0482
109	1	LC-5: 0.9D+1.0W	-0.0695	0.0206	-0.0364	0.0104	-0.0153	0.0114
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3342	-0.0045	0.1409	0.0789	0.1003	0.0392
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0840	-0.0201	-0.0131	-0.0133	0.0229	0.0236
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1782	0.1194	0.0967	0.0193	-0.1170	-0.1269
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0811	-0.0201	-0.0242	-0.0133	-0.0050	-0.0066
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1812	0.1194	0.0856	0.0193	0.0198	0.0522
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1858	0.0933	0.0901	-0.0198	-0.1058	-0.1061
111	0	LC-5: 0.9D+1.0W	0.0856	-0.0266	-0.0228	0.0142	0.0334	0.0295
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1888	0.0933	0.0790	-0.0198	0.0210	0.0338
111	1	LC-5: 0.9D+1.0W	0.0833	-0.0266	-0.0311	0.0142	-0.0069	-0.0104

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3875	-0.0556	0.3071	-0.3740	-1.1135	0.6031

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1256	0.0866	0.3594	-0.0228	-1.2696	-0.3160
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4363	-0.0496	0.1518	-0.3737	0.0336	0.4042
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1602	0.0807	0.2038	-0.0231	0.1385	0.0383
3	0	LC-5: 0.9D+1.0W	0.0426	-0.0425	-0.1190	0.0085	0.7844	0.2125
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4715	0.3275	0.8062	0.4197	-3.6246	-1.2620
3	1	LC-5: 0.9D+1.0W	0.0937	-0.0201	-0.2503	0.0084	-0.1389	0.0953
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4971	0.2590	0.6581	0.4198	0.0363	0.1845
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4700	-0.1323	1.3901	0.5618	-7.6094	0.0895
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1872	0.0879	-0.0977	-0.0640	0.7781	-0.2240
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4284	-0.0748	1.2346	0.5618	-1.0476	-0.4281
4	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2766	0.0458	0.0924	0.0941	-0.3344	-0.0216
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2484	-0.2028	0.6887	0.0218	-2.8722	0.6959
5	0	LC-5: 0.9D+1.0W	0.1121	0.0505	-0.0618	-0.0009	0.4649	-0.2162
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1916	-0.1574	0.5476	0.0216	0.2195	-0.0652
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0730	0.0841	-0.1486	0.0052	-0.1701	-0.0013
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4664	-0.3472	0.1565	0.0846	-0.2982	0.8646
6	0	LC-5: 0.9D+1.0W	-0.1500	0.0820	-0.0106	0.0110	0.0330	-0.1615
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4930	-0.3472	-0.1116	0.0846	0.1853	-0.4650
6	1	LC-5: 0.9D+1.0W	-0.1479	0.0820	-0.0325	0.0110	-0.0494	0.1523
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1587	-0.0702	0.0289	-0.0021	-0.0519	0.1600
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.6091	0.1003	-0.0614	-0.0953	0.2351	-0.4327
7	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1551	-0.0702	0.0142	-0.0021	-0.0092	0.0208
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6425	0.1003	-0.1969	-0.0953	-0.1252	-0.2337
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3279	-0.0795	0.0136	0.0177	-0.0205	0.0285
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1299	0.0807	0.0925	0.0354	-0.0572	0.0338
8	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3315	-0.0795	-0.0011	0.0177	-0.0081	-0.1289
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1335	0.0807	0.0777	0.0354	0.1114	0.1936
9	0	LC-5: 0.9D+1.0W	-0.0043	-0.0451	0.0359	-0.0240	-0.0485	-0.1110
9	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3046	0.2666	-0.0604	0.0248	0.0864	0.0224
9	1	LC-5: 0.9D+1.0W	-0.0037	-0.0451	0.0298	-0.0240	-0.0138	-0.1586
9	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3054	0.2666	-0.0684	0.0248	0.0184	0.3041
10	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3255	-0.2053	0.0750	-0.0110	0.0020	0.1744
10	0	LC-5: 0.9D+1.0W	-0.0298	0.0299	-0.0330	0.0214	-0.0110	-0.1048
10	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3247	-0.2053	0.0670	-0.0110	0.0771	-0.0426

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-5: 0.9D+1.0W	-0.0304	0.0299	-0.0390	0.0214	-0.0491	-0.0733
11	0	LC-5: 0.9D+1.0W	0.0799	-0.0097	-0.0534	0.0015	0.0939	0.0875
11	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3123	0.0893	0.0069	-0.0099	-0.0079	-0.1298
11	1	LC-5: 0.9D+1.0W	0.0766	-0.0097	-0.0670	0.0015	-0.0534	0.0636
11	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3078	0.0893	-0.0113	-0.0099	-0.0134	0.0888
12	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3804	-0.1551	0.0294	-0.0030	-0.0077	0.1326
12	0	LC-5: 0.9D+1.0W	-0.1348	0.0536	-0.0246	0.0128	0.0157	0.0057
12	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3760	-0.1551	0.0113	-0.0030	0.0420	-0.2459
12	1	LC-5: 0.9D+1.0W	-0.1381	0.0536	-0.0382	0.0128	-0.0610	0.1365
13	0	LC-5: 0.9D+1.0W	-0.1336	-0.0764	0.0337	-0.0124	-0.0531	0.1466
13	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3720	0.1600	-0.0020	0.0039	0.0169	-0.2518
13	1	LC-5: 0.9D+1.0W	-0.1358	-0.0764	0.0118	-0.0124	0.0340	-0.1461
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3691	0.1600	-0.0312	0.0039	-0.0468	0.3610
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5241	-0.1097	-0.0563	-0.0040	-0.0169	0.0004
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1774	0.0592	0.0226	0.0111	0.0078	-0.0227
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5267	-0.1097	-0.0667	-0.0040	-0.1023	-0.1520
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1748	0.0592	0.0123	0.0111	0.0320	0.0595
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1181	-0.1120	0.0581	-0.0001	-0.1000	0.1532
15	0	LC-5: 0.9D+1.0W	0.0740	0.0526	-0.0176	-0.0086	0.0389	-0.0692
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1155	-0.1120	0.0478	-0.0001	-0.0268	-0.0016
15	1	LC-5: 0.9D+1.0W	0.0759	0.0526	-0.0253	-0.0086	0.0092	0.0035
16	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1172	-0.3664	0.0332	-0.0421	-0.0231	0.1068
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1176	-0.3664	0.0288	-0.0421	-0.0053	-0.1040
16	1	LC-5: 0.9D+1.0W	-0.0406	0.1339	-0.0096	0.0177	0.0042	0.0397
17	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2413	-0.0725	0.0315	-0.0195	-0.0239	-0.0111
17	0	LC-5: 0.9D+1.0W	-0.0530	0.0133	-0.0049	0.0119	0.0077	0.0163
17	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2404	-0.0725	0.0228	-0.0195	0.0073	-0.0943
17	1	LC-5: 0.9D+1.0W	-0.0537	0.0133	-0.0115	0.0119	-0.0017	0.0316
18	0	LC-5: 0.9D+1.0W	-0.0494	-0.0263	0.0042	0.0022	0.0088	0.0321
18	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2234	0.1156	-0.0118	-0.0020	-0.0149	-0.0953
18	1	LC-5: 0.9D+1.0W	-0.0510	-0.0263	-0.0022	0.0022	0.0099	0.0019
18	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2213	0.1156	-0.0204	-0.0020	-0.0334	0.0373
19	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1597	-0.0742	0.0010	-0.0016	0.0006	0.0507

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0546	0.0288	0.0143	0.0020	-0.0390	0.0475
19	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1576	-0.0742	-0.0076	-0.0016	-0.0031	-0.0345
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0567	0.0288	0.0057	0.0020	-0.0275	0.0805
20	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0611	-0.0174	-0.0133	0.0286	-0.0035	0.0805
20	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1641	0.0553	0.0178	-0.0023	-0.0096	-0.0334
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0620	-0.0174	-0.0221	0.0286	-0.0238	0.0605
20	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1632	0.0553	0.0091	-0.0023	0.0059	0.0302
21	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0501	-0.2713	-0.0128	0.0371	-0.0090	0.0958
21	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1415	0.2058	0.0467	-0.0063	-0.0038	-0.0202
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
21	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1419	0.2058	0.0423	-0.0063	0.0216	0.0976
22	0	LC-5: 0.9D+1.0W	-0.1994	-0.0656	-0.0242	-0.0055	0.0457	0.0855
22	0	LC-3b: 1.2D+1.6Lr+0.5W	0.5567	0.2692	0.0752	-0.1386	-0.1323	-0.2801
22	1	LC-5: 0.9D+1.0W	-0.2019	-0.0656	-0.0344	-0.0055	-0.0084	-0.0355
22	1	LC-3b: 1.2D+1.6Lr+0.5W	0.5533	0.2692	0.0615	-0.1386	-0.0061	0.2168
23	0	LC-5: 0.9D+1.0W	0.0264	-0.0876	-0.0023	0.0129	0.0103	0.0123
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1233	0.5913	0.0257	-0.0609	-0.0224	-0.2708
23	1	LC-5: 0.9D+1.0W	0.0259	-0.0876	-0.0067	0.0129	0.0068	-0.0551
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1239	0.5913	0.0199	-0.0609	-0.0049	0.1840
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2487	-0.1014	0.1484	0.1441	-0.1399	0.4005
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1686	0.0652	0.0252	-0.0479	-0.0363	0.0393
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2482	-0.1014	0.1437	0.1441	-0.0511	0.3389
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1681	0.0652	0.0206	-0.0479	-0.0224	0.0789
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1716	-0.2797	0.0146	0.0743	-0.0315	0.1417
25	0	LC-5: 0.9D+1.0W	0.0274	0.0157	0.0094	0.0020	0.0132	-0.0128
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1129	-0.2797	-0.2230	0.0743	-0.0823	-0.0287
25	1	LC-5: 0.9D+1.0W	0.0283	0.0157	0.0060	0.0020	0.0179	-0.0032
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0925	-0.2511	0.2029	-0.0787	-0.0745	0.0267
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0034	0.0324	0.0218	-0.0020	-0.0435	-0.0841
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1526	-0.2511	-0.0416	-0.0787	-0.0712	-0.3571
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0062	0.0324	0.0104	-0.0020	-0.0190	-0.0346
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2229	-0.0955	-0.0362	-0.0062	-0.0440	-0.2833
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2019	0.0726	0.0072	0.0321	-0.0590	-0.3468
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2240	-0.0955	-0.0479	-0.0062	-0.1083	-0.4294

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2031	0.0726	-0.0044	0.0321	-0.0569	-0.2359
28	0	LC-5: 0.9D+1.0W	-0.0153	-0.0834	-0.0027	-0.0143	0.0059	0.0426
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1239	0.4599	-0.0534	0.0668	-0.0284	-0.4298
28	1	LC-5: 0.9D+1.0W	-0.0157	-0.0834	-0.0071	-0.0143	0.0022	-0.0215
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1233	0.4599	-0.0592	0.0668	-0.0717	-0.0764
29	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1909	-0.0814	0.0065	0.0011	-0.0075	0.0501
29	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2771	0.1234	-0.0330	0.0759	-0.0070	-0.0737
29	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1875	-0.0814	-0.0072	0.0011	-0.0081	-0.1003
29	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2805	0.1234	-0.0468	0.0759	-0.0807	0.1543
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2693	-0.0483	-0.0247	0.0049	-0.0315	-0.2364
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3250	0.1657	-0.0643	-0.0059	0.0327	-0.1772
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2700	-0.0483	-0.0317	0.0049	-0.0575	-0.2809
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3257	0.1657	-0.0713	-0.0059	-0.0297	-0.0246
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2361	-0.0794	0.1266	-0.0933	-0.1185	0.3142
31	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0045	0.0162	-0.0020	-0.0012	0.0128	-0.0040
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2368	-0.0794	0.1237	-0.0933	-0.0701	0.2836
31	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0038	0.0162	-0.0049	-0.0012	0.0114	0.0023
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1220	-0.2387	0.0751	0.0027	-0.0655	0.2993
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0083	0.0142	-0.0006	-0.0091	0.0079	0.0016
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1226	-0.2387	0.0694	0.0027	-0.0108	0.1184
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0089	0.0142	-0.0063	-0.0091	0.0052	0.0123
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0643	-0.2635	0.0686	0.0267	0.0021	0.1153
33	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0149	0.0036	-0.0052	-0.0087	-0.0018	0.0141
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0774	-0.2635	-0.0648	0.0267	0.0355	-0.0868
33	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0143	0.0036	-0.0110	-0.0087	-0.0080	0.0169
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2470	-0.1356	-0.0024	-0.0236	0.0486	-0.0808
34	0	LC-5: 0.9D+1.0W	0.0009	-0.0020	0.0036	-0.0004	0.0018	-0.0015
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2791	-0.1356	-0.1325	-0.0236	-0.0343	-0.1849
34	1	LC-5: 0.9D+1.0W	0.0019	-0.0020	-0.0007	-0.0004	0.0029	-0.0030
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0009	-0.0147	-0.0102	0.0172	-0.0164	0.0052
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3034	0.0800	-0.1228	-0.0071	-0.0102	-0.1893
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0023	-0.0147	-0.0158	0.0172	-0.0262	-0.0059
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3047	0.0800	-0.1284	-0.0071	-0.1054	-0.1287
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0109	-0.0109	-0.0130	0.0309	-0.0058	-0.0048

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1507	0.2435	-0.1851	0.0786	-0.0588	-0.1353
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0112	-0.0109	-0.0159	0.0309	-0.0113	-0.0089
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1510	0.2435	-0.1879	0.0786	-0.1296	-0.0430
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2339	-0.2648	0.0176	0.0494	-0.0428	0.2906
37	0	LC-5: 0.9D+1.0W	0.0249	0.0194	0.0092	0.0013	0.0018	-0.0262
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2322	-0.2648	0.0107	0.0494	-0.0298	0.0471
37	1	LC-5: 0.9D+1.0W	0.0261	0.0194	0.0041	0.0013	0.0079	-0.0084
38	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0649	-0.3365	0.0800	-0.0537	-0.1434	0.6898
38	0	LC-5: 0.9D+1.0W	0.0258	0.1327	-0.0184	0.0038	0.0441	-0.2459
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0628	-0.3365	0.0589	-0.0537	0.0492	-0.2431
38	1	LC-5: 0.9D+1.0W	0.0242	0.1327	-0.0343	0.0038	-0.0289	0.1219
39	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1870	-0.0573	0.0111	0.0103	-0.0044	0.0765
39	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4304	0.0107	0.0636	0.0486	-0.0699	0.1169
39	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1891	-0.0573	0.0025	0.0103	0.0034	0.0106
39	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4325	0.0107	0.0551	0.0486	-0.0016	0.1292
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6510	-0.6019	0.1394	0.0628	-0.0332	0.2427
40	0	LC-5: 0.9D+1.0W	-0.2083	0.1361	-0.0349	-0.0079	0.0157	-0.0506
40	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6519	-0.6019	0.1361	0.0628	0.0287	-0.0279
40	1	LC-5: 0.9D+1.0W	-0.2077	0.1361	-0.0374	-0.0079	-0.0005	0.0106
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8299	-0.0127	-0.2660	-0.1817	-0.1603	-1.0014
41	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3130	0.0814	-0.0529	-0.0408	-0.0183	-0.1473
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8302	-0.0127	-0.2694	-0.1817	-0.2795	-1.0070
41	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3134	0.0814	-0.0563	-0.0408	-0.0426	-0.1111
42	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4504	-0.1234	0.0769	-0.0026	-0.1004	0.0338
42	0	LC-5: 0.9D+1.0W	-0.1501	0.0392	-0.0201	0.0056	0.0337	-0.0096
42	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4486	-0.1234	0.0594	-0.0026	0.0560	-0.2494
42	1	LC-5: 0.9D+1.0W	-0.1514	0.0392	-0.0332	0.0056	-0.0274	0.0803
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4266	0.2558	-0.0256	0.0173	0.0334	-0.2920
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4224	0.2558	-0.0426	0.0173	-0.0449	0.2951
44	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2838	-0.2465	-0.0165	0.0027	0.0047	0.2844
44	0	LC-5: 0.9D+1.0W	-0.0791	0.0812	0.0049	-0.0014	0.0080	-0.0920
44	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2817	-0.2465	-0.0251	0.0027	-0.0192	0.0006

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-5: 0.9D+1.0W	-0.0807	0.0812	-0.0015	-0.0014	0.0100	0.0015
45	0	LC-5: 0.9D+1.0W	-0.0476	-0.0941	0.0316	0.0084	-0.0274	0.0950
45	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3306	0.2114	-0.0491	0.0002	0.0468	-0.1895
45	1	LC-5: 0.9D+1.0W	-0.0460	-0.0941	0.0158	0.0084	0.0384	-0.1658
45	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3327	0.2114	-0.0702	0.0002	-0.1185	0.3966
46	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9648	-0.0345	0.0044	0.0075	0.0270	0.0139
46	0	LC-5: 0.9D+1.0W	-0.2727	0.0038	0.0130	0.0003	-0.0167	0.0065
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9614	-0.0345	-0.0093	0.0075	0.0225	-0.0498
46	1	LC-5: 0.9D+1.0W	-0.2752	0.0038	0.0027	0.0003	-0.0022	0.0135
47	0	LC-5: 0.9D+1.0W	0.1337	-0.0634	-0.0240	-0.0007	0.0131	0.0213
47	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5717	0.2805	0.1208	0.0029	-0.0728	-0.0654
47	1	LC-5: 0.9D+1.0W	0.1342	-0.0634	-0.0284	-0.0007	-0.0070	-0.0274
47	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5711	0.2805	0.1150	0.0029	0.0178	0.1502
48	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6145	-0.1955	0.0073	0.0193	0.0076	0.1501
48	0	LC-5: 0.9D+1.0W	0.1435	0.0465	0.0053	-0.0035	-0.0061	-0.0278
48	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6117	-0.1955	-0.0040	0.0193	0.0102	-0.1479
48	1	LC-5: 0.9D+1.0W	0.1456	0.0465	-0.0032	-0.0035	-0.0046	0.0430
49	0	LC-5: 0.9D+1.0W	0.1489	-0.0632	0.0098	0.0001	-0.0103	0.0471
49	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5543	0.2169	-0.0151	0.0009	0.0308	-0.1720
49	1	LC-5: 0.9D+1.0W	0.1510	-0.0632	0.0012	0.0001	-0.0019	-0.0498
49	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5515	0.2169	-0.0265	0.0009	-0.0012	0.1607
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5416	-0.2397	0.0289	-0.0028	-0.0240	0.1589
50	0	LC-5: 0.9D+1.0W	0.1510	0.0654	-0.0032	-0.0002	0.0050	-0.0497
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5404	-0.2397	0.0172	-0.0028	0.0113	-0.2089
50	1	LC-5: 0.9D+1.0W	0.1518	0.0654	-0.0119	-0.0002	-0.0066	0.0506
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1065	-0.0172	0.0128	-0.0034	-0.0052	0.0189
51	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4086	0.0254	-0.0442	0.0137	0.0128	-0.1298
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1053	-0.0172	0.0012	-0.0034	0.0054	-0.0073
51	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4097	0.0254	-0.0558	0.0137	-0.0634	-0.0911
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3837	-0.3398	-0.0516	0.1072	-0.0546	-0.1287
52	0	LC-5: 0.9D+1.0W	0.1195	0.0946	0.0091	-0.0207	0.0068	0.0081
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3852	-0.3398	-0.0574	0.1072	-0.0969	-0.3919
52	1	LC-5: 0.9D+1.0W	0.1184	0.0946	0.0047	-0.0207	0.0122	0.0814
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2451	-0.3431	0.0977	-0.0519	-0.1458	0.6749

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-5: 0.9D+1.0W	-0.3286	0.1020	-0.0203	0.0064	0.0333	-0.1654
53	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2437	-0.3431	0.0836	-0.0519	0.0218	0.0402
53	1	LC-5: 0.9D+1.0W	-0.3296	0.1020	-0.0309	0.0064	-0.0141	0.0233
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0722	-0.8050	1.0441	-0.0378	-10.3258	4.3768
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.2831	0.8050	-1.0441	0.0378	7.3602	-2.3220
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6539	-0.6929	0.9319	-0.0378	-7.1148	1.9426
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.8648	0.6929	-0.9319	0.0378	4.1492	0.1121
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4866	-0.6929	1.0292	-0.3662	-7.1148	1.9082
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.9524	0.6929	-0.0949	0.0183	4.1492	0.1169
55	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0864	-0.2788	0.8446	-0.3662	-4.0157	0.5692
55	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.5134	0.2788	-0.0545	0.0183	3.9022	1.4559
56	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0087	-0.2788	0.8490	-0.4167	-4.0157	0.5333
56	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.4995	0.2788	0.3590	-0.1151	3.9022	1.4514
56	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4238	-0.1495	0.5993	-0.4167	-1.3019	-0.2693
56	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.0001	0.1495	0.3590	-0.1151	5.2476	2.2540
100	0	LC-5: 0.9D+1.0W	0.1795	-0.1105	-0.0447	-0.1009	0.1795	0.0411
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7399	0.4380	0.5060	0.4574	-1.2562	-0.3028
100	1	LC-5: 0.9D+1.0W	0.1782	-0.1138	-0.1147	-0.1016	-0.0598	-0.2241
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6949	0.4413	0.4128	0.4580	0.1220	0.9449
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1805	0.0944	0.0387	-0.1079	0.2130
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0088	0.0988	0.3309	0.0048	-0.4890	-0.0769
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1845	0.0797	0.0387	0.0662	-0.1519
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0088	0.0948	0.3161	0.0048	0.1581	0.1168
102	0	LC-5: 0.9D+1.0W	0.2659	-0.0117	-0.0121	0.0039	0.0415	0.0226
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9837	0.0770	0.0677	-0.0337	-0.1564	-0.1124
102	1	LC-5: 0.9D+1.0W	0.2659	-0.0162	-0.0287	0.0039	-0.0197	-0.0193
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9837	0.0710	0.0455	-0.0337	0.0134	0.1096
103	0	LC-5: 0.9D+1.0W	-0.1991	-0.0167	0.0036	-0.0006	0.0000	0.0199
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6391	0.0446	0.0231	0.0040	-0.0209	-0.0556
103	1	LC-5: 0.9D+1.0W	-0.1961	-0.0167	-0.0075	-0.0006	-0.0039	-0.0136
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6431	0.0446	0.0083	0.0040	0.0105	0.0336
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	0.0140	-0.0188	-0.0106	0.0922
104	0	LC-5: 0.9D+1.0W	-0.2133	0.0055	0.0066	0.0044	-0.0036	-0.0046
104	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	-0.0013	-0.0188	0.0022	-0.0296

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-5: 0.9D+1.0W	-0.2133	0.0055	-0.0049	0.0044	-0.0018	0.0063
107	0	LC-5: 0.9D+1.0W	0.1990	-0.0437	-0.0068	0.0067	0.0254	0.0995
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7090	0.1063	0.0620	-0.0109	-0.1078	-0.3038
107	1	LC-5: 0.9D+1.0W	0.1990	-0.0437	-0.0240	0.0067	-0.0208	-0.0317
107	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7090	0.1063	0.0391	-0.0109	0.0439	0.0152
106	0	LC-5: 0.9D+1.0W	0.0434	-0.0375	0.0081	-0.0004	-0.0122	0.0353
106	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1229	0.0461	0.0020	-0.0286	-0.1179
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
106	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1259	0.0350	0.0020	0.0322	0.0687
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3273	-0.1521	0.1803	0.0027	-0.2928	0.2239
108	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0128	0.0336	0.0116	-0.0383	-0.0007	-0.0350
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3313	-0.1521	0.1655	0.0027	0.0531	-0.0802
108	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0167	0.0336	-0.0032	-0.0383	0.0078	0.0322
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1838	-0.1045	0.0752	-0.0110	-0.1085	0.1595
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2275	0.0318	0.0932	0.0862	-0.0985	-0.0077
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1878	-0.1045	0.0605	-0.0110	0.0272	-0.0494
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2315	0.0318	0.0784	0.0862	0.0732	0.0559
110	0	LC-5: 0.9D+1.0W	-0.0752	-0.0453	-0.0228	-0.0134	0.0344	0.0444
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1775	0.1290	0.0970	0.0192	-0.1175	-0.1350
110	1	LC-5: 0.9D+1.0W	-0.0729	-0.0453	-0.0312	-0.0134	-0.0061	-0.0236
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1805	0.1290	0.0859	0.0192	0.0196	0.0585
111	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0310	-0.0813	0.0086	0.0057	-0.0015	0.0708
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1801	0.0982	0.0897	-0.0196	-0.1055	-0.1095
111	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0281	-0.0813	-0.0025	0.0057	0.0031	-0.0512
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1830	0.0982	0.0786	-0.0196	0.0207	0.0377

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-5: 0.9D+1.0W	0.2732	-0.0328	-0.0555	0.0021	0.4051	0.0043

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0623	0.0392	0.8279	-0.0155	-3.5575	-0.0882
2	1	LC-5: 0.9D+1.0W	0.2419	0.0247	-0.1721	0.0021	-0.1640	-0.0159
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1039	0.0105	0.6724	-0.0155	0.1933	0.0360
3	0	LC-5: 0.9D+1.0W	0.0937	0.0667	-0.1486	0.0084	0.8582	-0.0213
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0950	0.1077	1.1277	-0.0005	-6.0307	-0.6779
3	1	LC-5: 0.9D+1.0W	0.0426	-0.0182	-0.2504	0.0085	-0.1391	0.0606
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0695	0.0929	0.9650	-0.0005	-0.7990	-0.1569
4	0	LC-5: 0.9D+1.0W	-0.0854	0.0784	-0.2468	-0.1255	1.5679	-0.1443
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4700	-0.1323	1.3901	0.5618	-7.6094	0.0895
4	1	LC-5: 0.9D+1.0W	-0.0542	0.0209	-0.3634	-0.1255	0.0422	0.1041
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4284	-0.0748	1.2346	0.5618	-1.0476	-0.4281
5	0	LC-5: 0.9D+1.0W	0.0554	-0.0088	-0.0911	-0.0006	0.5372	-0.2074
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1916	-0.1435	0.7179	0.0216	-2.9445	0.6870
5	1	LC-5: 0.9D+1.0W	0.1121	0.0262	-0.1933	-0.0009	-0.1729	-0.0245
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2484	-0.1056	0.5481	0.0218	0.2198	-0.0751
6	0	LC-5: 0.9D+1.0W	-0.1121	0.0741	-0.0123	0.0108	0.0357	-0.1485
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0771	-0.0881	0.2830	0.0045	-0.1279	0.2206
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3430	-0.2420	-0.1453	0.0895	0.1228	-0.2967
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1741	-0.1487	0.0392	0.0026	0.0870	-0.2097
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.5929	0.0897	-0.0625	-0.0952	0.2359	-0.4241
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1015	-0.0442	0.0385	-0.0020	-0.0482	0.1294
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6264	0.0897	-0.1980	-0.0952	-0.1265	-0.2461
7	1	LC-5: 0.9D+1.0W	-0.1170	-0.0385	0.0253	-0.0147	0.0032	0.0488
8	0	LC-5: 0.9D+1.0W	-0.0455	-0.0388	-0.0306	0.0017	0.0118	-0.0256
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1557	0.0706	0.0934	0.0353	-0.0582	0.0447
8	1	LC-5: 0.9D+1.0W	-0.0428	-0.0388	-0.0417	0.0017	-0.0597	-0.1025
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1593	0.0706	0.0787	0.0353	0.1123	0.1846
9	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3046	0.2666	-0.0604	0.0248	0.0864	0.0224
9	0	LC-5: 0.9D+1.0W	-0.0043	-0.0451	0.0359	-0.0240	-0.0485	-0.1110
9	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3054	0.2666	-0.0684	0.0248	0.0184	0.3041
9	1	LC-5: 0.9D+1.0W	-0.0037	-0.0451	0.0298	-0.0240	-0.0138	-0.1586
10	0	LC-5: 0.9D+1.0W	-0.0298	0.0299	-0.0330	0.0214	-0.0110	-0.1048
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2032	-0.1430	0.0764	-0.0213	0.0198	0.2010
10	1	LC-5: 0.9D+1.0W	-0.0304	0.0299	-0.0390	0.0214	-0.0491	-0.0733

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2025	-0.1430	0.0684	-0.0213	0.0964	0.0498
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1827	0.0116	-0.0634	0.0004	0.1114	0.0670
11	0	LC-5: 0.9D+1.0W	-0.0511	0.0103	0.0412	-0.0101	-0.0629	-0.0660
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1782	0.0116	-0.0816	0.0004	-0.0660	0.0953
11	1	LC-5: 0.9D+1.0W	-0.0545	0.0103	0.0276	-0.0101	0.0213	-0.0408
12	0	LC-5: 0.9D+1.0W	-0.1224	0.0439	-0.0254	0.0130	0.0169	0.0227
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2543	-0.0636	0.0711	-0.0092	-0.0457	-0.0598
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0403	0.0053	-0.0423	0.0135	-0.0616	0.0813
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2498	-0.0636	0.0530	-0.0092	0.1057	-0.2149
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2142	0.1425	-0.0377	0.0066	0.0900	-0.2315
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0307	-0.0424	0.0389	-0.0123	-0.0603	0.0918
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1041	0.0837	-0.2820	0.0018	-0.1218	0.1889
13	1	LC-5: 0.9D+1.0W	-0.1202	-0.0746	0.0124	-0.0123	0.0351	-0.1456
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5205	-0.1029	-0.0569	-0.0038	-0.0166	-0.0078
14	0	LC-5: 0.9D+1.0W	-0.2147	0.0498	0.0275	0.0093	0.0067	0.0042
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5231	-0.1029	-0.0672	-0.0038	-0.1027	-0.1506
14	1	LC-5: 0.9D+1.0W	-0.2128	0.0498	0.0197	0.0093	0.0395	0.0733
15	0	LC-5: 0.9D+1.0W	0.1210	0.0503	-0.0180	-0.0085	0.0386	-0.0710
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2364	-0.1031	0.0637	0.0003	-0.1079	0.1582
15	1	LC-5: 0.9D+1.0W	0.1229	0.0503	-0.0257	-0.0085	0.0084	-0.0016
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2338	-0.1031	0.0534	0.0003	-0.0270	0.0158
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1854	-0.3041	0.0421	-0.0264	-0.0240	0.1117
16	1	LC-5: 0.9D+1.0W	-0.0406	0.1339	-0.0096	0.0177	0.0042	0.0397
16	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1858	-0.3041	0.0378	-0.0264	-0.0010	-0.0632
17	0	LC-5: 0.9D+1.0W	-0.0530	0.0133	-0.0049	0.0119	0.0077	0.0163
17	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1869	-0.0566	0.0316	-0.0292	-0.0284	-0.0400
17	1	LC-5: 0.9D+1.0W	-0.0537	0.0133	-0.0115	0.0119	-0.0017	0.0316
17	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1860	-0.0566	0.0229	-0.0292	0.0029	-0.1050
18	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2234	0.1156	-0.0118	-0.0020	-0.0149	-0.0953
18	0	LC-5: 0.9D+1.0W	-0.0494	-0.0263	0.0042	0.0022	0.0088	0.0321
18	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2213	0.1156	-0.0204	-0.0020	-0.0334	0.0373
18	1	LC-5: 0.9D+1.0W	-0.0510	-0.0263	-0.0022	0.0022	0.0099	0.0019
19	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1597	-0.0742	0.0010	-0.0016	0.0006	0.0507

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0546	0.0288	0.0143	0.0020	-0.0390	0.0475
19	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1576	-0.0742	-0.0076	-0.0016	-0.0031	-0.0345
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0567	0.0288	0.0057	0.0020	-0.0275	0.0805
20	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0611	-0.0174	-0.0133	0.0286	-0.0035	0.0805
20	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1641	0.0553	0.0178	-0.0023	-0.0096	-0.0334
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0620	-0.0174	-0.0221	0.0286	-0.0238	0.0605
20	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1632	0.0553	0.0091	-0.0023	0.0059	0.0302
21	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0501	-0.2713	-0.0128	0.0371	-0.0090	0.0958
21	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1415	0.2058	0.0467	-0.0063	-0.0038	-0.0202
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
21	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1419	0.2058	0.0423	-0.0063	0.0216	0.0976
22	0	LC-5: 0.9D+1.0W	-0.2048	-0.0642	-0.0244	-0.0051	0.0455	0.0913
22	0	LC-3b: 1.2D+1.6Lr+0.5W	1.2143	0.1978	0.1074	-0.0559	-0.2317	-0.3848
22	1	LC-5: 0.9D+1.0W	-0.2073	-0.0642	-0.0347	-0.0051	-0.0091	-0.0272
22	1	LC-3b: 1.2D+1.6Lr+0.5W	1.2109	0.1978	0.0937	-0.0559	-0.0461	-0.0197
23	0	LC-5: 0.9D+1.0W	0.0264	-0.0876	-0.0023	0.0129	0.0103	0.0123
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2680	0.3826	0.1281	0.0186	-0.1467	0.1896
23	1	LC-5: 0.9D+1.0W	0.0259	-0.0876	-0.0067	0.0129	0.0068	-0.0551
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2686	0.3826	0.1223	0.0186	-0.0504	0.4839
24	0	LC-5: 0.9D+1.0W	0.0268	0.0049	-0.0092	0.0106	0.0132	-0.0348
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2611	-0.0969	0.1494	0.1440	-0.1405	0.3981
24	1	LC-5: 0.9D+1.0W	0.0272	0.0049	-0.0127	0.0106	0.0066	-0.0318
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2606	-0.0969	0.1448	0.1440	-0.0511	0.3392
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0685	-0.2417	-0.1578	-0.1450	-0.0960	0.0857
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1147	-0.2341	0.0434	0.0831	-0.0015	0.1074
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1129	-0.2797	-0.2230	0.0743	-0.0823	-0.0287
25	1	LC-5: 0.9D+1.0W	0.0283	0.0157	0.0060	0.0020	0.0179	-0.0032
26	0	LC-5: 0.9D+1.0W	-0.0273	0.0144	0.0002	0.0003	0.0156	0.0131
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0925	-0.2511	0.2029	-0.0787	-0.0745	0.0267
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0990	-0.2233	-0.0536	-0.0735	-0.0467	-0.2707
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1914	-0.0895	0.0400	-0.0750	-0.0855	-0.3331
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2813	-0.0808	-0.0476	0.0176	-0.0489	-0.3705
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1435	0.0578	0.0186	0.0083	-0.0542	-0.2597
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2825	-0.0808	-0.0592	0.0176	-0.1305	-0.4940

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1447	0.0578	0.0069	0.0083	-0.0347	-0.1713
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1055	0.3012	-0.0575	0.0418	-0.0215	-0.3498
28	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0253	0.2597	0.0057	0.0394	-0.0083	-0.1297
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1049	0.3012	-0.0633	0.0418	-0.0679	-0.1183
28	1	LC-5: 0.9D+1.0W	0.0211	0.2339	0.0011	0.0358	-0.0054	0.0623
29	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1461	0.1069	-0.0665	0.0264	-0.0119	0.0382
29	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0263	-0.0460	0.0351	0.0073	-0.0068	0.0005
29	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1495	0.1069	-0.0802	0.0264	-0.1474	0.2356
29	1	LC-5: 0.9D+1.0W	0.0518	-0.0493	0.0229	0.0028	0.0494	-0.0917
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3250	0.1657	-0.0643	-0.0059	0.0327	-0.1772
30	0	LC-5: 0.9D+1.0W	0.0317	0.0018	0.0161	0.0071	-0.0054	0.0253
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3257	0.1657	-0.0713	-0.0059	-0.0297	-0.0246
30	1	LC-5: 0.9D+1.0W	0.0311	0.0018	0.0109	0.0071	0.0070	0.0270
31	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0040	0.0151	-0.0022	-0.0012	0.0129	-0.0025
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2356	-0.0783	0.1267	-0.0933	-0.1186	0.3128
31	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0033	0.0151	-0.0050	-0.0012	0.0115	0.0033
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2363	-0.0783	0.1238	-0.0933	-0.0702	0.2825
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0079	0.0131	-0.0008	-0.0091	0.0081	0.0026
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1224	-0.2376	0.0754	0.0026	-0.0658	0.2983
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0085	0.0131	-0.0066	-0.0091	0.0053	0.0125
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1230	-0.2376	0.0696	0.0026	-0.0108	0.1182
33	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0082	-0.0080	-0.0086	-0.0106	-0.0017	0.0249
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0576	-0.2518	0.0720	0.0286	0.0021	0.1044
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0774	-0.2635	-0.0648	0.0267	0.0355	-0.0868
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0233	-0.0351	0.0088	-0.0005	-0.0165	0.0613
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0018	-0.0124	-0.0144	0.0028	-0.0164	0.0176
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0404	-0.0075	0.0203	0.0203	-0.0165	0.0572
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2791	-0.1356	-0.1325	-0.0236	-0.0343	-0.1849
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0418	-0.0075	0.0146	0.0203	-0.0031	0.0515
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3034	0.0800	-0.1228	-0.0071	-0.0102	-0.1893
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0336	0.0261	0.0178	0.0192	0.0027	0.0513
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3047	0.0800	-0.1284	-0.0071	-0.1054	-0.1287
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0350	0.0261	0.0122	0.0192	0.0140	0.0711
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1507	0.2435	-0.1851	0.0786	-0.0588	-0.1353

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0074	0.0455	0.0079	-0.0017	0.0106	0.0740
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1510	0.2435	-0.1879	0.0786	-0.1296	-0.0430
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0077	0.0455	0.0050	-0.0017	0.0131	0.0913
37	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2128	-0.0887	-0.0157	-0.0035	-0.0091	0.1443
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1630	-0.2222	0.0289	0.0503	-0.0363	0.2270
37	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2112	-0.0887	-0.0225	-0.0035	-0.0267	0.0628
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1613	-0.2222	0.0221	0.0503	-0.0128	0.0227
38	0	LC-5: 0.9D+1.0W	0.0049	0.1314	-0.0186	0.0038	0.0445	-0.2432
38	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0858	-0.3352	0.0802	-0.0537	-0.1437	0.6871
38	1	LC-5: 0.9D+1.0W	0.0033	0.1314	-0.0344	0.0038	-0.0290	0.1211
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0837	-0.3352	0.0591	-0.0537	0.0493	-0.2422
39	0	LC-5: 0.9D+1.0W	-0.1593	0.0031	-0.0083	-0.0070	0.0212	-0.0386
39	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4683	0.0099	0.0672	0.0514	-0.0747	0.1269
39	1	LC-5: 0.9D+1.0W	-0.1577	0.0031	-0.0147	-0.0070	0.0080	-0.0350
39	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4704	0.0099	0.0586	0.0514	-0.0022	0.1384
40	0	LC-5: 0.9D+1.0W	-0.2083	0.1361	-0.0349	-0.0079	0.0157	-0.0506
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6510	-0.6019	0.1394	0.0628	-0.0332	0.2427
40	1	LC-5: 0.9D+1.0W	-0.2077	0.1361	-0.0374	-0.0079	-0.0005	0.0106
40	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6519	-0.6019	0.1361	0.0628	0.0287	-0.0279
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9117	-0.0030	-0.2865	-0.1926	-0.1704	-1.0718
41	0	LC-5: 0.9D+1.0W	-0.2342	-0.0036	0.0728	0.0282	0.0403	0.2491
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9121	-0.0030	-0.2899	-0.1926	-0.2988	-1.0732
41	1	LC-5: 0.9D+1.0W	-0.2340	-0.0036	0.0702	0.0282	0.0721	0.2475
42	0	LC-5: 0.9D+1.0W	-0.1501	0.0392	-0.0201	0.0056	0.0337	-0.0096
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4865	-0.1066	0.0944	-0.0062	-0.1291	-0.0414
42	1	LC-5: 0.9D+1.0W	-0.1514	0.0392	-0.0332	0.0056	-0.0274	0.0803
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4847	-0.1066	0.0769	-0.0062	0.0674	-0.2861
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4266	0.2558	-0.0256	0.0173	0.0334	-0.2920
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4224	0.2558	-0.0426	0.0173	-0.0449	0.2951
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
44	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3203	-0.2419	-0.0166	0.0034	0.0056	0.2927
44	0	LC-5: 0.9D+1.0W	-0.1156	0.0766	0.0050	-0.0022	0.0071	-0.1003
44	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3182	-0.2419	-0.0252	0.0034	-0.0184	0.0141

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-5: 0.9D+1.0W	-0.1172	0.0766	-0.0014	-0.0022	0.0091	-0.0120
45	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3887	0.2096	-0.0497	0.0005	0.0474	-0.1922
45	0	LC-5: 0.9D+1.0W	-0.1056	-0.0922	0.0323	0.0080	-0.0279	0.0976
45	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3908	0.2096	-0.0709	0.0005	-0.1198	0.3889
45	1	LC-5: 0.9D+1.0W	-0.1041	-0.0922	0.0165	0.0080	0.0398	-0.1581
46	0	LC-5: 0.9D+1.0W	0.7988	-0.0279	0.0024	0.0063	0.0250	0.0072
46	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1773	-0.0011	0.0156	0.0009	-0.0154	0.0098
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9571	-0.0345	-0.0095	0.0077	0.0241	-0.0531
46	1	LC-5: 0.9D+1.0W	-0.2752	0.0038	0.0027	0.0003	-0.0022	0.0135
47	0	LC-5: 0.9D+1.0W	0.1337	-0.0634	-0.0240	-0.0007	0.0131	0.0213
47	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5717	0.2805	0.1208	0.0029	-0.0728	-0.0654
47	1	LC-5: 0.9D+1.0W	0.1342	-0.0634	-0.0284	-0.0007	-0.0070	-0.0274
47	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5711	0.2805	0.1150	0.0029	0.0178	0.1502
48	0	LC-5: 0.9D+1.0W	0.1385	0.0451	0.0051	-0.0035	-0.0060	-0.0270
48	0	Load Cases: Self Weight	-0.2845	-0.0901	0.0085	0.0098	0.0004	0.0748
48	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1613	-0.0490	-0.0062	0.0035	-0.0024	-0.0342
48	1	LC-5: 0.9D+1.0W	-0.5021	-0.1609	-0.0026	0.0161	0.0090	-0.1221
49	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5543	0.2169	-0.0151	0.0009	0.0308	-0.1720
49	0	LC-5: 0.9D+1.0W	0.1489	-0.0632	0.0098	0.0001	-0.0103	0.0471
49	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5515	0.2169	-0.0265	0.0009	-0.0012	0.1607
49	1	LC-5: 0.9D+1.0W	0.1510	-0.0632	0.0012	0.0001	-0.0019	-0.0498
50	0	LC-5: 0.9D+1.0W	0.1510	0.0654	-0.0032	-0.0002	0.0050	-0.0497
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5263	-0.2319	0.0292	-0.0028	-0.0240	0.1545
50	1	LC-5: 0.9D+1.0W	0.1518	0.0654	-0.0119	-0.0002	-0.0066	0.0506
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5251	-0.2319	0.0175	-0.0028	0.0119	-0.2012
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5052	0.0168	-0.0610	0.0213	0.0149	-0.1734
51	0	LC-5: 0.9D+1.0W	0.1514	-0.0167	0.0183	-0.0055	-0.0063	0.0368
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5063	0.0168	-0.0726	0.0213	-0.0870	-0.1477
51	1	LC-5: 0.9D+1.0W	0.1506	-0.0167	0.0096	-0.0055	0.0149	0.0112
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3795	-0.3366	-0.0520	0.1072	-0.0546	-0.1291
52	0	LC-5: 0.9D+1.0W	0.1152	0.0914	0.0094	-0.0206	0.0068	0.0084
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3809	-0.3366	-0.0578	0.1072	-0.0971	-0.3898
52	1	LC-5: 0.9D+1.0W	0.1141	0.0914	0.0051	-0.0206	0.0124	0.0792
53	0	LC-5: 0.9D+1.0W	-0.3286	0.1020	-0.0203	0.0064	0.0333	-0.1654

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2451	-0.3431	0.0977	-0.0519	-0.1458	0.6749
53	1	LC-5: 0.9D+1.0W	-0.3296	0.1020	-0.0309	0.0064	-0.0141	0.0233
53	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2437	-0.3431	0.0836	-0.0519	0.0218	0.0402
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.2831	0.5050	-1.3441	0.0764	8.5600	-1.1223
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0721	-0.5050	1.3441	-0.0764	-10.8148	4.2129
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.8648	0.3929	-1.2319	0.0764	4.3740	0.3369
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6538	-0.3929	1.2319	-0.0764	-6.6288	2.7537
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.9242	0.3929	-0.4041	0.1143	4.6577	-0.2142
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5505	-0.3929	1.3445	-0.3863	-6.4584	1.7971
55	1	LC-5: 0.9D+1.0W	-3.8879	0.2788	-0.1619	0.1458	4.0184	0.7135
55	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2010	-0.2788	0.8643	-0.3863	-3.0695	0.6862
56	0	LC-5: 0.9D+1.0W	0.5455	0.2788	0.1947	0.0799	-1.9815	-1.2514
56	0	LC-3b: 1.2D+1.6Lr+0.5W	-4.0425	-0.1394	0.9128	-0.4029	1.9534	1.9804
56	1	LC-5: 0.9D+1.0W	0.9284	0.1495	0.2259	0.0799	-1.1933	-0.4489
56	1	LC-3b: 1.2D+1.6Lr+0.5W	-3.5933	-0.0747	0.7255	-0.4029	5.0233	1.5791
100	0	LC-5: 0.9D+1.0W	0.1594	-0.0793	-0.0448	-0.1016	0.1795	0.0656
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7199	0.4068	0.5060	0.4580	-1.2563	-0.3273
100	1	LC-5: 0.9D+1.0W	0.1782	-0.1138	-0.1147	-0.1016	-0.0598	-0.2241
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6949	0.4413	0.4128	0.4580	0.1220	0.9449
101	0	LC-5: 0.9D+1.0W	-0.0181	0.0299	-0.0070	-0.0010	0.0081	-0.0342
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0439	0.0394	0.3811	0.0102	-0.5509	-0.0086
101	1	LC-5: 0.9D+1.0W	-0.0181	0.0269	-0.0181	-0.0010	-0.0171	0.0226
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0439	0.0354	0.3663	0.0102	0.1964	0.0662
102	0	LC-5: 0.9D+1.0W	0.2659	-0.0117	-0.0121	0.0039	0.0415	0.0226
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0763	0.0721	-0.0357	-0.1675	-0.1111
102	1	LC-5: 0.9D+1.0W	0.2659	-0.0162	-0.0287	0.0039	-0.0197	-0.0193
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0703	0.0499	-0.0357	0.0154	0.1087
103	0	LC-5: 0.9D+1.0W	-0.1991	-0.0167	0.0036	-0.0006	0.0000	0.0199
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6391	0.0446	0.0231	0.0040	-0.0209	-0.0556
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1355	-0.0131	-0.0077	0.0000	-0.0032	-0.0109
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6431	0.0446	0.0083	0.0040	0.0105	0.0336
104	0	LC-5: 0.9D+1.0W	-0.2064	0.0050	0.0065	0.0045	-0.0035	-0.0041
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8168	-0.0604	0.0141	-0.0188	-0.0106	0.0917
104	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2073	-0.0231	-0.0066	-0.0028	-0.0028	-0.0112

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-5: 0.9D+1.0W	0.6779	-0.0494	-0.0005	-0.0158	0.0021	-0.0241
107	0	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0080	0.0069	0.0273	0.0871
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0632	-0.0110	-0.1097	-0.2915
107	1	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0252	0.0069	-0.0225	-0.0221
107	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0403	-0.0110	0.0456	0.0056
106	0	LC-5: 0.9D+1.0W	0.0434	-0.0375	0.0081	-0.0004	-0.0122	0.0353
106	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1229	0.0461	0.0020	-0.0286	-0.1179
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
106	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1259	0.0350	0.0020	0.0322	0.0687
108	0	LC-5: 0.9D+1.0W	0.0652	0.0316	-0.0237	-0.0082	0.0411	-0.0419
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3273	-0.1521	0.1803	0.0027	-0.2928	0.2239
108	1	LC-5: 0.9D+1.0W	0.0622	0.0316	-0.0348	-0.0082	-0.0175	0.0213
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3313	-0.1521	0.1655	0.0027	0.0531	-0.0802
109	0	LC-5: 0.9D+1.0W	-0.0725	0.0206	-0.0253	0.0104	0.0465	-0.0298
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3302	-0.0045	0.1557	0.0789	-0.1962	0.0482
109	1	LC-5: 0.9D+1.0W	-0.0695	0.0206	-0.0364	0.0104	-0.0153	0.0114
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3342	-0.0045	0.1409	0.0789	0.1003	0.0392
110	0	LC-5: 0.9D+1.0W	-0.0752	-0.0453	-0.0228	-0.0134	0.0344	0.0444
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1775	0.1290	0.0970	0.0192	-0.1175	-0.1350
110	1	LC-5: 0.9D+1.0W	-0.0729	-0.0453	-0.0312	-0.0134	-0.0061	-0.0236
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1805	0.1290	0.0859	0.0192	0.0196	0.0585
111	0	LC-5: 0.9D+1.0W	0.0856	-0.0266	-0.0228	0.0142	0.0334	0.0295
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1858	0.0933	0.0901	-0.0198	-0.1058	-0.1061
111	1	LC-5: 0.9D+1.0W	0.0833	-0.0266	-0.0311	0.0142	-0.0069	-0.0104
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1888	0.0933	0.0790	-0.0198	0.0210	0.0338

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.6748	-0.0449	0.5485	-0.3845	-2.1179	0.5744

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-5: 0.9D+1.0W	0.2590	0.0365	-0.0552	0.0027	0.4041	-0.0409
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.7164	-0.0162	0.3931	-0.3845	0.2359	0.4217
2	1	LC-5: 0.9D+1.0W	0.2278	-0.0210	-0.1718	0.0027	-0.1634	-0.0020
3	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0930	0.2177	0.8958	-0.0154	-4.1070	-0.8848
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4127	0.2160	0.3764	0.4307	-1.5226	-0.7908
3	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0930	0.1205	0.7553	-0.0154	0.0208	-0.0391
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4127	0.2021	0.2135	0.4307	-0.0478	0.2545
4	0	LC-5: 0.9D+1.0W	-0.0459	-0.0434	-0.2465	-0.1263	1.5665	0.1244
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5095	-0.0105	1.3897	0.5626	-7.6080	-0.1792
4	1	LC-5: 0.9D+1.0W	-0.0147	0.0141	-0.3631	-0.1263	0.0426	0.0513
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4679	-0.0680	1.2343	0.5626	-1.0480	-0.3754
5	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0232	0.1814	-0.0019	-0.5742	0.0461
5	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.5052	-0.0848	0.4901	0.0257	-1.9779	0.3395
5	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0002	-0.0093	0.0185	-0.0019	-0.0743	-0.0352
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.5052	-0.0154	0.3422	0.0257	0.1029	0.0889
6	0	LC-5: 0.9D+1.0W	0.1879	-0.1363	0.0551	0.0010	-0.0974	0.3208
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2974	-0.2381	0.1236	0.0896	-0.2330	0.6234
6	1	LC-5: 0.9D+1.0W	0.1901	-0.1363	0.0332	0.0010	0.0717	-0.2010
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3240	-0.2381	-0.1444	0.0896	0.1247	-0.2883
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4368	0.0556	-0.0231	-0.1118	0.1620	-0.2763
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1464	-0.0022	-0.0138	0.0495	0.0724	-0.0664
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4702	0.0556	-0.1585	-0.1118	-0.1221	-0.1661
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1500	-0.0022	-0.0285	0.0495	0.0305	-0.0709
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1112	-0.0524	0.0181	-0.0263	-0.0359	-0.0155
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1299	0.0807	0.0925	0.0354	-0.0572	0.0338
8	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1148	-0.0524	0.0034	-0.0263	-0.0146	-0.1193
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1335	0.0807	0.0777	0.0354	0.1114	0.1936
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0566	-0.0090	0.0320	-0.0285	-0.0434	-0.1378
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0435	0.1455	-0.0434	0.0369	0.1048	0.2130
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0574	-0.0090	0.0239	-0.0285	-0.0138	-0.1473
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0443	0.1455	-0.0514	0.0369	0.0547	0.3668
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1436	-0.1116	0.0727	-0.0236	0.0257	0.1994
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0154	0.0197	-0.0282	0.0215	-0.0091	-0.0939
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1428	-0.1116	0.0646	-0.0236	0.0983	0.0814

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0162	0.0197	-0.0363	0.0215	-0.0432	-0.0730
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1184	0.0517	0.0348	-0.0121	-0.0523	-0.1176
11	0	LC-5: 0.9D+1.0W	0.0799	-0.0097	-0.0534	0.0015	0.0939	0.0875
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1139	0.0517	0.0166	-0.0121	0.0106	0.0089
11	1	LC-5: 0.9D+1.0W	0.0766	-0.0097	-0.0670	0.0015	-0.0534	0.0636
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2543	-0.0636	0.0711	-0.0092	-0.0457	-0.0598
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1041	0.0400	-0.0191	0.0138	0.0117	0.0211
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2498	-0.0636	0.0530	-0.0092	0.1057	-0.2149
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1086	0.0400	-0.0373	0.0138	-0.0571	0.1187
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1240	-0.0695	0.0336	-0.0134	-0.0488	0.1375
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2297	0.1444	-0.0371	0.0067	0.0887	-0.2380
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1269	-0.0695	0.0044	-0.0134	0.0240	-0.1286
13	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2268	0.1444	-0.0662	0.0067	-0.1091	0.3147
14	0	LC-5: 0.9D+1.0W	0.4428	-0.0956	-0.0483	-0.0041	-0.0144	0.0009
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1774	0.0592	0.0226	0.0111	0.0078	-0.0227
14	1	LC-5: 0.9D+1.0W	0.4447	-0.0956	-0.0561	-0.0041	-0.0869	-0.1319
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1748	0.0592	0.0123	0.0111	0.0320	0.0595
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0697	0.0467	-0.0117	-0.0099	0.0300	-0.0583
15	0	LC-5: 0.9D+1.0W	-0.1605	-0.0915	0.0532	0.0011	-0.0917	0.1349
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0723	0.0467	-0.0219	-0.0099	0.0068	0.0062
15	1	LC-5: 0.9D+1.0W	-0.1587	-0.0915	0.0455	0.0011	-0.0235	0.0085
16	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1172	-0.3664	0.0332	-0.0421	-0.0231	0.1068
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1176	-0.3664	0.0288	-0.0421	-0.0053	-0.1040
16	1	LC-5: 0.9D+1.0W	-0.0406	0.1339	-0.0096	0.0177	0.0042	0.0397
17	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1524	-0.0470	0.0301	-0.0315	-0.0287	-0.0495
17	0	LC-5: 0.9D+1.0W	-0.0530	0.0133	-0.0049	0.0119	0.0077	0.0163
17	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1515	-0.0470	0.0214	-0.0315	0.0008	-0.1034
17	1	LC-5: 0.9D+1.0W	-0.0537	0.0133	-0.0115	0.0119	-0.0017	0.0316
18	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1424	0.0708	-0.0089	-0.0032	-0.0282	-0.1040
18	0	LC-5: 0.9D+1.0W	-0.0494	-0.0263	0.0042	0.0022	0.0088	0.0321
18	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1403	0.0708	-0.0174	-0.0032	-0.0433	-0.0228
18	1	LC-5: 0.9D+1.0W	-0.0510	-0.0263	-0.0022	0.0022	0.0099	0.0019
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0635	-0.0322	0.0042	-0.0020	0.0065	0.0067

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0546	0.0288	0.0143	0.0020	-0.0390	0.0475
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0614	-0.0322	-0.0043	-0.0020	0.0064	-0.0303
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0567	0.0288	0.0057	0.0020	-0.0275	0.0805
20	0	LC-5: 0.9D+1.0W	-0.0015	-0.0058	0.0072	-0.0116	0.0013	-0.0207
20	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0404	-0.0108	-0.0117	0.0287	-0.0046	0.0766
20	1	LC-5: 0.9D+1.0W	-0.0021	-0.0058	0.0006	-0.0116	0.0058	-0.0274
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0413	-0.0108	-0.0205	0.0287	-0.0230	0.0641
21	0	LC-5: 0.9D+1.0W	0.0123	0.0998	0.0023	-0.0174	0.0061	-0.0386
21	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0501	-0.2713	-0.0128	0.0371	-0.0090	0.0958
21	1	LC-5: 0.9D+1.0W	0.0126	0.0998	-0.0010	-0.0174	0.0065	0.0186
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
22	0	LC-3b: 1.2D+1.6Lr+0.5W	0.5594	0.2685	0.0753	-0.1388	-0.1321	-0.2830
22	0	LC-5: 0.9D+1.0W	-0.2048	-0.0642	-0.0244	-0.0051	0.0455	0.0913
22	1	LC-3b: 1.2D+1.6Lr+0.5W	0.5560	0.2685	0.0616	-0.1388	-0.0058	0.2126
22	1	LC-5: 0.9D+1.0W	-0.2073	-0.0642	-0.0347	-0.0051	-0.0091	-0.0272
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1233	0.5913	0.0257	-0.0609	-0.0224	-0.2708
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1962	0.2224	0.1074	0.0354	-0.1203	0.2020
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1239	0.5913	0.0199	-0.0609	-0.0049	0.1840
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1968	0.2224	0.1015	0.0354	-0.0400	0.3730
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2306	0.0593	0.0548	-0.0566	-0.0681	0.1170
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1867	-0.0955	0.1188	0.1528	-0.1081	0.3229
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2301	0.0593	0.0502	-0.0566	-0.0362	0.1530
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1862	-0.0955	0.1141	0.1528	-0.0374	0.2648
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0685	-0.2417	-0.1578	-0.1450	-0.0960	0.0857
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1147	-0.2341	0.0434	0.0831	-0.0015	0.1074
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0674	-0.2417	-0.1623	-0.1450	-0.1934	-0.0615
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0561	-0.2341	-0.1942	0.0831	-0.0347	-0.0351
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0833	-0.2462	0.2024	-0.0788	-0.0741	0.0218
26	0	LC-5: 0.9D+1.0W	-0.0088	0.0047	0.0012	0.0004	0.0148	0.0228
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1434	-0.2462	-0.0421	-0.0788	-0.0715	-0.3545
26	1	LC-5: 0.9D+1.0W	-0.0067	0.0047	-0.0074	0.0004	0.0100	0.0299
27	0	LC-5: 0.9D+1.0W	-0.0084	0.0020	0.0094	-0.0133	0.0004	0.0297
27	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0697	0.0311	-0.0078	0.0410	-0.0156	-0.1549
27	1	LC-5: 0.9D+1.0W	-0.0075	0.0020	0.0007	-0.0133	0.0081	0.0327

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0709	0.0311	-0.0194	0.0410	-0.0364	-0.1074
28	0	LC-5: 0.9D+1.0W	-0.0153	-0.0834	-0.0027	-0.0143	0.0059	0.0426
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1239	0.4599	-0.0534	0.0668	-0.0284	-0.4298
28	1	LC-5: 0.9D+1.0W	-0.0157	-0.0834	-0.0071	-0.0143	0.0022	-0.0215
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1233	0.4599	-0.0592	0.0668	-0.0717	-0.0764
29	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2015	-0.0783	0.0068	0.0010	-0.0077	0.0470
29	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2877	0.1203	-0.0332	0.0760	-0.0068	-0.0706
29	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1981	-0.0783	-0.0070	0.0010	-0.0079	-0.0976
29	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2911	0.1203	-0.0470	0.0760	-0.0809	0.1517
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2199	0.0687	-0.0397	-0.0464	0.0066	-0.1943
30	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0531	0.0502	0.0000	0.0075	0.0036	-0.0171
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2206	0.0687	-0.0467	-0.0464	-0.0332	-0.1311
30	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0538	0.0502	-0.0071	0.0075	0.0003	0.0291
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2356	-0.0783	0.1267	-0.0933	-0.1186	0.3128
31	0	LC-5: 0.9D+1.0W	0.0012	0.0015	0.0030	0.0001	-0.0041	-0.0014
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2363	-0.0783	0.1238	-0.0933	-0.0702	0.2825
31	1	LC-5: 0.9D+1.0W	0.0007	0.0015	0.0008	0.0001	-0.0033	-0.0009
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0089	-0.0537	0.0160	-0.0354	-0.0205	0.1359
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1179	-0.2260	0.0746	0.0064	-0.0673	0.2796
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0095	-0.0537	0.0102	-0.0354	-0.0106	0.0951
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1184	-0.2260	0.0688	0.0064	-0.0130	0.1083
33	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0092	-0.0075	-0.0085	-0.0107	-0.0018	0.0247
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0586	-0.2524	0.0719	0.0287	0.0021	0.1046
33	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0087	-0.0075	-0.0143	-0.0107	-0.0105	0.0190
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0718	-0.2524	-0.0615	0.0287	0.0380	-0.0889
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2347	-0.1320	0.0026	-0.0248	0.0517	-0.0826
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0526	-0.0112	0.0152	0.0215	-0.0196	0.0590
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2669	-0.1320	-0.1275	-0.0248	-0.0273	-0.1838
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0541	-0.0112	0.0095	0.0215	-0.0101	0.0504
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2918	0.0753	-0.1132	-0.0133	-0.0066	-0.1872
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0452	0.0308	0.0082	0.0255	-0.0010	0.0492
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2932	0.0753	-0.1189	-0.0133	-0.0946	-0.1302
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0466	0.0308	0.0026	0.0255	0.0032	0.0726
36	0	LC-5: 0.9D+1.0W	0.0026	0.0037	0.0020	-0.0049	0.0005	-0.0025

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1511	0.2424	-0.1848	0.0786	-0.0586	-0.1362
36	1	LC-5: 0.9D+1.0W	0.0028	0.0037	-0.0002	-0.0049	0.0008	-0.0011
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1514	0.2424	-0.1876	0.0786	-0.1292	-0.0443
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3547	-0.1006	-0.0133	-0.0101	0.0026	0.1806
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1630	-0.2222	0.0289	0.0503	-0.0363	0.2270
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3530	-0.1006	-0.0201	-0.0101	-0.0127	0.0881
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1613	-0.2222	0.0221	0.0503	-0.0128	0.0227
38	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0649	-0.3365	0.0800	-0.0537	-0.1434	0.6898
38	0	LC-5: 0.9D+1.0W	0.0258	0.1327	-0.0184	0.0038	0.0441	-0.2459
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0628	-0.3365	0.0589	-0.0537	0.0492	-0.2431
38	1	LC-5: 0.9D+1.0W	0.0242	0.1327	-0.0343	0.0038	-0.0289	0.1219
39	0	LC-5: 0.9D+1.0W	-0.1593	0.0031	-0.0083	-0.0070	0.0212	-0.0386
39	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4683	0.0099	0.0672	0.0514	-0.0747	0.1269
39	1	LC-5: 0.9D+1.0W	-0.1577	0.0031	-0.0147	-0.0070	0.0080	-0.0350
39	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4704	0.0099	0.0586	0.0514	-0.0022	0.1384
40	0	LC-5: 0.9D+1.0W	-0.1974	0.1307	-0.0345	-0.0080	0.0155	-0.0489
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6402	-0.5965	0.1389	0.0629	-0.0329	0.2409
40	1	LC-5: 0.9D+1.0W	-0.1968	0.1307	-0.0370	-0.0080	-0.0006	0.0098
40	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6410	-0.5965	0.1356	0.0629	0.0288	-0.0271
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9002	-0.0067	-0.2855	-0.1927	-0.1708	-1.0684
41	0	LC-5: 0.9D+1.0W	-0.2227	0.0000	0.0718	0.0283	0.0407	0.2457
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9005	-0.0067	-0.2889	-0.1927	-0.2987	-1.0714
41	1	LC-5: 0.9D+1.0W	-0.2224	0.0000	0.0692	0.0283	0.0721	0.2457
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4865	-0.1066	0.0944	-0.0062	-0.1291	-0.0414
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0634	0.0126	-0.0061	0.0056	0.0165	0.0049
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4847	-0.1066	0.0769	-0.0062	0.0674	-0.2861
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0651	0.0126	-0.0236	0.0056	-0.0177	0.0338
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4266	0.2558	-0.0256	0.0173	0.0334	-0.2920
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4224	0.2558	-0.0426	0.0173	-0.0449	0.2951
44	0	LC-5: 0.9D+1.0W	-0.1156	0.0766	0.0050	-0.0022	0.0071	-0.1003
44	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3334	-0.1407	-0.0110	0.0047	0.0098	0.2169
44	1	LC-5: 0.9D+1.0W	-0.1172	0.0766	-0.0014	-0.0022	0.0091	-0.0120

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3312	-0.1407	-0.0195	0.0047	-0.0078	0.0549
45	0	LC-5: 0.9D+1.0W	0.2643	0.1812	-0.0428	-0.0007	0.0406	-0.1626
45	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0567	-0.0795	0.0294	0.0101	-0.0250	0.0793
45	1	LC-5: 0.9D+1.0W	0.2659	0.1812	-0.0586	-0.0007	-0.0999	0.3399
45	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0588	-0.0795	0.0083	0.0101	0.0272	-0.1410
46	0	LC-5: 0.9D+1.0W	-0.2592	0.0030	0.0129	0.0003	-0.0167	0.0077
46	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9471	-0.0336	0.0043	0.0077	0.0290	0.0094
46	1	LC-5: 0.9D+1.0W	-0.2618	0.0030	0.0026	0.0003	-0.0024	0.0131
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9437	-0.0336	-0.0094	0.0077	0.0243	-0.0527
47	0	LC-5: 0.9D+1.0W	0.1292	-0.0609	-0.0234	-0.0007	0.0129	0.0202
47	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3840	0.1936	0.0818	0.0033	-0.0488	-0.0498
47	1	LC-5: 0.9D+1.0W	0.1297	-0.0609	-0.0278	-0.0007	-0.0068	-0.0267
47	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3834	0.1936	0.0759	0.0033	0.0118	0.0990
48	0	LC-5: 0.9D+1.0W	0.1385	0.0451	0.0051	-0.0035	-0.0060	-0.0270
48	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6095	-0.1941	0.0075	0.0193	0.0075	0.1493
48	1	LC-5: 0.9D+1.0W	0.1406	0.0451	-0.0034	-0.0035	-0.0048	0.0417
48	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6067	-0.1941	-0.0038	0.0193	0.0103	-0.1466
49	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0670	0.0207	0.0027	-0.0002	0.0016	-0.0203
49	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3677	0.1433	-0.0082	0.0012	0.0204	-0.1135
49	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0642	0.0207	-0.0087	-0.0002	-0.0030	0.0115
49	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3649	0.1433	-0.0196	0.0012	-0.0010	0.1064
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5368	-0.2379	0.0284	-0.0029	-0.0236	0.1575
50	0	LC-5: 0.9D+1.0W	0.1462	0.0635	-0.0027	-0.0002	0.0046	-0.0484
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5357	-0.2379	0.0167	-0.0029	0.0110	-0.2073
50	1	LC-5: 0.9D+1.0W	0.1471	0.0635	-0.0115	-0.0002	-0.0063	0.0491
51	0	LC-5: 0.9D+1.0W	0.1514	-0.0167	0.0183	-0.0055	-0.0063	0.0368
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5052	0.0168	-0.0610	0.0213	0.0149	-0.1734
51	1	LC-5: 0.9D+1.0W	0.1506	-0.0167	0.0096	-0.0055	0.0149	0.0112
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5063	0.0168	-0.0726	0.0213	-0.0870	-0.1477
52	0	LC-5: 0.9D+1.0W	0.1195	0.0946	0.0091	-0.0207	0.0068	0.0081
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3837	-0.3398	-0.0516	0.1072	-0.0546	-0.1287
52	1	LC-5: 0.9D+1.0W	0.1184	0.0946	0.0047	-0.0207	0.0122	0.0814
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3852	-0.3398	-0.0574	0.1072	-0.0969	-0.3919
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2303	-0.3427	0.0976	-0.0519	-0.1457	0.6735

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-5: 0.9D+1.0W	-0.3138	0.1017	-0.0203	0.0065	0.0332	-0.1641
53	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2289	-0.3427	0.0835	-0.0519	0.0218	0.0395
53	1	LC-5: 0.9D+1.0W	-0.3148	0.1017	-0.0309	0.0065	-0.0141	0.0240
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0721	0.8050	0.1030	-0.4734	-3.6555	-3.7615
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.4694	-0.8050	-0.1030	0.4734	1.6252	6.4034
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6538	0.6929	0.2151	-0.4734	-3.1386	-1.3273
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.0511	-0.6929	-0.2151	0.4734	1.1083	3.9693
55	0	LC-3b: 1.2D+1.6Lr+0.5W	-1.9456	-0.1965	0.8070	-0.8072	-4.2573	4.4734
55	0	LC-5: 0.9D+1.0W	-4.2219	0.3929	-0.2204	0.1458	4.6506	-0.3974
55	1	LC-3b: 1.2D+1.6Lr+0.5W	-1.5356	-0.1394	0.6787	-0.8072	-1.8002	3.9179
55	1	LC-5: 0.9D+1.0W	-3.8879	0.2788	-0.1619	0.1458	4.0184	0.7135
56	0	LC-3b: 1.2D+1.6Lr+0.5W	-3.6830	-0.1394	0.8165	-1.1625	1.1998	4.8152
56	0	LC-5: 0.9D+1.0W	0.5455	0.2788	0.1947	0.0799	-1.9815	-1.2514
56	1	LC-3b: 1.2D+1.6Lr+0.5W	-3.2338	-0.0747	0.6292	-1.1625	3.9086	4.4139
56	1	LC-5: 0.9D+1.0W	0.9284	0.1495	0.2259	0.0799	-1.1933	-0.4489
100	0	LC-5: 0.9D+1.0W	0.1594	-0.0793	-0.0448	-0.1016	0.1795	0.0656
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7199	0.4068	0.5060	0.4580	-1.2563	-0.3273
100	1	LC-5: 0.9D+1.0W	0.1782	-0.1138	-0.1147	-0.1016	-0.0598	-0.2241
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6949	0.4413	0.4128	0.4580	0.1220	0.9449
101	0	LC-5: 0.9D+1.0W	-0.0181	0.0299	-0.0070	-0.0010	0.0081	-0.0342
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1115	-0.0918	0.2058	0.0987	-0.3207	0.0839
101	1	LC-5: 0.9D+1.0W	-0.0181	0.0269	-0.0181	-0.0010	-0.0171	0.0226
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1115	-0.0957	0.1910	0.0987	0.0760	-0.1035
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9989	0.0734	0.0719	-0.0358	-0.1672	-0.1058
102	0	LC-5: 0.9D+1.0W	0.2570	-0.0089	-0.0120	0.0040	0.0413	0.0173
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9989	0.0675	0.0498	-0.0358	0.0153	0.1056
102	1	LC-5: 0.9D+1.0W	0.2570	-0.0134	-0.0286	0.0040	-0.0196	-0.0162
103	0	LC-5: 0.9D+1.0W	-0.1928	-0.0158	0.0036	-0.0006	0.0000	0.0189
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6329	0.0436	0.0231	0.0041	-0.0209	-0.0545
103	1	LC-5: 0.9D+1.0W	-0.1899	-0.0158	-0.0075	-0.0006	-0.0038	-0.0127
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6369	0.0436	0.0083	0.0041	0.0105	0.0328
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8168	-0.0604	0.0141	-0.0188	-0.0106	0.0917
104	0	LC-5: 0.9D+1.0W	-0.2064	0.0050	0.0065	0.0045	-0.0035	-0.0041
104	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8168	-0.0604	-0.0012	-0.0188	0.0022	-0.0292

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-5: 0.9D+1.0W	-0.2064	0.0050	-0.0049	0.0045	-0.0019	0.0059
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0632	-0.0110	-0.1097	-0.2915
107	0	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0080	0.0069	0.0273	0.0871
107	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0403	-0.0110	0.0456	0.0056
107	1	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0252	0.0069	-0.0225	-0.0221
106	0	LC-5: 0.9D+1.0W	0.0434	-0.0375	0.0081	-0.0004	-0.0122	0.0353
106	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3012	0.0525	0.0366	0.0026	-0.0254	-0.0439
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
106	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3012	0.0555	0.0255	0.0026	0.0212	0.0370
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2144	-0.1389	0.1640	-0.1305	-0.2725	0.1730
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2412	-0.0903	0.1208	0.0049	-0.2035	0.1403
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2184	-0.1389	0.1492	-0.1305	0.0408	-0.1049
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2451	-0.0903	0.1060	0.0049	0.0233	-0.0404
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1915	-0.1042	0.0754	-0.0111	-0.1086	0.1603
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2199	0.0315	0.0931	0.0863	-0.0984	-0.0085
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1954	-0.1042	0.0606	-0.0111	0.0273	-0.0481
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2239	0.0315	0.0783	0.0863	0.0730	0.0546
110	0	LC-5: 0.9D+1.0W	-0.0758	-0.0357	-0.0226	-0.0134	0.0339	0.0363
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1782	0.1194	0.0967	0.0193	-0.1170	-0.1269
110	1	LC-5: 0.9D+1.0W	-0.0736	-0.0357	-0.0309	-0.0134	-0.0063	-0.0173
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1812	0.1194	0.0856	0.0193	0.0198	0.0522
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1858	0.0933	0.0901	-0.0198	-0.1058	-0.1061
111	0	LC-5: 0.9D+1.0W	0.0856	-0.0266	-0.0228	0.0142	0.0334	0.0295
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1888	0.0933	0.0790	-0.0198	0.0210	0.0338
111	1	LC-5: 0.9D+1.0W	0.0833	-0.0266	-0.0311	0.0142	-0.0069	-0.0104

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0623	0.0392	0.8279	-0.0155	-3.5575	-0.0882

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-5: 0.9D+1.0W	0.2732	-0.0328	-0.0555	0.0021	0.4051	0.0043
2	1	LC-5: 0.9D+1.0W	0.2419	0.0247	-0.1721	0.0021	-0.1640	-0.0159
2	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5224	-0.0110	0.3904	-0.1361	0.2807	0.1749
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0950	0.1077	1.1277	-0.0005	-6.0307	-0.6779
3	0	LC-5: 0.9D+1.0W	0.0937	0.0667	-0.1486	0.0084	0.8582	-0.0213
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0107	0.0370	0.5203	0.0104	-0.8833	-0.1042
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.4715	0.2581	0.6582	0.4197	0.0364	0.2019
4	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4700	-0.1323	1.3901	0.5618	-7.6094	0.0895
4	0	LC-5: 0.9D+1.0W	-0.0854	0.0784	-0.2468	-0.1255	1.5679	-0.1443
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4679	-0.0680	1.2343	0.5626	-1.0480	-0.3754
4	1	LC-5: 0.9D+1.0W	-0.0147	0.0141	-0.3631	-0.1263	0.0426	0.0513
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1916	-0.1435	0.7179	0.0216	-2.9445	0.6870
5	0	LC-5: 0.9D+1.0W	0.0554	-0.0088	-0.0911	-0.0006	0.5372	-0.2074
5	1	LC-5: 0.9D+1.0W	0.1121	0.0262	-0.1933	-0.0009	-0.1729	-0.0245
5	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2484	-0.1056	0.5481	0.0218	0.2198	-0.0751
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4475	-0.3433	0.1573	0.0847	-0.2996	0.8581
6	0	LC-5: 0.9D+1.0W	-0.1121	0.0741	-0.0123	0.0108	0.0357	-0.1485
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1228	0.0723	-0.0352	0.0176	-0.0539	0.1542
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4740	-0.3433	-0.1107	0.0847	0.1872	-0.4565
7	0	LC-5: 0.9D+1.0W	-0.1198	-0.0385	0.0364	-0.0147	-0.0580	0.1251
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.5929	0.0897	-0.0625	-0.0952	0.2359	-0.4241
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6264	0.0897	-0.1980	-0.0952	-0.1265	-0.2461
7	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0061	-0.0364	0.0109	0.0330	0.0349	0.0092
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1876	0.0111	0.0742	0.0167	-0.0722	0.0304
8	0	LC-5: 0.9D+1.0W	-0.0455	-0.0388	-0.0306	0.0017	0.0118	-0.0256
8	1	LC-5: 0.9D+1.0W	-0.0428	-0.0388	-0.0417	0.0017	-0.0597	-0.1025
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1593	0.0706	0.0787	0.0353	0.1123	0.1846
9	0	LC-5: 0.9D+1.0W	-0.0043	-0.0451	0.0359	-0.0240	-0.0485	-0.1110
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0687	0.1566	-0.0461	0.0368	0.1068	0.2041
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1105	0.0322	0.0123	-0.0210	-0.0149	-0.1043
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0443	0.1455	-0.0514	0.0369	0.0547	0.3668
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1191	-0.0603	-0.0092	0.0211	-0.0168	-0.0590
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0814	-0.0736	0.0637	-0.0235	0.0291	0.1838
10	1	LC-5: 0.9D+1.0W	-0.0304	0.0299	-0.0390	0.0214	-0.0491	-0.0733

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1428	-0.1116	0.0646	-0.0236	0.0983	0.0814
11	0	LC-5: 0.9D+1.0W	-0.0511	0.0103	0.0412	-0.0101	-0.0629	-0.0660
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1827	0.0116	-0.0634	0.0004	0.1114	0.0670
11	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1782	0.0116	-0.0816	0.0004	-0.0660	0.0953
11	1	LC-5: 0.9D+1.0W	-0.0545	0.0103	0.0276	-0.0101	0.0213	-0.0408
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2543	-0.0636	0.0711	-0.0092	-0.0457	-0.0598
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0358	0.0053	-0.0242	0.0135	0.0195	0.0684
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0403	0.0053	-0.0423	0.0135	-0.0616	0.0813
12	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2498	-0.0636	0.0530	-0.0092	0.1057	-0.2149
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0307	-0.0424	0.0389	-0.0123	-0.0603	0.0918
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2142	0.1425	-0.0377	0.0066	0.0900	-0.2315
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1041	0.0837	-0.2820	0.0018	-0.1218	0.1889
13	1	LC-5: 0.9D+1.0W	-0.1202	-0.0746	0.0124	-0.0123	0.0351	-0.1456
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5241	-0.1097	-0.0563	-0.0040	-0.0169	0.0004
14	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1774	0.0592	0.0226	0.0111	0.0078	-0.0227
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5231	-0.1029	-0.0672	-0.0038	-0.1027	-0.1506
14	1	LC-5: 0.9D+1.0W	-0.2128	0.0498	0.0197	0.0093	0.0395	0.0733
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1893	-0.1054	0.0633	0.0005	-0.1082	0.1564
15	0	LC-5: 0.9D+1.0W	0.0740	0.0526	-0.0176	-0.0086	0.0389	-0.0692
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1868	-0.1054	0.0530	0.0005	-0.0278	0.0107
15	1	LC-5: 0.9D+1.0W	0.0759	0.0526	-0.0253	-0.0086	0.0092	0.0035
16	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1433	-0.3620	0.0369	-0.0392	-0.0243	0.1124
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0984	-0.3425	0.0233	-0.0417	-0.0061	-0.1018
16	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0233	0.0568	0.0045	0.0141	0.0054	0.0298
17	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1524	-0.0470	0.0301	-0.0315	-0.0287	-0.0495
17	0	LC-5: 0.9D+1.0W	-0.0530	0.0133	-0.0049	0.0119	0.0077	0.0163
17	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0412	0.0090	-0.0104	0.0094	-0.0019	0.0224
17	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2404	-0.0725	0.0228	-0.0195	0.0073	-0.0943
18	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1210	0.0607	-0.0078	-0.0031	-0.0285	-0.0989
18	0	LC-5: 0.9D+1.0W	-0.0280	-0.0162	0.0032	0.0021	0.0091	0.0270
18	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1403	0.0708	-0.0174	-0.0032	-0.0433	-0.0228
18	1	LC-5: 0.9D+1.0W	-0.0510	-0.0263	-0.0022	0.0022	0.0099	0.0019
19	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0546	0.0288	0.0143	0.0020	-0.0390	0.0475

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-5: 0.9D+1.0W	0.0174	-0.0113	0.0040	-0.0017	0.0085	-0.0120
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0373	0.0190	0.0048	0.0020	-0.0281	0.0765
19	1	LC-5: 0.9D+1.0W	-0.0035	-0.0015	-0.0015	-0.0017	0.0100	-0.0209
20	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1387	0.0512	0.0084	0.0157	-0.0117	0.0109
20	0	LC-5: 0.9D+1.0W	-0.0015	-0.0058	0.0072	-0.0116	0.0013	-0.0207
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0620	-0.0174	-0.0221	0.0286	-0.0238	0.0605
20	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0654	0.0174	0.0041	-0.0100	0.0069	-0.0097
21	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1227	0.0491	0.0425	0.0183	-0.0111	0.0397
21	0	LC-5: 0.9D+1.0W	-0.0044	0.0845	-0.0019	-0.0174	0.0065	-0.0384
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
21	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1419	0.2058	0.0423	-0.0063	0.0216	0.0976
22	0	LC-3b: 1.2D+1.6Lr+0.5W	1.2116	0.1985	0.1073	-0.0557	-0.2318	-0.3819
22	0	LC-5: 0.9D+1.0W	-0.1994	-0.0656	-0.0242	-0.0055	0.0457	0.0855
22	1	LC-3b: 1.2D+1.6Lr+0.5W	0.8886	0.0929	0.0449	-0.0469	-0.0573	-0.0745
22	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5175	0.1707	0.0732	-0.0287	0.0153	0.0989
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2680	0.3826	0.1281	0.0186	-0.1467	0.1896
23	0	LC-5: 0.9D+1.0W	0.0264	-0.0876	-0.0023	0.0129	0.0103	0.0123
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2573	0.3694	0.1191	0.0188	-0.0510	0.4819
23	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0203	0.0924	0.0014	-0.0035	0.0085	-0.0155
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3228	-0.0820	0.0774	0.0204	-0.1471	0.5319
24	0	LC-5: 0.9D+1.0W	0.0268	0.0049	-0.0092	0.0106	0.0132	-0.0348
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3099	-0.0865	0.0718	0.0205	-0.1015	0.4818
24	1	LC-5: 0.9D+1.0W	0.0023	0.0138	-0.0106	0.0105	0.0067	-0.0313
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0685	-0.2417	-0.1578	-0.1450	-0.0960	0.0857
25	0	LC-5: 0.9D+1.0W	0.0274	0.0157	0.0094	0.0020	0.0132	-0.0128
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0674	-0.2417	-0.1623	-0.1450	-0.1934	-0.0615
25	1	LC-5: 0.9D+1.0W	0.0283	0.0157	0.0060	0.0020	0.0179	-0.0032
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1886	-0.0895	0.0514	-0.0750	-0.1553	-0.1963
26	0	LC-5: 0.9D+1.0W	-0.0273	0.0144	0.0002	0.0003	0.0156	0.0131
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1821	-0.0846	0.0395	-0.0750	-0.0858	-0.3305
26	1	LC-5: 0.9D+1.0W	-0.0067	0.0047	-0.0074	0.0004	0.0100	0.0299
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1919	0.0697	0.0079	0.0321	-0.0597	-0.3443
27	0	LC-5: 0.9D+1.0W	-0.0084	0.0020	0.0094	-0.0133	0.0004	0.0297
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2825	-0.0808	-0.0592	0.0176	-0.1305	-0.4940

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-5: 0.9D+1.0W	-0.0275	-0.0038	0.0021	-0.0133	0.0090	0.0290
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1239	0.4599	-0.0534	0.0668	-0.0284	-0.4298
28	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0055	0.1217	-0.0157	0.0047	0.0124	-0.0178
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1233	0.4599	-0.0592	0.0668	-0.0717	-0.0764
28	1	LC-5: 0.9D+1.0W	-0.0157	-0.0834	-0.0071	-0.0143	0.0022	-0.0215
29	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1338	0.0547	-0.0195	0.0224	-0.0171	0.0130
29	0	LC-5: 0.9D+1.0W	0.0331	-0.0555	0.0328	0.0029	-0.0022	0.0055
29	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1495	0.1069	-0.0802	0.0264	-0.1474	0.2356
29	1	LC-5: 0.9D+1.0W	0.0518	-0.0493	0.0229	0.0028	0.0494	-0.0917
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2693	-0.0483	-0.0247	0.0049	-0.0315	-0.2364
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3250	0.1657	-0.0643	-0.0059	0.0327	-0.1772
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3512	-0.0348	-0.0536	-0.0067	-0.0705	-0.3311
30	1	LC-5: 0.9D+1.0W	0.0311	0.0018	0.0109	0.0071	0.0070	0.0270
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2241	-0.0719	0.1205	-0.0879	-0.1187	0.2909
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0076	0.0087	0.0040	-0.0066	0.0130	0.0194
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2248	-0.0719	0.1177	-0.0879	-0.0727	0.2631
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0083	0.0087	0.0011	-0.0066	0.0140	0.0228
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1182	-0.2249	0.0749	0.0064	-0.0676	0.2785
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.0121	0.0004	-0.0003	-0.0128	0.0099	0.0224
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1188	-0.2249	0.0691	0.0064	-0.0130	0.1081
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0127	0.0004	-0.0061	-0.0128	0.0075	0.0226
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0227	-0.0351	0.0146	-0.0005	-0.0255	0.0882
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0643	-0.2635	0.0686	0.0267	0.0021	0.1153
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0300	-0.0468	0.0054	-0.0025	-0.0190	0.0632
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0707	-0.2518	-0.0614	0.0286	0.0380	-0.0887
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0515	-0.0115	0.0152	0.0214	-0.0196	0.0592
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2359	-0.1316	0.0027	-0.0247	0.0517	-0.0828
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2791	-0.1356	-0.1325	-0.0236	-0.0343	-0.1849
34	1	LC-5: 0.9D+1.0W	0.0019	-0.0020	-0.0007	-0.0004	0.0029	-0.0030
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0125	-0.0099	-0.0197	0.0235	-0.0200	0.0031
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0341	0.0272	0.0177	0.0192	0.0027	0.0514
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3047	0.0800	-0.1284	-0.0071	-0.1054	-0.1287
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0350	0.0261	0.0122	0.0192	0.0140	0.0711
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1507	0.2435	-0.1851	0.0786	-0.0588	-0.1353

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0074	0.0455	0.0079	-0.0017	0.0106	0.0740
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1510	0.2435	-0.1879	0.0786	-0.1296	-0.0430
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0077	0.0455	0.0050	-0.0017	0.0131	0.0913
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1964	-0.0944	-0.0006	-0.0094	-0.0440	0.1923
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2970	-0.0637	-0.0025	-0.0093	0.0094	0.1206
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2079	-0.1000	-0.0080	-0.0094	-0.0479	0.1039
37	1	LC-5: 0.9D+1.0W	0.0261	0.0194	0.0041	0.0013	0.0079	-0.0084
38	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0858	-0.3352	0.0802	-0.0537	-0.1437	0.6871
38	0	LC-5: 0.9D+1.0W	0.0049	0.1314	-0.0186	0.0038	0.0445	-0.2432
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0405	0.1129	-0.0333	-0.0052	-0.0301	0.1226
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0837	-0.3352	0.0591	-0.0537	0.0493	-0.2422
39	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4683	0.0099	0.0672	0.0514	-0.0747	0.1269
39	0	LC-5: 0.9D+1.0W	-0.1593	0.0031	-0.0083	-0.0070	0.0212	-0.0386
39	1	LC-5: 0.9D+1.0W	0.4031	0.0043	0.0487	0.0425	-0.0028	0.1144
39	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0274	0.0037	0.0034	0.0085	0.0122	0.0064
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6510	-0.6019	0.1394	0.0628	-0.0332	0.2427
40	0	LC-5: 0.9D+1.0W	-0.2083	0.1361	-0.0349	-0.0079	0.0157	-0.0506
40	1	LC-5: 0.9D+1.0W	-0.1968	0.1307	-0.0370	-0.0080	-0.0006	0.0098
40	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6410	-0.5965	0.1356	0.0629	0.0288	-0.0271
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9002	-0.0067	-0.2855	-0.1927	-0.1708	-1.0684
41	0	LC-5: 0.9D+1.0W	-0.2227	0.0000	0.0718	0.0283	0.0407	0.2457
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9121	-0.0030	-0.2899	-0.1926	-0.2988	-1.0732
41	1	LC-5: 0.9D+1.0W	-0.2340	-0.0036	0.0702	0.0282	0.0721	0.2475
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4865	-0.1066	0.0944	-0.0062	-0.1291	-0.0414
42	0	LC-5: 0.9D+1.0W	-0.1501	0.0392	-0.0201	0.0056	0.0337	-0.0096
42	1	LC-5: 0.9D+1.0W	-0.1514	0.0392	-0.0332	0.0056	-0.0274	0.0803
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4847	-0.1066	0.0769	-0.0062	0.0674	-0.2861
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4266	0.2558	-0.0256	0.0173	0.0334	-0.2920
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4224	0.2558	-0.0426	0.0173	-0.0449	0.2951
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
44	0	LC-5: 0.9D+1.0W	0.2314	-0.2084	-0.0138	0.0021	0.0029	0.2379
44	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1598	0.0018	-0.0016	0.0025	0.0119	0.0478
44	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2817	-0.2465	-0.0251	0.0027	-0.0192	0.0006

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-5: 0.9D+1.0W	-0.0807	0.0812	-0.0015	-0.0014	0.0100	0.0015
45	0	LC-5: 0.9D+1.0W	-0.1056	-0.0922	0.0323	0.0080	-0.0279	0.0976
45	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3887	0.2096	-0.0497	0.0005	0.0474	-0.1922
45	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3908	0.2096	-0.0709	0.0005	-0.1198	0.3889
45	1	LC-5: 0.9D+1.0W	-0.1041	-0.0922	0.0165	0.0080	0.0398	-0.1581
46	0	LC-5: 0.9D+1.0W	-0.2592	0.0030	0.0129	0.0003	-0.0167	0.0077
46	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9471	-0.0336	0.0043	0.0077	0.0290	0.0094
46	1	LC-5: 0.9D+1.0W	-0.2618	0.0030	0.0026	0.0003	-0.0024	0.0131
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9437	-0.0336	-0.0094	0.0077	0.0243	-0.0527
47	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5717	0.2805	0.1208	0.0029	-0.0728	-0.0654
47	0	LC-5: 0.9D+1.0W	0.1337	-0.0634	-0.0240	-0.0007	0.0131	0.0213
47	1	LC-5: 0.9D+1.0W	0.1342	-0.0634	-0.0284	-0.0007	-0.0070	-0.0274
47	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5711	0.2805	0.1150	0.0029	0.0178	0.1502
48	0	LC-5: 0.9D+1.0W	0.1435	0.0465	0.0053	-0.0035	-0.0061	-0.0278
48	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6145	-0.1955	0.0073	0.0193	0.0076	0.1501
48	1	LC-5: 0.9D+1.0W	0.1406	0.0451	-0.0034	-0.0035	-0.0048	0.0417
48	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6067	-0.1941	-0.0038	0.0193	0.0103	-0.1466
49	0	LC-5: 0.9D+1.0W	0.1489	-0.0632	0.0098	0.0001	-0.0103	0.0471
49	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5543	0.2169	-0.0151	0.0009	0.0308	-0.1720
49	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1329	0.0532	-0.0112	0.0006	-0.0042	0.0361
49	1	LC-5: 0.9D+1.0W	-0.4546	0.1789	-0.0214	0.0008	-0.0005	0.1331
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5416	-0.2397	0.0289	-0.0028	-0.0240	0.1589
50	0	LC-5: 0.9D+1.0W	0.1510	0.0654	-0.0032	-0.0002	0.0050	-0.0497
50	1	LC-5: 0.9D+1.0W	0.1518	0.0654	-0.0119	-0.0002	-0.0066	0.0506
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5251	-0.2319	0.0175	-0.0028	0.0119	-0.2012
51	0	LC-5: 0.9D+1.0W	0.1514	-0.0167	0.0183	-0.0055	-0.0063	0.0368
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5052	0.0168	-0.0610	0.0213	0.0149	-0.1734
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5063	0.0168	-0.0726	0.0213	-0.0870	-0.1477
51	1	LC-5: 0.9D+1.0W	0.1506	-0.0167	0.0096	-0.0055	0.0149	0.0112
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3837	-0.3398	-0.0516	0.1072	-0.0546	-0.1287
52	0	LC-5: 0.9D+1.0W	0.1195	0.0946	0.0091	-0.0207	0.0068	0.0081
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3809	-0.3366	-0.0578	0.1072	-0.0971	-0.3898
52	1	LC-5: 0.9D+1.0W	0.1141	0.0914	0.0051	-0.0206	0.0124	0.0792
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2451	-0.3431	0.0977	-0.0519	-0.1458	0.6749

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-5: 0.9D+1.0W	-0.3286	0.1020	-0.0203	0.0064	0.0333	-0.1654
53	1	LC-5: 0.9D+1.0W	-0.3148	0.1017	-0.0309	0.0065	-0.0141	0.0240
53	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2289	-0.3427	0.0835	-0.0519	0.0218	0.0395
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0722	-0.5050	1.3441	-0.0764	-11.5256	3.1770
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.2030	0.5050	-1.3441	0.0764	8.8437	-1.6896
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6539	-0.3929	1.2319	-0.0764	-7.3395	1.7179
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.7847	0.3929	-1.2319	0.0764	4.6577	-0.2305
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4358	-0.3929	1.3249	-0.3662	-7.3395	1.6801
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.9242	0.3929	-0.4041	0.1143	4.6577	-0.2142
55	1	LC-3b: 1.2D+1.6Lr+0.5W	-1.5357	-0.1394	0.6787	-0.2460	-4.0745	0.6511
55	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.6970	0.2788	-0.0230	0.0942	4.2310	1.0137
56	0	LC-3b: 1.2D+1.6Lr+0.5W	-1.4671	-0.1394	0.8165	-0.3046	-4.0745	0.6258
56	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.6794	0.2788	0.4072	0.0010	4.2310	1.0181
56	1	LC-3b: 1.2D+1.6Lr+0.5W	-1.0179	-0.0747	0.6292	-0.3046	-1.3656	0.2245
56	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-4.1800	0.1495	0.4072	0.0010	5.7571	1.8207
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7199	0.4068	0.5060	0.4580	-1.2563	-0.3273
100	0	LC-5: 0.9D+1.0W	0.1594	-0.0793	-0.0448	-0.1016	0.1795	0.0656
100	1	LC-5: 0.9D+1.0W	0.1782	-0.1138	-0.1147	-0.1016	-0.0598	-0.2241
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6949	0.4413	0.4128	0.4580	0.1220	0.9449
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0439	0.0394	0.3811	0.0102	-0.5509	-0.0086
101	0	LC-5: 0.9D+1.0W	-0.0181	0.0299	-0.0070	-0.0010	0.0081	-0.0342
101	1	LC-5: 0.9D+1.0W	-0.0181	0.0269	-0.0181	-0.0010	-0.0171	0.0226
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0439	0.0354	0.3663	0.0102	0.1964	0.0662
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0763	0.0721	-0.0357	-0.1675	-0.1111
102	0	LC-5: 0.9D+1.0W	0.2659	-0.0117	-0.0121	0.0039	0.0415	0.0226
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1624	-0.0086	-0.0271	-0.0010	-0.0212	-0.0063
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-1.0077	0.0703	0.0499	-0.0357	0.0154	0.1087
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6391	0.0446	0.0231	0.0040	-0.0209	-0.0556
103	0	LC-5: 0.9D+1.0W	-0.1991	-0.0167	0.0036	-0.0006	0.0000	0.0199
103	1	LC-5: 0.9D+1.0W	-0.1961	-0.0167	-0.0075	-0.0006	-0.0039	-0.0136
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6431	0.0446	0.0083	0.0040	0.0105	0.0336
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.7594	-0.0580	0.0140	-0.0174	-0.0107	0.0884
104	0	LC-5: 0.9D+1.0W	-0.2064	0.0050	0.0065	0.0045	-0.0035	-0.0041
104	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2073	-0.0231	-0.0066	-0.0028	-0.0028	-0.0112

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8168	-0.0604	-0.0012	-0.0188	0.0022	-0.0292
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0632	-0.0110	-0.1097	-0.2915
107	0	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0080	0.0069	0.0273	0.0871
107	1	LC-5: 0.9D+1.0W	0.2373	-0.0364	-0.0252	0.0069	-0.0225	-0.0221
107	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7473	0.0990	0.0403	-0.0110	0.0456	0.0056
106	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0541	0.1212	0.0460	0.0019	-0.0286	-0.1160
106	0	LC-5: 0.9D+1.0W	0.0093	-0.0358	0.0081	-0.0003	-0.0122	0.0334
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
106	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1259	0.0350	0.0020	0.0322	0.0687
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3273	-0.1521	0.1803	0.0027	-0.2928	0.2239
108	0	LC-5: 0.9D+1.0W	0.0652	0.0316	-0.0237	-0.0082	0.0411	-0.0419
108	1	LC-5: 0.9D+1.0W	0.0640	0.0196	-0.0347	-0.0082	-0.0177	0.0120
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3030	-0.0264	0.1376	-0.1003	0.0992	0.0148
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3302	-0.0045	0.1557	0.0789	-0.1962	0.0482
109	0	LC-5: 0.9D+1.0W	-0.0725	0.0206	-0.0253	0.0104	0.0465	-0.0298
109	1	LC-5: 0.9D+1.0W	-0.0695	0.0206	-0.0364	0.0104	-0.0153	0.0114
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3342	-0.0045	0.1409	0.0789	0.1003	0.0392
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1775	0.1290	0.0970	0.0192	-0.1175	-0.1350
110	0	LC-5: 0.9D+1.0W	-0.0752	-0.0453	-0.0228	-0.0134	0.0344	0.0444
110	1	LC-5: 0.9D+1.0W	-0.0736	-0.0357	-0.0309	-0.0134	-0.0063	-0.0173
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1812	0.1194	0.0856	0.0193	0.0198	0.0522
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1858	0.0933	0.0901	-0.0198	-0.1058	-0.1061
111	0	LC-5: 0.9D+1.0W	0.0856	-0.0266	-0.0228	0.0142	0.0334	0.0295
111	1	LC-5: 0.9D+1.0W	0.0833	-0.0266	-0.0311	0.0142	-0.0069	-0.0104
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1888	0.0933	0.0790	-0.0198	0.0210	0.0338

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft) Result Cases

Strength		

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1256	0.0866	0.3594	-0.0228	-1.2696	-0.3160

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
2	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3875	-0.0556	0.3071	-0.3740	-1.1135	0.6031
2	1	LC-5: 0.9D+1.0W	0.2419	0.0247	-0.1721	0.0021	-0.1640	-0.0159
2	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.7235	-0.0390	0.3932	-0.3842	0.2362	0.4287
3	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4715	0.3275	0.8062	0.4197	-3.6246	-1.2620
3	0	LC-5: 0.9D+1.0W	0.0426	-0.0425	-0.1190	0.0085	0.7844	0.2125
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0950	0.0938	0.9649	-0.0005	-0.7991	-0.1742
3	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3872	0.2012	0.2136	0.4306	-0.0477	0.2718
4	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.4681	0.0360	0.9495	0.3920	-5.1444	-0.3333
4	0	LC-5: 0.9D+1.0W	-0.0459	-0.0434	-0.2465	-0.1263	1.5665	0.1244
4	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5229	-0.0660	1.1525	0.5245	-0.9948	-0.4333
4	1	LC-5: 0.9D+1.0W	-0.0542	0.0209	-0.3634	-0.1255	0.0422	0.1041
5	0	LC-5: 0.9D+1.0W	0.1121	0.0505	-0.0618	-0.0009	0.4649	-0.2162
5	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2484	-0.2028	0.6887	0.0218	-2.8722	0.6959
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2112	-0.1070	0.4678	0.0196	0.1749	-0.0894
5	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3432	0.0392	0.0132	0.0163	-0.0809	0.1029
6	0	LC-5: 0.9D+1.0W	-0.1500	0.0820	-0.0106	0.0110	0.0330	-0.1615
6	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4664	-0.3472	0.1565	0.0846	-0.2982	0.8646
6	1	LC-3b: 1.2D+1.6Lr+0.5W	0.4930	-0.3472	-0.1116	0.0846	0.1853	-0.4650
6	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1607	0.0801	-0.0335	0.0178	-0.0501	0.1710
7	0	LC-3b: 1.2D+1.6Lr+0.5W	0.6091	0.1003	-0.0614	-0.0953	0.2351	-0.4327
7	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1587	-0.0702	0.0289	-0.0021	-0.0519	0.1600
7	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6264	0.0897	-0.1980	-0.0952	-0.1265	-0.2461
7	1	LC-5: 0.9D+1.0W	-0.1170	-0.0385	0.0253	-0.0147	0.0032	0.0488
8	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0047	-0.0467	-0.0186	-0.0056	-0.0024	-0.0277
8	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4016	-0.0235	0.0679	0.0312	-0.0501	0.0546
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0924	-0.0652	-0.0338	0.0080	-0.0509	-0.1323
8	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1335	0.0807	0.0777	0.0354	0.1114	0.1936
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1098	0.0322	0.0204	-0.0210	-0.0322	-0.1383
9	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0435	0.1455	-0.0434	0.0369	0.1048	0.2130
9	1	LC-5: 0.9D+1.0W	-0.0037	-0.0451	0.0298	-0.0240	-0.0138	-0.1586
9	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0695	0.1566	-0.0542	0.0368	0.0538	0.3696
10	0	LC-5: 0.9D+1.0W	-0.0298	0.0299	-0.0330	0.0214	-0.0110	-0.1048
10	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2032	-0.1430	0.0764	-0.0213	0.0198	0.2010
10	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2826	-0.1639	0.0242	0.0102	0.0135	-0.1289

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
10	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0806	-0.0736	0.0557	-0.0235	0.0922	0.1060
11	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3123	0.0893	0.0069	-0.0099	-0.0079	-0.1298
11	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1113	-0.0056	-0.0615	0.0007	0.1090	0.0921
11	1	LC-5: 0.9D+1.0W	-0.0545	0.0103	0.0276	-0.0101	0.0213	-0.0408
11	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3733	0.0793	-0.0586	-0.0041	-0.0507	0.1411
12	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2543	-0.0636	0.0711	-0.0092	-0.0457	-0.0598
12	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2049	-0.1001	-0.0130	0.0077	0.0195	0.1607
12	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3760	-0.1551	0.0113	-0.0030	0.0420	-0.2459
12	1	LC-5: 0.9D+1.0W	-0.1381	0.0536	-0.0382	0.0128	-0.0610	0.1365
13	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.2882	0.1577	-0.0285	0.0066	0.0709	-0.2573
13	0	LC-5: 0.9D+1.0W	-0.1336	-0.0764	0.0337	-0.0124	-0.0531	0.1466
13	1	LC-5: 0.9D+1.0W	-0.1358	-0.0764	0.0118	-0.0124	0.0340	-0.1461
13	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3691	0.1600	-0.0312	0.0039	-0.0468	0.3610
14	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3243	-0.0316	-0.0359	0.0024	-0.0035	-0.0632
14	0	LC-5: 0.9D+1.0W	-0.2147	0.0498	0.0275	0.0093	0.0067	0.0042
14	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.5267	-0.1097	-0.0667	-0.0040	-0.1023	-0.1520
14	1	LC-5: 0.9D+1.0W	-0.2164	0.0566	0.0192	0.0095	0.0390	0.0747
15	0	LC-5: 0.9D+1.0W	0.1210	0.0503	-0.0180	-0.0085	0.0386	-0.0710
15	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2364	-0.1031	0.0637	0.0003	-0.1079	0.1582
15	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2091	-0.0359	-0.0078	-0.0073	-0.0050	-0.0343
15	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.2093	-0.0951	0.0493	-0.0003	-0.0251	0.0162
16	0	LC-5: 0.9D+1.0W	-0.0409	0.1339	-0.0063	0.0177	0.0088	-0.0373
16	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1433	-0.3620	0.0369	-0.0392	-0.0243	0.1124
16	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1176	-0.3664	0.0288	-0.0421	-0.0053	-0.1040
16	1	LC-5: 0.9D+1.0W	-0.0406	0.1339	-0.0096	0.0177	0.0042	0.0397
17	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1300	-0.0393	0.0283	-0.0313	-0.0277	-0.0534
17	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0274	-0.0118	0.0036	0.0092	0.0025	0.0223
17	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1860	-0.0566	0.0229	-0.0292	0.0029	-0.1050
17	1	LC-5: 0.9D+1.0W	-0.0537	0.0133	-0.0115	0.0119	-0.0017	0.0316
18	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1740	0.0881	-0.0102	-0.0030	-0.0253	-0.1057
18	0	LC-5: 0.9D+1.0W	-0.0494	-0.0263	0.0042	0.0022	0.0088	0.0321
18	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1189	0.0607	-0.0164	-0.0031	-0.0424	-0.0293
18	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1471	0.0774	-0.0150	0.0004	-0.0108	0.0508
19	0	LC-5: 0.9D+1.0W	-0.0020	-0.0015	0.0049	-0.0017	0.0080	-0.0193

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
19	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1373	-0.0610	0.0042	0.0002	-0.0196	0.0799
19	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1576	-0.0742	-0.0076	-0.0016	-0.0031	-0.0345
19	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0567	0.0288	0.0057	0.0020	-0.0275	0.0805
20	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1641	0.0553	0.0178	-0.0023	-0.0096	-0.0334
20	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0611	-0.0174	-0.0133	0.0286	-0.0035	0.0805
20	1	LC-5: 0.9D+1.0W	-0.0021	-0.0058	0.0006	-0.0116	0.0058	-0.0274
20	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1379	0.0512	-0.0003	0.0157	-0.0070	0.0697
21	0	LC-5: 0.9D+1.0W	0.0123	0.0998	0.0023	-0.0174	0.0061	-0.0386
21	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0501	-0.2713	-0.0128	0.0371	-0.0090	0.0958
21	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0496	-0.2713	-0.0171	0.0371	-0.0176	-0.0595
21	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1419	0.2058	0.0423	-0.0063	0.0216	0.0976
22	0	LC-3b: 1.2D+1.6Lr+0.5W	1.2143	0.1978	0.1074	-0.0559	-0.2317	-0.3848
22	0	LC-5: 0.9D+1.0W	-0.2048	-0.0642	-0.0244	-0.0051	0.0455	0.0913
22	1	LC-3b: 1.2D+1.6Lr+0.5W	0.8913	0.0922	0.0451	-0.0472	-0.0570	-0.0786
22	1	LC-3b: 1.2D+1.6Lr+0.5W	0.5533	0.2692	0.0615	-0.1386	-0.0061	0.2168
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1233	0.5913	0.0257	-0.0609	-0.0224	-0.2708
23	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1962	0.2224	0.1074	0.0354	-0.1203	0.2020
23	1	LC-5: 0.9D+1.0W	0.0259	-0.0876	-0.0067	0.0129	0.0068	-0.0551
23	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1833	0.4730	0.0828	-0.0525	-0.0379	0.4945
24	0	LC-5: 0.9D+1.0W	0.0020	0.0138	-0.0071	0.0105	0.0120	-0.0397
24	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3104	-0.0865	0.0764	0.0205	-0.1465	0.5344
24	1	LC-5: 0.9D+1.0W	0.0272	0.0049	-0.0127	0.0106	0.0066	-0.0318
24	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3223	-0.0820	0.0728	0.0204	-0.1014	0.4821
25	0	LC-5: 0.9D+1.0W	0.0034	0.0047	0.0083	0.0020	0.0129	-0.0134
25	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1596	-0.2743	0.0151	0.0743	-0.0313	0.1420
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.0225	-0.2015	-0.1340	-0.1361	-0.1464	-0.0715
25	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1863	-0.1095	-0.0438	-0.0302	-0.1188	0.0446
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1793	-0.0846	0.0509	-0.0750	-0.1549	-0.2012
26	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0481	-0.2282	0.1914	-0.0735	-0.0322	0.0754
26	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1526	-0.2511	-0.0416	-0.0787	-0.0712	-0.3571
26	1	LC-5: 0.9D+1.0W	-0.0252	0.0144	-0.0083	0.0003	0.0094	0.0352
27	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2813	-0.0808	-0.0476	0.0176	-0.0489	-0.3705
27	0	LC-5: 0.9D+1.0W	-0.0284	-0.0038	0.0108	-0.0133	-0.0009	0.0348
27	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2725	-0.0837	-0.0585	0.0176	-0.1300	-0.4958

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
27	1	LC-5: 0.9D+1.0W	-0.0075	0.0020	0.0007	-0.0133	0.0081	0.0327
28	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1158	0.4577	-0.0527	0.0668	-0.0284	-0.4304
28	0	LC-5: 0.9D+1.0W	0.0009	-0.0791	-0.0040	-0.0142	0.0058	0.0439
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0968	0.2991	-0.0626	0.0417	-0.0673	-0.1206
28	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0204	0.2826	-0.0182	0.0298	-0.0063	0.1200
29	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1976	0.0496	0.0120	0.0667	-0.0034	-0.0868
29	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1113	-0.0076	-0.0385	0.0103	-0.0111	0.0632
29	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0816	-0.0707	0.0151	0.0037	0.0360	-0.1092
29	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1283	0.1131	-0.0798	0.0263	-0.1470	0.2410
30	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3505	-0.0348	-0.0466	-0.0067	-0.0244	-0.2991
30	0	LC-5: 0.9D+1.0W	0.0317	0.0018	0.0161	0.0071	-0.0054	0.0253
30	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.3377	-0.0398	-0.0524	-0.0065	-0.0702	-0.3323
30	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0807	0.0603	-0.0094	0.0072	-0.0004	0.0314
31	0	LC-5: 0.9D+1.0W	0.0023	0.0036	0.0032	0.0000	-0.0043	-0.0044
31	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2361	-0.0794	0.1266	-0.0933	-0.1185	0.3142
31	1	LC-5: 0.9D+1.0W	0.0018	0.0036	0.0011	0.0000	-0.0035	-0.0030
31	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2368	-0.0794	0.1237	-0.0933	-0.0701	0.2836
32	0	LC-5: 0.9D+1.0W	-0.0014	0.0028	0.0046	0.0018	-0.0033	-0.0026
32	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.1220	-0.2387	0.0751	0.0027	-0.0655	0.2993
32	1	LC-5: 0.9D+1.0W	-0.0018	0.0028	0.0002	0.0018	-0.0015	-0.0005
32	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1226	-0.2387	0.0694	0.0027	-0.0108	0.1184
33	0	LC-5: 0.9D+1.0W	-0.0031	-0.0004	0.0038	0.0016	-0.0002	-0.0009
33	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0643	-0.2635	0.0686	0.0267	0.0021	0.1153
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0718	-0.2524	-0.0615	0.0287	0.0380	-0.0889
33	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0289	-0.0463	0.0055	-0.0025	-0.0190	0.0634
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.2359	-0.1316	0.0027	-0.0247	0.0517	-0.0828
34	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0515	-0.0115	0.0152	0.0214	-0.0196	0.0592
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2791	-0.1356	-0.1325	-0.0236	-0.0343	-0.1849
34	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0418	-0.0075	0.0146	0.0203	-0.0031	0.0515
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3028	0.0790	-0.1227	-0.0070	-0.0103	-0.1894
35	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0341	0.0272	0.0177	0.0192	0.0027	0.0514
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2926	0.0743	-0.1187	-0.0133	-0.0945	-0.1310
35	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0471	0.0319	0.0025	0.0255	0.0031	0.0735
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1469	0.2335	-0.1698	0.0660	-0.0551	-0.1380

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
36	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0112	0.0555	-0.0074	0.0109	0.0069	0.0767
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1472	0.2335	-0.1727	0.0660	-0.1200	-0.0494
36	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0115	0.0555	-0.0103	0.0109	0.0035	0.0977
37	0	LC-5: 0.9D+1.0W	0.0249	0.0194	0.0092	0.0013	0.0018	-0.0262
37	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.2339	-0.2648	0.0176	0.0494	-0.0428	0.2906
37	1	LC-5: 0.9D+1.0W	-0.0004	0.0081	0.0030	0.0012	0.0073	-0.0117
37	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.1947	-0.0944	-0.0074	-0.0094	-0.0476	0.1055
38	0	LC-5: 0.9D+1.0W	0.0258	0.1327	-0.0184	0.0038	0.0441	-0.2459
38	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0649	-0.3365	0.0800	-0.0537	-0.1434	0.6898
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0628	-0.3365	0.0589	-0.0537	0.0492	-0.2431
38	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.0614	0.1142	-0.0331	-0.0052	-0.0301	0.1235
39	0	LC-5: 0.9D+1.0W	-0.1691	0.0075	-0.0077	-0.0069	0.0207	-0.0424
39	0	LC-3b: 1.2D+1.6Lr+0.5W	0.4674	-0.0567	0.0428	0.0351	-0.0463	0.1506
39	1	LC-5: 0.9D+1.0W	-0.1577	0.0031	-0.0147	-0.0070	0.0080	-0.0350
39	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4704	0.0099	0.0586	0.0514	-0.0022	0.1384
40	0	LC-5: 0.9D+1.0W	-0.2083	0.1361	-0.0349	-0.0079	0.0157	-0.0506
40	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6510	-0.6019	0.1394	0.0628	-0.0332	0.2427
40	1	LC-3b: 1.2D+1.6Lr+0.5W	0.6218	-0.4828	0.0983	0.0452	0.0213	-0.0324
40	1	LC-5: 0.9D+1.0W	-0.2077	0.1361	-0.0374	-0.0079	-0.0005	0.0106
41	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9117	-0.0030	-0.2865	-0.1926	-0.1704	-1.0718
41	0	LC-5: 0.9D+1.0W	-0.2342	-0.0036	0.0728	0.0282	0.0403	0.2491
41	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9121	-0.0030	-0.2899	-0.1926	-0.2988	-1.0732
41	1	LC-5: 0.9D+1.0W	-0.2340	-0.0036	0.0702	0.0282	0.0721	0.2475
42	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4103	-0.0816	0.0844	-0.0055	-0.1160	-0.0595
42	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1914	-0.0671	0.0295	0.0029	-0.0317	0.0549
42	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4847	-0.1066	0.0769	-0.0062	0.0674	-0.2861
42	1	LC-5: 0.9D+1.0W	-0.1514	0.0392	-0.0332	0.0056	-0.0274	0.0803
43	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4266	0.2558	-0.0256	0.0173	0.0334	-0.2920
43	0	LC-5: 0.9D+1.0W	-0.1409	-0.0720	0.0216	-0.0064	-0.0170	0.0832
43	1	LC-5: 0.9D+1.0W	-0.1440	-0.0720	0.0088	-0.0064	0.0179	-0.0822
43	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.4224	0.2558	-0.0426	0.0173	-0.0449	0.2951
44	0	LC-5: 0.9D+1.0W	-0.1156	0.0766	0.0050	-0.0022	0.0071	-0.1003
44	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3203	-0.2419	-0.0166	0.0034	0.0056	0.2927
44	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0924	0.0554	-0.0050	-0.0021	0.0080	-0.0121

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
44	1	LC-3b: 1.2D+1.6Lr+0.5W	0.3312	-0.1407	-0.0195	0.0047	-0.0078	0.0549
45	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3887	0.2096	-0.0497	0.0005	0.0474	-0.1922
45	0	LC-5: 0.9D+1.0W	-0.1056	-0.0922	0.0323	0.0080	-0.0279	0.0976
45	1	LC-5: 0.9D+1.0W	-0.0460	-0.0941	0.0158	0.0084	0.0384	-0.1658
45	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.3327	0.2114	-0.0702	0.0002	-0.1185	0.3966
46	0	LC-5: 0.9D+1.0W	0.7854	-0.0270	0.0025	0.0063	0.0251	0.0060
46	0	LC-3b: 1.2D+1.6Lr+0.5W	0.3402	-0.0170	0.0111	0.0033	-0.0031	0.0236
46	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.9571	-0.0345	-0.0095	0.0077	0.0241	-0.0531
46	1	LC-5: 0.9D+1.0W	-0.2752	0.0038	0.0027	0.0003	-0.0022	0.0135
47	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5717	0.2805	0.1208	0.0029	-0.0728	-0.0654
47	0	LC-5: 0.9D+1.0W	0.1337	-0.0634	-0.0240	-0.0007	0.0131	0.0213
47	1	LC-5: 0.9D+1.0W	0.1342	-0.0634	-0.0284	-0.0007	-0.0070	-0.0274
47	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5711	0.2805	0.1150	0.0029	0.0178	0.1502
48	0	LC-5: 0.9D+1.0W	0.1435	0.0465	0.0053	-0.0035	-0.0061	-0.0278
48	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6145	-0.1955	0.0073	0.0193	0.0076	0.1501
48	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.6117	-0.1955	-0.0040	0.0193	0.0102	-0.1479
48	1	LC-5: 0.9D+1.0W	0.1456	0.0465	-0.0032	-0.0035	-0.0046	0.0430
49	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5543	0.2169	-0.0151	0.0009	0.0308	-0.1720
49	0	LC-5: 0.9D+1.0W	0.1489	-0.0632	0.0098	0.0001	-0.0103	0.0471
49	1	LC-5: 0.9D+1.0W	0.1510	-0.0632	0.0012	0.0001	-0.0019	-0.0498
49	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5515	0.2169	-0.0265	0.0009	-0.0012	0.1607
50	0	LC-5: 0.9D+1.0W	0.1510	0.0654	-0.0032	-0.0002	0.0050	-0.0497
50	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5416	-0.2397	0.0289	-0.0028	-0.0240	0.1589
50	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5404	-0.2397	0.0172	-0.0028	0.0113	-0.2089
50	1	LC-5: 0.9D+1.0W	0.1518	0.0654	-0.0119	-0.0002	-0.0066	0.0506
51	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5052	0.0168	-0.0610	0.0213	0.0149	-0.1734
51	0	LC-5: 0.9D+1.0W	0.1514	-0.0167	0.0183	-0.0055	-0.0063	0.0368
51	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5010	0.0161	-0.0725	0.0213	-0.0869	-0.1480
51	1	LC-5: 0.9D+1.0W	0.1453	-0.0160	0.0094	-0.0055	0.0148	0.0116
52	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3795	-0.3366	-0.0520	0.1072	-0.0546	-0.1291
52	0	LC-5: 0.9D+1.0W	0.1152	0.0914	0.0094	-0.0206	0.0068	0.0084
52	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.3852	-0.3398	-0.0574	0.1072	-0.0969	-0.3919
52	1	LC-5: 0.9D+1.0W	0.1184	0.0946	0.0047	-0.0207	0.0122	0.0814
53	0	LC-5: 0.9D+1.0W	-0.3286	0.1020	-0.0203	0.0064	0.0333	-0.1654

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
53	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	1.2451	-0.3431	0.0977	-0.0519	-0.1458	0.6749
53	1	LC-5: 0.9D+1.0W	-0.3296	0.1020	-0.0309	0.0064	-0.0141	0.0233
53	1	LC-3b: 1.2D+1.6Lr+0.5W	1.0619	-0.2075	0.0542	-0.0367	0.0143	0.0482
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9221	0.8050	0.1030	-0.4734	-3.4259	-4.7973
54	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-5.3530	-0.8050	-0.1030	0.4734	1.4548	7.3206
54	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.5038	0.6929	0.2151	-0.4734	-2.9090	-2.3632
54	1	LC-3b: 1.2D+1.6Lr+0.5W	-4.1946	-0.1965	-0.1076	0.2174	-0.5863	5.4995
55	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.4601	0.6929	0.2973	-0.0665	-2.9090	-2.4092
55	0	LC-3b: 1.2D+1.6Lr+0.5W	-4.1522	-0.1965	0.6041	-0.7168	-0.5863	5.4569
55	1	LC-5: 0.9D+1.0W	0.5254	0.2788	0.2438	-0.0350	-1.9815	-1.2535
55	1	LC-3b: 1.2D+1.6Lr+0.5W	-3.7423	-0.1394	0.4758	-0.7168	1.1998	4.9014
56	0	LC-5: 0.9D+1.0W	0.5455	0.2788	0.1947	0.0799	-1.9815	-1.2514
56	0	LC-3b: 1.2D+1.6Lr+0.5W	-3.6830	-0.1394	0.8165	-1.1625	1.1998	4.8152
56	1	LC-5: 0.9D+1.0W	0.9880	-0.1495	0.4481	-0.3686	-1.1933	-0.4489
56	1	LC-3b: 1.2D+1.6Lr+0.5W	-3.2636	0.0747	0.5181	-0.9383	3.9086	4.4139
100	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7409	0.3930	0.4787	0.4289	-1.1844	-0.3375
100	0	LC-5: 0.9D+1.0W	0.1594	-0.0793	-0.0448	-0.1016	0.1795	0.0656
100	1	LC-5: 0.9D+1.0W	0.1982	-0.0760	-0.1147	-0.1009	-0.0597	-0.2388
100	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7150	0.4035	0.4127	0.4574	0.1218	0.9595
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0088	0.0988	0.3309	0.0048	-0.4890	-0.0769
101	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1805	0.0944	0.0387	-0.1079	0.2130
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1721	-0.1845	0.0797	0.0387	0.0662	-0.1519
101	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0088	0.0948	0.3161	0.0048	0.1581	0.1168
102	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9837	0.0770	0.0677	-0.0337	-0.1564	-0.1124
102	0	LC-5: 0.9D+1.0W	0.2659	-0.0117	-0.0121	0.0039	0.0415	0.0226
102	1	LC-5: 0.9D+1.0W	0.2659	-0.0162	-0.0287	0.0039	-0.0197	-0.0193
102	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.9837	0.0710	0.0455	-0.0337	0.0134	0.1096
103	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6391	0.0446	0.0231	0.0040	-0.0209	-0.0556
103	0	LC-5: 0.9D+1.0W	-0.1991	-0.0167	0.0036	-0.0006	0.0000	0.0199
103	1	LC-5: 0.9D+1.0W	-0.1961	-0.0167	-0.0075	-0.0006	-0.0039	-0.0136
103	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.6431	0.0446	0.0083	0.0040	0.0105	0.0336
104	0	LC-5: 0.9D+1.0W	-0.2133	0.0055	0.0066	0.0044	-0.0036	-0.0046
104	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	0.0140	-0.0188	-0.0106	0.0922
104	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.8237	-0.0609	-0.0013	-0.0188	0.0022	-0.0296

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
104	1	LC-5: 0.9D+1.0W	-0.2133	0.0055	-0.0049	0.0044	-0.0018	0.0063
107	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.7090	0.1063	0.0620	-0.0109	-0.1078	-0.3038
107	0	LC-5: 0.9D+1.0W	0.1990	-0.0437	-0.0068	0.0067	0.0254	0.0995
107	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2086	-0.0222	-0.0042	0.0019	0.0019	-0.0529
107	1	LC-5: 0.9D+1.0W	-0.5867	0.0921	0.0338	-0.0095	0.0373	0.0173
106	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1229	0.0461	0.0020	-0.0286	-0.1179
106	0	LC-5: 0.9D+1.0W	0.0434	-0.0375	0.0081	-0.0004	-0.0122	0.0353
106	1	LC-5: 0.9D+1.0W	0.0434	-0.0352	-0.0002	-0.0004	-0.0063	-0.0192
106	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0883	0.1259	0.0350	0.0020	0.0322	0.0687
108	0	LC-5: 0.9D+1.0W	0.0652	0.0316	-0.0237	-0.0082	0.0411	-0.0419
108	0	LC-3b: 1.2D+1.6Lr+0.5W	-0.3273	-0.1521	0.1803	0.0027	-0.2928	0.2239
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2184	-0.1389	0.1492	-0.1305	0.0408	-0.1049
108	1	LC-3b: 1.2D+1.6Lr+0.5W	-0.2159	0.0294	0.0781	-0.0980	0.0692	0.0501
109	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.0509	0.0252	-0.0107	0.0160	0.0314	-0.0299
109	0	LC-3b: 1.2D+1.6Lr+0.5W	0.1915	-0.1042	0.0754	-0.0111	-0.1086	0.1603
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.1878	-0.1045	0.0605	-0.0110	0.0272	-0.0494
109	1	LC-3b: 1.2D+1.6Lr+0.5W	0.2315	0.0318	0.0784	0.0862	0.0732	0.0559
110	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1775	0.1290	0.0970	0.0192	-0.1175	-0.1350
110	0	LC-5: 0.9D+1.0W	-0.0752	-0.0453	-0.0228	-0.0134	0.0344	0.0444
110	1	LC-5: 0.9D+1.0W	-0.0729	-0.0453	-0.0312	-0.0134	-0.0061	-0.0236
110	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	0.1453	0.1236	0.0796	0.0170	0.0178	0.0600
111	0	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1801	0.0982	0.0897	-0.0196	-0.1055	-0.1095
111	0	LC-3b: 1.2D+1.6Lr+0.5W	0.0310	-0.0813	0.0086	0.0057	-0.0015	0.0708
111	1	LC-3b: 1.2D+1.6Lr+0.5W	0.0281	-0.0813	-0.0025	0.0057	0.0031	-0.0512
111	1	LC-4: 1.2D+1.0W+1.0L+0.5Lr	-0.1830	0.0982	0.0786	-0.0196	0.0207	0.0377

Butterfly Report

Friday, June 14, 2024	**harshi.chauhan**	**Tel:**

PROJECT SUMMARY

INPUT PROPERTIES	Count
Universal Restraints	NONE
Materials	2
Sections	4
User Coordinate System	NONE
Spring Curves	NONE
Isolater Property	NONE
Creep Definitions	NONE

INPUT GEOMETRY	Count
Joints	16
Members	19
Shells	4
Springs	NONE
Isolaters	NONE
Mass Elements	NONE
DOF Constraints	NONE
Tendons	NONE

Load Cases	Count
Load Cases	22
Combination Cases	NONE
Construction Stages	NONE
Linked Databases	NONE

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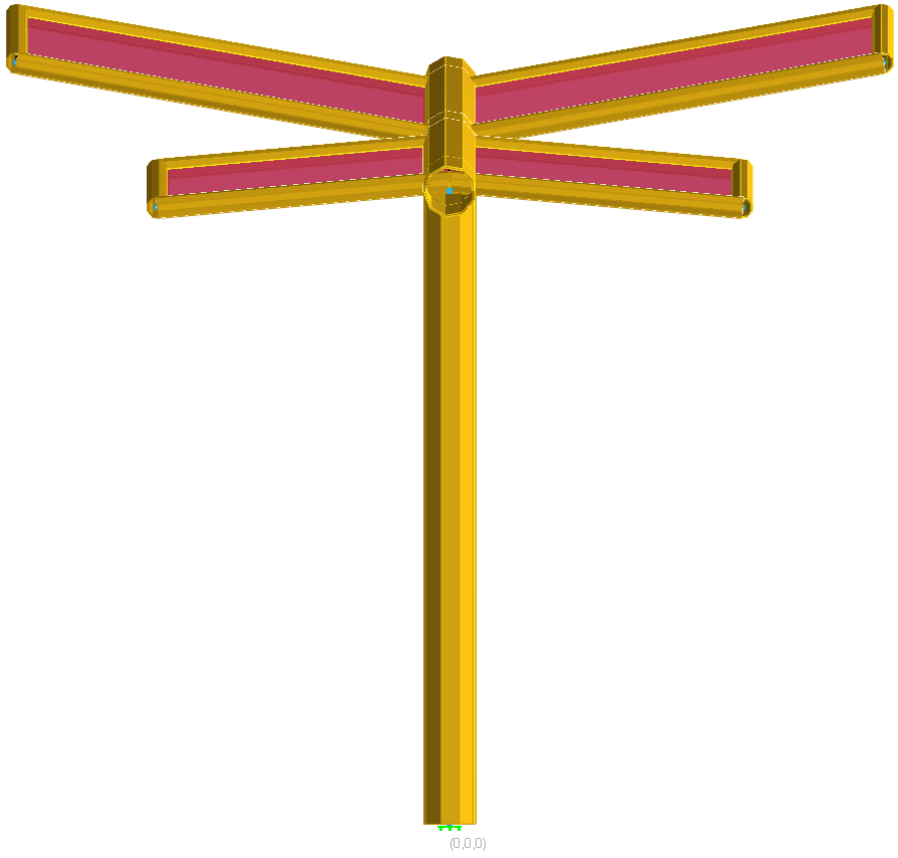
Graphics View 1

Zoom 1.000X



Local/UCS Axes

INPUT : Material Properties

Name	Modulus of Elasticity (E) (lb/in²)	Poisson's Ratio	Shear Modulus (G) (lb/in²)	Unit Weight (lb/in³)	Thermal Expansion (1/ °F *10^-6)	Assigned
A53 Gr B	2.90e7	0.2946	1.12e7	0.2836	6.500000	Yes
A53 Gr B (43% Perforated)	2.90e7	0.2946	1.12e7	0.1616	6.500000	Yes

INPUT : Sections

Name	Section Area (in²)	Shear Area in yy (in²)	Shear Area in zz (in²)	Torsion Constant (in^4)	Inertia Izz (in^4)	Inertia Iyy (in^4)	Plastic Modulus Zyy (in³)	Plastic Modulus Zzz (in³)	Perimeter (in)	Material Time-Effect	Ductility	Residual Strength (%)	Assigned
HSS3.000x0.250 [DB:American	2.03	1.8549	1.8549	3.9	1.95	1.95	1.79	1.79	9.4248	0	50	0	No
Std 8" Pipe	6.0868	5.8905	5.8905	91.4928	45.7464	45.7464	0.0000	0.0000	25.1327	(NONE)	50.	0.	No
PIPE8STD [DB:American v3]	8.4	8.0786	8.0786	145	72.5	72.5	22.2	22.2	27.1119	0	50	0	Yes
PIPE3STD [DB:American v3]	2.23	2.0819	2.0819	6.03	3.02	3.02	2.33	2.33	10.9956	0	50	0	Yes

INPUT : Section Stress Points

Name	Point 1 Y (in)	Point 1 Z (in)	Point 2 Y (in)	Point 2 Z (in)	Point 3 Y (in)	Point 3 Z (in)	Point 4 Y (in)	Point 4 Z (in)	Point 5 Y (in)	Point 5 Z (in)	Point 6 Y (in)	Point 6 Z (in)
HSS3.000x0.250	1.5000	1.5000	1.5000	-1.5000	-1.5000	-1.5000	-1.5000	1.5000	(NONE)	(NONE)	(NONE)	(NONE)
Std 8" Pipe	4.0000	4.0000	4.0000	-4.0000	-4.0000	-4.0000	-4.0000	4.0000	(NONE)	(NONE)	(NONE)	(NONE)
PIPE8STD	4.3150	4.3150	4.3150	-4.3150	-4.3150	-4.3150	-4.3150	4.3150	(NONE)	(NONE)	(NONE)	(NONE)
PIPE3STD	1.7500	1.7500	1.7500	-1.7500	-1.7500	-1.7500	-1.7500	1.7500	(NONE)	(NONE)	(NONE)	(NONE)

INPUT : Section Dimensions

Name	Shape	Dimension D1	Dimension D2	Dimension D3	Dimension D4	Dimension D5	Dimension D6
HSS3.000x0.250 [DB:American	Hollow Circle (DB)	3	.233				
Std 8" Pipe	Hollow Circle	8.0000	0.2500				
PIPE8STD [DB:American v3]	Hollow Circle (DB)	8.63	.322				
PIPE3STD [DB:American v3]	Hollow Circle (DB)	3.5	.216				

INPUT : Joints

ID	X (ft)	Y (ft)	Z (ft)	Translation DOF	Rotation DOF	Displacement UCS	Assigned
1	0.0000	0.0000	0.0000	all fixed	all fixed	Global	Yes
2	0.0000	0.0000	9.3366	all free	all free	Global	Yes
3	0.0000	-5.2814	8.5944	all free	all free	Global	Yes
4	0.0000	5.2814	10.0789	all free	all free	Global	Yes
5	0.0000	-4.3943	8.7190	all free	all free	Global	Yes
6	3.9792	-4.3943	8.3709	all free	all free	Global	Yes
7	3.9792	-0.7221	8.8870	all free	all free	Global	Yes
8	-3.9792	-0.7221	8.8870	all free	all free	Global	Yes
9	-3.9792	-4.3943	8.3709	all free	all free	Global	Yes
10	0.0000	-0.2682	9.2989	all free	all free	Global	Yes
11	5.8958	-0.2682	10.3385	all free	all free	Global	Yes
12	5.8958	4.3943	10.9938	all free	all free	Global	Yes
13	0.0000	4.3943	9.9542	all free	all free	Global	Yes
14	-5.8958	4.3943	10.9938	all free	all free	Global	Yes
15	-5.8958	-0.2682	10.3385	all free	all free	Global	Yes
16	0.0000	-0.7221	9.2351	all free	all free	Global	Yes

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force (kips)	Length (ft)	Rigid Zone from Start (x/L)	Rigid Zone from End (x/L)	Orientation Angle (deg)	Castin g (day)	Structure Group
1	1	2	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	9.3366	0.0000	0.0000	0.0000	0	(none)
2	3	5	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	.8958	0.0000	0.0000	0.0000	0	(none)
3	5	16	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.7083	0.0000	0.0000	0.0000	0	(none)
4	10	2	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	.2708	0.0000	0.0000	0.0000	0	(none)
5	2	13	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	4.4375	0.0000	0.0000	0.0000	0	(none)
6	13	4	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	.8958	0.0000	0.0000	0.0000	0	(none)
7	5	6	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.9944	0.0000	0.0000	0.0000	0	Smaller Wings
8	6	7	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.7083	0.0000	0.0000	0.0000	0	Smaller Wings
9	7	16	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.9944	0.0000	0.0000	0.0000	0	Smaller Wings
10	16	8	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.9944	0.0000	0.0000	0.0000	0	Smaller Wings

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force (kips)	Length (ft)	Rigid Zone from Start (x/L)	Rigid Zone from End (x/L)	Orientation Angle (deg)	Castin g (day)	Structure Group
11	8	9	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.7083	0.0000	0.0000	0.0000	0	Smaller Wings
12	9	5	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	3.9944	0.0000	0.0000	0.0000	0	Smaller Wings
13	10	11	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	5.9868	0.0000	0.0000	0.0000	0	Larger Wings
14	11	12	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	4.7083	0.0000	0.0000	0.0000	0	Larger Wings
15	12	13	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	5.9868	0.0000	0.0000	0.0000	0	Larger Wings
16	13	14	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	5.9868	0.0000	0.0000	0.0000	0	Larger Wings
17	14	15	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	4.7083	0.0000	0.0000	0.0000	0	Larger Wings
18	15	10	-	Beam	PIPE3STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	5.9868	0.0000	0.0000	0.0000	0	Larger Wings
19	16	10	-	Beam	PIPE8STD [DB:American v3]	(same as start)	A53 Gr B	0.0000	.4584	0.0000	0.0000	0.0000	0	(none)

INPUT : Member End Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Shells

ID	Bending Type	Membrane Type	I-Joint	J-Joint	K-Joint	L-Joint	Material	Thickness (in)	Casting (day)	Structure Group	Area (ft²)	Material Angle (°)
1	Thin Plate	Inactive	5	6	7	16	A53 Gr B (43%	0.1250	0	(none)	14.8113	
2	Thin Plate	Inactive	9	5	16	8	A53 Gr B (43%	0.1250	0	(none)	14.8113	
3	Thin Plate	Inactive	10	11	12	13	A53 Gr B (43%	0.1250	0	(none)	28.1794	
4	Thin Plate	Inactive	15	10	13	14	A53 Gr B (43%	0.1250	0	(none)	28.1794	

INPUT : More Material Properties

Name	Yield Stress (lb/in²)	Post-yield to Initial Slope Ratio	Concrete Strength Specimen	Concrete Fck or Steel Fu (lb/in²)	Concrete Cement Hardening Type	Tendon GUTS (lb/in²)	Material Time-Effect	Assigned
A53 Gr B	35,000.00	0.020	Cylinder	58,000.00	Not Concrete	0.00	(NONE)	Yes
A53 Gr B (43% Perforated)	0.00	0.020	Cylinder	0.00	Not Concrete	0.00	(NONE)	Yes

INPUT : Shell Offsets

ID	I-Offset X (ft)	I-Offset Y (ft)	I-Offset Z (ft)	J-Offset X (ft)	J-Offset Y (ft)	J-Offset Z (ft)	K-Offset X (ft)	K-Offset Y (ft)	K-Offset Z (ft)	L-Offset X (ft)	L-Offset Y (ft)	L-Offset Z (ft)
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

INPUT : Orthotropic Material Properties

Name	Anisotropy	Material UCS	Modulus of Elasticity E11 (lb/in²)	Modulus of Elasticity E22 (lb/in²)	Poisson's Ratio m12	Shear Modulus G12 (lb/in²)	Shear Modulus G13 (lb/in²)	Shear Modulus G23 (lb/in²)	Assigned
A53 Gr B	Isotropic	(NONE)							Yes
A53 Gr B (43%	Isotropic	(NONE)							Yes

STRUCTURE GROUP SUMMARY

Smaller Wings						
Joints						
5	6	7	2	8	9	16
Members						
7	8	9	10	11	12	
Larger Wings						
Joints						
10	11	12	13	14	15	
Members						
13	14	15	16	17	18	

Load Cases

ID	Name	Analysis Type	Class	Status	Weight Factor X	Weight Factor Y	Weight Factor Z	Is Dynamic Mass?	Assigned	# of Joint Loads	# of Support Loads	# of Member Loads	# of Member Therma	# of Shell Loads	# of Solid Loads	# of Moving Loads	# of THA Loading	# of THA Initial
1	DC	Static	Dead Load	Activ	0.0000	0.0000	-1.0000	No	No	0	0	0	0	0	0	0	0	0
4	LL Hang1	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
5	LL Hang2	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
6	LL Hang3	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
7	LL Hang4	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
8	LL Hang5	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
13	LL Hang6	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
20	LL Roof	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	4	0	0	0	0
27	Wind Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	12	0	0	0	0	0	0
28	Wind Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	12	0	0	0	0	0	0
32	Wind Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	4	0	0	0	0
33	Wind Strength	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	4	0	0	0	0
36	E_h - Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	4	0	0	0	0	0	0
37	E_h + Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	4	0	0	0	0	0	0
38	E_v	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	2	0	0	0	0	0	0
40	LL Lean -X	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
41	LL Lean +Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0

Load Cases

ID	Name	Analysis Type	Class	Status	Weight Factor X	Weight Factor Y	Weight Factor Z	Is Dynamic Mass?	Assigned	# of Joint Loads	# of Support Loads	# of Member Loads	# of Member Therma	# of Shell Loads	# of Solid Loads	# of Moving Loads	# of THA Loading	# of THA Initial
42	LL Lean -Y	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0
43	LL Roof-1	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	2	0	0	0	0
44	LL Roof-2	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	0	0	2	0	0	0	0
45	Capture from	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	26	0	0	0	0	0	0
46	Load Case 46	Static	None	Activ	0.0000	0.0000	0.0000	No	No	0	0	1	0	0	0	0	0	0

Load Case LL Hang1, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
17	Uniform Force	Global Z	-0.3000		0.0000	0.1062
16	Uniform Force	Global Z	-0.3000		0.9160	1.0000

Load Case LL Hang2, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
17	Uniform Force	Global Z	-0.3000		0.8938	1.0000
18	Uniform Force	Global Z	-0.3000		0.0000	0.0840

Load Case LL Hang3, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
17	Uniform Force	Global Z	-0.3000		0.3938	0.6062

Load Case LL Hang4, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
16	Uniform Force	Global Z	-0.3000		0.8320	1.0000

Load Case LL Hang5, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Z	-0.3349		0.0000	1.0000

Load Case LL Hang6, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
2	Uniform Force	Global Z	-0.3349		0.0000	1.0000

Load Case LL Roof, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
1	Uniform Force	Local z	-0.0050			0.0000	0.0000
2	Uniform Force	Local z	-0.0050			0.0000	0.0000
3	Uniform Force	Local z	-0.0050			0.0000	0.0000
4	Uniform Force	Local z	-0.0050			0.0000	0.0000

Load Case Wind Strength - Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Uniform Force	Global Y	-0.0131		0.0000	1.0000
1	Uniform Force	Global X	-0.0131		0.0000	1.0000
2	Uniform Force	Global X	-0.0131		0.0000	1.0000
3	Uniform Force	Global X	-0.0131		0.0000	1.0000
19	Uniform Force	Global X	-0.0131		0.0000	1.0000
5	Uniform Force	Global X	-0.0131		0.0000	1.0000
6	Uniform Force	Global X	-0.0131		0.0000	1.0000
2	Uniform Force	Global Y	-0.0018		0.0000	1.0000
3	Uniform Force	Global Y	-0.0018		0.0000	1.0000
19	Uniform Force	Global Y	-0.0018		0.0000	1.0000
5	Uniform Force	Global Y	-0.0018		0.0000	1.0000

Load Case Wind Strength - Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
6	Uniform Force	Global Y	-0.0018		0.0000	1.0000

Load Case Wind Strength + Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Uniform Force	Global Y	0.0131		0.0000	1.0000
1	Uniform Force	Global X	-0.0131		0.0000	1.0000
2	Uniform Force	Global X	-0.0131		0.0000	1.0000
3	Uniform Force	Global X	-0.0131		0.0000	1.0000
19	Uniform Force	Global X	-0.0131		0.0000	1.0000
5	Uniform Force	Global X	-0.0131		0.0000	1.0000
6	Uniform Force	Global X	-0.0131		0.0000	1.0000
2	Uniform Force	Global Y	0.0018		0.0000	1.0000
3	Uniform Force	Global Y	0.0018		0.0000	1.0000
19	Uniform Force	Global Y	0.0018		0.0000	1.0000
5	Uniform Force	Global Y	0.0018		0.0000	1.0000
6	Uniform Force	Global Y	0.0018		0.0000	1.0000

Load Case Wind Strength uplift , Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
1	Uniform Force	Local z	0.0171			0.0000	0.0000
2	Uniform Force	Local z	0.0171			0.0000	0.0000
3	Uniform Force	Local z	0.0171			0.0000	0.0000
4	Uniform Force	Local z	0.0171			0.0000	0.0000

Load Case Wind Strength Downward , Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
1	Uniform Force	Local z	-0.0171			0.0000	0.0000
2	Uniform Force	Local z	-0.0171			0.0000	0.0000
3	Uniform Force	Local z	-0.0171			0.0000	0.0000

Load Case Wind Strength Downward , Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
4	Uniform Force	Local z	-0.0171			0.0000	0.0000

Load Case E_h - Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	-0.2000		0.8934	
1	Point Force	Global Y	-0.7600		0.1607	
1	Point Force	Global X	-0.2000		0.8934	
1	Point Force	Global X	-0.7600		0.1607	

Load Case E_h + Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	0.2000		0.8934	
1	Point Force	Global Y	0.7600		0.1607	
1	Point Force	Global X	-0.2000		0.8934	
1	Point Force	Global X	-0.7600		0.1607	

Load Case E_v, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Z	-0.0500		0.8934	
1	Point Force	Global Z	-0.1900		0.1607	

Load Case LL Lean -X, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global X	-0.3000		0.4300	

Load Case LL Lean +Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	0.3000		0.4300	

Load Case LL Lean -Y, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Point Force	Global Y	-0.3000		0.4300	

Load Case LL Roof-1, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
2	Uniform Force	Local z	-0.0050			0.0000	0.0000
4	Uniform Force	Local z	-0.0050			0.0000	0.0000

Load Case LL Roof-2, Shell Loads

Shell	Type	Direction	Load	Relative X Location (x/XL)	Relative Y Location (y/YL)	Uniform Temperature Change (°F)	Temperature Gradient (°F/ft)
2	Uniform Force	Local z	-0.0050			0.0000	0.0000
1	Uniform Force	Local z	-0.0050			0.0000	0.0000

Load Case Capture from LC-6, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
1	Uniform Force	Global Z	-0.0343		0.0000	1.0000
2	Uniform Force	Global Z	-0.0343		0.0000	1.0000
3	Uniform Force	Global Z	-0.0343		0.0000	1.0000
4	Uniform Force	Global Z	-0.0343		0.0000	1.0000
5	Uniform Force	Global Z	-0.0343		0.0000	1.0000
6	Uniform Force	Global Z	-0.0343		0.0000	1.0000
7	Uniform Force	Global Z	-0.0091		0.0000	1.0000
8	Uniform Force	Global Z	-0.0091		0.0000	1.0000

Load Case Capture from LC-6, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
9	Uniform Force	Global Z	-0.0091		0.0000	1.0000
10	Uniform Force	Global Z	-0.0091		0.0000	1.0000
11	Uniform Force	Global Z	-0.0091		0.0000	1.0000
12	Uniform Force	Global Z	-0.0091		0.0000	1.0000
13	Uniform Force	Global Z	-0.0091		0.0000	1.0000
14	Uniform Force	Global Z	-0.0091		0.0000	1.0000
15	Uniform Force	Global Z	-0.0091		0.0000	1.0000
16	Uniform Force	Global Z	-0.0091		0.0000	1.0000
17	Uniform Force	Global Z	-0.0091		0.0000	1.0000
18	Uniform Force	Global Z	-0.0091		0.0000	1.0000
19	Uniform Force	Global Z	-0.0343		0.0000	1.0000
1	Point Force	Global Y	0.2000		0.8934	
1	Point Force	Global Y	0.7600		0.1607	
1	Point Force	Global X	-0.2000		0.8934	
1	Point Force	Global X	-0.7600		0.1607	
1	Point Force	Global Z	-0.0500		0.8934	
1	Point Force	Global Z	-0.1900		0.1607	
1	Point Force	Global Y	0.1500		0.4300	

Load Case Load Case 46, Member Loads

Member	Type	Direction	Magnitude at Start (kips, ft)	Magnitude at End (kips, ft)	Start Position (x/L)	End Position from start (x/L)
18	Point Force	Global X	10.0000		0.5000	

POST-COMPUTED RESULT CASES SUMMARY

Linear Result Combination: LC-1			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.4	None	No
Linear Result Combination: LC-2			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.2	None	No
Extreme LL Lean	1.6	None	No
Extreme LL Roof	0.5	None	No
Linear Result Combination: LC-3a			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.2	None	No
Extreme LL Lean	0.5	None	No
Extreme LL Roof	1.6	None	No
Linear Result Combination: LC-3b			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.2	None	No
Extreme LL Roof	1.6	None	No
Extreme W_h Strength	0.5	None	No
Extreme W_v Strength	0.5	None	No
Linear Result Combination: LC-4			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.2	None	No
Extreme LL Roof	0.5	None	No
Extreme W_h Strength	1	None	No
Extreme W_v Strength	1	None	No
Extreme LL Lean	1	None	No
Linear Result Combination: LC-5			
Load Class	None		
Case	Factor	Load Class	Incremental

DC	0.9	None	No
Extreme W_h Strength	1	None	No
Extreme W_v Strength	1	None	No
Linear Result Combination: LC-6			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1.2	None	No
Extreme E_h	1	None	No
E_v	1	None	No
Extreme LL Lean	0.5	None	No
Linear Result Combination: LC-7			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	0.9	None	No
Extreme E_h	1	None	No
E_v	-1	None	No
Linear Result Combination: LC-8			
Load Class	None		
Case	Factor	Load Class	Incremental
Extreme LL Lean	1	None	No
LL Roof	1	None	No
Linear Result Combination: LC-9			
Load Class	None		
Case	Factor	Load Class	Incremental
Extreme LL Lean	0.5	None	No
Extreme W_h Strength	0.7	None	No
Extreme W_v Strength	0.7	None	No
LL Roof	0.5	None	No
Linear Result Combination: D+W			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme W_h Strength	1	None	No
Extreme W_v Strength	1	None	No
Linear Result Combination: D+L			
Load Class	None		

Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme LL Lean	1	None	No
Linear Result Combination: D+Lr			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme LL Roof	1	None	No
Linear Result Combination: D+0.75(L+Lr)			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme LL Roof	0.75	None	No
Extreme LL Lean	0.75	None	No
Linear Result Combination: D+0.5(L+Lr)+W			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme LL Roof	0.5	None	No
Extreme LL Lean	0.5	None	No
Extreme W_h Strength	1	None	No
Extreme W_v Strength	1	None	No
Linear Result Combination: D+0.7Ev+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme E_h	1	None	No
E_v	1	None	No
Linear Result Combination: D-0.7Ev+0.7Eh			
Load Class	None		
Case	Factor	Load Class	Incremental
DC	1	None	No
Extreme E_h	1	None	No
E_v	-1	None	No
Extreme Effect Group: Extreme LL Lean			
Allow Positive Minimum/Negative Maximum	No		

Load Class	None		
Case	Factor	Load Class	Incremental
LL Lean -X	1	None	No
LL Lean +Y	1	None	No
LL Lean -Y	1	None	No
Extreme Effect Group: Extreme LL Roof			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
LL Hang1	1	None	No
LL Hang2	1	None	No
LL Hang3	1	None	No
LL Hang4	1	None	No
LL Hang5	1	None	No
LL Hang6	1	None	No
LL Roof	1	None	No
Extreme Effect Group: Extreme W_h Strength			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Wind Strength - Y	1	None	No
Wind Strength + Y	1	None	No
Extreme Effect Group: Extreme W_v Strength			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
Wind Strength uplift	1	None	No
Wind Strength Downward	1	None	No
Extreme Effect Group: Extreme E_h			
Allow Positive Minimum/Negative Maximum	No		
Load Class	None		
Case	Factor	Load Class	Incremental
E_h - Y	1	None	No
E_h + Y	1	None	No

Result Cases Summary

Linear Combinations: LC-9

Extreme Effect Groups: Extreme LL Lean * 0.5

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_h Strength * 0.7

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength * 0.7

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof * 0.5

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-8

Extreme Effect Groups: Extreme LL Lean

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-1

Load Cases: DC * 1.4

Solved: 6/14/2024

Load Class: Dead Load

Linear Combinations: LC-2

Load Cases: DC * 1.2

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Lean * 1.6

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Roof * 0.5

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-3a

Load Cases: DC * 1.2

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Lean * 0.5

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Roof * 1.6

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-3b

Load Cases: DC * 1.2

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Roof * 1.6

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_h Strength * 0.5

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength * 0.5

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-4

Load Cases: DC * 1.2

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Roof * 0.5

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_h Strength

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Lean

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-5

Load Cases: DC * 0.9

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme W_h Strength

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-6

Load Cases: DC * 1.2

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme E_h

Load Cases: E_h - Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_h + Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_v

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Lean * 0.5

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Linear Combinations: LC-7

Load Cases: DC * 0.9

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme E_h

Load Cases: E_h - Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_h + Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_v * -1

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+W

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme W_h Strength

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+L

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Lean

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+Lr

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Roof

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+0.75(L+Lr)

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Roof * 0.75

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Lean * 0.75

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+0.5(L+Lr)+W

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme LL Roof * 0.5

Load Cases: LL Hang1

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang2

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang3

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang4

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang5

Solved: 6/14/2024

Load Class: None

Load Cases: LL Hang6

Solved: 6/14/2024

Load Class: None

Load Cases: LL Roof

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme LL Lean * 0.5

Load Cases: LL Lean -X

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean +Y

Solved: 6/14/2024

Load Class: None

Load Cases: LL Lean -Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_h Strength

Load Cases: Wind Strength - Y

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength + Y

Solved: 6/14/2024

Load Class: None

Extreme Effect Groups: Extreme W_v Strength

Load Cases: Wind Strength uplift

Solved: 6/14/2024

Load Class: None

Load Cases: Wind Strength Downward

Solved: 6/14/2024

Load Class: None

Linear Combinations: D+0.7Ev+0.7Eh

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme E_h

Load Cases: E_h - Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_h + Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_v

Solved: 6/14/2024

Load Class: None

Linear Combinations: D-0.7Ev+0.7Eh

Load Cases: DC

Solved: 6/14/2024

Load Class: Dead Load

Extreme Effect Groups: Extreme E_h

Load Cases: E_h - Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_h + Y

Solved: 6/14/2024

Load Class: None

Load Cases: E_v * -1

Solved: 6/14/2024

Load Class: None

RESULT ENVELOPE :Joint Displacements @ Translation Z (in) Result Cases

LC-9	LC-8	

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
1	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	LC-9	-0.0286	0.0423	-0.0006	-0.0007	-0.0004	0.0000
2	LC-9	-0.0286	-0.0214	0.0004	0.0004	-0.0004	0.0000
3	LC-9	-0.0260	-0.0513	-0.0464	0.0007	-0.0004	0.0000
3	LC-9	-0.0260	0.0697	0.0640	-0.0010	-0.0004	0.0000
4	LC-9	-0.0326	0.0902	-0.0818	-0.0013	-0.0004	0.0000
4	LC-9	-0.0326	-0.0660	0.0581	0.0009	-0.0004	0.0000
5	LC-9	-0.0264	-0.0524	-0.0387	0.0007	-0.0004	0.0000
5	LC-9	-0.0264	0.0712	0.0534	-0.0010	-0.0004	0.0000
6	LC-9	0.0009	-0.0420	-0.0213	0.0007	-0.0003	0.0000
6	LC-9	-0.0263	0.0687	0.0544	-0.0011	0.0001	0.0001
7	LC-9	-0.0015	0.0509	-0.0105	-0.0007	0.0005	0.0001
7	LC-9	-0.0332	-0.0292	0.0290	0.0004	-0.0008	-0.0001
8	LC-9	-0.0327	0.0494	-0.0324	-0.0006	-0.0009	-0.0001
8	LC-9	-0.0010	-0.0307	0.0071	0.0004	0.0003	0.0000
9	LC-9	-0.0258	-0.0503	-0.0455	0.0008	-0.0001	0.0000
9	LC-9	0.0015	0.0605	0.0302	-0.0010	-0.0005	-0.0001
10	LC-9	-0.0284	-0.0575	-0.0022	0.0008	-0.0004	0.0000
10	LC-9	-0.0284	0.0783	0.0030	-0.0011	-0.0004	0.0000
11	LC-9	0.0186	0.0787	-0.1033	-0.0012	0.0020	0.0002
11	LC-9	-0.0542	-0.0452	0.1000	0.0007	-0.0018	-0.0001
12	LC-9	0.0186	0.1057	-0.1664	-0.0009	0.0020	0.0003

RESULT ENVELOPE :Joint Displacements @ Translation Z (in)

Joint	Result Case	Translation X (in)	Translation Y (in)	Translation Z (in)	Rotation X (rad)	Rotation Y (rad)	Rotation Z (rad)
12	LC-9	-0.0584	-0.0750	0.1447	0.0007	-0.0017	-0.0002
13	LC-9	-0.0319	0.0882	-0.0676	-0.0013	-0.0004	0.0000
13	LC-9	-0.0319	-0.0646	0.0481	0.0009	-0.0004	0.0000
14	LC-9	-0.0648	0.1082	-0.2007	-0.0010	-0.0024	-0.0003
14	LC-9	0.0122	-0.0725	0.1104	0.0006	0.0013	0.0002
15	LC-9	-0.0606	0.0755	-0.1356	-0.0011	-0.0024	-0.0002
15	LC-9	0.0122	-0.0484	0.0677	0.0007	0.0013	0.0002
16	LC-9	-0.0282	-0.0569	-0.0064	0.0008	-0.0004	0.0000
16	LC-9	-0.0282	0.0775	0.0088	-0.0011	-0.0004	0.0000

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-3b	0.0000	0.1012	1.2632	-3.4091	0.0000	0.0000
1	LC-6	1.1100	0.9600	1.7431	-2.5854	3.4108	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-6	0.9600	-1.1100	1.7431	3.6339	2.8086	0.0000
1	LC-6	0.9600	1.1100	1.7431	-3.1876	2.8086	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-5	0.2585	0.0609	-0.3125	-1.7031	1.8425	-0.0005
1	LC-4	0.2585	0.2095	3.1535	1.2722	1.8425	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4	0.2585	0.6438	0.2133	-5.0765	1.8425	-0.0005
1	LC-4	0.2585	-0.6438	3.0930	5.5229	1.8425	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-3b	0.0000	0.1012	1.2632	-3.4091	0.0000	0.0000
1	LC-4	0.5585	-0.0609	3.0930	2.4031	3.9314	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	LC-4	0.2585	-0.3609	3.0935	3.9405	2.7108	-0.0005
1	LC-3b	0.0000	0.1012	1.2632	-3.4091	0.0000	0.0000

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-4	-3.1535	0.2095	-0.2585	0.0005	1.8425	1.2722
1	0	LC-5	0.3125	0.0609	-0.2585	0.0005	1.8425	-1.7031
1	1	LC-4	-2.8333	-0.2128	-0.1362	0.0005	0.0001	1.0606
1	1	LC-5	0.5527	0.1832	-0.1362	0.0005	0.0001	-0.5632
2	0	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-3b	0.0719	0.0059	-0.5057	0.0000	-0.2265	0.0026
3	0	LC-8	0.0004	0.0000	-0.0734	0.0000	0.0289	0.0000
3	0	LC-3b	0.0988	0.0056	-0.7825	0.0000	-0.1281	-0.0002
3	1	LC-8	0.0004	0.0000	-0.0734	0.0000	-0.2435	0.0000
3	1	LC-3b	0.1199	0.0299	-0.9080	0.0000	-3.2624	0.0658
4	0	LC-8	-0.0010	0.0000	-0.2864	0.0000	-0.2620	0.0000
4	0	LC-3b	0.1743	0.0334	-0.7226	0.0001	-2.8216	0.0795

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
4	1	LC-8	-0.0010	0.0000	-0.2864	0.0000	-0.3396	0.0000
4	1	LC-3b	0.1756	0.0334	-0.7318	0.0001	-3.0185	0.0886
5	0	LC-3b	-0.1395	-0.0347	1.1354	0.0001	-4.7427	0.0888
5	0	LC-8	-0.0010	0.0000	0.1388	0.0000	-0.5532	0.0000
5	1	LC-3b	-0.1143	-0.0057	0.9853	0.0001	-0.0374	-0.0008
5	1	LC-8	-0.0010	0.0000	0.1388	0.0000	0.0627	0.0000
6	0	LC-3b	-0.0719	-0.0059	0.5057	0.0000	-0.2265	0.0026
6	0	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-3b	0.0000	-0.0015	0.0951	-0.0235	-0.2792	0.0144
7	0	LC-4	0.0006	0.0076	0.0030	0.0052	0.0279	-0.0176
7	1	Load Cases: DC	-0.0034	0.0006	0.0340	-0.0095	0.0107	0.0104
7	1	LC-8	0.0000	-0.0024	0.0182	-0.0039	0.0121	-0.0015
8	0	LC-3b	-0.0048	-0.0056	0.0138	0.0030	0.0050	0.0117
8	0	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0075	-0.0005
8	1	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0069	-0.0006
8	1	LC-4	0.0036	-0.0051	-0.0172	0.0001	-0.0271	-0.0085
9	0	LC-8	0.0000	-0.0028	-0.0184	0.0045	0.0123	0.0018
9	0	Load Cases: DC	0.0095	-0.0006	-0.0352	0.0120	0.0121	-0.0105
9	1	LC-8	0.0000	-0.0028	-0.0184	0.0045	-0.0614	-0.0093
9	1	Load Cases: DC	0.0132	-0.0006	-0.0775	0.0120	-0.2128	-0.0129
10	0	LC-8	0.0000	0.0028	0.0184	-0.0045	-0.0614	-0.0093
10	0	Load Cases: DC	0.0132	0.0006	0.0775	-0.0120	-0.2128	-0.0129
10	1	LC-8	0.0000	0.0028	0.0184	-0.0045	0.0123	0.0018
10	1	Load Cases: DC	0.0095	0.0006	0.0352	-0.0120	0.0121	-0.0105
11	0	LC-3b	-0.0006	0.0057	0.0197	-0.0030	-0.0059	-0.0090
11	0	LC-4	0.0026	0.0053	0.0172	-0.0001	-0.0270	-0.0082
11	1	LC-3b	-0.0053	0.0057	-0.0138	-0.0030	0.0051	0.0122
11	1	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0075	-0.0005
12	0	Load Cases: DC	-0.0034	-0.0006	-0.0340	0.0095	0.0107	0.0104
12	0	LC-8	0.0000	0.0024	-0.0182	0.0039	0.0121	-0.0015
12	1	LC-4	-0.0002	0.0060	-0.1272	0.0241	-0.3857	0.0293
12	1	LC-4	0.0004	-0.0086	-0.0032	-0.0052	0.0275	-0.0204

RESULT ENVELOPE :Member Sectional Forces @ Force X (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
13	0	Load Cases: DC	-0.0320	-0.0011	0.1154	-0.0177	-0.4720	0.0301
13	0	LC-8	-0.0001	-0.0053	0.0347	-0.0088	-0.1736	0.0267
13	1	Load Cases: DC	-0.0210	-0.0011	0.0527	-0.0177	0.0311	0.0237
13	1	LC-8	-0.0001	-0.0053	0.0347	-0.0088	0.0344	-0.0051
14	0	LC-4	-0.0039	-0.0095	0.0231	-0.0004	-0.0643	0.0139
14	0	LC-3b	0.0025	-0.0118	0.0144	-0.0043	0.0432	0.0273
14	1	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0186	0.0025
14	1	LC-3b	0.0085	-0.0118	-0.0280	-0.0043	0.0112	-0.0283
15	0	LC-8	0.0001	-0.0043	-0.0349	0.0088	0.0352	0.0041
15	0	LC-4	0.0026	-0.0124	-0.1646	0.0477	0.1472	-0.0083
15	1	Load Cases: DC	-0.0087	0.0011	-0.1154	0.0171	-0.4719	-0.0165
15	1	LC-8	0.0001	-0.0043	-0.0349	0.0088	-0.1739	-0.0219
16	0	LC-3b	-0.0598	0.0074	0.4107	0.2262	-1.8746	-0.1096
16	0	LC-3b	0.0249	-0.0084	0.2658	-0.2518	-1.5550	-0.0716
16	1	LC-3b	-0.0033	-0.0008	0.2161	-0.0566	-0.0161	-0.0803
16	1	LC-3b	0.0343	-0.0084	0.2121	-0.2518	-0.1243	-0.1220
17	0	LC-3b	-0.0278	0.0230	-0.0843	-0.2154	0.2051	-0.0552
17	0	LC-3b	0.0332	0.0603	0.1162	0.2298	-0.1591	-0.1332
17	1	LC-3b	-0.0457	0.0447	-0.2712	-0.0079	-0.1285	0.1195
17	1	LC-3b	0.0008	0.0102	-0.0239	0.0017	0.0189	0.0251
18	0	LC-3b	-0.0964	0.0027	-0.3459	0.1073	0.0913	0.1274
18	0	LC-8	-0.0001	0.0053	-0.0347	0.0088	0.0344	-0.0051
18	1	LC-3b	-0.1434	0.0248	-0.5244	-0.1795	-2.5892	0.2128
18	1	LC-8	-0.0001	0.0053	-0.0347	0.0088	-0.1736	0.0267
19	0	LC-8	0.0000	0.0000	-0.1476	0.0000	-0.2772	0.0000
19	0	LC-3b	0.1370	0.0302	-1.1968	0.0000	-3.3892	0.0694
19	1	LC-8	0.0000	0.0000	-0.1476	0.0000	-0.3448	0.0000
19	1	LC-3b	0.1396	0.0332	-1.2123	0.0000	-3.9414	0.0839

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-6	-1.7431	-1.1100	-0.9600	0.0000	2.8086	3.6339
1	0	LC-6	-1.7431	1.1100	-0.9600	0.0000	2.8086	-3.1876
1	1	LC-4	-2.8333	-0.2511	-0.1362	0.0005	0.0001	1.0606
1	1	LC-4	0.1070	0.2215	-0.1362	0.0005	0.0001	-1.2331
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-3a	0.0043	0.0000	-0.0304	0.0000	-0.0136	0.0000
2	1	LC-4	0.0059	0.0117	-0.0302	0.0000	-0.0135	0.0053
3	0	LC-3b	0.0277	0.0000	-0.3105	0.0000	0.0663	0.0000
3	0	LC-4	0.0494	0.0113	-0.0811	0.0001	-0.1425	-0.0004
3	1	LC-3b	0.0454	0.0000	-0.4365	0.0000	-1.3188	0.0000
3	1	LC-4	0.0739	0.0599	-0.2061	0.0001	-0.6750	0.1316
4	0	LC-3a	0.1384	-0.0494	-1.1129	1.9214	-1.2716	-0.0992
4	0	LC-4	0.1062	0.0667	-1.7155	0.0001	-1.9656	0.1591
4	1	LC-3a	0.1396	-0.0494	-1.1221	1.9214	-1.5743	-0.1126
4	1	LC-4	0.1075	0.0667	-1.7247	0.0001	-2.4315	0.1772
5	0	LC-4	-0.0842	-0.0849	0.9301	-0.2592	-3.4638	0.2633
5	0	LC-4	-0.0585	0.0000	-0.0496	0.0000	0.3869	0.0000
5	1	LC-3b	-0.0733	-0.0551	0.6125	-0.8299	0.3792	0.0541
5	1	LC-4	-0.0373	0.0000	-0.2003	0.0000	-0.1675	0.0000
6	0	LC-4	-0.0059	-0.0117	0.0302	0.0000	-0.0135	0.0053
6	0	LC-3a	-0.0043	0.0000	0.0304	0.0000	-0.0136	0.0000
6	1	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-4	0.0003	-0.0097	0.1364	-0.0234	-0.4163	0.0407
7	0	LC-4	0.0003	0.0092	0.0028	0.0025	0.0287	-0.0223
7	1	LC-4	-0.0028	-0.0097	0.1002	-0.0234	0.0563	0.0020
7	1	LC-4	-0.0029	0.0092	-0.0335	0.0025	-0.0326	0.0146
8	0	Load Cases: DC	-0.0032	-0.0063	0.0183	0.0008	0.0008	0.0117
8	0	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0075	-0.0005
8	1	Load Cases: DC	0.0023	-0.0063	-0.0207	0.0008	-0.0038	-0.0118
8	1	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0069	-0.0006

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
9	0	LC-4	0.0083	-0.0113	-0.1025	0.0279	0.0587	-0.0020
9	0	LC-5	0.0057	0.0100	0.0403	-0.0076	-0.0343	-0.0131
9	1	LC-4	0.0114	-0.0113	-0.1387	0.0279	-0.4230	-0.0474
9	1	LC-5	0.0081	0.0100	0.0131	-0.0076	0.0725	0.0270
10	0	LC-5	0.0083	-0.0091	-0.0133	0.0076	0.0730	0.0234
10	0	LC-4	0.0116	0.0123	0.1386	-0.0279	-0.4224	-0.0510
10	1	LC-5	0.0059	-0.0091	-0.0405	0.0076	-0.0343	-0.0128
10	1	LC-4	0.0085	0.0123	0.1023	-0.0279	0.0586	-0.0018
11	0	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0069	-0.0006
11	0	Load Cases: DC	0.0023	0.0063	0.0207	-0.0008	-0.0038	-0.0118
11	1	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0075	-0.0005
11	1	Load Cases: DC	-0.0032	0.0063	-0.0183	-0.0008	0.0008	0.0117
12	0	LC-4	-0.0031	-0.0102	0.0333	-0.0025	-0.0325	0.0157
12	0	LC-4	-0.0031	0.0087	-0.1003	0.0233	0.0565	0.0031
12	1	LC-4	0.0001	-0.0102	-0.0029	-0.0025	0.0283	-0.0251
12	1	LC-4	0.0001	0.0087	-0.1366	0.0233	-0.4167	0.0379
13	0	LC-4	-0.0280	-0.0225	0.2349	-0.0494	-1.0844	0.1348
13	0	LC-5	-0.0203	0.0174	-0.0447	0.0185	0.2902	-0.0718
13	1	LC-4	-0.0185	-0.0225	0.1813	-0.0494	0.1615	0.0001
13	1	LC-5	-0.0132	0.0174	-0.0849	0.0185	-0.0977	0.0325
14	0	LC-3b	0.0025	-0.0119	0.0141	-0.0044	0.0443	0.0275
14	0	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0187	0.0030
14	1	LC-3b	0.0085	-0.0119	-0.0284	-0.0044	0.0107	-0.0283
14	1	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0186	0.0025
15	0	LC-4	0.0024	-0.0161	-0.1821	0.0493	0.1648	-0.0039
15	0	LC-4	0.0019	0.0174	0.0712	-0.0062	-0.0939	-0.0366
15	1	LC-4	-0.0071	-0.0161	-0.2358	0.0493	-1.0862	-0.1001
15	1	LC-4	-0.0076	0.0174	0.0175	-0.0062	0.1715	0.0673
16	0	LC-3b	0.0245	-0.0233	0.1464	-0.2215	-0.9602	0.0034
16	0	LC-3b	-0.0530	0.0233	0.5152	0.1920	-2.5299	-0.1968
16	1	LC-3b	0.0340	-0.0233	0.0927	-0.2215	-0.2445	-0.1359
16	1	LC-3b	-0.0016	0.0233	0.2237	0.1920	0.3337	-0.0571
17	0	LC-8	0.0005	0.0001	0.0000	-0.0001	0.0186	0.0025
17	0	LC-3b	0.0332	0.0603	0.1162	0.2298	-0.1591	-0.1332

RESULT ENVELOPE :Member Sectional Forces @ Force Y (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
17	1	LC-8	0.0005	0.0001	0.0000	-0.0001	0.0187	0.0030
17	1	LC-3b	-0.0062	0.0603	-0.1639	0.2298	0.2287	0.1507
18	0	LC-3b	-0.0557	-0.0251	-0.1026	0.2534	-0.2677	0.1492
18	0	LC-3b	-0.0920	0.0248	-0.2330	-0.1795	0.3298	0.0645
18	1	LC-3b	-0.0652	-0.0251	-0.1562	0.2534	-1.0424	-0.0011
18	1	LC-3b	-0.1434	0.0248	-0.5244	-0.1795	-2.5892	0.2128
19	0	LC-3b	0.1328	0.0000	-0.6928	0.0000	-2.4427	0.0000
19	0	LC-4	0.0744	0.0603	-0.9732	0.0000	-1.8863	0.1388
19	1	LC-3b	0.1350	0.0000	-0.7083	0.0000	-2.7638	0.0000
19	1	LC-4	0.0774	0.0663	-0.9887	0.0000	-2.3359	0.1679

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-6	-1.7431	0.9600	-1.1100	0.0000	3.4108	-2.5854
1	0	LC-3b	-1.2632	0.1012	0.0000	0.0000	0.0000	-3.4091
1	1	LC-4	-2.7728	-0.1832	-0.1362	0.0005	0.0001	1.6795
1	1	LC-3b	-0.9430	0.1012	0.0000	0.0000	0.0000	-2.4643
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-3b	0.0702	0.0059	-0.5059	0.0000	-0.2266	0.0026
2	1	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0	LC-3b	0.0972	0.0056	-0.7827	0.0000	-0.1282	-0.0002
3	0	LC-5	0.0207	0.0113	0.1127	0.0001	-0.0860	-0.0004
3	1	LC-3b	0.1115	0.0299	-0.9091	0.0000	-3.2651	0.0658
3	1	LC-5	0.0407	0.0599	0.0192	0.0001	0.1585	0.1316
4	0	LC-4	0.1099	0.0667	-1.8663	0.0001	-2.6656	0.1591

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
4	0	LC-5	0.0888	0.0667	0.4280	0.0001	0.0875	0.1591
4	1	LC-4	0.1112	0.0667	-1.8755	0.0001	-3.1723	0.1772
4	1	LC-5	0.0897	0.0667	0.4211	0.0001	0.2025	0.1772
5	0	LC-5	-0.0527	-0.0695	-0.1570	0.0001	0.7657	0.1776
5	0	LC-3b	-0.1298	-0.0347	1.1368	0.0001	-4.7463	0.0888
5	1	LC-5	-0.0287	-0.0113	-0.2689	0.0001	-0.1794	-0.0016
5	1	LC-3b	-0.1126	-0.0057	0.9855	0.0001	-0.0375	-0.0008
6	0	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0	LC-3b	-0.0703	-0.0059	0.5059	0.0000	-0.2266	0.0026
6	1	LC-3a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-3a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-5	0.0005	0.0075	-0.0133	0.0072	0.0728	-0.0193
7	0	LC-4	0.0001	-0.0087	0.1366	-0.0233	-0.4167	0.0379
7	1	LC-5	-0.0018	0.0075	-0.0405	0.0072	-0.0346	0.0107
7	1	LC-4	-0.0031	-0.0087	0.1003	-0.0233	0.0565	0.0031
8	0	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0075	-0.0005
8	0	Load Cases: DC	-0.0032	-0.0063	0.0183	0.0008	0.0008	0.0117
8	1	Load Cases: DC	0.0023	-0.0063	-0.0207	0.0008	-0.0038	-0.0118
8	1	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0069	-0.0006
9	0	LC-4	0.0080	-0.0104	-0.1026	0.0280	0.0587	-0.0023
9	0	LC-5	0.0059	0.0091	0.0405	-0.0076	-0.0343	-0.0128
9	1	LC-4	0.0112	-0.0104	-0.1388	0.0280	-0.4235	-0.0438
9	1	LC-5	0.0083	0.0091	0.0133	-0.0076	0.0730	0.0234
10	0	LC-5	0.0085	-0.0081	-0.0134	0.0077	0.0736	0.0198
10	0	LC-4	0.0114	0.0113	0.1387	-0.0279	-0.4230	-0.0474
10	1	LC-5	0.0062	-0.0081	-0.0406	0.0077	-0.0344	-0.0126
10	1	LC-4	0.0083	0.0113	0.1025	-0.0279	0.0587	-0.0020
11	0	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0069	-0.0006
11	0	Load Cases: DC	0.0023	0.0063	0.0207	-0.0008	-0.0038	-0.0118
11	1	Load Cases: DC	-0.0032	0.0063	-0.0183	-0.0008	0.0008	0.0117
11	1	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0075	-0.0005
12	0	LC-4	-0.0033	0.0078	-0.1005	0.0233	0.0566	0.0041
12	0	LC-5	-0.0021	-0.0085	0.0403	-0.0072	-0.0344	0.0118
12	1	LC-4	-0.0001	0.0078	-0.1367	0.0233	-0.4171	0.0352

RESULT ENVELOPE :Member Sectional Forces @ Force Z (kips)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
12	1	LC-5	0.0003	-0.0085	0.0132	-0.0072	0.0724	-0.0221
13	0	LC-5	-0.0204	0.0166	-0.0448	0.0187	0.2909	-0.0675
13	0	LC-4	-0.0278	-0.0217	0.2351	-0.0495	-1.0850	0.1304
13	1	LC-5	-0.0133	0.0166	-0.0851	0.0187	-0.0978	0.0321
13	1	LC-4	-0.0184	-0.0217	0.1814	-0.0495	0.1616	0.0005
14	0	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0187	0.0030
14	0	Load Cases: DC	-0.0027	-0.0115	0.0269	-0.0002	-0.0005	0.0281
14	1	LC-3b	0.0081	-0.0118	-0.0284	-0.0044	0.0105	-0.0276
14	1	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0186	0.0025
15	0	LC-4	0.0026	-0.0153	-0.1822	0.0492	0.1650	-0.0052
15	0	LC-5	0.0012	0.0156	0.0855	-0.0193	-0.1000	-0.0288
15	1	LC-4	-0.0069	-0.0153	-0.2359	0.0492	-1.0867	-0.0967
15	1	LC-5	-0.0059	0.0156	0.0452	-0.0193	0.2914	0.0645
16	0	LC-5	-0.0061	-0.0148	-0.0454	0.0192	0.2919	0.0611
16	0	LC-3b	-0.0594	0.0219	0.5301	0.1960	-2.4696	-0.1829
16	1	LC-3b	0.0335	0.0074	-0.1185	0.2262	0.1841	-0.0650
16	1	LC-3b	-0.0029	0.0136	0.3356	-0.0869	0.1042	-0.0671
17	0	LC-3b	-0.0274	0.0231	-0.0843	-0.2154	0.2052	-0.0559
17	0	LC-3b	0.0287	0.0451	0.2467	-0.0082	-0.0070	-0.0825
17	1	LC-3b	-0.0453	0.0448	-0.2712	-0.0079	-0.1284	0.1194
17	1	LC-8	0.0005	0.0001	0.0000	-0.0001	0.0187	0.0030
18	0	LC-3b	-0.0964	0.0023	-0.3459	0.1074	0.0913	0.1276
18	0	LC-5	-0.0132	-0.0174	0.0849	-0.0185	-0.0977	0.0325
18	1	LC-3b	-0.1433	0.0244	-0.5245	-0.1794	-2.5896	0.2106
18	1	LC-5	-0.0203	-0.0174	0.0447	-0.0185	0.2902	-0.0718
19	0	LC-3b	0.1287	0.0302	-1.1980	0.0000	-3.3920	0.0694
19	0	LC-5	0.0579	0.0603	0.1535	0.0000	0.2449	0.1388
19	1	LC-3b	0.1304	0.0332	-1.2136	0.0000	-3.9447	0.0839
19	1	LC-5	0.0604	0.0663	0.1420	0.0000	0.3126	0.1679

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4

LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-3b	-1.2632	0.1012	0.0000	0.0000	0.0000	-3.4091
1	0	LC-4	-3.0935	-0.3609	-0.2585	0.0005	2.7108	3.9405
1	1	LC-3b	-0.9430	0.1012	0.0000	0.0000	0.0000	-2.4643
1	1	LC-4	-2.7732	-0.1832	-0.1362	0.0005	0.8683	1.5963
2	0	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-4	0.0026	0.0117	-0.0307	0.0000	-0.0137	0.0053
2	1	LC-3b	0.0043	0.0000	-0.0304	0.0000	-0.0136	0.0000
3	0	LC-3b	0.0277	0.0000	-0.3105	0.0000	0.0663	0.0000
3	0	LC-4	0.0494	0.0113	-0.0811	0.0001	-0.1425	-0.0004
3	1	LC-3b	0.0454	0.0000	-0.4365	0.0000	-1.3188	0.0000
3	1	LC-4	0.0739	0.0599	-0.2061	0.0001	-0.6750	0.1316
4	0	LC-3b	0.0955	0.0000	-1.2284	0.0000	-1.4999	0.0000
4	0	LC-3b	0.1446	-0.0160	-0.6226	1.9215	-0.8220	-0.0197
4	1	LC-3b	0.0968	0.0000	-1.2376	0.0000	-1.8338	0.0000
4	1	LC-3b	0.1459	-0.0160	-0.6317	1.9215	-0.9919	-0.0240
5	0	LC-3a	-0.0989	-0.0154	0.7929	-1.7682	-3.3485	0.2093
5	0	LC-4	-0.0752	-0.0695	0.9680	0.0001	-3.6712	0.1776
5	1	LC-3a	-0.0777	-0.0154	0.6422	-1.7682	-0.1643	0.1408
5	1	LC-4	-0.0459	-0.0113	0.8184	0.0001	0.2923	-0.0016
6	0	LC-3b	-0.0035	-0.0059	0.0305	0.0000	-0.0137	0.0026
6	0	LC-3b	-0.0051	-0.0059	0.0303	0.0000	-0.0136	0.0026
6	1	LC-3a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-4	0.0003	-0.0079	0.1269	-0.0242	-0.3849	0.0349
7	0	LC-5	0.0003	0.0085	-0.0132	0.0072	0.0724	-0.0221
7	1	LC-4	-0.0029	-0.0079	0.0907	-0.0242	0.0498	0.0033
7	1	LC-5	-0.0021	0.0085	-0.0403	0.0072	-0.0344	0.0118
8	0	LC-5	-0.0014	-0.0040	0.0123	-0.0001	-0.0253	0.0091
8	0	LC-3b	-0.0043	-0.0055	0.0138	0.0030	0.0050	0.0111
8	1	LC-5	0.0021	-0.0040	-0.0128	-0.0001	-0.0262	-0.0057

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
8	1	LC-3b	0.0004	-0.0055	-0.0197	0.0030	-0.0060	-0.0092
9	0	LC-5	0.0059	0.0091	0.0405	-0.0076	-0.0343	-0.0128
9	0	LC-3b	0.0083	-0.0067	-0.0631	0.0327	0.0332	-0.0051
9	1	LC-5	0.0083	0.0091	0.0133	-0.0076	0.0730	0.0234
9	1	LC-3b	0.0115	-0.0067	-0.0993	0.0327	-0.2913	-0.0320
10	0	LC-3b	0.0116	0.0072	0.0993	-0.0327	-0.2910	-0.0338
10	0	LC-5	0.0085	-0.0081	-0.0134	0.0077	0.0736	0.0198
10	1	LC-3b	0.0084	0.0072	0.0630	-0.0327	0.0331	-0.0050
10	1	LC-5	0.0062	-0.0081	-0.0406	0.0077	-0.0344	-0.0126
11	0	LC-3b	-0.0001	0.0056	0.0197	-0.0030	-0.0059	-0.0091
11	0	LC-5	0.0011	0.0042	0.0128	0.0001	-0.0261	-0.0055
11	1	LC-3b	-0.0048	0.0056	-0.0138	-0.0030	0.0050	0.0117
11	1	LC-5	-0.0024	0.0042	-0.0123	0.0001	-0.0252	0.0102
12	0	LC-5	-0.0023	-0.0094	0.0402	-0.0073	-0.0342	0.0128
12	0	LC-4	-0.0031	0.0069	-0.0908	0.0241	0.0499	0.0044
12	1	LC-5	0.0001	-0.0094	0.0130	-0.0073	0.0720	-0.0249
12	1	LC-4	0.0001	0.0069	-0.1271	0.0241	-0.3853	0.0321
13	0	LC-4	-0.0278	-0.0217	0.2351	-0.0495	-1.0850	0.1304
13	0	LC-4	-0.0273	0.0157	-0.0231	0.0187	0.2089	-0.0580
13	1	LC-4	-0.0184	-0.0217	0.1814	-0.0495	0.1616	0.0005
13	1	LC-4	-0.0179	0.0157	-0.0767	0.0187	-0.0898	0.0359
14	0	LC-3b	0.0005	-0.0114	0.0141	-0.0047	-0.0196	0.0176
14	0	LC-4	0.0004	-0.0105	0.0230	0.0002	0.0730	0.0353
14	1	LC-3b	0.0064	-0.0114	-0.0284	-0.0047	-0.0532	-0.0360
14	1	LC-4	0.0064	-0.0105	-0.0194	0.0002	0.0815	-0.0140
15	0	LC-5	0.0014	0.0164	0.0854	-0.0194	-0.0997	-0.0301
15	0	LC-3b	0.0022	-0.0042	-0.1145	0.0606	0.0841	-0.0177
15	1	LC-5	-0.0057	0.0164	0.0451	-0.0194	0.2909	0.0679
15	1	LC-3b	-0.0072	-0.0042	-0.1682	0.0606	-0.7621	-0.0427
16	0	LC-3b	0.0248	-0.0080	0.2658	-0.2518	-1.5547	-0.0733
16	0	LC-3b	-0.0597	0.0070	0.4107	0.2263	-1.8749	-0.1079
16	1	LC-3b	0.0342	-0.0080	0.2121	-0.2518	-0.1244	-0.1213
16	1	LC-3b	0.0336	0.0070	-0.1184	0.2263	0.1842	-0.0657
17	0	LC-3b	0.0046	0.0272	0.1392	-0.2437	0.2660	-0.0581

RESULT ENVELOPE :Member Sectional Forces @ Moment X (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
17	0	LC-3b	0.0311	0.0598	0.1162	0.2301	-0.2230	-0.1409
17	1	LC-3b	-0.0348	0.0272	-0.1409	-0.2437	-0.2380	0.0700
17	1	LC-3b	-0.0083	0.0598	-0.1639	0.2301	0.1648	0.1407
18	0	LC-3b	-0.0917	0.0066	-0.1142	-0.2094	0.2121	0.0818
18	0	LC-3b	-0.0561	-0.0070	-0.2214	0.2834	-0.1500	0.1320
18	1	LC-3b	-0.1430	0.0066	-0.4056	-0.2094	-1.9956	0.1216
18	1	LC-3b	-0.0655	-0.0070	-0.2751	0.2834	-1.6360	0.0901
19	0	LC-3b	0.0660	0.0000	-0.7221	0.0000	-1.4150	0.0000
19	0	LC-4	0.0953	0.0603	-0.1125	0.0000	-0.6078	0.1388
19	1	LC-3b	0.0682	0.0000	-0.7377	0.0000	-1.7495	0.0000
19	1	LC-4	0.0983	0.0663	-0.1279	0.0000	-0.6629	0.1679

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft) Result Cases

LC-8	LC-1	LC-2
LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-3b	-1.2632	0.1012	0.0000	0.0000	0.0000	-3.4091
1	0	LC-4	-3.0930	-0.0609	-0.5585	0.0005	3.9314	2.4031
1	1	LC-3b	-2.3828	-0.1012	0.0000	0.0000	0.0000	2.9107
1	1	LC-3b	-0.9430	0.1107	-0.0681	0.0002	2.8302	0.8482
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-3b	0.0702	0.0059	-0.5059	0.0000	-0.2266	0.0026
2	1	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0	LC-3b	0.0959	0.0056	-0.5315	0.0000	-0.2270	-0.0002
3	0	LC-4	0.0301	0.0113	-0.4726	0.0001	0.1302	-0.0004
3	1	LC-3b	0.1115	0.0299	-0.9091	0.0000	-3.2651	0.0658
3	1	LC-5	0.0407	0.0599	0.0192	0.0001	0.1585	0.1316

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
4	0	LC-3b	0.1618	0.0334	-1.7033	0.0001	-3.7208	0.0795
4	0	LC-5	0.0888	0.0667	0.4280	0.0001	0.0875	0.1591
4	1	LC-3b	0.1631	0.0334	-1.7125	0.0001	-4.1834	0.0886
4	1	LC-5	0.0897	0.0667	0.4211	0.0001	0.2025	0.1772
5	0	LC-3b	-0.1298	-0.0347	1.1368	0.0001	-4.7463	0.0888
5	0	LC-5	-0.0527	-0.0695	-0.1570	0.0001	0.7657	0.1776
5	1	LC-3b	-0.0785	-0.0174	0.4202	-1.7082	-0.2738	0.1440
5	1	LC-3b	-0.0733	-0.0551	0.6125	-0.8299	0.3792	0.0541
6	0	LC-3b	-0.0703	-0.0059	0.5059	0.0000	-0.2266	0.0026
6	0	LC-8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-4	0.0001	-0.0087	0.1366	-0.0233	-0.4167	0.0379
7	0	LC-5	0.0005	0.0075	-0.0133	0.0072	0.0728	-0.0193
7	1	LC-5	-0.0018	0.0075	-0.0405	0.0072	-0.0346	0.0107
7	1	LC-4	-0.0031	-0.0087	0.1003	-0.0233	0.0565	0.0031
8	0	LC-4	-0.0017	-0.0052	0.0157	0.0007	-0.0279	0.0113
8	0	LC-4	-0.0034	-0.0055	0.0150	0.0015	0.0302	0.0083
8	1	LC-4	0.0030	-0.0052	-0.0177	0.0007	-0.0316	-0.0078
8	1	LC-4	0.0013	-0.0055	-0.0184	0.0015	0.0239	-0.0123
9	0	LC-5	0.0059	0.0091	0.0405	-0.0076	-0.0343	-0.0128
9	0	LC-4	0.0080	-0.0104	-0.1026	0.0280	0.0587	-0.0023
9	1	LC-4	0.0112	-0.0104	-0.1388	0.0280	-0.4235	-0.0438
9	1	LC-5	0.0083	0.0091	0.0133	-0.0076	0.0730	0.0234
10	0	LC-4	0.0114	0.0113	0.1387	-0.0279	-0.4230	-0.0474
10	0	LC-5	0.0085	-0.0081	-0.0134	0.0077	0.0736	0.0198
10	1	LC-5	0.0062	-0.0081	-0.0406	0.0077	-0.0344	-0.0126
10	1	LC-4	0.0083	0.0113	0.1025	-0.0279	0.0587	-0.0020
11	0	LC-4	0.0020	0.0054	0.0177	-0.0007	-0.0315	-0.0076
11	0	LC-4	0.0003	0.0058	0.0184	-0.0015	0.0240	-0.0120
11	1	LC-4	-0.0027	0.0054	-0.0157	-0.0007	-0.0278	0.0124
11	1	LC-4	-0.0044	0.0058	-0.0150	-0.0015	0.0304	0.0093
12	0	LC-5	-0.0021	-0.0085	0.0403	-0.0072	-0.0344	0.0118
12	0	LC-4	-0.0033	0.0078	-0.1005	0.0233	0.0566	0.0041

RESULT ENVELOPE :Member Sectional Forces @ Moment Y (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
12	1	LC-4	-0.0001	0.0078	-0.1367	0.0233	-0.4171	0.0352
12	1	LC-5	0.0003	-0.0085	0.0132	-0.0072	0.0724	-0.0221
13	0	LC-4	-0.0278	-0.0217	0.2351	-0.0495	-1.0850	0.1304
13	0	LC-5	-0.0204	0.0166	-0.0448	0.0187	0.2909	-0.0675
13	1	LC-5	-0.0133	0.0166	-0.0851	0.0187	-0.0978	0.0321
13	1	LC-4	-0.0184	-0.0217	0.1814	-0.0495	0.1616	0.0005
14	0	LC-4	-0.0032	-0.0095	0.0234	-0.0010	-0.0682	0.0127
14	0	LC-4	0.0004	-0.0105	0.0230	0.0002	0.0730	0.0353
14	1	LC-4	0.0031	-0.0100	-0.0222	-0.0018	-0.0648	-0.0336
14	1	LC-4	0.0064	-0.0105	-0.0194	0.0002	0.0815	-0.0140
15	0	LC-5	0.0012	0.0156	0.0855	-0.0193	-0.1000	-0.0288
15	0	LC-4	0.0026	-0.0153	-0.1822	0.0492	0.1650	-0.0052
15	1	LC-4	-0.0069	-0.0153	-0.2359	0.0492	-1.0867	-0.0967
15	1	LC-5	-0.0059	0.0156	0.0452	-0.0193	0.2914	0.0645
16	0	LC-3b	-0.0529	0.0229	0.5152	0.1920	-2.5302	-0.1951
16	0	LC-5	-0.0061	-0.0148	-0.0454	0.0192	0.2919	0.0611
16	1	LC-3b	0.0339	-0.0229	0.0926	-0.2215	-0.2446	-0.1352
16	1	LC-3b	-0.0015	0.0229	0.2238	0.1920	0.3338	-0.0578
17	0	LC-3b	0.0311	0.0598	0.1162	0.2301	-0.2230	-0.1409
17	0	LC-3b	-0.0258	0.0235	-0.0843	-0.2157	0.2689	-0.0475
17	1	LC-3b	-0.0368	0.0267	-0.1409	-0.2434	-0.3019	0.0601
17	1	LC-3b	-0.0062	0.0603	-0.1639	0.2298	0.2287	0.1507
18	0	LC-3b	-0.0558	-0.0247	-0.1025	0.2533	-0.2677	0.1490
18	0	LC-3b	-0.0919	0.0244	-0.2331	-0.1794	0.3298	0.0647
18	1	LC-3b	-0.1433	0.0244	-0.5245	-0.1794	-2.5896	0.2106
18	1	LC-5	-0.0203	-0.0174	0.0447	-0.0185	0.2902	-0.0718
19	0	LC-3b	0.1287	0.0302	-1.1980	0.0000	-3.3920	0.0694
19	0	LC-5	0.0579	0.0603	0.1535	0.0000	0.2449	0.1388
19	1	LC-3b	0.1304	0.0332	-1.2136	0.0000	-3.9447	0.0839
19	1	LC-5	0.0604	0.0663	0.1420	0.0000	0.3126	0.1679

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft) Result Cases

LC-8	LC-1	LC-2

LC-3a	LC-3b	LC-4
LC-5	LC-6	LC-7

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	0	LC-4	-0.2133	0.6438	-0.2585	0.0005	1.8425	-5.0765
1	0	LC-4	-3.0930	-0.6438	-0.2585	0.0005	1.8425	5.5229
1	1	LC-3b	-0.9430	0.1107	-0.0681	0.0002	0.0000	-2.4643
1	1	LC-3b	-2.3828	-0.1107	-0.0681	0.0002	0.0000	2.9107
2	0	LC-3a	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	LC-6	0.0043	0.0000	-0.0304	0.0000	-0.0136	0.0000
2	1	LC-4	0.0059	0.0117	-0.0302	0.0000	-0.0135	0.0053
3	0	LC-4	0.0299	0.0113	-0.4359	0.0001	0.1158	-0.0004
3	0	LC-4	0.0478	0.0000	-0.0813	0.0000	-0.1426	0.0000
3	1	LC-3b	0.0454	0.0000	-0.4365	0.0000	-1.3188	0.0000
3	1	LC-4	0.0739	0.0599	-0.2061	0.0001	-0.6750	0.1316
4	0	LC-3a	0.1314	-0.0154	-0.8460	0.9832	-0.8390	-0.1733
4	0	LC-4	0.1349	0.0667	0.0950	0.0001	-0.8671	0.1591
4	1	LC-3a	0.1327	-0.0154	-0.8552	0.9832	-1.0694	-0.1774
4	1	LC-4	0.1362	0.0667	0.0858	0.0001	-0.8426	0.1772
5	0	LC-4	-0.0585	0.0000	-0.0496	0.0000	0.3869	0.0000
5	0	LC-3b	-0.0985	-0.0841	0.7627	-0.8299	-2.6719	0.3629
5	1	LC-4	-0.0390	-0.0113	-0.2005	0.0001	-0.1674	-0.0016
5	1	LC-3a	-0.0810	-0.0117	0.6574	-1.7083	-0.1666	0.1448
6	0	LC-3a	-0.0043	0.0000	0.0304	0.0000	-0.0136	0.0000
6	0	LC-4	-0.0059	-0.0117	0.0302	0.0000	-0.0135	0.0053
6	1	LC-3b	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	1	LC-4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0	LC-4	0.0003	0.0092	0.0028	0.0025	0.0287	-0.0223
7	0	LC-4	0.0003	-0.0097	0.1364	-0.0234	-0.4163	0.0407
7	1	LC-8	0.0000	-0.0024	0.0182	-0.0039	0.0121	-0.0015
7	1	LC-4	-0.0029	0.0092	-0.0335	0.0025	-0.0326	0.0146
8	0	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0075	-0.0005
8	0	LC-3b	-0.0042	-0.0055	0.0143	0.0024	-0.0208	0.0132

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
8	1	LC-4	0.0022	-0.0053	-0.0184	0.0015	0.0238	-0.0125
8	1	LC-8	-0.0002	0.0000	-0.0002	0.0002	0.0069	-0.0006
9	0	LC-4	0.0078	0.0099	0.0328	-0.0050	-0.0317	-0.0153
9	0	LC-8	0.0000	-0.0028	-0.0184	0.0045	0.0123	0.0018
9	1	LC-4	0.0114	-0.0113	-0.1387	0.0279	-0.4230	-0.0474
9	1	LC-5	0.0081	0.0100	0.0131	-0.0076	0.0725	0.0270
10	0	LC-4	0.0116	0.0123	0.1386	-0.0279	-0.4224	-0.0510
10	0	LC-5	0.0083	-0.0091	-0.0133	0.0076	0.0730	0.0234
10	1	LC-4	0.0080	-0.0089	-0.0329	0.0050	-0.0317	-0.0151
10	1	LC-8	0.0000	0.0028	0.0184	-0.0045	0.0123	0.0018
11	0	LC-4	0.0013	0.0055	0.0184	-0.0015	0.0239	-0.0123
11	0	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0069	-0.0006
11	1	LC-8	-0.0002	0.0000	0.0002	-0.0002	0.0075	-0.0005
11	1	LC-3b	-0.0047	0.0056	-0.0143	-0.0024	-0.0207	0.0138
12	0	LC-8	0.0000	0.0024	-0.0182	0.0039	0.0121	-0.0015
12	0	LC-4	-0.0031	-0.0102	0.0333	-0.0025	-0.0325	0.0157
12	1	LC-4	0.0001	-0.0102	-0.0029	-0.0025	0.0283	-0.0251
12	1	LC-4	0.0001	0.0087	-0.1366	0.0233	-0.4167	0.0379
13	0	LC-5	-0.0203	0.0174	-0.0447	0.0185	0.2902	-0.0718
13	0	LC-4	-0.0280	-0.0225	0.2349	-0.0494	-1.0844	0.1348
13	1	LC-8	-0.0001	-0.0053	0.0347	-0.0088	0.0344	-0.0051
13	1	LC-4	-0.0177	0.0172	-0.0736	0.0147	-0.0910	0.0376
14	0	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0187	0.0030
14	0	LC-4	-0.0004	-0.0103	0.0230	0.0002	0.0727	0.0357
14	1	LC-3b	0.0068	-0.0115	-0.0283	-0.0047	-0.0530	-0.0367
14	1	LC-8	0.0005	-0.0001	0.0000	0.0001	0.0186	0.0025
15	0	LC-4	0.0019	0.0174	0.0712	-0.0062	-0.0939	-0.0366
15	0	LC-8	0.0001	-0.0043	-0.0349	0.0088	0.0352	0.0041
15	1	LC-4	-0.0071	-0.0161	-0.2358	0.0493	-1.0862	-0.1001
15	1	LC-5	-0.0057	0.0164	0.0451	-0.0193	0.2909	0.0679
16	0	LC-3b	-0.0530	0.0233	0.5152	0.1920	-2.5299	-0.1968
16	0	LC-5	-0.0059	-0.0156	-0.0452	0.0193	0.2914	0.0645
16	1	LC-3b	0.0340	-0.0233	0.0927	-0.2215	-0.2445	-0.1359
16	1	LC-8	0.0001	0.0043	0.0349	-0.0088	0.0352	0.0041

RESULT ENVELOPE :Member Sectional Forces @ Moment Z (kips-ft)

Member	Station	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
17	0	LC-3b	0.0315	0.0599	0.1162	0.2301	-0.2228	-0.1416
17	0	LC-8	0.0005	0.0001	0.0000	-0.0001	0.0186	0.0025
17	1	LC-8	0.0005	0.0001	0.0000	-0.0001	0.0187	0.0030
17	1	LC-3b	-0.0066	0.0602	-0.1639	0.2298	0.2286	0.1509
18	0	LC-8	-0.0001	0.0053	-0.0347	0.0088	0.0344	-0.0051
18	0	LC-3b	-0.0557	-0.0251	-0.1026	0.2534	-0.2677	0.1492
18	1	LC-5	-0.0201	-0.0182	0.0445	-0.0184	0.2895	-0.0762
18	1	LC-3b	-0.1434	0.0248	-0.5244	-0.1795	-2.5892	0.2128
19	0	LC-3b	0.0660	0.0000	-0.7221	0.0000	-1.4150	0.0000
19	0	LC-4	0.0953	0.0603	-0.1125	0.0000	-0.6078	0.1388
19	1	LC-3b	0.0682	0.0000	-0.7377	0.0000	-1.7495	0.0000
19	1	LC-4	0.0983	0.0663	-0.1279	0.0000	-0.6629	0.1679

RESULT ENVELOPE :Joint Reactions @ Force X (kips) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Force X (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.5(L+Lr)+W	0.0000	0.3524	-0.0372	-3.7620	0.0000	0.0000
1	D+0.7Ev+0.7Eh	0.9600	0.9600	1.4926	-2.6226	2.8086	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Y (kips) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.7Ev+0.7Eh	0.9600	-0.9600	1.4926	2.9945	2.8086	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Y (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.7Ev+0.7Eh	0.9600	0.9600	1.4926	-2.6226	2.8086	0.0000

RESULT ENVELOPE :Joint Reactions @ Force Z (kips) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Force Z (kips)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+W	0.2585	0.0609	-0.1873	-1.6845	1.8425	-0.0005
1	D+0.5(L+Lr)+W	0.2585	0.0595	2.9030	1.8373	1.8425	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Moment X (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.5(L+Lr)+W	0.2585	0.4938	-0.0372	-4.5115	1.8425	-0.0005
1	D+0.5(L+Lr)+W	0.2585	-0.4938	2.8425	4.8835	1.8425	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.5(L+Lr)+W	0.0000	0.3524	-0.0372	-3.7620	0.0000	0.0000

RESULT ENVELOPE :Joint Reactions @ Moment Y (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+0.5(L+Lr)+W	0.4085	-0.0609	2.8425	2.3659	3.3292	-0.0005

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft) Result Cases

D+W	D+L	D+Lr
D+0.75(L+Lr)	D+0.5(L+Lr)+W	D+0.7Ev+0.7Eh
D-0.7Ev+0.7Eh		

RESULT ENVELOPE :Joint Reactions @ Moment Z (kips-ft)

Joint	Result Case	Force X (kips)	Force Y (kips)	Force Z (kips)	Moment X (kips-ft)	Moment Y (kips-ft)	Moment Z (kips-ft)
1	D+W	0.2585	-0.0609	2.6925	2.0564	1.8425	-0.0005
1	D+0.5(L+Lr)+W	0.0000	0.3524	-0.0372	-3.7620	0.0000	0.0000