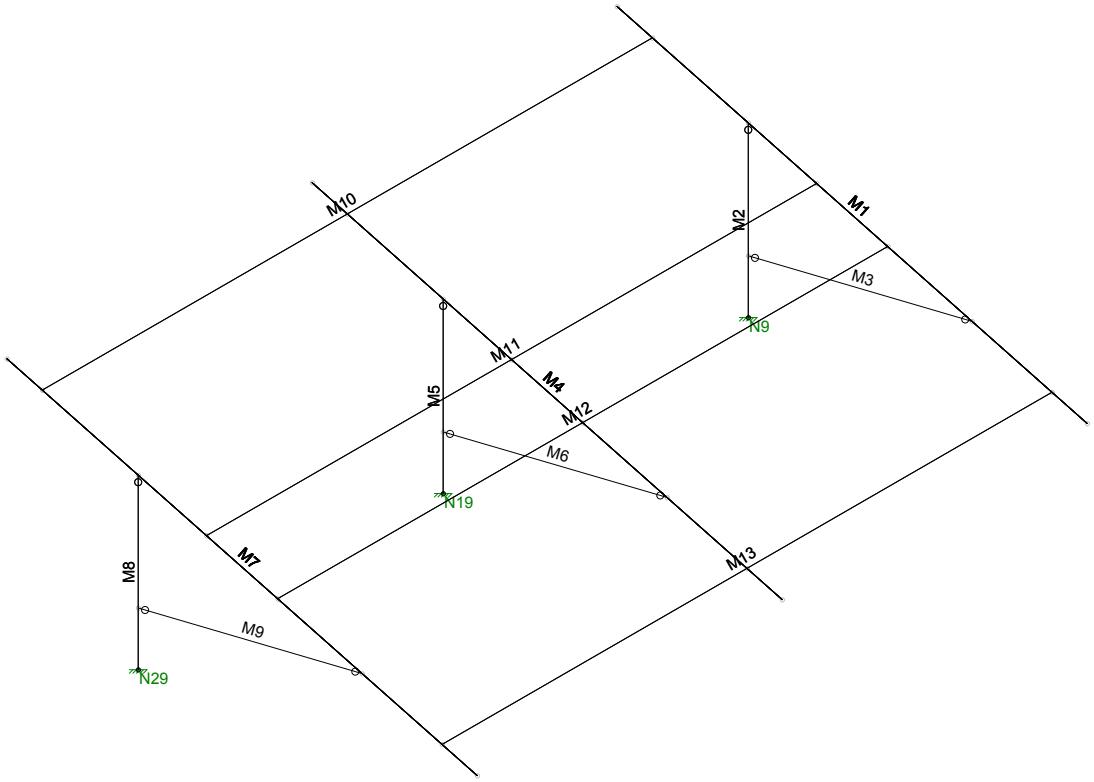


Schletter, Inc.		15° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

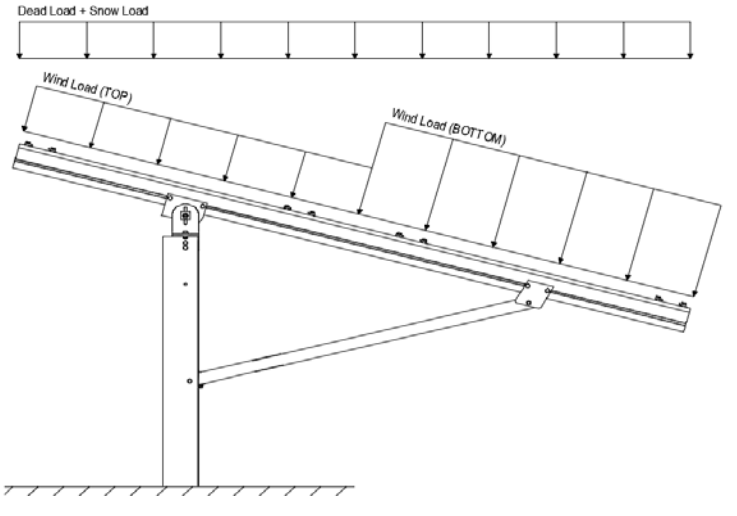
1.2 Construction

Photovoltaic modules are attached to aluminum purlins using clamp fasteners. Purlins are clamped to inclined aluminum girders, which are then connected to galvanized steel posts. Each support structure is equally spaced.

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	1700	mm	Height =	1550	mm
Width =	1050	mm	Width =	970	mm
Dead Load =	3.00	psf	Dead Load =	1.75	psf

Modules Per Row =	2
Module Tilt =	15°
Maximum Height Above Grade =	3 ft



Typical loading conditions of the module dead loads, snow loads, and wind loads are shown on the left.

1.3 Technical Codes

- ASCE 7-10 - Chapter 26-31, Wind Loads
- ASCE 7-10 - Chapter 7, Snow Loads
- ASCE 7-10 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2012, 2015
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} =	3.00	psf	*Self-weight of the PV modules.*
g_{MIN} =	1.75	psf	

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	22.68	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	1.00		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	110	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	19.00	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$ =	1	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.6		
$Cf-_{TOP}$ =	-2.04	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads

S_S =	2.50	R =	1.25
S_{DS} =	1.67	C_S =	0.8
S_1 =	1.00	ρ =	1.3
S_{D1} =	1.00	Ω =	1.25
T_a =	0.07	C_d =	1.25

ASCE 7, Section 12.8.1.3: A maximum S_s of 1.5 may be used to calculate the base shear, C_s, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a S_{ds} of 1.0 was used to calculate C_s.

2.5 Combination of Loads

ASCE 7 requires that all structures be checked by specified combinations of loads. Applicable load combinations are provided below.

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W	
1.2D + 1.0W + 0.5S	
0.9D + 1.0W [M]	
1.54D + 1.3E + 0.2S [R]	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E [R]	
1.54D + 1.25E + 0.2S [O]	
0.56D + 1.25E [O]	

Allowable Stress Design, ASD

Member deflection checks and foundation designs are done according to the following ASD load combinations:

1.0D + 1.0S	
1.0D + 0.6W	
1.0D + 0.75L + 0.45W + 0.75S	
0.6D + 0.6W [M]	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E [O]	
1.1785D + 0.65625E + 0.75S [O]	
0.362D + 0.875E [O]	

[M] *Uses the minimum allowable module dead load.*
[R] *Include redundancy factor of 1.3.*
[O] *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

Appendix B.1 contains outputs from the structural analysis software package, RISA. These outputs are used to accurately determine resultant member and reaction forces from the loads seen throughout Section 2.

3.2 RISA Components

A member and node list has been provided below to correlate the RISA components with the design calculations in Section 4. Items of significance have been listed.

Purlins	Location
M10	Top
M11	Mid-Top
M12	Mid-Bottom
M13	Bottom

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

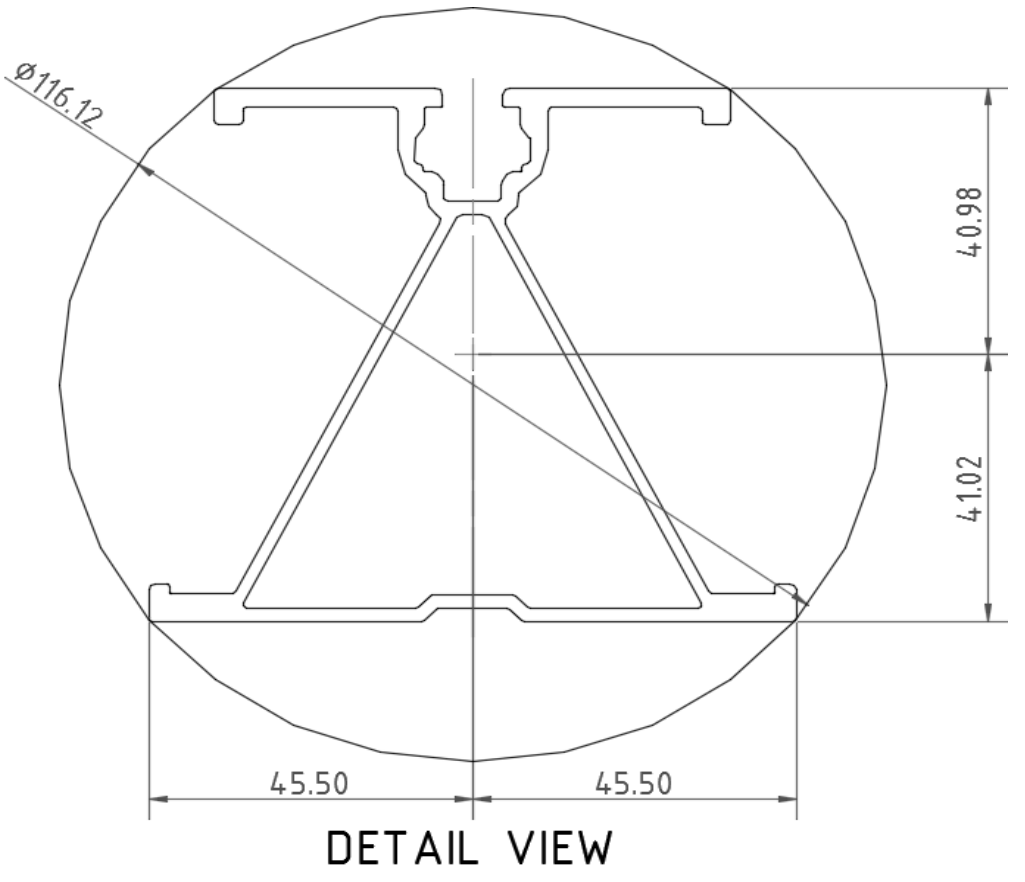
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

Aluminum purlins are used to transfer loads to the support structure. Purlins are designed as continous beams with cantilevers. These are considered beams with internal hinges that can be joined with splices at 25% of the support respective span. See Appendix A.1 for detailed member calculations. Section units are in (mm).

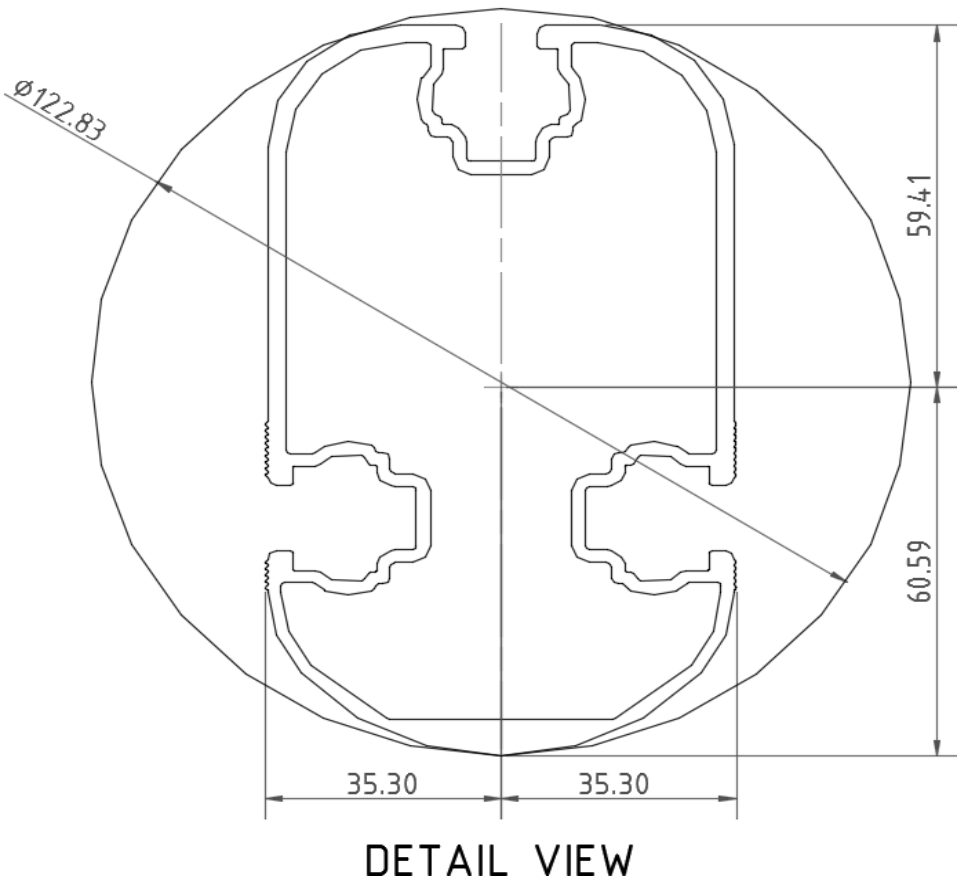
Purlin Type	=	**S1.5**	
Aluminum Type	=	6105-T5	
F_{ty}	=	35	ksi
L_b	=	126	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$	=	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$	=	23.08	ksi
S_y	=	1.33	in^3
S_x	=	0.6	in^3
E	=	10100	ksi
I_y	=	2.16	in^4
I_x	=	1.07	in^4
A	=	1.25	in^2
g	=	1.50	lbs/ft
M_y	=	1.847	k-ft
M_z	=	0.152	k-ft
$M_{y\ allowable}$	=	2.779	k-ft
$M_{z\ allowable}$	=	1.154	k-ft
Utilization	=	80%	



4.2 Girder Design

Loads from purlins are transferred to the posts using an inclined girder, which is connected to the steel post. Loads on the girder result from the support reactions of the purlins. See Appendix A.2 for detailed member calculations. Section units are in (mm).

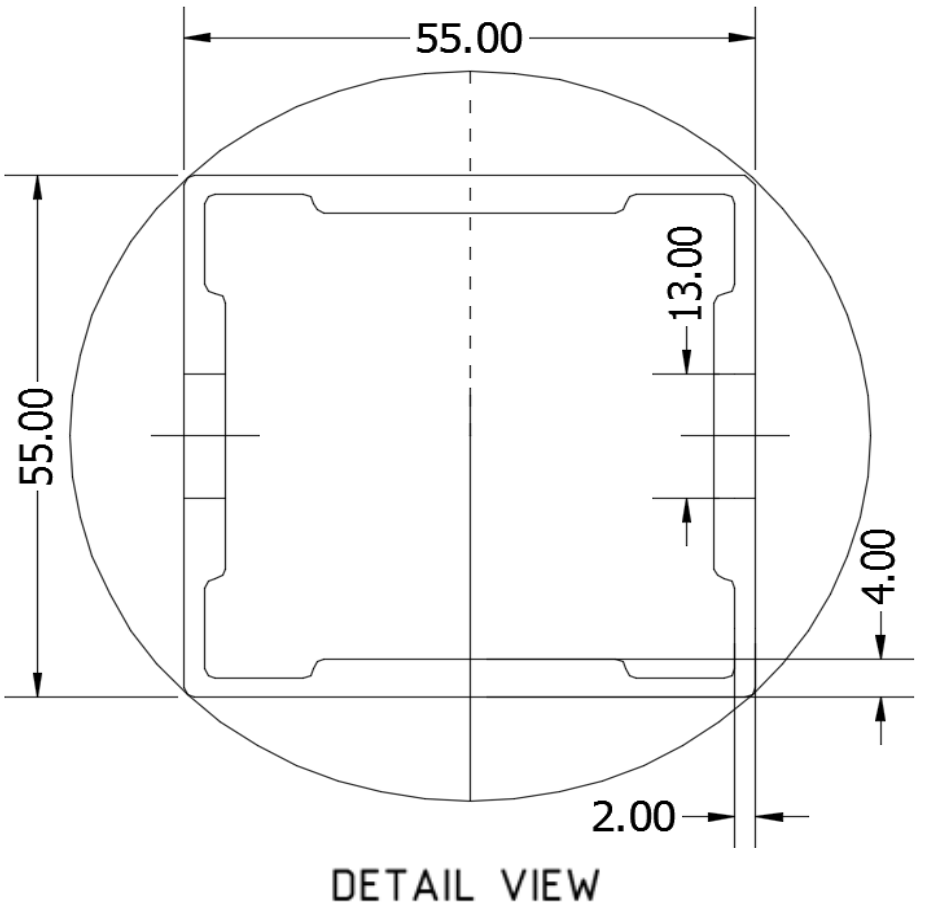
Girder Type	=	**T5**	
Aluminum Type	=	6105-T5	
F_{ty}	=	35	ksi
L_b	=	63.82	in
$\Phi F_{ty\ AXIAL}$	=	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$	=	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$	=	31.56	ksi
S_y	=	1.98	in^3
S_x	=	1.32	in^3
E	=	10100	ksi
I_y	=	4.74	in^4
I_x	=	1.83	in^4
A	=	1.93	in^2
g	=	2.32	lbs/ft
M_y	=	3.773	k-ft
M_z	=	0.000	k-ft
P_n	=	0.255	k
$M_{y\ allowable}$	=	5.026	k-ft
$M_{z\ allowable}$	=	3.472	k-ft
$P_{n\ allowable}$	=	59.439	k
Utilization	=	76%	



4.3 Strut Design

The aluminum strut connects a portion of the girder to the galvanized steel post. Girder forces are then transferred down through the strut into the post. The strut is attached with single M10 bolts at each end. See Appendix A.3 for detailed member calculations. Section units are in (mm).

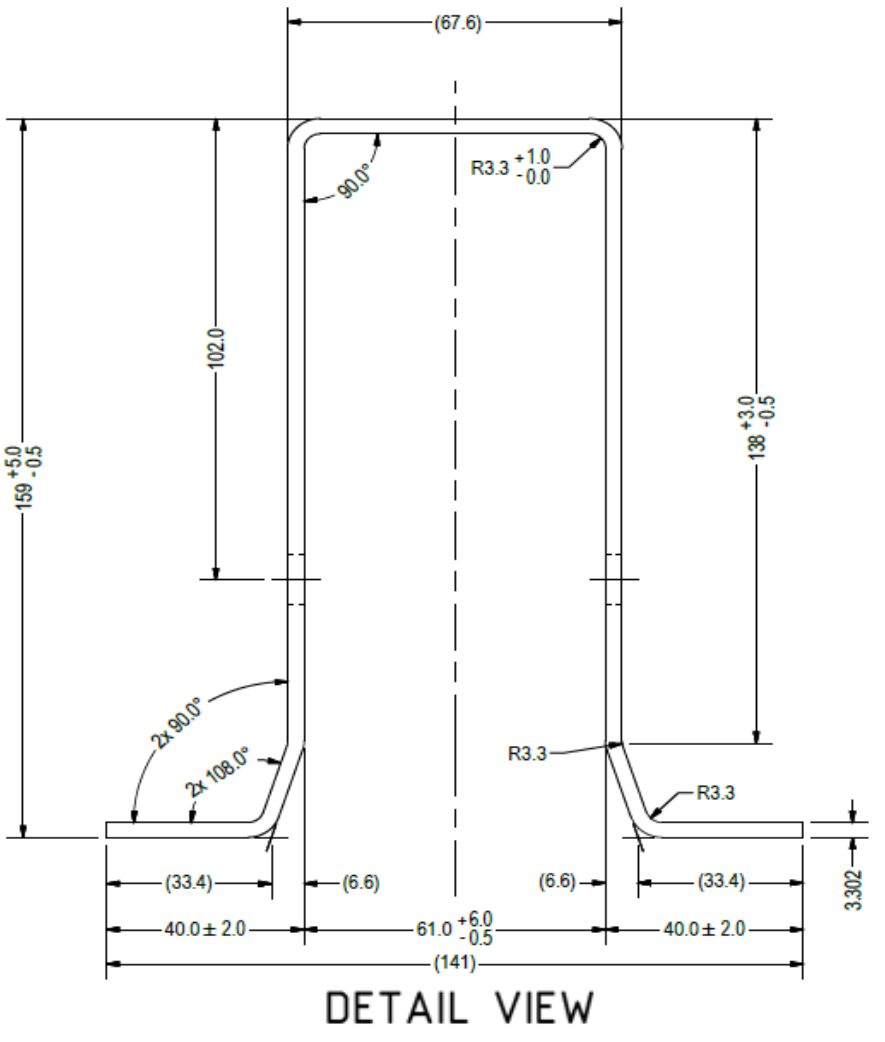
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	7.058	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	53%	



4.4 Post Design

Galvanized steel posts are a roll formed steel section, that are either ram driven into the ground or placed in a concrete foundation at a defined depth. Embedment depths will be provided on the structural drawings or through a geotechnical testing report. See Appendix A.4 for detailed member calculations. Section units are in (mm).

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	58.42	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	16.006	k-ft
M_z =	0.000	k-ft
P_r =	7.048	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	57.399	k
Utilization =	99%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

The following LRFD loads include a safety factor of 1.3, and are to be used in conjunction with a Schletter, Inc. Geotechnical Investigation Report. The forces below should fall within the guidelines provided in the Geotechnical Investigation Report. If a Geotechnical Investigation Report is not present, please proceed to Section 5.2 for a concrete footing design.

Maximum Tensile Load =	4.59	k
Maximum Lateral Load =	1.47	k

5.2 Design of Drilled Shaft Foundations

The galvanized steel post is to be embedded into a cylindrical drilled shaft foundation. For the purpose of design, the post is considered to be fixed to the ground. The applicable lateral force, uplift, and compression resistance checks are seen below.

5.3 Lateral Force Resistance

The equivalent lateral force is applied at the top of the post to determine the required embedment depth. A lateral soil bearing capacity for clay is assumed. Footing is unrestrained at ground level. (IBC, Eq. 18-1)

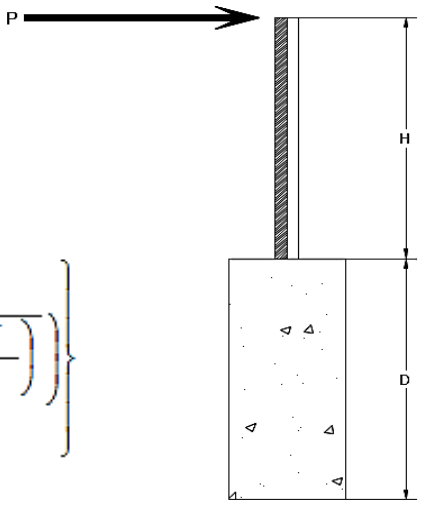
Lateral Force @ Top of Pole, P =	2.37	k
Height of Pole Above Grade, H =	3.87	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

$$S_3 = Min\ (D, 12')$$

$$S_1 = Min\left(\frac{D}{3}, 12'\right)$$

$$A = 2.34\ P/S_1 B$$

$$D = \left\{0.5A\left(1 + \sqrt{1 + \left(\frac{4.36\ H}{A}\right)}\right)\right\}$$



Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

Non-Constrained

Lateral Force @ Top of Pole, P =	2.37	k
Height of Pole Above Grade, H =	3.87	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	12.82	
Required Footing Depth, D =	16.16	ft

2nd Trial @ D_2 =	9.71	ft
Lateral Soil Bearing @ D/3, S_1 =	0.65	ksf
Lateral Soil Bearing @ D, S_3 =	1.94	ksf
Constant 2.34P/(S_1B), A =	4.29	
Required Footing Depth, D =	6.91	ft

3rd Trial @ D_3 =	8.31	ft
Lateral Soil Bearing @ D/3, S_1 =	0.55	ksf
Lateral Soil Bearing @ D, S_3 =	1.66	ksf
Constant 2.34P/(S_1B), A =	5.01	
Required Footing Depth, D =	7.74	ft

4th Trial @ D_4 =	8.03	ft
Lateral Soil Bearing @ D/3, S_1 =	0.54	ksf
Lateral Soil Bearing @ D, S_3 =	1.61	ksf
Constant 2.34P/(S_1B), A =	5.19	
Required Footing Depth, D =	7.94	ft

5th Trial @ D_5 =	7.99	ft
Lateral Soil Bearing @ D/3, S_1 =	0.53	ksf
Lateral Soil Bearing @ D, S_3 =	1.60	ksf
Constant 2.34P/(S_1B), A =	5.22	
Required Footing Depth, D =	8.00	ft

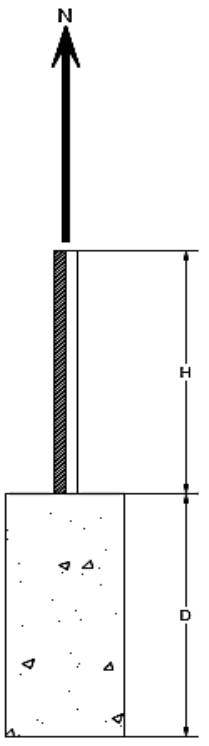
A 2ft diameter x 8ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

Uplifting forces of the racking system are checked against the uplift resistance of the soil. Clay soils are assumed.

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.10	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.34	k
Required Concrete Volume, V =	9.26	ft^3
Required Footing Depth, D =	3.00	ft

A 2ft diameter x 3ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.50
2	0.4	0.2	118.10	4.40
3	0.6	0.2	118.10	4.30
4	0.8	0.2	118.10	4.19
5	1	0.2	118.10	4.09
6	1.2	0.2	118.10	3.99
7	1.4	0.2	118.10	3.88
8	1.6	0.2	118.10	3.78
9	1.8	0.2	118.10	3.67
10	2	0.2	118.10	3.57
11	2.2	0.2	118.10	3.47
12	2.4	0.2	118.10	3.36
13	2.6	0.2	118.10	3.26
14	2.8	0.2	118.10	3.16
15	3	0.2	118.10	3.05
16	3.2	0.2	118.10	2.95
17	0	0.0	0.00	2.95
18	0	0.0	0.00	2.95
19	0	0.0	0.00	2.95
20	0	0.0	0.00	2.95
21	0	0.0	0.00	2.95
22	0	0.0	0.00	2.95
23	0	0.0	0.00	2.95
24	0	0.0	0.00	2.95
25	0	0.0	0.00	2.95
26	0	0.0	0.00	2.95
27	0	0.0	0.00	2.95
28	0	0.0	0.00	2.95
29	0	0.0	0.00	2.95
30	0	0.0	0.00	2.95
31	0	0.0	0.00	2.95
32	0	0.0	0.00	2.95
33	0	0.0	0.00	2.95
34	0	0.0	0.00	2.95
Max	3.2	Sum	0.76	

5.5 Compressive Force Resistance

Skin friction of the soil is checked against the compression force from the racking and the weight of the drilled shaft foundation. Skin friction starts at 3ft below grade. Clay soils are again assumed.

Depth Below Grade, D =	8.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.27	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	31.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

Bearing Area =	3.14	ft^2
Bearing Capacity =	1.5	ksf
Resistance =	4.71	k

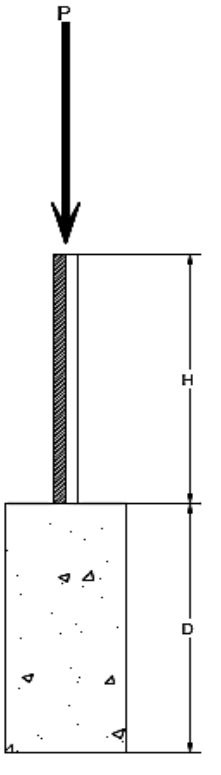
Weight of Concrete

Footing Volume	25.13	ft^3
Weight	3.64	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.71	k
1/3 Increase for Wind =	1.33	
Total Resistance =	12.57	k
Applied Force =	7.92	k
Utilization =	63%	

A 2ft diameter footing passes at a depth of 8ft.



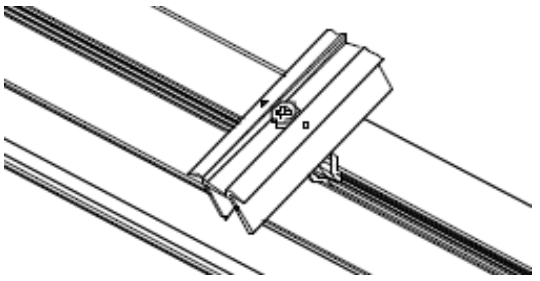
6. DESIGN OF JOINTS AND CONNECTIONS

6.1 Anchorage of Modules to Purlins and Connection of Purlins to Girders

Modules are secured to the purlins with Schletter, Inc. Rapid2+ mounting clamps. Purlins are secured to the girders with the use of 40mm mounting clamps. The reliability of calculations is uncertain due to limited standards, therefore the strength of the clamp fasteners has been evaluated by load testing.

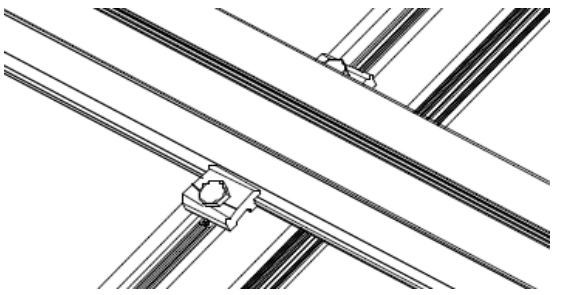
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.357	k
Allowable Uplift =	1.214	k
Utilization =	29%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	1.307	k
Allowable Uplift =	2.180	k
Utilization =	60%	

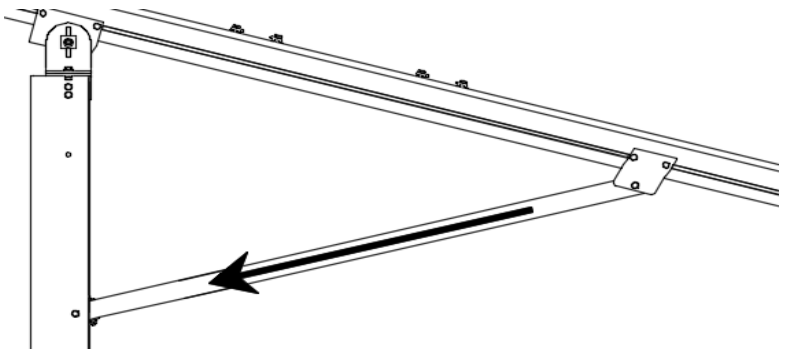


6.2 Strut Connections

The aluminum struts connect the front end of girder to a center section of the steel post. Single M10 bolts are used to attach each end of the strut to the girder and post. ASTM A193/A193M-86 equivalent stainless steel bolts are used.

Maximum Axial Load =	7.058	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	79%	

Bolt capacity is accounting for double shear. (ASCE 8-02, Eq. 5.3.4-1)

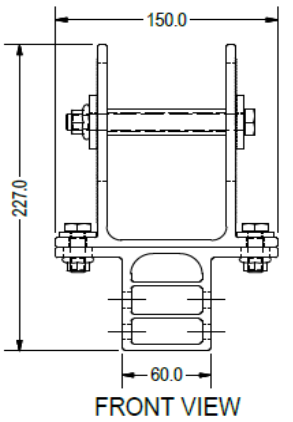


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

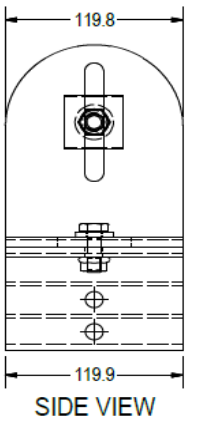
6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

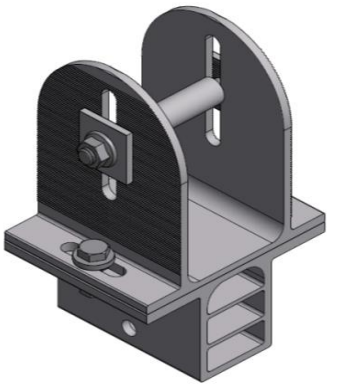
Maximum Tensile Load =	2.831	k
Allowable Load =	5.649	k
Utilization =	50%	



FRONT VIEW



SIDE VIEW



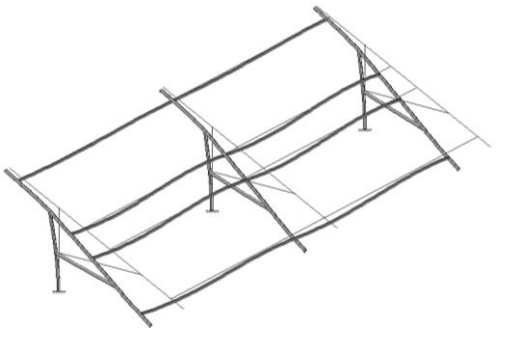
7. SEISMIC DESIGN

7.1 Seismic Drift

The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).

Mean Height, h_{sx} =		49.47	in
Allowable Story Drift for All Other Structures, Δ =	{	$0.020h_{sx}$	
		0.989	in
Max Drift, Δ_{MAX} =		0.513	in
0.513 ≤ 0.989, OK.			

The racking structure's reaction to seismic loads is shown to the right. The deflections have been magnified to provide a clear portrayal of potential story drift.



APPENDIX A

A.1 Design of Aluminum Purlins - Aluminum Design Manual, 2005 Edition

Purlin = **S1.5**

Strong Axis:

3.4.14

L_b = 126 in

J = 0.432

348.575

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 27.2 ksi

3.4.16

b/t = 32.195

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

$$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$$

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

φF_LSt= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

M_{max}St = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 126

J = 0.432

221.673

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 28.5

3.4.16

b/t = 37.0588

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

M_{max}Wk = 1.152 k-ft

Compression

3.4.9

b/t = 32.195
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
φF_L = φc[Bp-1.6Dp*b/t]
φF_L = 25.1 ksi

b/t = 37.0588
S1 = 12.21
S2 = 32.70
φF_L = (φck2*√(BpE))/(1.6b/t)
φF_L = 21.9 ksi

3.4.10

Rb/t = 0.0

$$S1 = \left(\frac{Bt - \frac{\theta_y}{\theta_b} Fcy}{Dt}\right)^2$$

S1 = 6.87
S2 = 131.3
φF_L = φyFcy
φF_L = 33.25 ksi

φF_L = 21.94 ksi
A = 1215.13 mm^2
1.88 in^2
P_{max} = 41.32 kips

A.2 Design of Aluminum Girders - Aluminum Design Manual, 2005 Edition

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.5 ksi

3.4.16

b/t = 4.5

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.3

3.4.16

b/t = 16.3333

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7
φF_L = φb[Bp-1.6Dp*b/t]
φF_L = 31.6 ksi

3.4.16.1 Used

Rb/t = 20.0

$$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$$

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$$

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 5.001 k-ft

3.4.18

h/t = 4.5

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

$M_{max}Wk$ = 3.499 k-ft

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

$$S1 = \left(\frac{Bt - \frac{\theta_y}{\theta_b}Fcy}{Dt}\right)^2$$

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

A.3 Design of Aluminum Struts - Aluminum Design Manual, 2005 Edition

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

$$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$$

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

$M_{max}St$ = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 30.2

3.4.16

b/t = 24.5

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

$M_{max}Wk$ = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

$$S1^* = \frac{Bc - Fcy}{1.6Dc^*}$$

S1* = 0.33515

$$S2^* = \frac{Cc}{\pi}\sqrt{Fcy/E}$$

S2* = 1.23671

φcc = 0.77756

φF_L = (φccFcy)/(λ²)

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

$$S1 = \left(\frac{Bt - \frac{\theta_y}{\theta_b}Fcy}{Dt}\right)^2$$

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	58.42	in	
Pr =	7.05	k	(LRFD Factored Load)
Mr (Strong) =	16.01	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	84.05		
4.71√(E/Fy) =	103.55	=> kL/r	≤ 4.71√(E/Fy)
Fcr =	32.28	ksi	
Fe =	40.51	ksi	
Pn =	71.985	k	

Torsional/Flexural Torsional Buckling:

Fcr =	25.7394	ksi
Fey =	103.338	ksi
Fez =	32.5781	ksi
Pn =	57.3988	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1364	<	0.2	
Utilization =	0.99	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.136	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 99%

APPENDIX B

B.1

The following pages will contain the results from RISA. Please refer back to Section 2 for load information and Section 4-5 for member and foundation design.

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead Load, Max	DL		-1				4		
2	Dead Load, Min	DL		-1				4		
3	Snow Load	SL						4		
4	Wind Load - Pressure	WL						4		
5	Wind Load - Suction	WL						4		
6	Seismic - Lateral	EL			.8			8		

Member Distributed Loads (BLC 1 : Dead Load, Max)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-8.366	-8.366	0	0
2	M11	Y	-8.366	-8.366	0	0
3	M12	Y	-8.366	-8.366	0	0
4	M13	Y	-8.366	-8.366	0	0

Member Distributed Loads (BLC 2 : Dead Load, Min)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-4.45	-4.45	0	0
2	M11	Y	-4.45	-4.45	0	0
3	M12	Y	-4.45	-4.45	0	0
4	M13	Y	-4.45	-4.45	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-61.093	-61.093	0	0
2	M11	Y	-61.093	-61.093	0	0
3	M12	Y	-61.093	-61.093	0	0
4	M13	Y	-61.093	-61.093	0	0

Member Distributed Loads (BLC 4 : Wind Load - Pressure)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-52.98	-52.98	0	0
2	M11	y	-52.98	-52.98	0	0
3	M12	y	-84.769	-84.769	0	0
4	M13	y	-84.769	-84.769	0	0

Member Distributed Loads (BLC 5 : Wind Load - Suction)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	108.08	108.08	0	0
2	M11	y	108.08	108.08	0	0
3	M12	y	52.98	52.98	0	0
4	M13	y	52.98	52.98	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Z	6.693	6.693	0	0
2	M11	Z	6.693	6.693	0	0
3	M12	Z	6.693	6.693	0	0
4	M13	Z	6.693	6.693	0	0
5	M10	Z	0	0	0	0
6	M11	Z	0	0	0	0
7	M12	Z	0	0	0	0
8	M13	Z	0	0	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.5W	Yes	Y		1	1.2	3	1.6	4	.5														
2	LRFD 1.2D + 1.0W + 0.5S	Yes	Y		1	1.2	3	.5	4	1														
3	LRFD 0.9D + 1.0W	Yes	Y		2	.9					5	1												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 0.6W	Yes	Y		1	1			4	.6														
11	ASD 1.0D + 0.75L + 0.45W + 0....	Yes	Y		1	1	3	.75	4	.45														
12	ASD 0.6D + 0.6W	Yes	Y		2	.6					5	.6												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	208.839	2	2566.855	1	348.383	1	.279	1	.005	5	6.623	1
2		min	-349.338	3	-1191.78	3	-332.119	5	-1.11	5	-.005	1	-.369	3
3	N19	max	1079.709	2	7088.916	1	0	12	0	3	.005	4	15.443	1
4		min	-1052.112	3	-3533.34	3	-363.781	5	-1.168	4	0	2	-1.4	3
5	N29	max	208.839	2	2566.855	1	210.862	3	.143	3	.006	4	6.623	1
6		min	-349.338	3	-1191.78	3	-414.951	4	-1.189	4	-.002	3	-.369	3
7	Totals:	max	1497.387	2	12222.626	1	0	12						
8		min	-1750.787	3	-5916.9	3	-1055.245	4						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.005	1	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.135	15	-.504	15	0	3	0	1	0	3	0	6
4			min	-.575	6	-2.144	6	-1.499	5	0	1	0	5	0	15
5		3	max	-3.144	12	201.918	3	14.417	3	.054	3	.243	1	.29	1
6			min	-162.952	1	-654.052	1	-168.786	1	-.23	1	0	3	-.089	3
7		4	max	-3.368	12	200.665	3	14.417	3	.054	3	.139	1	.696	1
8			min	-163.4	1	-655.723	1	-168.786	1	-.23	1	.006	12	-.214	3
9		5	max	-3.592	12	199.411	3	14.417	3	.054	3	.065	4	1.104	1
10			min	-163.848	1	-657.395	1	-168.786	1	-.23	1	-.007	10	-.338	3
11		6	max	581.928	3	566.038	1	31.345	3	-.002	9	.125	1	1.063	1
12			min	-2399.404	1	-128.02	3	-221.106	1	-.019	3	-.035	3	-.342	3
13		7	max	581.592	3	564.367	1	31.345	3	-.002	9	.01	2	.712	1
14			min	-2399.852	1	-129.274	3	-221.106	1	-.019	3	-.042	4	-.262	3
15		8	max	581.256	3	562.695	1	31.345	3	-.002	9	.004	3	.362	1
16			min	-2400.3	1	-130.527	3	-221.106	1	-.019	3	-.15	1	-.181	3
17		9	max	577.666	3	52.138	3	41.488	3	.01	5	.086	4	.165	1
18			min	-2570.195	1	-63.524	1	-239.88	1	-.203	1	.004	10	-.144	3
19		10	max	577.33	3	50.885	3	41.488	3	.01	5	.042	3	.205	1
20			min	-2570.643	1	-65.195	1	-239.88	1	-.203	1	-.073	1	-.176	3
21		11	max	576.994	3	49.631	3	41.488	3	.01	5	.068	3	.246	1
22			min	-2571.091	1	-66.867	1	-239.88	1	-.203	1	-.222	1	-.207	3
23		12	max	571.151	3	501.234	3	126.424	1	.291	3	.112	1	.525	1
24			min	-2735.795	1	-637.004	1	-213.04	5	-.49	1	.006	15	-.419	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
25		13	max	570.815	3	499.98	3	126.424	1	.291	3	.191	1	.92	1
26			min	-2736.242	1	-638.675	1	-214.539	5	-.49	1	-.124	5	-.729	3
27		14	max	165.382	1	574.113	1	78.561	5	.315	1	.052	1	1.301	1
28			min	2.919	12	-446.353	3	-167.355	1	-.287	3	-.229	5	-1.026	3
29		15	max	164.934	1	572.442	1	77.061	5	.315	1	-.003	10	.945	1
30			min	2.695	12	-447.606	3	-167.355	1	-.287	3	-.192	4	-.749	3
31		16	max	164.486	1	570.77	1	75.561	5	.315	1	-.005	12	.59	1
32			min	2.471	12	-448.86	3	-167.355	1	-.287	3	-.163	4	-.471	3
33		17	max	164.038	1	569.099	1	74.062	5	.315	1	.007	3	.236	1
34			min	2.247	12	-450.114	3	-167.355	1	-.287	3	-.259	1	-.192	3
35		18	max	.575	6	2.145	6	1.5	5	0	1	0	12	0	6
36			min	.135	15	.504	15	0	12	0	1	0	5	0	15
37		19	max	0	1	0	1	0	1	0	1	0	1	0	1
38			min	0	1	-.001	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.012	1	.001	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.135	15	-.504	15	0	1	0	1	0	1	0	4
42			min	-.575	4	-2.142	4	-1.499	5	0	1	0	5	0	15
43		3	max	-9.479	15	592.258	3	0	1	.012	4	.23	4	.68	1
44			min	-272.443	1	-1800.738	1	-110.926	5	0	1	0	1	-.224	3
45		4	max	-9.614	15	591.005	3	0	1	.012	4	.161	4	1.798	1
46			min	-272.89	1	-1802.409	1	-112.426	5	0	1	0	1	-.591	3
47		5	max	-9.749	15	589.751	3	0	1	.012	4	.091	4	2.917	1
48			min	-273.338	1	-1804.081	1	-113.925	5	0	1	0	1	-.957	3
49		6	max	1848.464	3	1617.462	1	0	1	0	1	.005	4	2.781	1
50			min	-6516.316	1	-442.325	3	-115.053	4	-.009	4	0	1	-.945	3
51		7	max	1848.128	3	1615.79	1	0	1	0	1	0	1	1.778	1
52			min	-6516.764	1	-443.578	3	-116.552	4	-.009	4	-.067	5	-.67	3
53		8	max	1847.792	3	1614.119	1	0	1	0	1	0	1	.776	1
54			min	-6517.212	1	-444.832	3	-118.052	4	-.009	4	-.14	4	-.394	3
55		9	max	1824.839	3	184.501	3	0	1	.011	4	.139	4	.176	1
56			min	-6774.425	1	-280.368	1	-240.323	4	0	1	0	1	-.253	3
57		10	max	1824.503	3	183.248	3	0	1	.011	4	0	1	.35	1
58			min	-6774.872	1	-282.04	1	-241.823	4	0	1	-.011	4	-.368	3
59		11	max	1824.167	3	181.994	3	0	1	.011	4	0	1	.526	1
60			min	-6775.32	1	-283.711	1	-243.323	4	0	1	-.161	4	-.481	3
61		12	max	1805.719	3	1426.825	3	0	1	.094	4	.053	5	1.347	1
62			min	-7042.916	1	-1965.522	1	-256.687	5	0	1	0	1	-1.084	3
63		13	max	1805.384	3	1425.571	3	0	1	.094	4	0	1	2.567	1
64			min	-7043.363	1	-1967.193	1	-258.187	5	0	1	-.107	5	-1.969	3
65		14	max	271.614	1	1657.079	1	65.542	5	0	1	0	1	3.739	1
66			min	9.777	15	-1249.831	3	0	1	-.067	4	-.221	5	-2.817	3
67		15	max	271.166	1	1655.408	1	64.042	5	0	1	0	1	2.711	1
68			min	9.642	15	-1251.084	3	0	1	-.067	4	-.181	5	-2.041	3
69		16	max	270.719	1	1653.737	1	62.542	5	0	1	0	1	1.684	1
70			min	9.507	15	-1252.338	3	0	1	-.067	4	-.142	4	-1.264	3
71		17	max	270.271	1	1652.065	1	61.043	5	0	1	0	1	.658	1
72			min	9.372	15	-1253.592	3	0	1	-.067	4	-.104	4	-.486	3
73		18	max	.575	6	2.146	6	1.5	5	0	1	0	1	0	6
74			min	.135	15	.504	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.002	1	0	1	0	1	0	1	0	1
76			min	0	1	-.004	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.005	1	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	-.135	15	-.504	15	0	1	0	1	0	1	0	4
80			min	-.575	6	-2.144	4	-1.499	5	0	1	0	5	0	15
81		3	max	19.018	5	201.918	3	168.786	1	.23	1	.115	5	.29	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
82			min	-162.952	1	-654.052	1	-49.288	5	-.054	3	-.243	1	-.089	3
83		4	max	18.809	5	200.665	3	168.786	1	.23	1	.083	5	.696	1
84			min	-163.4	1	-655.723	1	-50.788	5	-.054	3	-.139	1	-.214	3
85		5	max	18.6	5	199.411	3	168.786	1	.23	1	.051	5	1.104	1
86			min	-163.848	1	-657.395	1	-52.287	5	-.054	3	-.034	1	-.338	3
87		6	max	581.928	3	566.038	1	221.106	1	.019	3	.035	3	1.063	1
88			min	-2399.404	1	-128.02	3	-50.241	5	-.006	5	-.125	1	-.342	3
89		7	max	581.592	3	564.367	1	221.106	1	.019	3	.016	3	.712	1
90			min	-2399.852	1	-129.274	3	-51.741	5	-.006	5	-.036	5	-.262	3
91		8	max	581.256	3	562.695	1	221.106	1	.019	3	.15	1	.362	1
92			min	-2400.3	1	-130.527	3	-53.24	5	-.006	5	-.069	5	-.181	3
93		9	max	577.666	3	52.138	3	239.88	1	.203	1	.063	5	.165	1
94			min	-2570.195	1	-63.524	1	-100.706	5	.015	15	-.076	1	-.144	3
95		10	max	577.33	3	50.885	3	239.88	1	.203	1	.073	1	.205	1
96			min	-2570.643	1	-65.195	1	-102.206	5	.015	15	-.042	3	-.176	3
97		11	max	576.994	3	49.631	3	239.88	1	.203	1	.222	1	.246	1
98			min	-2571.091	1	-66.867	1	-103.706	5	.015	15	-.068	3	-.207	3
99		12	max	571.151	3	501.234	3	170.167	3	.49	1	0	15	.525	1
100			min	-2735.795	1	-637.004	1	-239.758	4	-.291	3	-.112	1	-.419	3
101		13	max	570.815	3	499.98	3	170.167	3	.49	1	.089	3	.92	1
102			min	-2736.242	1	-638.675	1	-241.257	4	-.291	3	-.191	1	-.729	3
103		14	max	165.382	1	574.113	1	167.355	1	.287	3	.038	3	1.301	1
104			min	.703	15	-446.353	3	-24.054	3	-.315	1	-.242	4	-1.026	3
105		15	max	164.934	1	572.442	1	167.355	1	.287	3	.051	1	.945	1
106			min	.568	15	-447.606	3	-24.054	3	-.315	1	-.176	5	-.749	3
107		16	max	164.486	1	570.77	1	167.355	1	.287	3	.155	1	.59	1
108			min	.432	15	-448.86	3	-24.054	3	-.315	1	-.119	5	-.471	3
109		17	max	164.038	1	569.099	1	167.355	1	.287	3	.259	1	.236	1
110			min	.297	15	-450.114	3	-24.054	3	-.315	1	-.063	5	-.192	3
111		18	max	.575	4	2.145	4	1.5	5	0	1	0	1	0	4
112			min	.135	15	.504	15	0	1	0	1	0	5	0	15
113		19	max	0	1	0	1	0	12	0	1	0	1	0	1
114			min	0	1	-.001	3	0	4	0	1	0	1	0	1
115	M10	1	max	167.304	1	565.66	1	-.03	15	.005	1	.327	1	.315	1
116			min	-24.053	3	-452.567	3	-163.566	1	-.01	3	-.026	5	-.287	3
117		2	max	167.304	1	411.253	1	1.313	5	.005	1	.155	1	.171	3
118			min	-24.053	3	-332.513	3	-130.473	1	-.01	3	-.025	5	-.255	1
119		3	max	167.304	1	256.847	1	2.982	5	.005	1	.032	2	.489	3
120			min	-24.053	3	-212.458	3	-97.381	1	-.01	3	-.023	5	-.645	1
121		4	max	167.304	1	102.44	1	4.651	5	.005	1	.003	10	.667	3
122			min	-24.053	3	-92.404	3	-64.289	1	-.01	3	-.072	1	-.854	1
123		5	max	167.304	1	27.651	3	6.32	5	.005	1	-.008	12	.705	3
124			min	-24.053	3	-51.967	1	-31.197	1	-.01	3	-.128	1	-.884	1
125		6	max	167.304	1	147.705	3	9.492	4	.005	1	-.002	15	.603	3
126			min	-24.053	3	-206.374	1	-7.499	2	-.01	3	-.145	1	-.733	1
127		7	max	167.304	1	267.76	3	34.988	1	.005	1	.007	5	.36	3
128			min	-24.053	3	-360.781	1	-2.465	10	-.01	3	-.123	1	-.402	1
129		8	max	167.304	1	387.814	3	68.08	1	.005	1	.019	5	.109	1
130			min	-24.053	3	-515.187	1	.515	10	-.01	3	-.063	1	-.022	3
131		9	max	167.304	1	507.869	3	101.172	1	.005	1	.046	14	.8	1
132			min	-24.053	3	-669.594	1	3.496	10	-.01	3	-.02	2	-.545	3
133		10	max	167.304	1	627.923	3	134.264	1	0	15	.173	1	1.671	1
134			min	-24.053	3	-824.001	1	-69.231	14	-.01	3	-.014	10	-1.207	3
135		11	max	167.304	1	669.594	1	2.262	5	.01	3	.037	9	.8	1
136			min	-24.053	3	-507.869	3	-101.172	1	-.005	1	-.027	5	-.545	3
137		12	max	167.304	1	515.187	1	3.931	5	.01	3	.012	3	.109	1
138			min	-24.053	3	-387.814	3	-68.08	1	-.005	1	-.063	1	-.022	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	167.304	1	360.781	1	5.6	5	.01	3	.002	3	.36	3
140			min	-24.053	3	-267.76	3	-34.988	1	-.005	1	-.123	1	-.402	1
141		14	max	167.304	1	206.374	1	7.499	2	.01	3	-.004	12	.603	3
142			min	-24.053	3	-147.705	3	-5.93	3	-.005	1	-.145	1	-.733	1
143		15	max	167.304	1	51.967	1	31.197	1	.01	3	0	15	.705	3
144			min	-24.053	3	-27.651	3	-4.312	3	-.005	1	-.128	1	-.884	1
145		16	max	167.304	1	92.404	3	64.289	1	.01	3	.01	5	.667	3
146			min	-35.167	5	-102.44	1	-2.694	3	-.005	1	-.072	1	-.854	1
147		17	max	167.304	1	212.458	3	97.381	1	.01	3	.032	2	.489	3
148			min	-47.143	5	-256.847	1	-1.076	3	-.005	1	-.018	3	-.645	1
149		18	max	167.304	1	332.513	3	130.473	1	.01	3	.155	1	.171	3
150			min	-59.119	5	-411.253	1	.542	3	-.005	1	-.019	3	-.255	1
151		19	max	167.304	1	452.567	3	163.566	1	.01	3	.327	1	.315	1
152			min	-71.095	5	-565.66	1	1.803	12	-.005	1	-.017	3	-.287	3
153	M11	1	max	366.746	1	564.389	1	27.501	5	.002	3	.338	1	.287	1
154			min	-211.464	3	-453.809	3	-165.196	1	-.011	1	-.173	5	-.343	3
155		2	max	366.746	1	409.982	1	29.17	5	.002	3	.164	1	.116	3
156			min	-211.464	3	-333.755	3	-132.104	1	-.011	1	-.14	5	-.282	1
157		3	max	366.746	1	255.576	1	30.839	5	.002	3	.031	2	.435	3
158			min	-211.464	3	-213.7	3	-99.012	1	-.011	1	-.105	5	-.67	1
159		4	max	366.746	1	101.169	1	32.508	5	.002	3	.001	10	.615	3
160			min	-211.464	3	-93.646	3	-65.919	1	-.011	1	-.083	4	-.878	1
161		5	max	366.746	1	26.409	3	34.177	5	.002	3	-.003	12	.654	3
162			min	-211.464	3	-53.238	1	-32.827	1	-.011	1	-.124	1	-.906	1
163		6	max	366.746	1	146.463	3	36.964	4	.002	3	.011	5	.553	3
164			min	-211.464	3	-207.645	1	-7.218	2	-.011	1	-.143	1	-.754	1
165		7	max	366.746	1	266.518	3	45.243	4	.002	3	.054	5	.312	3
166			min	-211.464	3	-362.052	1	-1.977	10	-.011	1	-.124	1	-.422	1
167		8	max	366.746	1	386.572	3	66.449	1	.002	3	.099	5	.091	1
168			min	-211.464	3	-516.458	1	1.003	10	-.011	1	-.065	1	-.069	3
169		9	max	366.746	1	506.627	3	99.542	1	.002	3	.156	4	.783	1
170			min	-211.464	3	-670.865	1	3.983	10	-.011	1	-.02	2	-.59	3
171		10	max	366.746	1	626.681	3	132.634	1	0	15	.233	4	1.656	1
172			min	-211.464	3	-825.272	1	-53.932	14	-.011	1	-.013	10	-1.251	3
173		11	max	366.746	1	670.865	1	30.319	5	.011	1	.034	9	.783	1
174			min	-211.464	3	-506.627	3	-99.542	1	-.002	3	-.14	5	-.59	3
175		12	max	366.746	1	516.458	1	31.988	5	.011	1	.008	3	.091	1
176			min	-211.464	3	-386.572	3	-66.449	1	-.002	3	-.114	4	-.069	3
177		13	max	366.746	1	362.052	1	33.657	5	.011	1	.002	3	.312	3
178			min	-211.464	3	-266.518	3	-33.357	1	-.002	3	-.124	1	-.422	1
179		14	max	366.746	1	207.645	1	35.326	5	.011	1	-.002	12	.553	3
180			min	-211.464	3	-146.463	3	-3.222	9	-.002	3	-.143	1	-.754	1
181		15	max	366.746	1	53.238	1	42.711	4	.011	1	.017	5	.654	3
182			min	-211.464	3	-26.409	3	-.872	3	-.002	3	-.124	1	-.906	1
183		16	max	366.746	1	93.646	3	65.919	1	.011	1	.061	5	.615	3
184			min	-211.464	3	-101.169	1	.637	12	-.002	3	-.067	1	-.878	1
185		17	max	366.746	1	213.7	3	99.012	1	.011	1	.111	4	.435	3
186			min	-211.464	3	-255.576	1	1.716	12	-.002	3	-.002	3	-.67	1
187		18	max	366.746	1	333.755	3	132.104	1	.011	1	.185	4	.116	3
188			min	-211.464	3	-409.982	1	2.794	12	-.002	3	.001	12	-.282	1
189		19	max	366.746	1	453.809	3	165.196	1	.011	1	.338	1	.287	1
190			min	-211.464	3	-564.389	1	3.873	12	-.002	3	.005	12	-.343	3
191	M12	1	max	45.814	5	621.068	1	28.071	5	.003	3	.367	1	.196	1
192			min	-18.984	9	-184.526	3	-169.403	1	-.012	1	-.175	5	.019	15
193		2	max	33.838	5	448.118	1	29.74	5	.003	3	.189	1	.216	3
194			min	-18.984	9	-128.755	3	-136.311	1	-.012	1	-.142	5	-.428	1
195		3	max	21.862	5	275.167	1	31.409	5	.003	3	.049	1	.334	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-18.984	9	-72.984	3	-103.219	1	-.012	1	-.106	5	-.849	1
197		4	max	12.471	2	102.217	1	33.078	5	.003	3	.006	10	.386	3
198			min	-18.984	9	-17.212	3	-70.127	1	-.012	1	-.081	4	-1.07	1
199		5	max	12.471	2	38.559	3	34.747	5	.003	3	-.006	12	.374	3
200			min	-18.984	9	-70.733	1	-37.034	1	-.012	1	-.115	1	-1.088	1
201		6	max	12.471	2	94.33	3	36.898	4	.003	3	.013	5	.296	3
202			min	-21.776	14	-243.684	1	-10.372	2	-.012	1	-.139	1	-.905	1
203		7	max	12.471	2	150.101	3	45.178	4	.003	3	.056	5	.154	3
204			min	-32.018	4	-416.634	1	-3.407	10	-.012	1	-.124	1	-.519	1
205		8	max	12.471	2	205.872	3	62.242	1	.003	3	.102	5	.068	1
206			min	-43.995	4	-589.585	1	-.427	10	-.012	1	-.071	1	-.054	3
207		9	max	12.471	2	261.644	3	95.334	1	.003	3	.158	4	.856	1
208			min	-55.971	4	-762.535	1	2.554	10	-.012	1	-.028	2	-.327	3
209		10	max	12.471	2	317.415	3	128.427	1	.012	1	.235	4	1.847	1
210			min	-67.947	4	-935.485	1	5.534	10	-.005	14	-.018	10	-.664	3
211		11	max	46.456	5	762.535	1	31.226	5	.012	1	.029	9	.856	1
212			min	-18.984	9	-261.644	3	-95.334	1	-.003	3	-.144	5	-.327	3
213		12	max	34.48	5	589.585	1	32.895	5	.012	1	.011	3	.068	1
214			min	-18.984	9	-205.872	3	-62.242	1	-.003	3	-.118	4	-.054	3
215		13	max	22.504	5	416.634	1	34.564	5	.012	1	.002	3	.154	3
216			min	-18.984	9	-150.101	3	-29.15	1	-.003	3	-.124	1	-.519	1
217		14	max	12.471	2	243.684	1	36.233	5	.012	1	-.003	12	.296	3
218			min	-18.984	9	-94.33	3	-4.841	3	-.003	3	-.139	1	-.905	1
219		15	max	12.471	2	70.733	1	44.287	4	.012	1	.017	5	.374	3
220			min	-18.984	9	-38.559	3	-3.223	3	-.003	3	-.115	1	-1.088	1
221		16	max	12.471	2	17.212	3	70.127	1	.012	1	.062	5	.386	3
222			min	-21.269	14	-102.217	1	-1.605	3	-.003	3	-.052	1	-1.07	1
223		17	max	12.471	2	72.984	3	103.219	1	.012	1	.116	4	.334	3
224			min	-31.221	4	-275.167	1	.013	3	-.003	3	-.013	3	-.849	1
225		18	max	12.471	2	128.755	3	136.311	1	.012	1	.192	4	.216	3
226			min	-43.197	4	-448.118	1	1.395	12	-.003	3	-.012	3	-.428	1
227		19	max	12.471	2	184.526	3	169.403	1	.012	1	.367	1	.196	1
228			min	-55.173	4	-621.068	1	2.473	12	-.003	3	-.009	3	-.016	5
229	M13	1	max	46.2	5	651.605	1	19.438	5	.008	3	.312	1	.23	1
230			min	-168.681	1	-204.473	3	-161.611	1	-.025	1	-.135	5	-.054	3
231		2	max	34.224	5	478.655	1	21.107	5	.008	3	.142	1	.152	3
232			min	-168.681	1	-148.701	3	-128.519	1	-.025	1	-.111	5	-.429	1
233		3	max	22.248	5	305.705	1	22.776	5	.008	3	.025	2	.293	3
234			min	-168.681	1	-92.93	3	-95.427	1	-.025	1	-.086	4	-.887	1
235		4	max	14.417	3	132.754	1	24.445	5	.008	3	0	10	.369	3
236			min	-168.681	1	-37.159	3	-62.335	1	-.025	1	-.08	1	-1.142	1
237		5	max	14.417	3	18.612	3	26.114	5	.008	3	-.005	12	.38	3
238			min	-168.681	1	-40.196	1	-29.243	1	-.025	1	-.134	1	-1.196	1
239		6	max	14.417	3	74.383	3	29.601	4	.008	3	.003	5	.326	3
240			min	-168.681	1	-213.147	1	-6.19	2	-.025	1	-.148	1	-1.049	1
241		7	max	14.417	3	130.155	3	37.88	4	.008	3	.036	5	.207	3
242			min	-168.681	1	-386.097	1	-1.906	10	-.025	1	-.125	1	-.699	1
243		8	max	14.417	3	185.926	3	70.034	1	.008	3	.071	5	.022	3
244			min	-168.681	1	-559.047	1	1.074	10	-.025	1	-.062	1	-.148	1
245		9	max	14.417	3	241.697	3	103.126	1	.008	3	.121	4	.605	1
246			min	-168.681	1	-731.998	1	4.054	10	-.025	1	-.019	10	-.227	3
247		10	max	14.417	3	297.468	3	136.218	1	.025	1	.189	4	1.56	1
248			min	-168.681	1	-904.948	1	7.015	12	-.01	14	-.013	10	-.542	3
249		11	max	34.433	5	731.998	1	21.882	5	.025	1	.039	9	.605	1
250			min	-168.681	1	-241.697	3	-103.126	1	-.008	3	-.103	5	-.227	3
251		12	max	22.457	5	559.047	1	23.551	5	.025	1	.01	3	.022	3
252			min	-168.681	1	-185.926	3	-70.034	1	-.008	3	-.085	4	-.148	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	14.417	3	386.097	1	25.22	5	.025	1	.002	3	.207	3
254			min	-168.681	1	-130.155	3	-36.942	1	-.008	3	-.125	1	-.699	1
255		14	max	14.417	3	213.147	1	26.889	5	.025	1	-.003	12	.326	3
256			min	-168.681	1	-74.383	3	-5.678	9	-.008	3	-.148	1	-1.049	1
257		15	max	14.417	3	40.196	1	33.46	4	.025	1	.015	5	.38	3
258			min	-168.681	1	-18.612	3	-2.818	3	-.008	3	-.134	1	-1.196	1
259		16	max	14.417	3	37.159	3	62.335	1	.025	1	.049	5	.369	3
260			min	-168.681	1	-132.754	1	-1.2	3	-.008	3	-.08	1	-1.142	1
261		17	max	14.417	3	92.93	3	95.427	1	.025	1	.086	5	.293	3
262			min	-168.681	1	-305.705	1	.418	3	-.008	3	-.011	3	-.887	1
263		18	max	14.417	3	148.701	3	128.519	1	.025	1	.149	4	.152	3
264			min	-168.681	1	-478.655	1	1.615	12	-.008	3	-.009	3	-.429	1
265		19	max	14.417	3	204.473	3	161.611	1	.025	1	.312	1	.23	1
266			min	-168.681	1	-651.605	1	2.694	12	-.008	3	-.006	3	-.054	3
267	M2	1	max	2566.855	1	349.491	3	348.665	1	.005	5	1.11	5	6.623	1
268			min	-1191.78	3	-206.189	2	-332.214	5	-.005	1	-.279	1	-.369	3
269		2	max	2564.898	1	349.491	3	348.665	1	.005	5	1.039	5	6.619	1
270			min	-1193.248	3	-206.189	2	-330.518	5	-.005	1	-.204	1	-.445	3
271		3	max	2562.942	1	349.491	3	348.665	1	.005	5	.968	5	6.615	1
272			min	-1194.715	3	-206.189	2	-328.822	5	-.005	1	-.129	1	-.52	3
273		4	max	2560.985	1	349.491	3	348.665	1	.005	5	.897	5	6.611	1
274			min	-1196.183	3	-206.189	2	-327.126	5	-.005	1	-.054	1	-.595	3
275		5	max	2559.028	1	349.491	3	348.665	1	.005	5	.838	4	6.607	1
276			min	-1197.65	3	-206.189	2	-325.43	5	-.005	1	-.038	3	-.67	3
277		6	max	2557.071	1	349.491	3	348.665	1	.005	5	.78	4	6.603	1
278			min	-1199.118	3	-206.189	2	-323.734	5	-.005	1	-.084	3	-.745	3
279		7	max	1960.926	1	2497.818	1	293.925	1	.003	1	.712	4	6.441	1
280			min	-1042.279	3	-301.953	3	-316.126	5	0	3	-.097	3	-.779	3
281		8	max	1958.97	1	2497.818	1	293.925	1	.003	1	.654	4	5.904	1
282			min	-1043.747	3	-301.953	3	-314.43	5	0	3	-.139	3	-.714	3
283		9	max	1957.013	1	2497.818	1	293.925	1	.003	1	.596	4	5.368	1
284			min	-1045.214	3	-301.953	3	-312.734	5	0	3	-.18	3	-.649	3
285		10	max	1955.056	1	2497.818	1	293.925	1	.003	1	.538	4	4.831	1
286			min	-1046.682	3	-301.953	3	-311.038	5	0	3	-.222	3	-.584	3
287		11	max	1953.099	1	2497.818	1	293.925	1	.003	1	.48	4	4.294	1
288			min	-1048.15	3	-301.953	3	-309.342	5	0	3	-.264	3	-.519	3
289		12	max	1951.142	1	2497.818	1	293.925	1	.003	1	.423	4	3.757	1
290			min	-1049.617	3	-301.953	3	-307.647	5	0	3	-.306	3	-.454	3
291		13	max	1949.186	1	2497.818	1	293.925	1	.003	1	.453	1	3.221	1
292			min	-1051.085	3	-301.953	3	-305.951	5	0	3	-.348	3	-.389	3
293		14	max	1947.229	1	2497.818	1	293.925	1	.003	1	.516	1	2.684	1
294			min	-1052.552	3	-301.953	3	-304.255	5	0	3	-.389	3	-.324	3
295		15	max	1945.272	1	2497.818	1	293.925	1	.003	1	.58	1	2.147	1
296			min	-1054.02	3	-301.953	3	-302.559	5	0	3	-.431	3	-.26	3
297		16	max	1943.315	1	2497.818	1	293.925	1	.003	1	.643	1	1.61	1
298			min	-1055.488	3	-301.953	3	-300.863	5	0	3	-.473	3	-.195	3
299		17	max	1941.359	1	2497.818	1	293.925	1	.003	1	.706	1	1.074	1
300			min	-1056.955	3	-301.953	3	-299.167	5	0	3	-.515	3	-.13	3
301		18	max	1939.402	1	2497.818	1	293.925	1	.003	1	.769	1	.537	1
302			min	-1058.423	3	-301.953	3	-297.471	5	0	3	-.556	3	-.065	3
303		19	max	1937.445	1	2497.818	1	293.925	1	.003	1	.832	1	0	1
304			min	-1059.89	3	-301.953	3	-295.775	5	0	3	-.598	3	0	1
305	M5	1	max	7088.916	1	1053.763	3	0	1	.005	4	1.168	4	15.443	1
306			min	-3533.34	3	-1061.721	2	-364.001	5	0	1	0	1	-1.4	3
307		2	max	7086.959	1	1053.763	3	0	1	.005	4	1.09	4	15.603	1
308			min	-3534.808	3	-1061.721	2	-362.306	5	0	1	0	1	-1.627	3
309		3	max	7085.002	1	1053.763	3	0	1	.005	4	1.013	4	15.764	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-3536.275	3	-1061.721	2	-360.61	5	0	1	0	1	-1.853	3
311		4	max	7083.045	1	1053.763	3	0	1	.005	4	.936	4	15.924	1
312			min	-3537.743	3	-1061.721	2	-358.914	5	0	1	0	1	-2.079	3
313		5	max	7081.089	1	1053.763	3	0	1	.005	4	.859	4	16.084	1
314			min	-3539.211	3	-1061.721	2	-357.218	5	0	1	0	1	-2.306	3
315		6	max	7079.132	1	1053.763	3	0	1	.005	4	.783	4	16.245	1
316			min	-3540.678	3	-1061.721	2	-355.522	5	0	1	0	1	-2.532	3
317		7	max	5505.373	1	6190.476	1	0	1	0	1	.717	4	15.964	1
318			min	-3026.835	3	-1018.681	3	-352.716	4	0	4	0	1	-2.627	3
319		8	max	5503.416	1	6190.476	1	0	1	0	1	.641	4	14.633	1
320			min	-3028.302	3	-1018.681	3	-351.02	4	0	4	0	1	-2.408	3
321		9	max	5501.46	1	6190.476	1	0	1	0	1	.566	4	13.303	1
322			min	-3029.77	3	-1018.681	3	-349.324	4	0	4	0	1	-2.189	3
323		10	max	5499.503	1	6190.476	1	0	1	0	1	.491	4	11.973	1
324			min	-3031.237	3	-1018.681	3	-347.628	4	0	4	0	1	-1.97	3
325		11	max	5497.546	1	6190.476	1	0	1	0	1	.416	4	10.642	1
326			min	-3032.705	3	-1018.681	3	-345.932	4	0	4	0	1	-1.751	3
327		12	max	5495.589	1	6190.476	1	0	1	0	1	.342	4	9.312	1
328			min	-3034.173	3	-1018.681	3	-344.237	4	0	4	0	1	-1.532	3
329		13	max	5493.633	1	6190.476	1	0	1	0	1	.268	4	7.982	1
330			min	-3035.64	3	-1018.681	3	-342.541	4	0	4	0	1	-1.313	3
331		14	max	5491.676	1	6190.476	1	0	1	0	1	.195	4	6.652	1
332			min	-3037.108	3	-1018.681	3	-340.845	4	0	4	0	1	-1.095	3
333		15	max	5489.719	1	6190.476	1	0	1	0	1	.122	4	5.321	1
334			min	-3038.575	3	-1018.681	3	-339.149	4	0	4	0	1	-.876	3
335		16	max	5487.762	1	6190.476	1	0	1	0	1	.049	4	3.991	1
336			min	-3040.043	3	-1018.681	3	-337.453	4	0	4	0	1	-.657	3
337		17	max	5485.805	1	6190.476	1	0	1	0	1	0	1	2.661	1
338			min	-3041.511	3	-1018.681	3	-335.757	4	0	4	-.024	5	-.438	3
339		18	max	5483.849	1	6190.476	1	0	1	0	1	0	1	1.33	1
340			min	-3042.978	3	-1018.681	3	-334.061	4	0	4	-.095	4	-.219	3
341		19	max	5481.892	1	6190.476	1	0	1	0	1	0	1	0	1
342			min	-3044.446	3	-1018.681	3	-332.365	4	0	4	-.167	4	0	1
343	M8	1	max	2566.855	1	349.491	3	210.804	3	.006	4	1.189	4	6.623	1
344			min	-1191.78	3	-206.189	2	-415.365	4	-.002	3	-.143	3	-.369	3
345		2	max	2564.898	1	349.491	3	210.804	3	.006	4	1.1	4	6.619	1
346			min	-1193.248	3	-206.189	2	-413.669	4	-.002	3	-.098	3	-.445	3
347		3	max	2562.942	1	349.491	3	210.804	3	.006	4	1.011	4	6.615	1
348			min	-1194.715	3	-206.189	2	-411.973	4	-.002	3	-.052	3	-.52	3
349		4	max	2560.985	1	349.491	3	210.804	3	.006	4	.923	4	6.611	1
350			min	-1196.183	3	-206.189	2	-410.277	4	-.002	3	-.007	3	-.595	3
351		5	max	2559.028	1	349.491	3	210.804	3	.006	4	.835	4	6.607	1
352			min	-1197.65	3	-206.189	2	-408.581	4	-.002	3	-.033	2	-.67	3
353		6	max	2557.071	1	349.491	3	210.804	3	.006	4	.751	5	6.603	1
354			min	-1199.118	3	-206.189	2	-406.885	4	-.002	3	-.096	1	-.745	3
355		7	max	1960.926	1	2497.818	1	194.346	3	0	3	.687	5	6.441	1
356			min	-1042.279	3	-301.953	3	-390.143	4	-.003	1	-.074	1	-.779	3
357		8	max	1958.97	1	2497.818	1	194.346	3	0	3	.614	5	5.904	1
358			min	-1043.747	3	-301.953	3	-388.447	4	-.003	1	-.137	1	-.714	3
359		9	max	1957.013	1	2497.818	1	194.346	3	0	3	.542	5	5.368	1
360			min	-1045.214	3	-301.953	3	-386.751	4	-.003	1	-.201	1	-.649	3
361		10	max	1955.056	1	2497.818	1	194.346	3	0	3	.47	5	4.831	1
362			min	-1046.682	3	-301.953	3	-385.055	4	-.003	1	-.264	1	-.584	3
363		11	max	1953.099	1	2497.818	1	194.346	3	0	3	.398	5	4.294	1
364			min	-1048.15	3	-301.953	3	-383.359	4	-.003	1	-.327	1	-.519	3
365		12	max	1951.142	1	2497.818	1	194.346	3	0	3	.327	5	3.757	1
366			min	-1049.617	3	-301.953	3	-381.663	4	-.003	1	-.39	1	-.454	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
367		13	max	1949.186	1	2497.818	1	194.346	3	0	3	.348	3	3.221	1
368			min	-1051.085	3	-301.953	3	-379.967	4	-.003	1	-.453	1	-.389	3
369		14	max	1947.229	1	2497.818	1	194.346	3	0	3	.389	3	2.684	1
370			min	-1052.552	3	-301.953	3	-378.271	4	-.003	1	-.516	1	-.324	3
371		15	max	1945.272	1	2497.818	1	194.346	3	0	3	.431	3	2.147	1
372			min	-1054.02	3	-301.953	3	-376.576	4	-.003	1	-.58	1	-.26	3
373		16	max	1943.315	1	2497.818	1	194.346	3	0	3	.473	3	1.61	1
374			min	-1055.488	3	-301.953	3	-374.88	4	-.003	1	-.643	1	-.195	3
375		17	max	1941.359	1	2497.818	1	194.346	3	0	3	.515	3	1.074	1
376			min	-1056.955	3	-301.953	3	-373.184	4	-.003	1	-.706	1	-.13	3
377		18	max	1939.402	1	2497.818	1	194.346	3	0	3	.556	3	.537	1
378			min	-1058.423	3	-301.953	3	-371.488	4	-.003	1	-.769	1	-.065	3
379		19	max	1937.445	1	2497.818	1	194.346	3	0	3	.598	3	0	1
380			min	-1059.89	3	-301.953	3	-369.792	4	-.003	1	-.832	1	0	1
381	M3	1	max	2541.458	1	4.89	4	53.147	1	.031	3	.015	1	0	1
382			min	-670.92	3	1.149	15	-16.917	3	-.092	1	-.005	3	0	1
383		2	max	2541.354	1	4.347	4	53.147	1	.031	3	.03	1	0	15
384			min	-670.998	3	1.022	15	-16.917	3	-.092	1	-.01	3	-.001	4
385		3	max	2541.249	1	3.803	4	53.147	1	.031	3	.046	1	0	15
386			min	-671.076	3	.894	15	-16.917	3	-.092	1	-.015	3	-.003	4
387		4	max	2541.145	1	3.26	4	53.147	1	.031	3	.062	1	0	15
388			min	-671.154	3	.766	15	-16.917	3	-.092	1	-.02	3	-.004	4
389		5	max	2541.041	1	2.717	4	53.147	1	.031	3	.077	1	-.001	15
390			min	-671.233	3	.639	15	-16.917	3	-.092	1	-.025	3	-.004	4
391		6	max	2540.936	1	2.173	4	53.147	1	.031	3	.093	1	-.001	15
392			min	-671.311	3	.511	15	-16.917	3	-.092	1	-.03	3	-.005	4
393		7	max	2540.832	1	1.63	4	53.147	1	.031	3	.108	1	-.001	15
394			min	-671.389	3	.383	15	-16.917	3	-.092	1	-.035	3	-.006	4
395		8	max	2540.728	1	1.087	4	53.147	1	.031	3	.124	1	-.001	15
396			min	-671.467	3	.255	15	-16.917	3	-.092	1	-.04	3	-.006	4
397		9	max	2540.623	1	.543	4	53.147	1	.031	3	.14	1	-.002	15
398			min	-671.546	3	.128	15	-16.917	3	-.092	1	-.045	3	-.006	4
399		10	max	2540.519	1	0	1	53.147	1	.031	3	.155	1	-.002	15
400			min	-671.624	3	0	1	-16.917	3	-.092	1	-.05	3	-.006	4
401		11	max	2540.415	1	-.128	15	53.147	1	.031	3	.171	1	-.002	15
402			min	-671.702	3	-.543	6	-16.917	3	-.092	1	-.055	3	-.006	4
403		12	max	2540.31	1	-.255	15	53.147	1	.031	3	.187	1	-.001	15
404			min	-671.78	3	-1.087	6	-16.917	3	-.092	1	-.06	3	-.006	4
405		13	max	2540.206	1	-.383	15	53.147	1	.031	3	.202	1	-.001	15
406			min	-671.859	3	-1.63	6	-16.917	3	-.092	1	-.065	3	-.006	4
407		14	max	2540.102	1	-.511	15	53.147	1	.031	3	.218	1	-.001	15
408			min	-671.937	3	-2.173	6	-16.917	3	-.092	1	-.07	3	-.005	4
409		15	max	2539.997	1	-.639	15	53.147	1	.031	3	.233	1	-.001	15
410			min	-672.015	3	-2.717	6	-16.917	3	-.092	1	-.075	3	-.004	4
411		16	max	2539.893	1	-.766	15	53.147	1	.031	3	.249	1	0	15
412			min	-672.093	3	-3.26	6	-16.917	3	-.092	1	-.079	3	-.004	4
413		17	max	2539.789	1	-.894	15	53.147	1	.031	3	.265	1	0	15
414			min	-672.172	3	-3.803	6	-16.917	3	-.092	1	-.084	3	-.003	4
415		18	max	2539.684	1	-1.022	15	53.147	1	.031	3	.28	1	0	15
416			min	-672.25	3	-4.347	6	-16.917	3	-.092	1	-.089	3	-.001	4
417		19	max	2539.58	1	-1.149	15	53.147	1	.031	3	.296	1	0	1
418			min	-672.328	3	-4.89	6	-16.917	3	-.092	1	-.094	3	0	1
419	M6	1	max	7057.992	1	4.89	6	0	1	.011	4	.003	4	0	1
420			min	-2140.587	3	1.149	15	-8.414	4	0	1	0	1	0	1
421		2	max	7057.887	1	4.347	6	0	1	.011	4	.001	5	0	15
422			min	-2140.665	3	1.022	15	-8.036	4	0	1	0	1	-.001	6
423		3	max	7057.783	1	3.803	6	0	1	.011	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-2140.743	3	.894	15	-7.658	4	0	1	-.001	4	-.003	6
425		4	max	7057.679	1	3.26	6	0	1	.011	4	0	1	0	15
426			min	-2140.821	3	.766	15	-7.28	4	0	1	-.003	4	-.004	6
427		5	max	7057.574	1	2.717	6	0	1	.011	4	0	1	-.001	15
428			min	-2140.9	3	.639	15	-6.902	4	0	1	-.006	4	-.004	6
429		6	max	7057.47	1	2.173	6	0	1	.011	4	0	1	-.001	15
430			min	-2140.978	3	.511	15	-6.525	4	0	1	-.008	4	-.005	6
431		7	max	7057.366	1	1.63	6	0	1	.011	4	0	1	-.001	15
432			min	-2141.056	3	.383	15	-6.147	4	0	1	-.009	4	-.006	6
433		8	max	7057.261	1	1.087	6	0	1	.011	4	0	1	-.001	15
434			min	-2141.134	3	.255	15	-5.769	4	0	1	-.011	4	-.006	6
435		9	max	7057.157	1	.543	6	0	1	.011	4	0	1	-.002	15
436			min	-2141.213	3	.128	15	-5.391	4	0	1	-.013	4	-.006	6
437		10	max	7057.053	1	0	1	0	1	.011	4	0	1	-.002	15
438			min	-2141.291	3	0	1	-5.013	4	0	1	-.014	4	-.006	6
439		11	max	7056.948	1	-.128	15	0	1	.011	4	0	1	-.002	15
440			min	-2141.369	3	-.543	4	-4.635	4	0	1	-.016	4	-.006	6
441		12	max	7056.844	1	-.255	15	0	1	.011	4	0	1	-.001	15
442			min	-2141.447	3	-1.087	4	-4.257	4	0	1	-.017	4	-.006	6
443		13	max	7056.74	1	-.383	15	0	1	.011	4	0	1	-.001	15
444			min	-2141.526	3	-1.63	4	-3.879	4	0	1	-.018	4	-.006	6
445		14	max	7056.635	1	-.511	15	0	1	.011	4	0	1	-.001	15
446			min	-2141.604	3	-2.173	4	-3.501	4	0	1	-.019	4	-.005	6
447		15	max	7056.531	1	-.639	15	0	1	.011	4	0	1	-.001	15
448			min	-2141.682	3	-2.717	4	-3.123	4	0	1	-.02	4	-.004	6
449		16	max	7056.427	1	-.766	15	0	1	.011	4	0	1	0	15
450			min	-2141.76	3	-3.26	4	-2.746	4	0	1	-.021	4	-.004	6
451		17	max	7056.322	1	-.894	15	0	1	.011	4	0	1	0	15
452			min	-2141.839	3	-3.803	4	-2.368	4	0	1	-.022	4	-.003	6
453		18	max	7056.218	1	-1.022	15	0	1	.011	4	0	1	0	15
454			min	-2141.917	3	-4.347	4	-1.99	4	0	1	-.023	4	-.001	6
455		19	max	7056.114	1	-1.149	15	0	1	.011	4	0	1	0	1
456			min	-2141.995	3	-4.89	4	-1.612	4	0	1	-.023	4	0	1
457	M9	1	max	2541.458	1	4.89	6	16.917	3	.092	1	.005	3	0	1
458			min	-670.92	3	1.149	15	-53.147	1	-.031	3	-.015	1	0	1
459		2	max	2541.354	1	4.347	6	16.917	3	.092	1	.01	3	0	15
460			min	-670.998	3	1.022	15	-53.147	1	-.031	3	-.03	1	-.001	6
461		3	max	2541.249	1	3.803	6	16.917	3	.092	1	.015	3	0	15
462			min	-671.076	3	.894	15	-53.147	1	-.031	3	-.046	1	-.003	6
463		4	max	2541.145	1	3.26	6	16.917	3	.092	1	.02	3	0	15
464			min	-671.154	3	.766	15	-53.147	1	-.031	3	-.062	1	-.004	6
465		5	max	2541.041	1	2.717	6	16.917	3	.092	1	.025	3	-.001	15
466			min	-671.233	3	.639	15	-53.147	1	-.031	3	-.077	1	-.004	6
467		6	max	2540.936	1	2.173	6	16.917	3	.092	1	.03	3	-.001	15
468			min	-671.311	3	.511	15	-53.147	1	-.031	3	-.093	1	-.005	6
469		7	max	2540.832	1	1.63	6	16.917	3	.092	1	.035	3	-.001	15
470			min	-671.389	3	.383	15	-53.147	1	-.031	3	-.108	1	-.006	6
471		8	max	2540.728	1	1.087	6	16.917	3	.092	1	.04	3	-.001	15
472			min	-671.467	3	.255	15	-53.147	1	-.031	3	-.124	1	-.006	6
473		9	max	2540.623	1	.543	6	16.917	3	.092	1	.045	3	-.002	15
474			min	-671.546	3	.128	15	-53.147	1	-.031	3	-.14	1	-.006	6
475		10	max	2540.519	1	0	1	16.917	3	.092	1	.05	3	-.002	15
476			min	-671.624	3	0	1	-53.147	1	-.031	3	-.155	1	-.006	6
477		11	max	2540.415	1	-.128	15	16.917	3	.092	1	.055	3	-.002	15
478			min	-671.702	3	-.543	4	-53.147	1	-.031	3	-.171	1	-.006	6
479		12	max	2540.31	1	-.255	15	16.917	3	.092	1	.06	3	-.001	15
480			min	-671.78	3	-1.087	4	-53.147	1	-.031	3	-.187	1	-.006	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	2540.206	1	-.383	15	16.917	3	.092	1	.065	3	-.001	15
482			min	-671.859	3	-1.63	4	-53.147	1	-.031	3	-.202	1	-.006	6
483		14	max	2540.102	1	-.511	15	16.917	3	.092	1	.07	3	-.001	15
484			min	-671.937	3	-2.173	4	-53.147	1	-.031	3	-.218	1	-.005	6
485		15	max	2539.997	1	-.639	15	16.917	3	.092	1	.075	3	-.001	15
486			min	-672.015	3	-2.717	4	-53.147	1	-.031	3	-.233	1	-.004	6
487		16	max	2539.893	1	-.766	15	16.917	3	.092	1	.079	3	0	15
488			min	-672.093	3	-3.26	4	-53.147	1	-.031	3	-.249	1	-.004	6
489		17	max	2539.789	1	-.894	15	16.917	3	.092	1	.084	3	0	15
490			min	-672.172	3	-3.803	4	-53.147	1	-.031	3	-.265	1	-.003	6
491		18	max	2539.684	1	-1.022	15	16.917	3	.092	1	.089	3	0	15
492			min	-672.25	3	-4.347	4	-53.147	1	-.031	3	-.28	1	-.001	6
493		19	max	2539.58	1	-1.149	15	16.917	3	.092	1	.094	3	0	1
494			min	-672.328	3	-4.89	4	-53.147	1	-.031	3	-.296	1	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	.024	3	.173	3	.023	1	9.828e-3	3	NC	3	NC	3
2			min	-.232	1	-.878	1	-.525	5	-3.24e-2	1	148.16	1	259.129	5
3		2	max	.024	3	.143	3	.007	1	9.828e-3	3	7595.904	12	NC	2
4			min	-.232	1	-.763	1	-.497	4	-3.24e-2	1	169.673	1	273.919	5
5		3	max	.024	3	.113	3	0	3	9.408e-3	3	3795.598	12	NC	1
6			min	-.232	1	-.648	1	-.471	4	-3.059e-2	1	198.524	1	291.264	5
7		4	max	.024	3	.084	3	0	3	8.764e-3	3	3291.856	15	NC	1
8			min	-.232	1	-.537	1	-.438	4	-2.782e-2	1	237.585	1	313.889	4
9		5	max	.024	3	.058	3	0	3	8.119e-3	3	3671.165	15	NC	1
10			min	-.231	1	-.436	1	-.401	4	-2.505e-2	1	289.622	1	343.869	4
11		6	max	.024	3	.037	3	.002	3	7.989e-3	3	4102.694	15	NC	1
12			min	-.231	1	-.35	1	-.361	4	-2.386e-2	1	355.456	1	382.846	5
13		7	max	.024	3	.02	3	.001	3	8.215e-3	3	4592.267	15	NC	1
14			min	-.23	1	-.279	1	-.321	4	-2.378e-2	1	437.367	1	431.343	5
15		8	max	.023	3	.008	3	0	3	8.441e-3	3	5166.309	15	NC	2
16			min	-.229	1	-.218	1	-.282	4	-2.37e-2	1	545.536	1	491.424	5
17		9	max	.023	3	-.002	12	0	9	8.811e-3	3	5870.465	15	NC	2
18			min	-.228	1	-.163	1	-.246	4	-2.276e-2	1	706.31	1	565.033	5
19		10	max	.023	3	-.007	12	0	1	9.438e-3	3	6772.906	15	NC	2
20			min	-.227	1	-.109	1	-.209	4	-2.031e-2	1	730.78	3	667.854	5
21		11	max	.023	3	-.004	15	.001	3	1.006e-2	3	7963.015	15	NC	2
22			min	-.226	1	-.058	1	-.173	4	-1.787e-2	1	708.145	3	815.357	5
23		12	max	.023	3	-.002	15	.005	3	8.05e-3	3	NC	9	NC	1
24			min	-.225	1	-.02	3	-.139	4	-1.322e-2	1	696.668	3	1034.205	5
25		13	max	.022	3	.031	1	.009	3	4.542e-3	3	NC	1	NC	1
26			min	-.224	1	-.017	3	-.105	4	-7.32e-3	1	705.986	3	1411.535	5
27		14	max	.022	3	.059	1	.011	3	1.187e-3	3	NC	2	NC	1
28			min	-.223	1	-.005	3	-.074	4	-3.513e-3	4	756.397	3	2069.75	5
29		15	max	.022	3	.069	1	.009	3	4.637e-3	3	NC	4	NC	2
30			min	-.223	1	.006	15	-.051	4	-5.427e-3	1	889.567	3	3156.794	5
31		16	max	.022	3	.066	1	.006	3	8.087e-3	3	NC	4	NC	2
32			min	-.223	1	.008	15	-.034	5	-9.218e-3	1	1178.011	3	5030.01	5
33		17	max	.022	3	.102	3	.003	1	1.154e-2	3	NC	4	NC	2
34			min	-.223	1	.009	15	-.023	5	-1.301e-2	1	1904.556	3	6849.638	1
35		18	max	.022	3	.148	3	0	12	1.379e-2	3	NC	2	NC	1
36			min	-.223	1	.011	15	-.016	4	-1.548e-2	1	5480.48	3	NC	1
37		19	max	.022	3	.194	3	-.002	10	1.379e-2	3	NC	1	NC	1
38			min	-.223	1	.007	9	-.016	1	-1.548e-2	1	6272.715	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	.082	3	.505	3	0	1	1.963e-4	4	NC	12	NC	1
40			min	-.564	1	-2.175	1	-.519	4	0	1	61.81	1	262.462	4
41		2	max	.082	3	.423	3	0	1	1.963e-4	4	3286.348	12	NC	1
42			min	-.564	1	-1.89	1	-.497	4	0	1	71.146	1	274.523	4
43		3	max	.082	3	.34	3	0	1	1.045e-4	5	3347.308	15	NC	1
44			min	-.564	1	-1.605	1	-.472	4	0	1	83.837	1	289.014	4
45		4	max	.082	3	.26	3	0	1	0	1	4059.088	15	NC	1
46			min	-.564	1	-1.329	1	-.44	4	-3.78e-5	4	101.349	1	310.546	4
47		5	max	.082	3	.189	3	0	1	0	1	5039.023	15	NC	1
48			min	-.564	1	-1.077	1	-.402	4	-1.795e-4	4	125.134	1	340.466	4
49		6	max	.082	3	.131	3	0	1	0	1	6328.653	15	NC	1
50			min	-.562	1	-.867	1	-.361	4	-1.759e-4	4	155.643	1	380.152	4
51		7	max	.081	3	.086	3	0	1	0	1	8016.113	15	NC	1
52			min	-.56	1	-.697	1	-.32	4	-7.184e-5	4	194.037	1	430.611	4
53		8	max	.08	3	.051	3	0	1	3.295e-5	5	NC	15	NC	1
54			min	-.557	1	-.551	1	-.281	4	0	1	245.948	1	492.126	4
55		9	max	.08	3	.021	3	0	1	5.113e-5	5	NC	15	NC	1
56			min	-.555	1	-.415	1	-.246	4	0	1	289.385	3	564.222	4
57		10	max	.079	3	-.004	12	0	1	0	1	NC	5	NC	1
58			min	-.552	1	-.282	1	-.209	4	-8.216e-5	4	273.6	3	668.202	4
59		11	max	.078	3	-.004	15	0	1	0	1	NC	5	NC	1
60			min	-.55	1	-.153	1	-.173	4	-2.151e-4	4	262.027	3	817.22	4
61		12	max	.078	3	0	15	0	1	0	1	NC	4	NC	1
62			min	-.547	1	-.043	3	-.139	4	-9.891e-4	4	254.4	3	1026.93	4
63		13	max	.077	3	.073	1	0	1	0	1	NC	2	NC	1
64			min	-.544	1	-.044	3	-.105	4	-2.126e-3	4	254.058	3	1396.186	4
65		14	max	.076	3	.142	1	0	1	0	1	NC	5	NC	1
66			min	-.542	1	-.017	3	-.074	4	-3.219e-3	4	267.546	3	2051.867	4
67		15	max	.076	3	.159	1	0	1	0	1	NC	5	NC	1
68			min	-.542	1	.004	15	-.051	4	-2.415e-3	4	307.181	3	3155.762	4
69		16	max	.076	3	.141	3	0	1	0	1	NC	5	NC	1
70			min	-.542	1	.003	15	-.035	4	-1.611e-3	4	390.255	3	5134.006	4
71		17	max	.076	3	.251	3	0	1	0	1	NC	5	NC	1
72			min	-.542	1	.002	15	-.023	4	-8.072e-4	4	575.036	3	9039.157	4
73		18	max	.076	3	.368	3	0	1	0	1	NC	4	NC	1
74			min	-.542	1	0	15	-.016	4	-2.83e-4	4	1152.041	3	NC	1
75		19	max	.076	3	.484	3	0	1	0	1	NC	1	NC	1
76			min	-.542	1	-.03	9	-.009	4	-2.83e-4	4	NC	1	NC	1
77	M7	1	max	.024	3	.173	3	0	3	3.24e-2	1	NC	3	NC	3
78			min	-.232	1	-.878	1	-.533	4	-9.828e-3	3	148.16	1	252.778	4
79		2	max	.024	3	.143	3	0	3	3.24e-2	1	NC	5	NC	2
80			min	-.232	1	-.763	1	-.501	4	-9.828e-3	3	169.673	1	269.272	4
81		3	max	.024	3	.113	3	.007	1	3.059e-2	1	NC	5	NC	1
82			min	-.232	1	-.648	1	-.468	4	-9.408e-3	3	198.524	1	288.423	4
83		4	max	.024	3	.084	3	.012	1	2.782e-2	1	NC	5	NC	1
84			min	-.232	1	-.537	1	-.433	5	-8.764e-3	3	237.585	1	312.191	4
85		5	max	.024	3	.058	3	.013	1	2.505e-2	1	NC	5	NC	1
86			min	-.231	1	-.436	1	-.395	5	-8.119e-3	3	289.622	1	341.998	4
87		6	max	.024	3	.037	3	.011	1	2.386e-2	1	NC	5	NC	1
88			min	-.231	1	-.35	1	-.356	5	-7.989e-3	3	355.456	1	379.387	4
89		7	max	.024	3	.02	3	.006	1	2.378e-2	1	NC	5	NC	1
90			min	-.23	1	-.279	1	-.318	4	-8.215e-3	3	437.367	1	425.058	4
91		8	max	.023	3	.008	3	0	2	2.37e-2	1	NC	13	NC	2
92			min	-.229	1	-.218	1	-.282	4	-8.441e-3	3	545.536	1	481.241	4
93		9	max	.023	3	.001	5	0	3	2.276e-2	1	NC	4	NC	2
94			min	-.228	1	-.163	1	-.246	4	-8.811e-3	3	706.31	1	551.734	4
95		10	max	.023	3	.001	5	0	3	2.031e-2	1	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.227	1	-.109	1	-.209	4	-9.438e-3	3	730.78	3	649.261	4
97		11	max	.023	3	.002	5	.001	1	1.787e-2	1	NC	4	NC	2
98			min	-.226	1	-.058	1	-.173	4	-1.006e-2	3	708.145	3	790.584	4
99		12	max	.023	3	.001	5	.009	1	1.322e-2	1	NC	4	NC	1
100			min	-.225	1	-.02	3	-.136	5	-8.05e-3	3	696.668	3	1009.313	4
101		13	max	.022	3	.031	1	.013	1	7.32e-3	1	NC	1	NC	1
102			min	-.224	1	-.017	3	-.101	5	-4.542e-3	3	705.986	3	1380.28	4
103		14	max	.022	3	.059	1	.01	1	1.637e-3	1	NC	2	NC	1
104			min	-.223	1	-.005	3	-.071	5	-3.092e-3	5	756.397	3	1982.621	4
105		15	max	.022	3	.069	1	.004	2	5.427e-3	1	NC	5	NC	2
106			min	-.223	1	-.002	5	-.05	4	-4.637e-3	3	889.567	3	2841.358	4
107		16	max	.022	3	.066	1	0	10	9.218e-3	1	NC	5	NC	2
108			min	-.223	1	-.005	5	-.036	4	-8.087e-3	3	1178.011	3	4099.495	4
109		17	max	.022	3	.102	3	0	10	1.301e-2	1	NC	4	NC	2
110			min	-.223	1	-.009	5	-.024	4	-1.154e-2	3	1904.556	3	6246.854	4
111		18	max	.022	3	.148	3	.005	1	1.548e-2	1	NC	2	NC	1
112			min	-.223	1	-.013	5	-.014	5	-1.379e-2	3	5480.48	3	NC	1
113		19	max	.022	3	.194	3	.016	1	1.548e-2	1	NC	1	NC	1
114			min	-.223	1	-.016	5	-.006	5	-1.379e-2	3	6272.715	3	NC	1
115	M10	1	max	.002	1	.132	3	.223	1	6.155e-3	3	NC	1	NC	1
116			min	-.018	4	-.011	5	-.022	3	-1.866e-3	1	NC	1	NC	1
117		2	max	.001	1	.331	3	.273	1	7.207e-3	3	NC	5	NC	2
118			min	-.018	4	-.176	1	-.019	3	-2.422e-3	1	1133.728	1	5075.714	1
119		3	max	.001	1	.514	3	.357	1	8.259e-3	3	NC	5	NC	3
120			min	-.018	4	-.373	1	-.019	3	-2.978e-3	1	601.964	1	1884.506	1
121		4	max	.001	1	.644	3	.447	1	9.311e-3	3	NC	5	NC	3
122			min	-.018	4	-.501	1	-.023	3	-3.533e-3	1	460.721	1	1128.146	1
123		5	max	0	1	.704	3	.521	1	1.036e-2	3	NC	5	NC	3
124			min	-.018	4	-.539	1	-.031	3	-4.089e-3	1	431.024	1	845.239	1
125		6	max	0	1	.689	3	.569	1	1.142e-2	3	NC	5	NC	3
126			min	-.018	4	-.482	1	-.041	3	-4.644e-3	1	452.817	3	728.473	1
127		7	max	0	1	.61	3	.586	1	1.247e-2	3	NC	5	NC	5
128			min	-.018	4	-.349	1	-.053	3	-5.2e-3	1	527.718	3	694.154	1
129		8	max	0	1	.493	3	.577	1	1.352e-2	3	NC	5	NC	5
130			min	-.018	4	-.173	1	-.064	3	-5.756e-3	1	698.277	3	711.628	1
131		9	max	0	1	.38	3	.556	1	1.457e-2	3	NC	2	NC	5
132			min	-.018	4	-.026	9	-.073	3	-6.311e-3	1	1016.524	3	758.499	1
133		10	max	0	1	.327	3	.542	1	1.563e-2	3	NC	1	NC	5
134			min	-.018	4	0	15	-.076	3	-6.867e-3	1	1292.259	3	790.435	1
135		11	max	0	3	.38	3	.556	1	1.457e-2	3	NC	2	NC	5
136			min	-.018	4	-.026	9	-.073	3	-6.311e-3	1	1016.524	3	758.499	1
137		12	max	0	3	.493	3	.577	1	1.352e-2	3	NC	5	NC	5
138			min	-.018	4	-.173	1	-.064	3	-5.756e-3	1	698.277	3	711.628	1
139		13	max	0	3	.61	3	.586	1	1.247e-2	3	NC	5	NC	5
140			min	-.018	4	-.349	1	-.053	3	-5.2e-3	1	527.718	3	694.154	1
141		14	max	0	3	.689	3	.569	1	1.142e-2	3	NC	5	NC	3
142			min	-.018	4	-.482	1	-.041	3	-4.644e-3	1	452.817	3	728.473	1
143		15	max	0	3	.704	3	.521	1	1.036e-2	3	NC	5	NC	3
144			min	-.018	4	-.539	1	-.031	3	-4.089e-3	1	431.024	1	845.239	1
145		16	max	0	3	.644	3	.447	1	9.311e-3	3	NC	5	NC	3
146			min	-.018	4	-.501	1	-.023	3	-3.533e-3	1	460.721	1	1128.146	1
147		17	max	0	3	.514	3	.357	1	8.259e-3	3	NC	5	NC	3
148			min	-.018	4	-.373	1	-.019	3	-2.978e-3	1	601.964	1	1884.506	1
149		18	max	0	3	.331	3	.273	1	7.207e-3	3	NC	5	NC	2
150			min	-.018	4	-.176	1	-.019	3	-2.422e-3	1	1133.728	1	5075.714	1
151		19	max	0	3	.132	3	.223	1	6.155e-3	3	NC	1	NC	1
152			min	-.018	4	.01	15	-.022	3	-1.866e-3	1	9408.791	4	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.004	1	.001	5	.226	1	6.454e-3	1	NC	1	NC	1
154			min	-.159	4	-.04	1	-.023	3	-4.551e-4	3	NC	1	NC	1
155		2	max	.003	1	.135	3	.272	1	7.565e-3	1	NC	5	NC	3
156			min	-.16	4	-.282	1	-.029	3	-6.415e-4	3	1042.213	1	4617.186	4
157		3	max	.003	1	.277	3	.354	1	8.676e-3	1	NC	5	NC	3
158			min	-.16	4	-.495	1	-.034	3	-8.279e-4	3	554.128	1	1959.402	1
159		4	max	.002	1	.374	3	.444	1	9.787e-3	1	NC	5	NC	3
160			min	-.16	4	-.637	1	-.04	3	-1.014e-3	3	422.116	1	1154.695	1
161		5	max	.002	1	.405	3	.52	1	1.09e-2	1	NC	5	NC	3
162			min	-.16	4	-.686	1	-.047	3	-1.201e-3	3	390.101	1	856.801	1
163		6	max	.002	1	.367	3	.57	1	1.201e-2	1	NC	5	NC	5
164			min	-.16	4	-.639	1	-.055	3	-1.387e-3	3	420.89	1	733.106	1
165		7	max	.001	1	.271	3	.589	1	1.312e-2	1	NC	5	NC	5
166			min	-.16	4	-.512	1	-.063	3	-1.573e-3	3	534.278	1	694.226	1
167		8	max	0	1	.142	3	.582	1	1.423e-2	1	NC	5	NC	4
168			min	-.16	4	-.341	1	-.07	3	-1.76e-3	3	838.1	1	707.613	1
169		9	max	0	1	.021	3	.562	1	1.534e-2	1	NC	5	NC	4
170			min	-.16	4	-.181	1	-.076	3	-1.946e-3	3	1785.591	1	750.497	1
171		10	max	0	1	-.003	15	.549	1	1.645e-2	1	NC	3	NC	5
172			min	-.161	4	-.108	1	-.078	3	-2.133e-3	3	3715.58	1	780.282	1
173		11	max	0	3	.021	3	.562	1	1.534e-2	1	NC	4	8085.452	12
174			min	-.161	4	-.181	1	-.076	3	-1.946e-3	3	1785.591	1	750.497	1
175		12	max	0	3	.142	3	.582	1	1.423e-2	1	NC	5	9121.788	12
176			min	-.161	4	-.341	1	-.07	3	-1.76e-3	3	838.1	1	707.613	1
177		13	max	0	3	.271	3	.589	1	1.312e-2	1	NC	5	NC	12
178			min	-.161	4	-.512	1	-.063	3	-1.573e-3	3	534.278	1	694.226	1
179		14	max	0	3	.367	3	.57	1	1.201e-2	1	NC	15	NC	5
180			min	-.161	4	-.639	1	-.055	3	-1.387e-3	3	420.89	1	733.106	1
181		15	max	.001	3	.405	3	.52	1	1.09e-2	1	NC	15	NC	3
182			min	-.161	4	-.686	1	-.047	3	-1.201e-3	3	390.101	1	856.801	1
183		16	max	.001	3	.374	3	.444	1	9.787e-3	1	NC	15	NC	3
184			min	-.161	4	-.637	1	-.04	3	-1.014e-3	3	422.116	1	1154.695	1
185		17	max	.002	3	.277	3	.354	1	8.676e-3	1	NC	15	NC	3
186			min	-.161	4	-.495	1	-.034	3	-8.279e-4	3	554.128	1	1959.402	1
187		18	max	.002	3	.135	3	.272	1	7.565e-3	1	NC	5	NC	3
188			min	-.161	4	-.282	1	-.029	3	-6.415e-4	3	1042.213	1	5465.059	1
189		19	max	.002	3	-.003	15	.226	1	6.454e-3	1	NC	1	NC	1
190			min	-.161	4	-.04	1	-.023	3	-4.551e-4	3	NC	1	NC	1
191	M12	1	max	0	2	.001	5	.229	1	7.494e-3	1	NC	1	NC	1
192			min	-.259	4	-.183	1	-.023	3	-1.343e-3	3	NC	1	NC	1
193		2	max	0	2	.116	3	.264	1	8.687e-3	1	NC	5	NC	2
194			min	-.259	4	-.512	1	-.023	3	-1.637e-3	3	766.025	1	4775.713	4
195		3	max	0	2	.207	3	.341	1	9.879e-3	1	NC	5	NC	3
196			min	-.259	4	-.796	1	-.026	3	-1.931e-3	3	410.704	1	2231.751	1
197		4	max	0	2	.264	3	.43	1	1.107e-2	1	NC	5	NC	3
198			min	-.259	4	-.991	1	-.031	3	-2.226e-3	3	311.782	1	1250.844	1
199		5	max	0	2	.279	3	.508	1	1.226e-2	1	NC	5	NC	3
200			min	-.259	4	-1.072	1	-.039	3	-2.52e-3	3	283.394	1	902.087	1
201		6	max	0	2	.255	3	.562	1	1.346e-2	1	NC	5	NC	3
202			min	-.259	4	-1.037	1	-.048	3	-2.814e-3	3	294.912	1	756.726	1
203		7	max	0	2	.199	3	.586	1	1.465e-2	1	NC	5	NC	5
204			min	-.259	4	-.906	1	-.059	3	-3.108e-3	3	348.124	1	705.367	1
205		8	max	0	2	.127	3	.584	1	1.584e-2	1	NC	5	NC	4
206			min	-.259	4	-.722	1	-.069	3	-3.402e-3	3	467.544	1	709.29	1
207		9	max	0	2	.061	3	.567	1	1.703e-2	1	NC	5	NC	4
208			min	-.259	4	-.546	1	-.077	3	-3.696e-3	3	693.812	1	744.117	1
209		10	max	0	1	.031	3	.556	1	1.823e-2	1	NC	5	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.259	4	-.464	1	-.08	3	-3.991e-3	3	894.423	1	769.879	1
211		11	max	0	9	.061	3	.567	1	1.703e-2	1	NC	5	8013.159	12
212			min	-.259	4	-.546	1	-.077	3	-3.696e-3	3	693.812	1	744.117	1
213		12	max	0	9	.127	3	.584	1	1.584e-2	1	NC	5	9440.019	12
214			min	-.259	4	-.722	1	-.069	3	-3.402e-3	3	467.544	1	709.29	1
215		13	max	0	9	.199	3	.586	1	1.465e-2	1	NC	15	NC	12
216			min	-.259	4	-.906	1	-.059	3	-3.108e-3	3	348.124	1	705.367	1
217		14	max	0	9	.255	3	.562	1	1.346e-2	1	NC	15	NC	3
218			min	-.259	4	-1.037	1	-.048	3	-2.814e-3	3	294.912	1	756.726	1
219		15	max	0	9	.279	3	.508	1	1.226e-2	1	9829.338	15	NC	3
220			min	-.259	4	-1.072	1	-.039	3	-2.52e-3	3	283.394	1	902.087	1
221		16	max	0	9	.264	3	.43	1	1.107e-2	1	NC	15	NC	3
222			min	-.259	4	-.991	1	-.031	3	-2.226e-3	3	311.782	1	1250.844	1
223		17	max	0	9	.207	3	.341	1	9.879e-3	1	NC	15	NC	3
224			min	-.259	4	-.796	1	-.032	5	-1.931e-3	3	410.704	1	2231.751	1
225		18	max	0	9	.116	3	.264	1	8.687e-3	1	NC	5	NC	2
226			min	-.259	4	-.512	1	-.023	3	-1.637e-3	3	766.025	1	5902.637	5
227		19	max	0	9	0	3	.229	1	7.494e-3	1	NC	1	NC	1
228			min	-.259	4	-.183	1	-.023	3	-1.343e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.132	3	.232	1	1.54e-2	1	NC	1	NC	1
230			min	-.49	4	-.723	1	-.024	3	-4.028e-3	3	NC	1	NC	1
231		2	max	0	3	.268	3	.289	1	1.794e-2	1	NC	5	NC	3
232			min	-.489	4	-1.176	1	-.025	3	-4.811e-3	3	556.408	1	4359.232	1
233		3	max	0	3	.389	3	.379	1	2.047e-2	1	NC	15	NC	3
234			min	-.489	4	-1.584	1	-.029	3	-5.594e-3	3	292.584	1	1711.623	1
235		4	max	0	3	.478	3	.472	1	2.301e-2	1	NC	15	NC	3
236			min	-.489	4	-1.899	1	-.034	3	-6.377e-3	3	214.334	1	1050.396	1
237		5	max	0	3	.528	3	.548	1	2.554e-2	1	8567.57	15	NC	3
238			min	-.489	4	-2.091	1	-.042	3	-7.16e-3	3	184.128	1	797.776	1
239		6	max	0	3	.538	3	.595	1	2.808e-2	1	7989.932	15	NC	5
240			min	-.489	4	-2.157	1	-.052	3	-7.944e-3	3	175.72	1	693.182	1
241		7	max	0	3	.513	3	.611	1	3.061e-2	1	8065.267	15	NC	5
242			min	-.489	4	-2.111	1	-.062	3	-8.727e-3	3	181.537	1	663.712	1
243		8	max	0	3	.466	3	.601	1	3.314e-2	1	8614.737	15	NC	5
244			min	-.489	4	-1.991	1	-.072	3	-9.51e-3	3	198.657	1	682.061	1
245		9	max	0	3	.418	3	.578	1	3.568e-2	1	9406.088	15	NC	5
246			min	-.489	4	-1.858	1	-.079	3	-1.029e-2	3	222.074	1	727.397	1
247		10	max	0	1	.394	3	.564	1	3.821e-2	1	9843.938	15	NC	5
248			min	-.489	4	-1.791	1	-.082	3	-1.108e-2	3	235.909	1	757.845	1
249		11	max	0	1	.418	3	.578	1	3.568e-2	1	9170.673	15	9431.499	15
250			min	-.489	4	-1.858	1	-.079	3	-1.029e-2	3	222.074	1	727.397	1
251		12	max	0	1	.466	3	.601	1	3.314e-2	1	8085.038	15	9057.311	12
252			min	-.489	4	-1.991	1	-.072	3	-9.51e-3	3	198.657	1	682.061	1
253		13	max	0	1	.513	3	.611	1	3.061e-2	1	7277.812	15	NC	12
254			min	-.489	4	-2.111	1	-.062	3	-8.727e-3	3	181.537	1	663.712	1
255		14	max	0	1	.538	3	.595	1	2.808e-2	1	6939.373	15	NC	5
256			min	-.489	4	-2.157	1	-.052	3	-7.944e-3	3	175.72	1	693.182	1
257		15	max	0	1	.528	3	.548	1	2.554e-2	1	7157.758	15	NC	3
258			min	-.489	4	-2.091	1	-.042	3	-7.16e-3	3	184.128	1	797.776	1
259		16	max	.001	1	.478	3	.472	1	2.301e-2	1	8186.875	15	NC	3
260			min	-.489	4	-1.899	1	-.034	3	-6.377e-3	3	214.334	1	1050.396	1
261		17	max	.001	1	.389	3	.379	1	2.047e-2	1	NC	15	NC	3
262			min	-.489	4	-1.584	1	-.029	3	-5.594e-3	3	292.584	1	1711.623	1
263		18	max	.001	1	.268	3	.289	1	1.794e-2	1	NC	5	NC	3
264			min	-.489	4	-1.176	1	-.025	3	-4.811e-3	3	556.408	1	4359.232	1
265		19	max	.002	1	.132	3	.232	1	1.54e-2	1	NC	1	NC	1
266			min	-.489	4	-.723	1	-.024	3	-4.028e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	3	0	5	1.051e-3	1	NC	1	NC	1
270			min	0	1	0	1	0	1	-1.041e-3	5	NC	1	NC	1
271		3	max	0	3	0	3	.001	5	2.103e-3	1	NC	1	NC	1
272			min	0	1	-.003	1	0	1	-2.081e-3	5	NC	1	NC	1
273		4	max	0	3	0	3	.003	5	3.154e-3	1	NC	3	NC	1
274			min	0	1	-.007	1	0	1	-3.122e-3	5	6189.916	1	NC	1
275		5	max	0	3	0	3	.005	5	4.205e-3	1	NC	3	NC	1
276			min	0	1	-.013	1	-.001	1	-4.162e-3	5	3483.484	1	8724.339	5
277		6	max	0	3	.001	3	.008	5	5.257e-3	1	NC	3	NC	1
278			min	0	1	-.021	1	-.001	1	-5.203e-3	5	2230.174	1	5742.589	5
279		7	max	0	3	.002	3	.011	5	5.821e-3	1	NC	3	NC	1
280			min	0	1	-.03	1	-.002	1	-5.895e-3	5	1545.191	1	4097.168	5
281		8	max	0	3	.003	3	.015	5	5.227e-3	1	NC	3	NC	1
282			min	0	1	-.041	1	-.002	1	-5.759e-3	5	1130.498	1	3091.37	5
283		9	max	0	3	.004	3	.019	5	4.633e-3	1	NC	3	NC	1
284			min	0	1	-.054	1	-.002	1	-5.622e-3	5	866.629	1	2430.319	5
285		10	max	0	3	.006	3	.024	5	4.04e-3	1	NC	12	NC	1
286			min	0	1	-.067	1	-.002	1	-5.486e-3	5	688.549	1	1971.89	5
287		11	max	0	3	.007	3	.028	5	3.446e-3	1	NC	12	NC	1
288			min	0	1	-.082	1	-.002	1	-5.349e-3	5	562.752	1	1640.573	5
289		12	max	0	3	.009	3	.033	4	2.852e-3	1	9211.421	12	NC	1
290			min	0	1	-.099	1	-.002	1	-5.213e-3	5	470.619	1	1390.373	4
291		13	max	0	3	.011	3	.039	4	2.259e-3	1	7683.372	12	NC	1
292			min	-.001	1	-.116	1	-.001	3	-5.077e-3	5	401.108	1	1196.75	4
293		14	max	0	3	.013	3	.044	4	1.665e-3	1	6537.765	12	NC	1
294			min	-.001	1	-.134	1	-.002	3	-4.94e-3	5	347.364	1	1044.921	4
295		15	max	0	3	.014	3	.05	4	1.081e-3	2	5656.989	12	NC	1
296			min	-.001	1	-.152	1	-.003	3	-4.804e-3	5	304.965	1	923.636	4
297		16	max	0	3	.016	3	.056	4	6.101e-4	2	4965.351	12	NC	1
298			min	-.001	1	-.171	1	-.005	3	-4.667e-3	5	270.935	1	825.196	4
299		17	max	0	3	.019	3	.062	4	1.388e-4	2	4412.532	12	NC	2
300			min	-.001	1	-.191	1	-.006	3	-4.6e-3	4	243.217	1	744.201	4
301		18	max	0	3	.021	3	.069	4	2.884e-4	3	3964.131	12	NC	9
302			min	-.001	1	-.211	1	-.008	3	-4.551e-3	4	220.363	1	676.786	4
303		19	max	0	3	.023	3	.075	4	4.881e-4	3	3595.839	12	NC	10
304			min	-.002	1	-.231	1	-.011	3	-4.502e-3	4	201.317	1	620.105	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	3	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-1.094e-3	4	NC	1	NC	1
309		3	max	0	3	0	3	.001	4	0	1	NC	3	NC	1
310			min	0	1	-.008	1	0	1	-2.187e-3	4	6052.204	1	NC	1
311		4	max	0	3	.002	3	.003	4	0	1	NC	3	NC	1
312			min	0	1	-.017	1	0	1	-3.281e-3	4	2663.022	1	NC	1
313		5	max	0	3	.003	3	.006	4	0	1	NC	3	NC	1
314			min	-.001	1	-.031	1	0	1	-4.375e-3	4	1487.944	1	8311.25	4
315		6	max	0	3	.005	3	.008	4	0	1	NC	5	NC	1
316			min	-.001	1	-.049	1	0	1	-5.468e-3	4	947.148	1	5477.002	4
317		7	max	0	3	.008	3	.012	4	0	1	NC	5	NC	1
318			min	-.002	1	-.071	1	0	1	-6.192e-3	4	652.652	1	3912.052	4
319		8	max	0	3	.011	3	.016	4	0	1	NC	5	NC	1
320			min	-.002	1	-.098	1	0	1	-6.035e-3	4	474.938	1	2954.599	4
321		9	max	.001	3	.016	3	.02	4	0	1	NC	15	NC	1
322			min	-.002	1	-.128	1	0	1	-5.879e-3	4	362.581	1	2325.102	4
323		10	max	.001	3	.02	3	.025	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	1	-.162	1	0	1	-5.723e-3	4	287.142	1	1888.548	4
325		11	max	.001	3	.025	3	.03	4	0	1	8945.981	15	NC	1
326			min	-.003	1	-.198	1	0	1	-5.566e-3	4	234.073	1	1573.101	4
327		12	max	.001	3	.031	3	.035	4	0	1	7473.18	15	NC	1
328			min	-.003	1	-.238	1	0	1	-5.41e-3	4	195.339	1	1337.647	4
329		13	max	.002	3	.037	3	.04	4	0	1	6363.639	15	NC	1
330			min	-.003	1	-.279	1	0	1	-5.253e-3	4	166.199	1	1157.163	4
331		14	max	.002	3	.044	3	.046	4	0	1	5506.855	15	NC	1
332			min	-.003	1	-.323	1	0	1	-5.097e-3	4	143.723	1	1015.762	4
333		15	max	.002	3	.05	3	.051	4	0	1	4831.655	15	NC	1
334			min	-.003	1	-.368	1	0	1	-4.94e-3	4	126.028	1	902.968	4
335		16	max	.002	3	.057	3	.057	4	0	1	4290.223	15	NC	1
336			min	-.004	1	-.415	1	0	1	-4.784e-3	4	111.851	1	811.614	4
337		17	max	.002	3	.064	3	.063	4	0	1	3849.6	15	NC	1
338			min	-.004	1	-.463	1	0	1	-4.627e-3	4	100.322	1	736.678	4
339		18	max	.002	3	.071	3	.069	4	0	1	3486.541	15	NC	1
340			min	-.004	1	-.511	1	0	1	-4.471e-3	4	90.829	1	674.555	4
341		19	max	.002	3	.078	3	.075	4	0	1	3184.175	15	NC	1
342			min	-.004	1	-.56	1	0	1	-4.314e-3	4	82.928	1	622.599	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	3.45e-4	3	NC	1	NC	1
346			min	0	1	0	1	0	3	-1.274e-3	4	NC	1	NC	1
347		3	max	0	3	0	3	.002	4	6.899e-4	3	NC	1	NC	1
348			min	0	1	-.003	1	0	3	-2.549e-3	4	NC	1	NC	1
349		4	max	0	3	0	3	.003	4	1.035e-3	3	NC	3	NC	1
350			min	0	1	-.007	1	0	3	-3.823e-3	4	6189.916	1	NC	1
351		5	max	0	3	0	3	.006	4	1.38e-3	3	NC	3	NC	1
352			min	0	1	-.013	1	0	3	-5.098e-3	4	3483.484	1	8234.4	4
353		6	max	0	3	.001	3	.009	4	1.725e-3	3	NC	3	NC	1
354			min	0	1	-.021	1	0	3	-6.372e-3	4	2230.174	1	5448.476	4
355		7	max	0	3	.002	3	.012	4	1.908e-3	3	NC	3	NC	1
356			min	0	1	-.03	1	0	3	-7.189e-3	4	1545.191	1	3907.531	4
357		8	max	0	3	.003	3	.016	4	1.709e-3	3	NC	3	NC	1
358			min	0	1	-.041	1	0	3	-6.919e-3	4	1130.498	1	2962.195	4
359		9	max	0	3	.004	3	.02	4	1.509e-3	3	NC	3	NC	1
360			min	0	1	-.054	1	0	3	-6.648e-3	4	866.629	1	2339.091	4
361		10	max	0	3	.006	3	.024	4	1.309e-3	3	NC	5	NC	1
362			min	0	1	-.067	1	0	3	-6.378e-3	4	688.549	1	1906.295	4
363		11	max	0	3	.007	3	.029	4	1.11e-3	3	NC	5	NC	1
364			min	0	1	-.082	1	0	3	-6.108e-3	4	562.752	1	1593.279	4
365		12	max	0	3	.009	3	.034	4	9.099e-4	3	NC	5	NC	1
366			min	0	1	-.099	1	0	10	-5.837e-3	4	470.619	1	1359.551	4
367		13	max	0	3	.011	3	.039	4	7.101e-4	3	NC	5	NC	1
368			min	-.001	1	-.116	1	0	10	-5.567e-3	4	401.108	1	1180.414	4
369		14	max	0	3	.013	3	.045	4	5.104e-4	3	NC	5	NC	1
370			min	-.001	1	-.134	1	0	2	-5.297e-3	4	347.364	1	1040.165	4
371		15	max	0	3	.014	3	.05	4	3.107e-4	3	NC	5	NC	1
372			min	-.001	1	-.152	1	-.002	2	-5.026e-3	4	304.965	1	928.433	4
373		16	max	0	3	.016	3	.055	4	1.11e-4	3	NC	5	NC	1
374			min	-.001	1	-.171	1	-.003	2	-4.756e-3	4	270.935	1	838.122	4
375		17	max	0	3	.019	3	.061	4	1.487e-4	9	NC	5	NC	2
376			min	-.001	1	-.191	1	-.005	1	-4.508e-3	5	243.217	1	764.262	4
377		18	max	0	3	.021	3	.066	5	7.097e-4	1	NC	5	NC	9
378			min	-.001	1	-.211	1	-.007	1	-4.327e-3	5	220.363	1	700.796	5
379		19	max	0	3	.023	3	.072	5	1.303e-3	1	NC	5	NC	10
380			min	-.002	1	-.231	1	-.01	1	-4.146e-3	5	201.317	1	646.942	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.026	1	0	3	.01	5	1.345e-3	1	NC	1	NC	1
382			min	-.002	3	-.007	1	-.002	1	-4.519e-4	3	NC	1	NC	1
383		2	max	.025	1	.003	3	.032	5	2.433e-3	1	NC	1	NC	5
384			min	-.002	3	-.033	1	-.022	1	-8.131e-4	3	NC	1	2987.757	1
385		3	max	.024	1	.006	3	.053	5	3.52e-3	1	NC	1	NC	5
386			min	-.001	3	-.059	1	-.042	1	-1.174e-3	3	NC	1	1517.713	1
387		4	max	.024	1	.008	3	.075	5	4.608e-3	1	NC	1	NC	5
388			min	-.001	3	-.085	1	-.061	1	-1.536e-3	3	8512.383	3	1033.967	1
389		5	max	.023	1	.011	3	.096	5	5.695e-3	1	NC	1	NC	5
390			min	0	3	-.11	1	-.078	1	-1.897e-3	3	6337.409	3	797.4	1
391		6	max	.022	1	.013	3	.118	5	6.782e-3	1	NC	1	NC	5
392			min	0	3	-.136	1	-.094	1	-2.258e-3	3	5024.794	3	660.392	1
393		7	max	.021	1	.016	3	.139	5	7.87e-3	1	NC	1	NC	5
394			min	0	3	-.161	1	-.107	1	-2.619e-3	3	4144.541	3	555.706	4
395		8	max	.02	1	.019	3	.16	5	8.957e-3	1	NC	1	NC	5
396			min	0	3	-.187	1	-.119	1	-2.98e-3	3	3512.338	3	473.832	4
397		9	max	.019	1	.022	3	.181	5	1.004e-2	1	NC	1	NC	7
398			min	0	3	-.212	1	-.127	1	-3.342e-3	3	3035.986	3	412.307	4
399		10	max	.018	1	.025	3	.202	5	1.113e-2	1	NC	1	NC	15
400			min	0	12	-.238	1	-.133	1	-3.703e-3	3	2664.219	3	364.34	4
401		11	max	.018	1	.028	3	.223	5	1.222e-2	1	NC	1	NC	15
402			min	0	12	-.263	1	-.135	1	-4.064e-3	3	2366.228	3	325.857	4
403		12	max	.017	1	.031	3	.244	5	1.331e-2	1	NC	1	NC	15
404			min	0	12	-.288	1	-.133	1	-4.425e-3	3	2122.361	3	294.267	4
405		13	max	.016	1	.034	3	.264	5	1.439e-2	1	NC	1	NC	15
406			min	0	12	-.313	1	-.127	1	-4.786e-3	3	1919.477	3	267.843	4
407		14	max	.015	1	.037	3	.284	5	1.548e-2	1	NC	1	NC	7
408			min	0	12	-.337	1	-.117	1	-5.148e-3	3	1748.439	3	245.389	4
409		15	max	.014	1	.04	3	.304	5	1.657e-2	1	NC	1	NC	5
410			min	0	12	-.362	1	-.102	1	-5.509e-3	3	1602.692	3	226.052	4
411		16	max	.013	1	.044	3	.324	5	1.766e-2	1	NC	1	NC	5
412			min	.001	12	-.387	1	-.082	1	-5.87e-3	3	1477.401	3	209.207	4
413		17	max	.012	1	.047	3	.343	5	1.874e-2	1	NC	1	NC	5
414			min	.001	12	-.411	1	-.056	1	-6.231e-3	3	1368.92	3	194.385	4
415		18	max	.011	1	.051	3	.362	5	1.983e-2	1	NC	1	NC	5
416			min	.001	12	-.436	1	-.025	1	-6.592e-3	3	1274.443	3	181.229	4
417		19	max	.011	1	.054	3	.385	4	2.092e-2	1	NC	1	NC	1
418			min	.001	15	-.46	1	-.001	3	-6.954e-3	3	1191.778	3	169.462	4
419	M6	1	max	.062	1	.002	3	.011	4	0	1	NC	1	NC	1
420			min	-.006	3	-.017	1	0	1	-2.013e-4	5	NC	1	NC	1
421		2	max	.059	1	.012	3	.033	4	0	1	NC	1	NC	1
422			min	-.006	3	-.08	1	0	1	-3.259e-4	5	6675.696	3	NC	1
423		3	max	.057	1	.021	3	.056	4	0	1	NC	1	NC	1
424			min	-.005	3	-.142	1	0	1	-4.504e-4	5	3334.819	3	NC	1
425		4	max	.055	1	.031	3	.078	4	0	1	NC	1	NC	1
426			min	-.004	3	-.205	1	0	1	-5.749e-4	5	2220.001	3	NC	1
427		5	max	.052	1	.041	3	.101	4	0	1	NC	1	NC	1
428			min	-.004	3	-.268	1	0	1	-6.995e-4	5	1661.795	3	9458.222	4
429		6	max	.05	1	.05	3	.123	4	0	1	NC	1	NC	1
430			min	-.003	3	-.33	1	0	1	-8.24e-4	5	1326.312	3	7740.64	4
431		7	max	.047	1	.06	3	.145	4	0	1	NC	1	NC	1
432			min	-.002	3	-.393	1	0	1	-9.486e-4	5	1102.256	3	6665.125	4
433		8	max	.045	1	.07	3	.167	4	0	1	NC	1	NC	1
434			min	-.001	3	-.455	1	0	1	-1.073e-3	5	941.929	3	5965.797	4
435		9	max	.043	1	.08	3	.189	4	0	1	NC	1	NC	1
436			min	0	3	-.517	1	0	1	-1.198e-3	5	821.481	3	5514.379	4
437		10	max	.04	1	.09	3	.21	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	3	-.58	1	0	1	-1.322e-3	5	727.66	3	5245.704	4
439		11	max	.038	1	.1	3	.232	4	0	1	NC	1	NC	1
440			min	0	12	-.642	1	0	1	-1.447e-3	5	652.517	3	5129.342	4
441		12	max	.035	1	.11	3	.252	4	0	1	NC	1	NC	1
442			min	0	15	-.704	1	0	1	-1.571e-3	5	590.989	3	5159.25	4
443		13	max	.033	1	.12	3	.273	4	0	1	NC	1	NC	1
444			min	0	15	-.766	1	0	1	-1.696e-3	4	539.702	3	5353.635	4
445		14	max	.031	1	.13	3	.293	4	0	1	NC	1	NC	1
446			min	0	15	-.827	1	0	1	-1.821e-3	4	496.32	3	5766.031	4
447		15	max	.028	1	.141	3	.312	4	0	1	NC	1	NC	1
448			min	0	15	-.889	1	0	1	-1.947e-3	4	459.173	3	6520.072	4
449		16	max	.026	1	.151	3	.331	4	0	1	NC	1	NC	1
450			min	0	15	-.951	1	0	1	-2.072e-3	4	427.034	3	7918.868	4
451		17	max	.023	1	.162	3	.35	4	0	1	NC	1	NC	1
452			min	0	15	-1.012	1	0	1	-2.197e-3	4	398.984	3	NC	1
453		18	max	.021	1	.172	3	.368	4	0	1	NC	1	NC	1
454			min	0	15	-1.074	1	0	1	-2.322e-3	4	374.32	3	NC	1
455		19	max	.019	1	.183	3	.386	4	0	1	NC	1	NC	1
456			min	0	15	-1.135	1	0	1	-2.448e-3	4	352.494	3	NC	1
457	M9	1	max	.026	1	0	3	.011	4	4.519e-4	3	NC	1	NC	1
458			min	-.002	3	-.007	1	0	3	-1.345e-3	1	NC	1	NC	1
459		2	max	.025	1	.003	3	.037	4	8.131e-4	3	NC	1	NC	4
460			min	-.002	3	-.033	1	-.007	3	-2.433e-3	1	NC	1	2987.757	1
461		3	max	.024	1	.006	3	.063	4	1.174e-3	3	NC	1	NC	5
462			min	-.001	3	-.059	1	-.014	3	-3.52e-3	1	NC	1	1517.713	1
463		4	max	.024	1	.008	3	.089	4	1.536e-3	3	NC	1	NC	15
464			min	-.001	3	-.085	1	-.02	3	-4.608e-3	1	8512.383	3	1033.967	1
465		5	max	.023	1	.011	3	.114	4	1.897e-3	3	NC	1	NC	15
466			min	0	3	-.11	1	-.026	3	-5.695e-3	1	6337.409	3	797.4	1
467		6	max	.022	1	.013	3	.139	4	2.258e-3	3	NC	1	8204.51	15
468			min	0	3	-.136	1	-.031	3	-6.782e-3	1	5024.794	3	660.392	1
469		7	max	.021	1	.016	3	.163	4	2.619e-3	3	NC	1	7075.709	15
470			min	0	5	-.161	1	-.035	3	-7.87e-3	1	4144.541	3	573.964	1
471		8	max	.02	1	.019	3	.187	4	2.98e-3	3	NC	1	6339.784	15
472			min	0	5	-.187	1	-.039	3	-8.957e-3	1	3512.338	3	517.407	1
473		9	max	.019	1	.022	3	.21	4	3.342e-3	3	NC	1	5863.222	15
474			min	0	5	-.212	1	-.042	3	-1.004e-2	1	3035.986	3	480.728	1
475		10	max	.018	1	.025	3	.232	4	3.703e-3	3	NC	1	5578.167	15
476			min	0	5	-.238	1	-.044	3	-1.113e-2	1	2664.219	3	458.875	1
477		11	max	.018	1	.028	3	.254	4	4.064e-3	3	NC	1	5452.952	15
478			min	0	5	-.263	1	-.045	3	-1.222e-2	1	2366.228	3	449.54	1
479		12	max	.017	1	.031	3	.274	4	4.425e-3	3	NC	1	5481.371	15
480			min	0	5	-.288	1	-.044	3	-1.331e-2	1	2122.361	3	452.38	1
481		13	max	.016	1	.034	3	.293	4	4.786e-3	3	NC	1	5682.606	15
482			min	0	5	-.313	1	-.043	3	-1.439e-2	1	1919.477	3	469.057	1
483		14	max	.015	1	.037	3	.311	4	5.148e-3	3	NC	1	6112.884	15
484			min	0	5	-.337	1	-.04	3	-1.548e-2	1	1748.439	3	504.212	1
485		15	max	.014	1	.04	3	.328	4	5.509e-3	3	NC	1	6902.002	15
486			min	0	5	-.362	1	-.035	3	-1.657e-2	1	1602.692	3	568.441	1
487		16	max	.013	1	.044	3	.343	4	5.87e-3	3	NC	1	8368.152	15
488			min	0	5	-.387	1	-.029	3	-1.766e-2	1	1477.401	3	687.649	1
489		17	max	.012	1	.047	3	.356	4	6.231e-3	3	NC	1	NC	15
490			min	0	5	-.411	1	-.021	3	-1.874e-2	1	1368.92	3	940.748	1
491		18	max	.011	1	.051	3	.369	4	6.592e-3	3	NC	1	NC	5
492			min	0	5	-.436	1	-.011	3	-1.983e-2	1	1274.443	3	1724.007	1
493		19	max	.011	1	.054	3	.38	5	6.954e-3	3	NC	1	NC	1
494			min	0	5	-.46	1	-.013	1	-2.092e-2	1	1191.778	3	NC	1