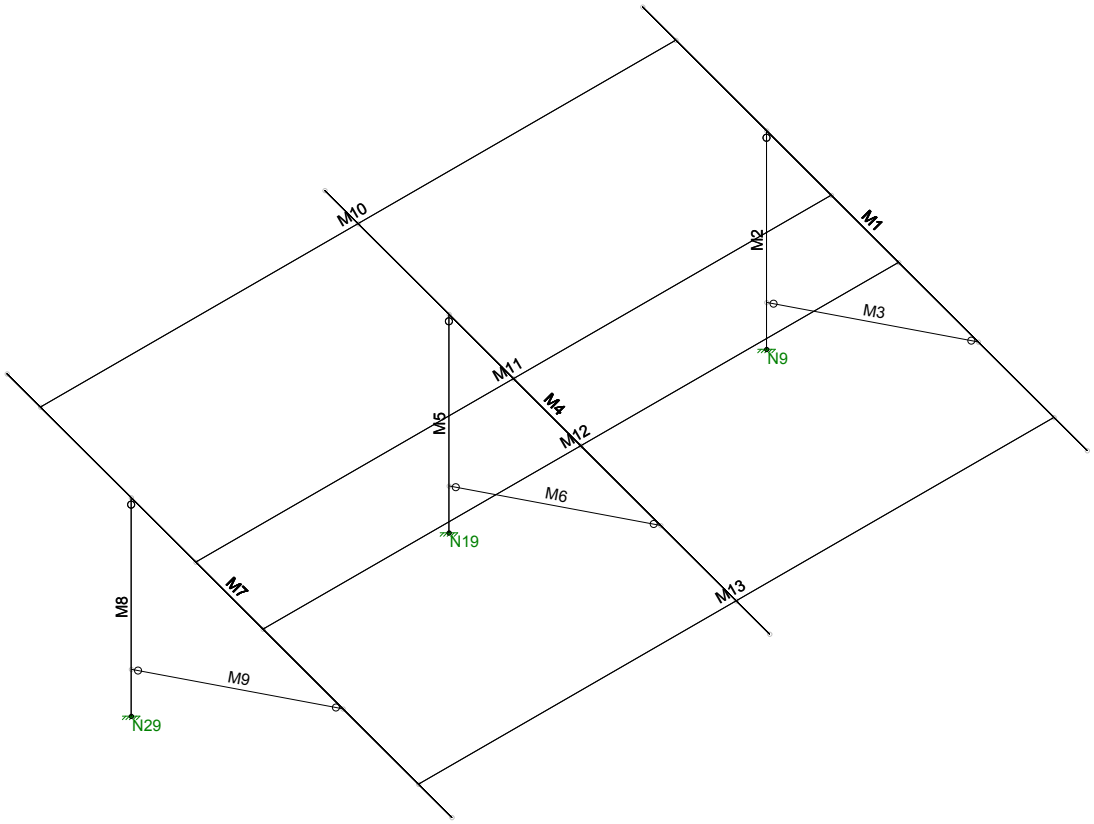


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

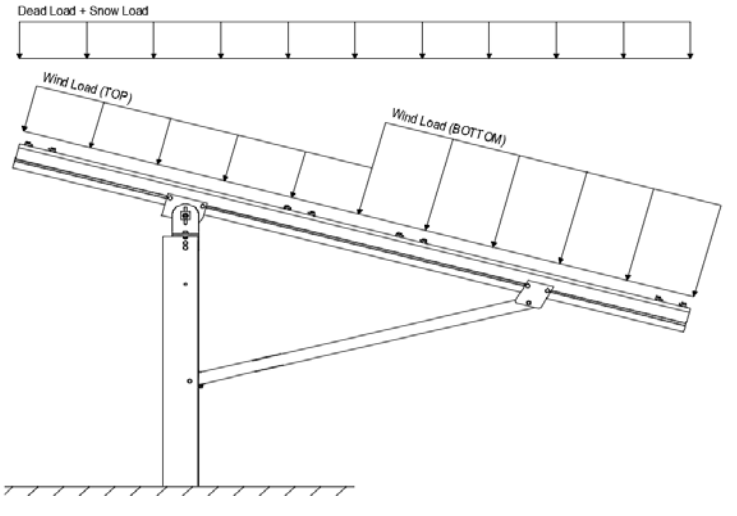
PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	20°
Maximum Height Above Grade =	3 ft

1.3 Technical Codes

- ASCE 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005



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

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 =	20.62	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.91		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	100	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	15.70	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.05		*(Pressure)*
$Cf+_{BOTTOM}$ =	1.65		
$Cf-_{TOP}$ =	-2.12		*(Suction)*
$Cf-_{BOTTOM}$ =	-1		

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.

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 + 0.8W	
1.2D + 1.6W + 0.5S	
0.9D + 1.6W [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 + 1.0W	
1.0D + 0.75L + 0.75W + 0.75S	
0.6D + 1.0W [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

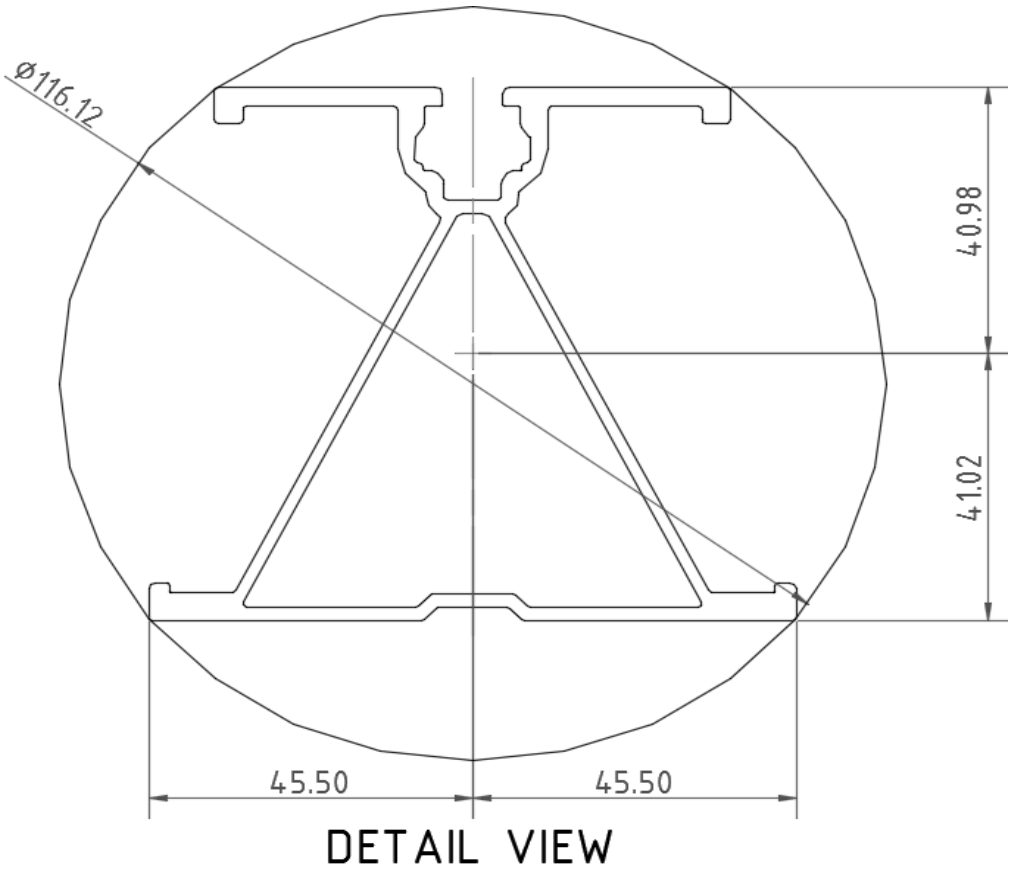
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	132	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 =	2.087	k-ft
M_z =	0.228	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	95%	

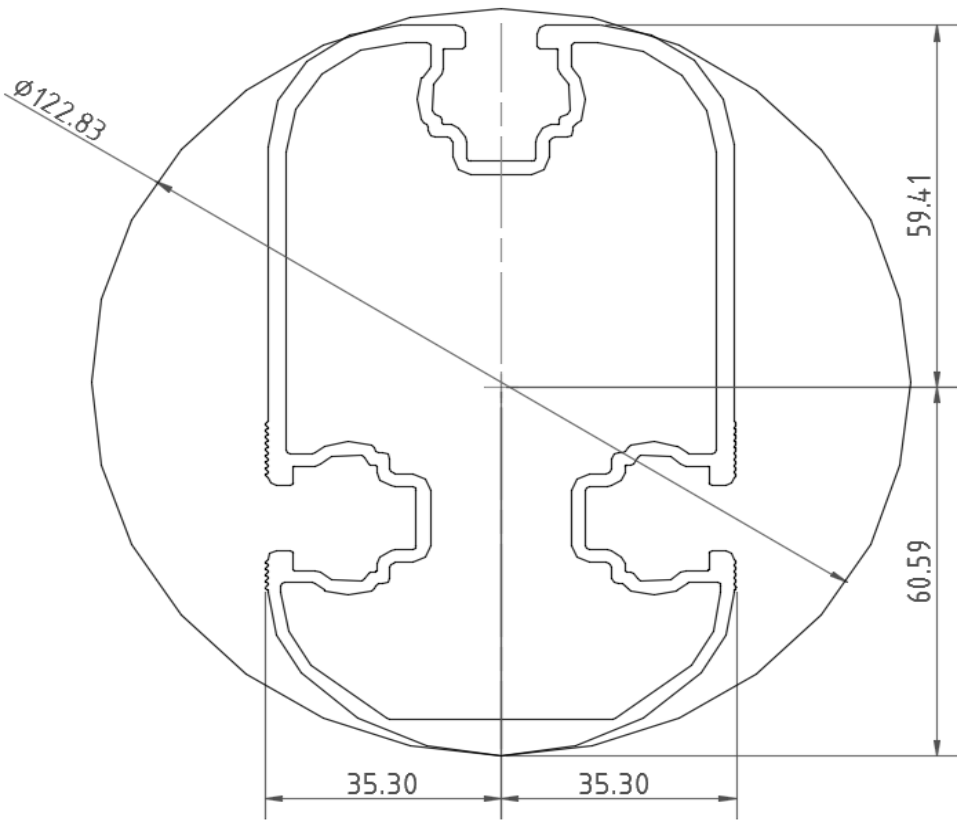


DETAIL VIEW

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 =	4.106	k-ft
M_z =	0.000	k-ft
P_n =	0.030	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	82%	

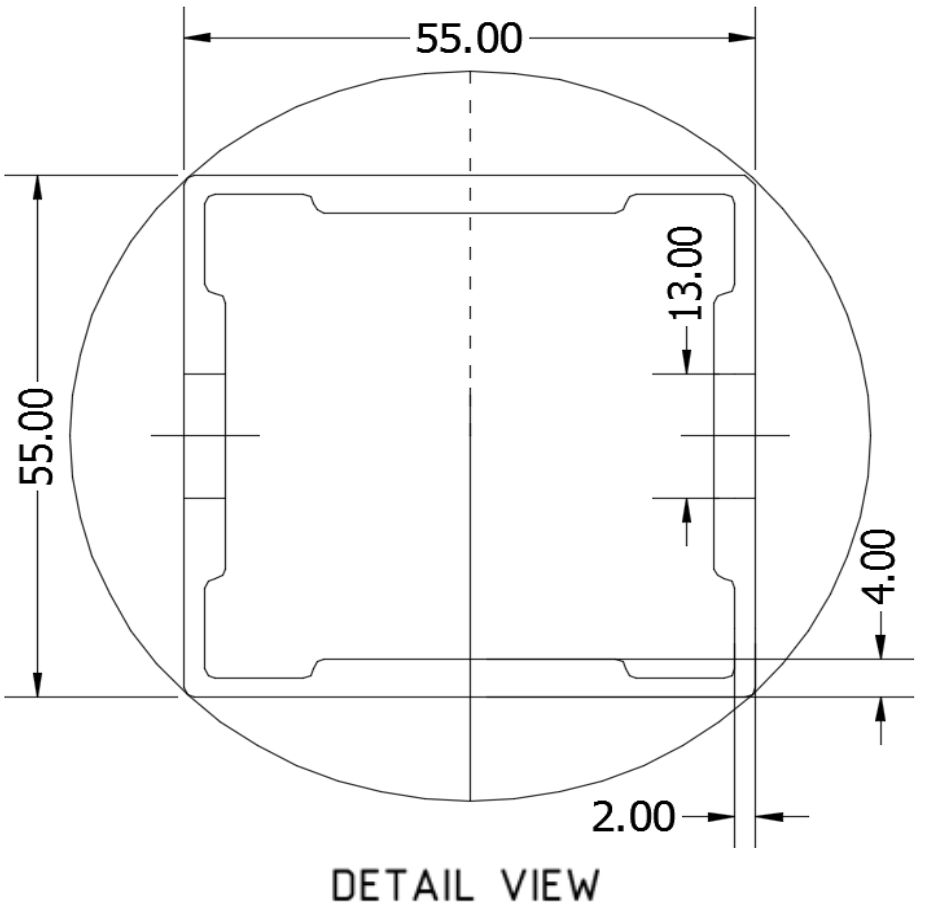


DETAIL VIEW

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).

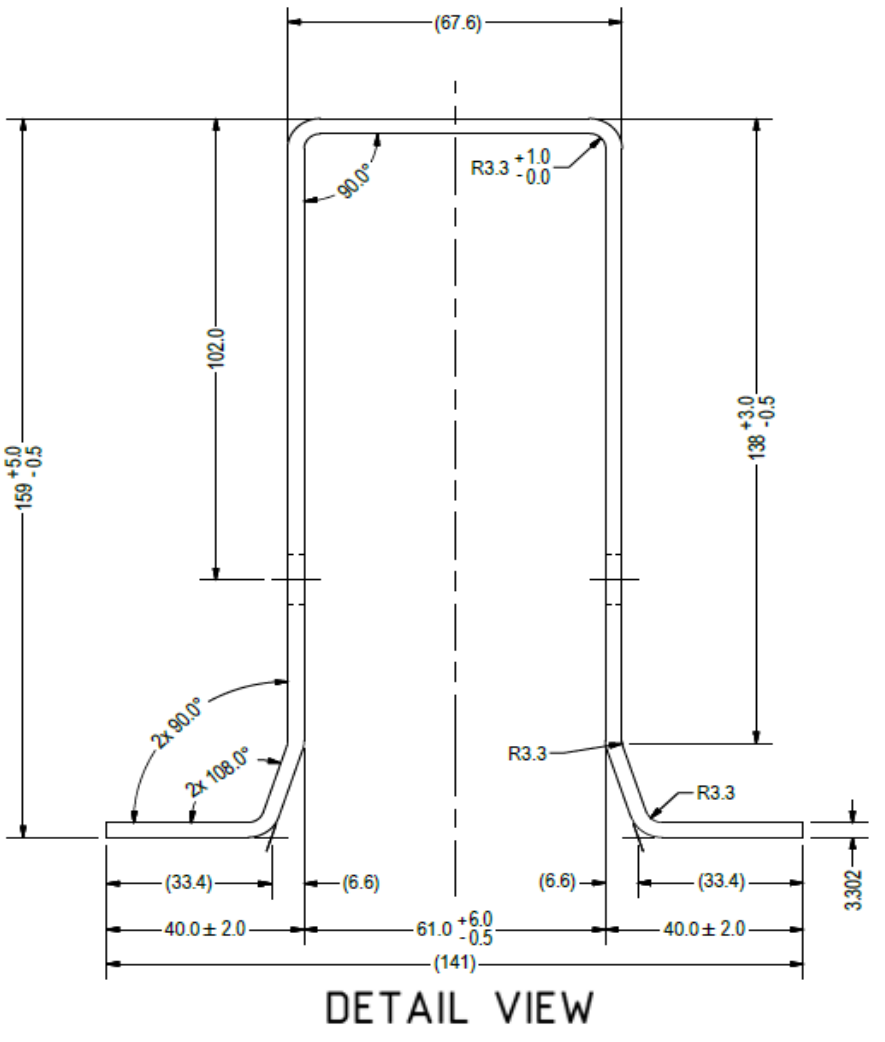
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	5.994	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	45%	



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 =	65.62	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 =	15.131	k-ft
M_z =	0.000	k-ft
P_r =	7.372	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	46.025	k
Utilization =	96%	



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 =	6.51	k
Maximum Lateral Load =	2.55	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)

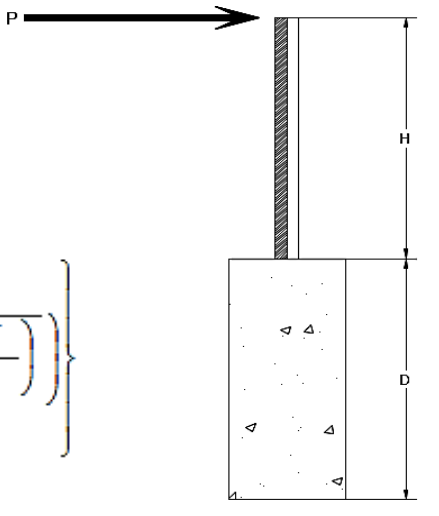
Lateral Force @ Top of Pole, P =	2.00	k
Height of Pole Above Grade, H =	4.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	2.00	k
Height of Pole Above Grade, H =	4.47	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 =	10.79	
Required Footing Depth, D =	14.43	ft

2nd Trial @ D_2 =	8.84	ft
Lateral Soil Bearing @ D/3, S_1 =	0.59	ksf
Lateral Soil Bearing @ D, S_3 =	1.77	ksf
Constant 2.34P/(S_1B), A =	3.97	
Required Footing Depth, D =	6.80	ft

3rd Trial @ D_3 =	7.82	ft
Lateral Soil Bearing @ D/3, S_1 =	0.52	ksf
Lateral Soil Bearing @ D, S_3 =	1.56	ksf
Constant 2.34P/(S_1B), A =	4.48	
Required Footing Depth, D =	7.42	ft

4th Trial @ D_4 =	7.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf
Lateral Soil Bearing @ D, S_3 =	1.52	ksf
Constant 2.34P/(S_1B), A =	4.60	
Required Footing Depth, D =	7.56	ft

5th Trial @ D_5 =	7.59	ft
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf
Lateral Soil Bearing @ D, S_3 =	1.52	ksf
Constant 2.34P/(S_1B), A =	4.62	
Required Footing Depth, D =	7.75	ft

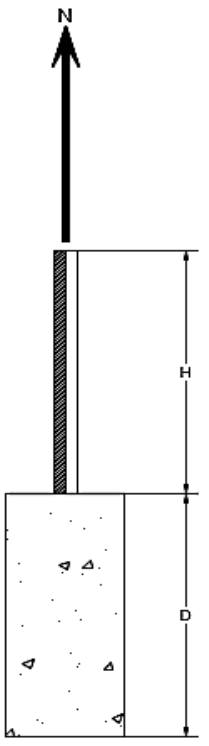
A 2ft diameter x 7.75ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.11	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 =	2.03	k
Required Concrete Volume, V =	13.98	ft^3
Required Footing Depth, D =	4.50	ft

A 2ft diameter x 4.5ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.73
2	0.4	0.2	118.10	6.63
3	0.6	0.2	118.10	6.53
4	0.8	0.2	118.10	6.42
5	1	0.2	118.10	6.32
6	1.2	0.2	118.10	6.21
7	1.4	0.2	118.10	6.11
8	1.6	0.2	118.10	6.01
9	1.8	0.2	118.10	5.90
10	2	0.2	118.10	5.80
11	2.2	0.2	118.10	5.70
12	2.4	0.2	118.10	5.59
13	2.6	0.2	118.10	5.49
14	2.8	0.2	118.10	5.38
15	3	0.2	118.10	5.28
16	3.2	0.2	118.10	5.18
17	3.4	0.2	118.10	5.07
18	3.6	0.2	118.10	4.97
19	3.8	0.2	118.10	4.87
20	4	0.2	118.10	4.76
21	4.2	0.2	118.10	4.66
22	4.4	0.2	118.10	4.55
23	4.6	0.2	118.10	4.45
24	0	0.0	0.00	4.45
25	0	0.0	0.00	4.45
26	0	0.0	0.00	4.45
27	0	0.0	0.00	4.45
28	0	0.0	0.00	4.45
29	0	0.0	0.00	4.45
30	0	0.0	0.00	4.45
31	0	0.0	0.00	4.45
32	0	0.0	0.00	4.45
33	0	0.0	0.00	4.45
34	0	0.0	0.00	4.45
Max	4.6	Sum	1.09	

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 =	7.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.80	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	29.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

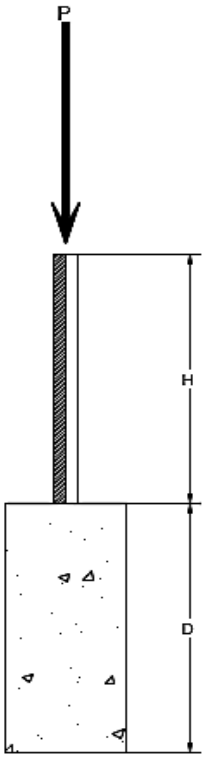
Weight of Concrete

Footing Volume	24.35	ft^3
Weight	3.53	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.48	k
1/3 Increase for Wind =	1.33	
Total Resistance =	12.25	k
Applied Force =	8.34	k
Utilization =	68%	

A 2ft diameter footing passes at a depth of 7.75ft.



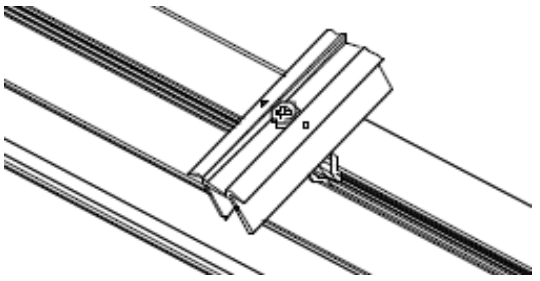
6. DESIGN OF JOINTS AND CONNECTIONS

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.

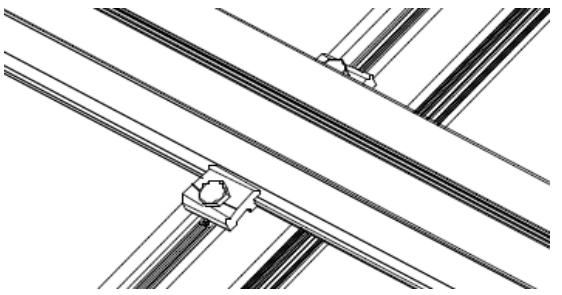
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.497 k
Allowable Uplift	=	1.214 k
Utilization	=	41%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.929 k
Allowable Uplift	=	2.180 k
Utilization	=	88%

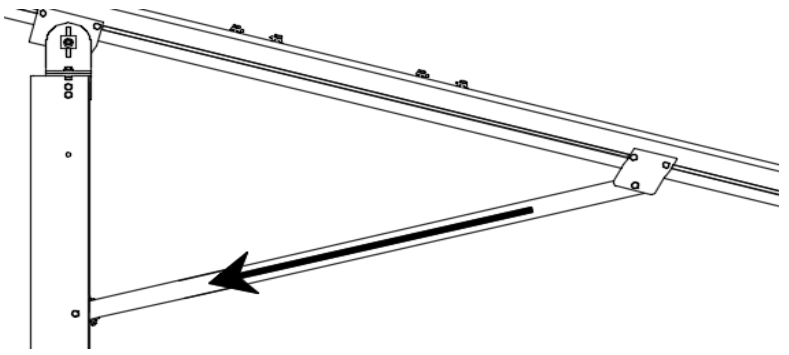


6.2 Strut Connections

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	=	5.994 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	67%

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

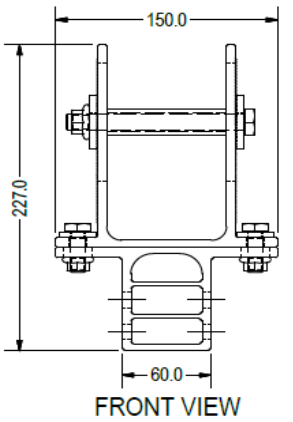


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

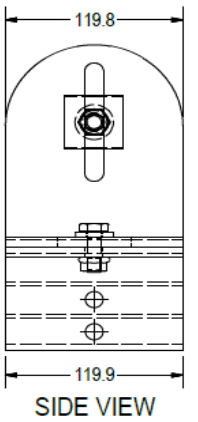
6.3 Girder to Post Connection

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.

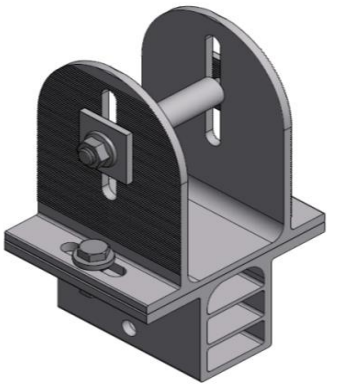
Maximum Tensile Load	=	4.122 k
Allowable Load	=	5.649 k
Utilization	=	73%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

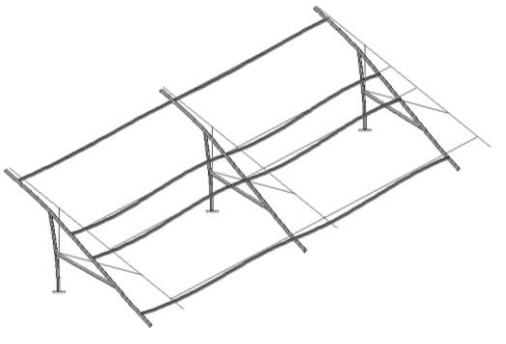
7.1 Seismic Drift

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}	=	53.92 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.078 in
Max Drift, Δ_{MAX}	=	0.577 in

0.577 ≤ 1.078, 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 = 132 in

J = 0.432

365.174

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

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= 27.1 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 = 132

J = 0.432

232.229

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

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= 28.4

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 =	65.62	in	
Pr =	7.37	k	(LRFD Factored Load)
Mr (Strong) =	15.13	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	94.42		
4.71√(E/Fy) =	103.55	=> kL/r	≤ 4.71√(E/Fy)
Fcr =	27.44	ksi	
Fe =	32.10	ksi	
Pn =	61.196	k	

Torsional/Flexural Torsional Buckling:

Fcr =	20.6391	ksi
Fey =	81.8881	ksi
Fez =	26.2099	ksi
Pn =	46.0252	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.178	<	0.2	
Utilization =	0.96	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.178	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 96%

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	-54.031	-54.031	0	0
2	M11	Y	-54.031	-54.031	0	0
3	M12	Y	-54.031	-54.031	0	0
4	M13	Y	-54.031	-54.031	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	-45.975	-45.975	0	0
2	M11	y	-45.975	-45.975	0	0
3	M12	y	-72.246	-72.246	0	0
4	M13	y	-72.246	-72.246	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	92.825	92.825	0	0
2	M11	y	92.825	92.825	0	0
3	M12	y	43.785	43.785	0	0
4	M13	y	43.785	43.785	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
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 + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
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	467.354	2	2697.809	1	363.591	1	.384	1	.007	5	6.438	1
2		min	-672.006	3	-1690.839	3	-349.445	5	-1.307	5	-.008	1	.379	12
3	N19	max	1911.844	2	7403.646	1	0	1	0	1	.008	4	14.396	1
4		min	-1945.314	3	-5004.856	3	-383.399	5	-1.376	4	0	3	.405	15
5	N29	max	467.354	2	2697.809	1	314.272	3	.313	3	.009	4	6.438	1
6		min	-672.006	3	-1690.839	3	-431.464	4	-1.411	4	-.004	3	-.122	5
7	Totals:	max	2846.551	2	12799.264	1	0	2						
8		min	-3289.325	3	-8386.533	3	-1110.467	5						

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	.006	1	.002	4	0	1	0	1	0	1
2			min	0	1	-.001	3	-.001	1	0	1	0	1	0	1
3		2	max	-.179	15	-.49	15	0	3	0	1	0	12	0	6
4			min	-.76	6	-2.085	6	-1.499	5	0	1	0	5	0	15
5		3	max	-5.987	12	282.819	3	15.081	3	.076	3	.299	1	.303	2
6			min	-197.528	1	-691.511	2	-201.538	1	-.264	1	.008	12	-.123	3
7		4	max	-6.283	12	281.6	3	15.081	3	.076	3	.174	1	.733	2
8			min	-198.119	1	-693.137	2	-201.538	1	-.264	1	.014	12	-.298	3
9		5	max	-6.578	12	280.38	3	15.081	3	.076	3	.073	4	1.164	2
10			min	-198.711	1	-694.763	2	-201.538	1	-.264	1	-.013	10	-.472	3
11		6	max	556.272	3	614.647	2	45.072	3	.036	1	.151	1	1.114	2
12			min	-1814.561	1	-177.284	3	-271.025	1	-.055	3	-.055	3	-.479	3
13		7	max	555.828	3	613.021	2	45.072	3	.036	1	.019	2	.74	1
14			min	-1815.153	1	-178.504	3	-271.025	1	-.055	3	-.056	4	-.368	3
15		8	max	555.384	3	611.395	2	45.072	3	.036	1	0	3	.372	1
16			min	-1815.745	1	-179.723	3	-271.025	1	-.055	3	-.186	1	-.257	3
17		9	max	547.299	3	79.581	3	48.146	3	.014	5	.092	1	.163	1
18			min	-2021.039	1	-70.8	1	-273.416	1	-.254	2	0	10	-.206	3
19		10	max	546.856	3	78.362	3	48.146	3	.014	5	.063	3	.208	1
20			min	-2021.631	1	-72.426	1	-273.416	1	-.254	2	-.078	1	-.255	3
21		11	max	546.412	3	77.142	3	48.146	3	.014	5	.093	3	.253	1
22			min	-2022.222	1	-74.052	1	-273.416	1	-.254	2	-.247	1	-.303	3
23		12	max	535.238	3	739.266	3	160.549	2	.443	3	.157	1	.537	1
24			min	-2222.437	1	-652.812	1	-281.68	3	-.515	1	-.008	5	-.614	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	534.794	3	738.046	3	160.549	2	.443	3	.233	1	.943	1
26			min	-2223.029	1	-654.438	1	-281.68	3	-.515	1	-.155	3	-1.072	3
27		14	max	199.73	1	587.605	1	80.625	5	.345	1	0	10	1.333	1
28			min	5.918	12	-657.575	3	-170.514	1	-.454	3	-.234	4	-1.511	3
29		15	max	199.138	1	585.979	1	79.125	5	.345	1	0	3	.969	1
30			min	5.622	12	-658.795	3	-170.514	1	-.454	3	-.204	4	-1.102	3
31		16	max	198.547	1	584.353	1	77.625	5	.345	1	.002	3	.605	1
32			min	5.326	12	-660.014	3	-170.514	1	-.454	3	-.217	1	-.693	3
33		17	max	197.955	1	582.727	1	76.125	5	.345	1	.004	3	.243	1
34			min	5.03	12	-661.234	3	-170.514	1	-.454	3	-.323	1	-.283	3
35		18	max	.76	4	2.087	6	1.5	5	0	1	0	12	0	6
36			min	.179	15	.49	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	-.003	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.002	4	0	1	0	1	0	1
40			min	0	1	-.004	3	0	1	0	1	0	1	0	1
41		2	max	-.179	15	-.49	15	0	1	0	1	0	1	0	4
42			min	-.76	4	-2.083	4	-1.499	5	0	1	0	5	0	15
43		3	max	-13.442	15	857.115	3	0	1	.02	4	.241	4	.751	2
44			min	-348.102	1	-1966.917	2	-115.504	5	0	1	0	1	-.328	3
45		4	max	-13.621	15	855.896	3	0	1	.02	4	.169	4	1.972	2
46			min	-348.693	1	-1968.543	2	-117.003	5	0	1	0	1	-.86	3
47		5	max	-13.799	15	854.676	3	0	1	.02	4	.096	4	3.195	2
48			min	-349.285	1	-1970.169	2	-118.503	5	0	1	0	1	-1.391	3
49		6	max	1836.3	3	1789.001	2	0	1	0	1	0	1	3.038	2
50			min	-4963.83	1	-636.559	3	-115.127	4	-.017	4	-.007	5	-1.374	3
51		7	max	1835.856	3	1787.375	2	0	1	0	1	0	1	1.928	2
52			min	-4964.422	1	-637.778	3	-116.627	4	-.017	4	-.078	4	-.979	3
53		8	max	1835.412	3	1785.749	2	0	1	0	1	0	1	.839	1
54			min	-4965.014	1	-638.998	3	-118.127	4	-.017	4	-.151	4	-.583	3
55		9	max	1809.929	3	261.374	3	0	1	.014	4	.129	4	.198	1
56			min	-5295.807	1	-278.754	1	-241.578	4	0	1	0	1	-.384	3
57		10	max	1809.485	3	260.155	3	0	1	.014	4	0	1	.371	1
58			min	-5296.399	1	-280.381	1	-243.078	4	0	1	-.021	4	-.545	3
59		11	max	1809.041	3	258.935	3	0	1	.014	4	0	1	.546	1
60			min	-5296.991	1	-282.007	1	-244.577	4	0	1	-.173	4	-.706	3
61		12	max	1789.736	3	2074.561	3	0	1	.125	4	.03	5	1.383	1
62			min	-5637.943	1	-1999.474	1	-262.913	5	0	1	0	1	-1.586	3
63		13	max	1789.292	3	2073.341	3	0	1	.125	4	0	1	2.625	1
64			min	-5638.535	1	-2001.1	1	-264.413	5	0	1	-.134	4	-2.873	3
65		14	max	349.023	1	1692.486	1	69.326	5	0	1	0	1	3.817	1
66			min	13.899	15	-1823.968	3	0	1	-.089	4	-.218	5	-4.106	3
67		15	max	348.431	1	1690.86	1	67.826	5	0	1	0	1	2.767	1
68			min	13.721	15	-1825.187	3	0	1	-.089	4	-.175	5	-2.974	3
69		16	max	347.839	1	1689.234	1	66.326	5	0	1	0	1	1.718	1
70			min	13.542	15	-1826.407	3	0	1	-.089	4	-.133	5	-1.841	3
71		17	max	347.247	1	1687.608	1	64.827	5	0	1	0	1	.67	1
72			min	13.363	15	-1827.626	3	0	1	-.089	4	-.093	4	-.707	3
73		18	max	.76	6	2.088	6	1.5	5	0	1	0	1	0	6
74			min	.179	15	.491	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.004	1	0	1	0	1	0	1	0	1
76			min	0	1	-.008	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.002	4	0	1	0	1	0	1
78			min	0	1	-.001	3	0	3	0	1	0	1	0	1
79		2	max	-.179	15	-.491	15	.001	1	0	1	0	1	0	4
80			min	-.76	4	-2.085	4	-1.499	5	0	1	0	5	0	15
81		3	max	16.001	5	282.819	3	201.538	1	.264	1	.115	5	.303	2

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	-197.528	1	-691.511	2	-49.817	5	-.076	3	-.299	1	-.123	3
83		4	max	15.725	5	281.6	3	201.538	1	.264	1	.084	5	.733	2
84			min	-198.119	1	-693.137	2	-51.316	5	-.076	3	-.174	1	-.298	3
85		5	max	15.449	5	280.38	3	201.538	1	.264	1	.052	5	1.164	2
86			min	-198.711	1	-694.763	2	-52.816	5	-.076	3	-.049	1	-.472	3
87		6	max	556.272	3	614.647	2	271.025	1	.055	3	.055	3	1.114	2
88			min	-1814.561	1	-177.284	3	-45.98	5	-.036	1	-.151	1	-.479	3
89		7	max	555.828	3	613.021	2	271.025	1	.055	3	.027	3	.74	1
90			min	-1815.153	1	-178.504	3	-47.48	5	-.036	1	-.046	5	-.368	3
91		8	max	555.384	3	611.395	2	271.025	1	.055	3	.186	1	.372	1
92			min	-1815.745	1	-179.723	3	-48.98	5	-.036	1	-.076	5	-.257	3
93		9	max	547.299	3	79.581	3	273.416	1	.254	2	.052	5	.163	1
94			min	-2021.039	1	-70.8	1	-100.815	5	.018	15	-.092	1	-.206	3
95		10	max	546.856	3	78.362	3	273.416	1	.254	2	.078	1	.208	1
96			min	-2021.631	1	-72.426	1	-102.315	5	.018	15	-.063	3	-.255	3
97		11	max	546.412	3	77.142	3	273.416	1	.254	2	.247	1	.253	1
98			min	-2022.222	1	-74.052	1	-103.815	5	.018	15	-.093	3	-.303	3
99		12	max	535.238	3	739.266	3	281.68	3	.515	1	-.013	12	.537	1
100			min	-2222.437	1	-652.812	1	-238.364	4	-.443	3	-.157	1	-.614	3
101		13	max	534.794	3	738.046	3	281.68	3	.515	1	.155	3	.943	1
102			min	-2223.029	1	-654.438	1	-239.863	4	-.443	3	-.233	1	-1.072	3
103		14	max	199.73	1	587.605	1	170.514	1	.454	3	.006	1	1.333	1
104			min	3.726	15	-657.575	3	-2.954	3	-.345	1	-.232	5	-1.511	3
105		15	max	199.138	1	585.979	1	170.514	1	.454	3	.112	1	.969	1
106			min	3.548	15	-658.795	3	-2.954	3	-.345	1	-.171	5	-1.102	3
107		16	max	198.547	1	584.353	1	170.514	1	.454	3	.217	1	.605	1
108			min	3.369	15	-660.014	3	-2.954	3	-.345	1	-.111	5	-.693	3
109		17	max	197.955	1	582.727	1	170.514	1	.454	3	.323	1	.243	1
110			min	3.19	15	-661.234	3	-2.954	3	-.345	1	-.053	5	-.283	3
111		18	max	.76	4	2.087	4	1.499	5	0	1	0	1	0	4
112			min	.179	15	.491	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	-.003	3	0	1	0	1	0	1	0	1
115	M10	1	max	170.473	1	579.252	1	-2.837	15	.007	1	.392	1	.345	1
116			min	-2.949	3	-663.598	3	-197.235	1	-.016	3	-.014	5	-.454	3
117		2	max	170.473	1	421.407	1	-1.343	15	.007	1	.176	1	.25	3
118			min	-2.949	3	-488.228	3	-156.146	1	-.016	3	-.018	5	-.267	1
119		3	max	170.473	1	263.562	1	.151	15	.007	1	.033	2	.74	3
120			min	-2.949	3	-312.859	3	-115.057	1	-.016	3	-.022	4	-.685	1
121		4	max	170.473	1	105.717	1	2.296	5	.007	1	.002	10	1.015	3
122			min	-2.949	3	-137.489	3	-73.968	1	-.016	3	-.105	1	-.911	1
123		5	max	170.473	1	37.881	3	4.607	5	.007	1	-.009	15	1.076	3
124			min	-2.949	3	-52.128	1	-32.878	1	-.016	3	-.17	1	-.944	1
125		6	max	170.473	1	213.251	3	10.825	14	.007	1	-.005	15	.923	3
126			min	-2.949	3	-209.973	1	-6.469	2	-.016	3	-.185	1	-.784	1
127		7	max	170.473	1	388.621	3	49.3	1	.007	1	.003	5	.555	3
128			min	-2.949	3	-367.818	1	-1.908	10	-.016	3	-.15	1	-.431	1
129		8	max	170.473	1	563.991	3	90.389	1	.007	1	.015	5	.115	1
130			min	-2.949	3	-525.663	1	2.218	10	-.016	3	-.065	1	-.027	3
131		9	max	170.473	1	739.361	3	131.478	1	.007	1	.071	1	.854	1
132			min	-9.563	5	-683.508	1	6.344	10	-.016	3	-.023	10	-.824	3
133		10	max	170.473	1	914.731	3	172.568	1	.016	3	.257	1	1.786	1
134			min	-2.949	3	-841.353	1	-91.748	14	-.003	14	-.012	10	-1.835	3
135		11	max	170.473	1	683.508	1	-.904	15	.016	3	.071	1	.854	1
136			min	-2.949	3	-739.361	3	-131.478	1	-.007	1	-.023	10	-.824	3
137		12	max	170.473	1	525.663	1	.669	5	.016	3	.007	3	.115	1
138			min	-2.949	3	-563.991	3	-90.389	1	-.007	1	-.065	1	-.027	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	170.473	1	367.818	1	2.979	5	.016	3	-.002	12	.555	3
140			min	-2.949	3	-388.621	3	-49.3	1	-.007	1	-.15	1	-.431	1
141		14	max	170.473	1	209.973	1	6.469	2	.016	3	-.007	12	.923	3
142			min	-10.427	5	-213.251	3	-9.394	9	-.007	1	-.185	1	-.784	1
143		15	max	170.473	1	52.128	1	32.878	1	.016	3	-.003	15	1.076	3
144			min	-22.974	5	-37.881	3	-2.542	3	-.007	1	-.17	1	-.944	1
145		16	max	170.473	1	137.489	3	73.968	1	.016	3	.005	5	1.015	3
146			min	-35.52	5	-105.717	1	-.302	3	-.007	1	-.105	1	-.911	1
147		17	max	170.473	1	312.859	3	115.057	1	.016	3	.033	2	.74	3
148			min	-48.066	5	-263.562	1	1.451	12	-.007	1	-.015	3	-.685	1
149		18	max	170.473	1	488.228	3	156.146	1	.016	3	.176	1	.25	3
150			min	-60.613	5	-421.407	1	2.945	12	-.007	1	-.012	3	-.267	1
151		19	max	170.473	1	663.598	3	197.235	1	.016	3	.392	1	.345	1
152			min	-73.159	5	-579.252	1	4.438	12	-.007	1	-.005	3	-.454	3
153	M11	1	max	395.258	1	573.945	1	22.151	5	0	3	.417	1	.302	1
154			min	-329.607	3	-664.732	3	-200.709	1	-.009	1	-.163	5	-.544	3
155		2	max	395.258	1	416.099	1	24.462	5	0	3	.197	1	.161	3
156			min	-329.607	3	-489.362	3	-159.62	1	-.009	1	-.134	5	-.303	1
157		3	max	395.258	1	258.254	1	26.772	5	0	3	.035	2	.652	3
158			min	-329.607	3	-313.993	3	-118.531	1	-.009	1	-.103	5	-.715	1
159		4	max	395.258	1	100.409	1	29.083	5	0	3	0	10	.929	3
160			min	-329.607	3	-138.623	3	-77.442	1	-.009	1	-.093	1	-.934	1
161		5	max	395.258	1	36.747	3	31.393	5	0	3	-.003	12	.991	3
162			min	-329.607	3	-57.436	1	-36.352	1	-.009	1	-.162	1	-.961	1
163		6	max	395.258	1	212.117	3	35.992	4	0	3	.008	5	.839	3
164			min	-329.607	3	-215.281	1	-6.81	2	-.009	1	-.181	1	-.794	1
165		7	max	395.258	1	387.487	3	46.863	4	0	3	.051	5	.473	3
166			min	-329.607	3	-373.126	1	-1.504	10	-.009	1	-.151	1	-.434	1
167		8	max	395.258	1	562.857	3	86.915	1	0	3	.096	5	.118	1
168			min	-329.607	3	-530.971	1	2.622	10	-.009	1	-.069	1	-.108	3
169		9	max	395.258	1	738.227	3	128.005	1	0	3	.163	4	.864	1
170			min	-329.607	3	-688.816	1	4.755	12	-.009	1	-.022	10	-.903	3
171		10	max	395.258	1	913.597	3	169.094	1	.009	1	.254	4	1.802	1
172			min	-329.607	3	-846.661	1	-75.887	14	-.003	14	-.011	10	-1.913	3
173		11	max	395.258	1	688.816	1	25.588	5	.009	1	.062	1	.864	1
174			min	-329.607	3	-738.227	3	-128.005	1	0	3	-.134	5	-.903	3
175		12	max	395.258	1	530.971	1	27.899	5	.009	1	.002	3	.118	1
176			min	-329.607	3	-562.857	3	-86.915	1	0	3	-.113	4	-.108	3
177		13	max	395.258	1	373.126	1	30.209	5	.009	1	-.002	12	.473	3
178			min	-329.607	3	-387.487	3	-45.826	1	0	3	-.151	1	-.434	1
179		14	max	395.258	1	215.281	1	32.52	5	.009	1	-.003	12	.839	3
180			min	-329.607	3	-212.117	3	-6.732	9	0	3	-.181	1	-.794	1
181		15	max	395.258	1	57.436	1	41.336	4	.009	1	.013	5	.991	3
182			min	-329.607	3	-36.747	3	1.219	12	0	3	-.162	1	-.961	1
183		16	max	395.258	1	138.623	3	77.442	1	.009	1	.057	5	.929	3
184			min	-329.607	3	-100.409	1	2.712	12	0	3	-.093	1	-.934	1
185		17	max	395.258	1	313.993	3	118.531	1	.009	1	.107	4	.652	3
186			min	-329.607	3	-258.254	1	4.206	12	0	3	.004	12	-.715	1
187		18	max	395.258	1	489.362	3	159.62	1	.009	1	.197	1	.161	3
188			min	-329.607	3	-416.099	1	5.699	12	0	3	.01	12	-.303	1
189		19	max	395.258	1	664.732	3	200.709	1	.009	1	.417	1	.302	1
190			min	-329.607	3	-573.945	1	7.192	12	0	3	.018	12	-.544	3
191	M12	1	max	50.2	5	671.198	2	23.694	5	.002	3	.446	1	.285	2
192			min	-17.425	9	-261.342	3	-204.7	1	-.01	1	-.17	5	.026	15
193		2	max	40.894	2	485.286	2	26.005	5	.002	3	.221	1	.318	3
194			min	-17.425	9	-181.872	3	-163.611	1	-.01	1	-.14	5	-.444	1
195		3	max	40.894	2	299.374	2	28.315	5	.002	3	.052	2	.491	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	-17.425	9	-102.403	3	-122.521	1	-.01	1	-.107	5	-.913	1
197		4	max	40.894	2	113.462	2	30.626	5	.002	3	.006	10	.568	3
198			min	-17.425	9	-22.934	3	-81.432	1	-.01	1	-.09	4	-1.157	1
199		5	max	40.894	2	56.536	3	32.937	5	.002	3	-.007	12	.547	3
200			min	-17.425	9	-75.334	1	-40.343	1	-.01	1	-.153	1	-1.179	2
201		6	max	40.894	2	136.005	3	36.991	4	.002	3	.01	5	.43	3
202			min	-19.767	14	-258.866	1	-10.392	2	-.01	1	-.177	1	-.977	2
203		7	max	40.894	2	215.475	3	47.862	4	.002	3	.054	5	.215	3
204			min	-30.719	4	-444.273	2	-3.341	10	-.01	1	-.151	1	-.547	2
205		8	max	40.894	2	294.944	3	82.925	1	.002	3	.102	5	.109	2
206			min	-43.266	4	-630.185	2	.785	10	-.01	1	-.075	1	-.097	3
207		9	max	40.894	2	374.414	3	124.014	1	.002	3	.169	4	.993	2
208			min	-55.812	4	-816.097	2	4.911	10	-.01	1	-.027	10	-.506	3
209		10	max	40.894	2	453.883	3	165.103	1	.002	3	.261	4	2.104	2
210			min	-68.358	4	-1002.009	2	8.223	12	-.01	1	-.018	10	-1.012	3
211		11	max	46.574	5	816.097	2	27.446	5	.01	1	.052	9	.993	2
212			min	-17.425	9	-374.414	3	-124.014	1	-.002	3	-.143	5	-.506	3
213		12	max	40.894	2	630.185	2	29.757	5	.01	1	.006	3	.109	2
214			min	-17.425	9	-294.944	3	-82.925	1	-.002	3	-.12	4	-.097	3
215		13	max	40.894	2	444.273	2	32.067	5	.01	1	-.002	12	.215	3
216			min	-17.425	9	-215.475	3	-41.835	1	-.002	3	-.151	1	-.547	2
217		14	max	40.894	2	258.866	1	34.378	5	.01	1	-.006	12	.43	3
218			min	-17.425	9	-136.005	3	-4.947	9	-.002	3	-.177	1	-.977	2
219		15	max	40.894	2	75.334	1	43.794	4	.01	1	.014	5	.547	3
220			min	-17.425	9	-56.536	3	-1.32	3	-.002	3	-.153	1	-1.179	2
221		16	max	40.894	2	22.934	3	81.432	1	.01	1	.06	5	.568	3
222			min	-21.737	4	-113.462	2	.737	12	-.002	3	-.078	1	-1.157	1
223		17	max	40.894	2	102.403	3	122.521	1	.01	1	.115	4	.491	3
224			min	-34.284	4	-299.374	2	2.23	12	-.002	3	-.009	3	-.913	1
225		18	max	40.894	2	181.872	3	163.611	1	.01	1	.221	1	.318	3
226			min	-46.83	4	-485.286	2	3.724	12	-.002	3	-.004	3	-.444	1
227		19	max	40.894	2	261.342	3	204.7	1	.01	1	.446	1	.285	2
228			min	-59.377	4	-671.198	2	5.217	12	-.002	3	.003	12	-.025	5
229	M13	1	max	46.737	5	688.564	2	16.556	5	.009	3	.38	1	.264	1
230			min	-201.38	1	-285.323	3	-195.779	1	-.024	1	-.136	5	-.076	3
231		2	max	34.19	5	502.652	2	18.866	5	.009	3	.166	1	.224	3
232			min	-201.38	1	-205.854	3	-154.69	1	-.024	1	-.115	5	-.465	2
233		3	max	21.644	5	316.74	2	21.177	5	.009	3	.026	2	.427	3
234			min	-201.38	1	-126.384	3	-113.601	1	-.024	1	-.093	4	-.965	2
235		4	max	15.08	3	131.86	1	23.487	5	.009	3	-.001	10	.533	3
236			min	-201.38	1	-46.915	3	-72.512	1	-.024	1	-.111	1	-1.239	2
237		5	max	15.08	3	32.555	3	25.798	5	.009	3	-.007	12	.542	3
238			min	-201.38	1	-55.083	2	-31.422	1	-.024	1	-.175	1	-1.285	2
239		6	max	15.08	3	112.024	3	31.421	4	.009	3	0	15	.454	3
240			min	-201.38	1	-240.995	2	-5.451	10	-.024	1	-.188	1	-1.104	2
241		7	max	15.08	3	191.493	3	50.756	1	.009	3	.036	5	.268	3
242			min	-201.38	1	-426.907	2	-1.325	10	-.024	1	-.151	1	-.703	1
243		8	max	15.08	3	270.963	3	91.845	1	.009	3	.075	5	-.004	15
244			min	-201.38	1	-612.819	2	2.801	10	-.024	1	-.064	1	-.079	1
245		9	max	15.08	3	350.432	3	132.934	1	.009	3	.137	4	.802	2
246			min	-201.38	1	-798.731	2	6.554	12	-.024	1	-.022	10	-.394	3
247		10	max	15.08	3	429.902	3	174.024	1	.009	3	.261	1	1.892	2
248			min	-201.38	1	-984.643	2	8.047	12	-.024	1	-.011	10	-.871	3
249		11	max	33.88	5	798.731	2	19.419	5	.024	1	.073	1	.802	2
250			min	-201.38	1	-350.432	3	-132.934	1	-.009	3	-.105	5	-.394	3
251		12	max	21.334	5	612.819	2	21.729	5	.024	1	.006	3	0	15
252			min	-201.38	1	-270.963	3	-91.845	1	-.009	3	-.089	4	-.079	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	15.08	3	426.907	2	24.04	5	.024	1	-.002	12	.268	3
254			min	-201.38	1	-191.493	3	-50.756	1	-.009	3	-.151	1	-.703	1
255		14	max	15.08	3	240.995	2	26.35	5	.024	1	-.005	12	.454	3
256			min	-201.38	1	-112.024	3	-10.098	9	-.009	3	-.188	1	-1.104	2
257		15	max	15.08	3	55.083	2	34.035	4	.024	1	.013	5	.542	3
258			min	-201.38	1	-32.555	3	-1.01	3	-.009	3	-.175	1	-1.285	2
259		16	max	15.08	3	46.915	3	72.512	1	.024	1	.049	5	.533	3
260			min	-201.38	1	-131.86	1	.913	12	-.009	3	-.111	1	-1.239	2
261		17	max	15.08	3	126.384	3	113.601	1	.024	1	.088	5	.427	3
262			min	-201.38	1	-316.74	2	2.407	12	-.009	3	-.009	9	-.965	2
263		18	max	15.08	3	205.854	3	154.69	1	.024	1	.166	1	.224	3
264			min	-201.38	1	-502.652	2	3.9	12	-.009	3	-.002	3	-.465	2
265		19	max	15.08	3	285.323	3	195.779	1	.024	1	.38	1	.264	1
266			min	-201.38	1	-688.564	2	5.393	12	-.009	3	.005	12	-.076	3
267	M2	1	max	2697.809	1	671.824	3	364.028	1	.007	5	1.307	5	6.438	1
268			min	-1690.839	3	-464.754	2	-349.543	5	-.008	1	-.384	1	.379	12
269		2	max	2695.548	1	671.824	3	364.028	1	.007	5	1.221	5	6.463	1
270			min	-1692.534	3	-464.754	2	-347.583	5	-.008	1	-.294	1	.275	12
271		3	max	2693.288	1	671.824	3	364.028	1	.007	5	1.135	5	6.488	1
272			min	-1694.23	3	-464.754	2	-345.624	5	-.008	1	-.203	1	.17	12
273		4	max	2691.027	1	671.824	3	364.028	1	.007	5	1.049	5	6.512	1
274			min	-1695.925	3	-464.754	2	-343.665	5	-.008	1	-.113	1	.066	12
275		5	max	2038.649	1	1861.264	1	292.278	1	.003	1	.967	5	6.469	1
276			min	-1467.389	3	-16.848	3	-332.066	5	-.001	3	-.102	1	-.059	3
277		6	max	2036.388	1	1861.264	1	292.278	1	.003	1	.889	4	6.007	1
278			min	-1469.085	3	-16.848	3	-330.107	5	-.001	3	-.034	3	-.054	3
279		7	max	2034.128	1	1861.264	1	292.278	1	.003	1	.817	4	5.545	1
280			min	-1470.78	3	-16.848	3	-328.147	5	-.001	3	-.104	3	-.05	3
281		8	max	2031.867	1	1861.264	1	292.278	1	.003	1	.745	4	5.083	1
282			min	-1472.475	3	-16.848	3	-326.188	5	-.001	3	-.175	3	-.046	3
283		9	max	2029.606	1	1861.264	1	292.278	1	.003	1	.674	4	4.621	1
284			min	-1474.171	3	-16.848	3	-324.229	5	-.001	3	-.246	3	-.042	3
285		10	max	2027.346	1	1861.264	1	292.278	1	.003	1	.604	4	4.159	1
286			min	-1475.866	3	-16.848	3	-322.27	5	-.001	3	-.317	3	-.038	3
287		11	max	2025.085	1	1861.264	1	292.278	1	.003	1	.534	4	3.697	1
288			min	-1477.562	3	-16.848	3	-320.311	5	-.001	3	-.387	3	-.033	3
289		12	max	2022.825	1	1861.264	1	292.278	1	.003	1	.464	4	3.235	1
290			min	-1479.257	3	-16.848	3	-318.351	5	-.001	3	-.458	3	-.029	3
291		13	max	2020.564	1	1861.264	1	292.278	1	.003	1	.479	1	2.772	1
292			min	-1480.953	3	-16.848	3	-316.392	5	-.001	3	-.529	3	-.025	3
293		14	max	2018.303	1	1861.264	1	292.278	1	.003	1	.551	1	2.31	1
294			min	-1482.648	3	-16.848	3	-314.433	5	-.001	3	-.599	3	-.021	3
295		15	max	2016.043	1	1861.264	1	292.278	1	.003	1	.624	1	1.848	1
296			min	-1484.344	3	-16.848	3	-312.474	5	-.001	3	-.67	3	-.017	3
297		16	max	2013.782	1	1861.264	1	292.278	1	.003	1	.696	1	1.386	1
298			min	-1486.039	3	-16.848	3	-310.515	5	-.001	3	-.741	3	-.013	3
299		17	max	2011.522	1	1861.264	1	292.278	1	.003	1	.769	1	.924	1
300			min	-1487.735	3	-16.848	3	-308.555	5	-.001	3	-.812	3	-.008	3
301		18	max	2009.261	1	1861.264	1	292.278	1	.003	1	.841	1	.462	1
302			min	-1489.43	3	-16.848	3	-306.596	5	-.001	3	-.882	3	-.004	3
303		19	max	2007	1	1861.264	1	292.278	1	.003	1	.914	1	0	1
304			min	-1491.125	3	-16.848	3	-304.637	5	-.001	3	-.953	3	0	1
305	M5	1	max	7403.646	1	1944.775	3	0	1	.008	4	1.376	4	14.396	1
306			min	-5004.856	3	-1894.462	2	-383.621	5	0	1	0	1	.405	15
307		2	max	7401.385	1	1944.775	3	0	1	.008	4	1.281	4	14.692	1
308			min	-5006.551	3	-1894.462	2	-381.662	5	0	1	0	1	.195	12
309		3	max	7399.125	1	1944.775	3	0	1	.008	4	1.187	4	14.987	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	-5008.247	3	-1894.462	2	-379.703	5	0	1	0	1	-.209	3
311		4	max	7396.864	1	1944.775	3	0	1	.008	4	1.094	4	15.283	1
312			min	-5009.942	3	-1894.462	2	-377.744	5	0	1	0	1	-.692	3
313		5	max	5608.932	1	4425.996	1	0	1	0	1	1.008	4	15.383	1
314			min	-4245.571	3	-315.26	3	-369.048	4	0	4	0	1	-1.096	3
315		6	max	5606.671	1	4425.996	1	0	1	0	1	.917	4	14.284	1
316			min	-4247.267	3	-315.26	3	-367.089	4	0	4	0	1	-1.017	3
317		7	max	5604.411	1	4425.996	1	0	1	0	1	.826	4	13.185	1
318			min	-4248.962	3	-315.26	3	-365.13	4	0	4	0	1	-.939	3
319		8	max	5602.15	1	4425.996	1	0	1	0	1	.735	4	12.087	1
320			min	-4250.658	3	-315.26	3	-363.17	4	0	4	0	1	-.861	3
321		9	max	5599.89	1	4425.996	1	0	1	0	1	.645	4	10.988	1
322			min	-4252.353	3	-315.26	3	-361.211	4	0	4	0	1	-.783	3
323		10	max	5597.629	1	4425.996	1	0	1	0	1	.556	4	9.889	1
324			min	-4254.049	3	-315.26	3	-359.252	4	0	4	0	1	-.704	3
325		11	max	5595.368	1	4425.996	1	0	1	0	1	.467	4	8.79	1
326			min	-4255.744	3	-315.26	3	-357.293	4	0	4	0	1	-.626	3
327		12	max	5593.108	1	4425.996	1	0	1	0	1	.379	4	7.692	1
328			min	-4257.44	3	-315.26	3	-355.334	4	0	4	0	1	-.548	3
329		13	max	5590.847	1	4425.996	1	0	1	0	1	.291	4	6.593	1
330			min	-4259.135	3	-315.26	3	-353.374	4	0	4	0	1	-.47	3
331		14	max	5588.587	1	4425.996	1	0	1	0	1	.203	4	5.494	1
332			min	-4260.83	3	-315.26	3	-351.415	4	0	4	0	1	-.391	3
333		15	max	5586.326	1	4425.996	1	0	1	0	1	.116	4	4.395	1
334			min	-4262.526	3	-315.26	3	-349.456	4	0	4	0	1	-.313	3
335		16	max	5584.065	1	4425.996	1	0	1	0	1	.03	4	3.296	1
336			min	-4264.221	3	-315.26	3	-347.497	4	0	4	0	1	-.235	3
337		17	max	5581.805	1	4425.996	1	0	1	0	1	0	1	2.198	1
338			min	-4265.917	3	-315.26	3	-345.538	4	0	4	-.056	4	-.157	3
339		18	max	5579.544	1	4425.996	1	0	1	0	1	0	1	1.099	1
340			min	-4267.612	3	-315.26	3	-343.579	4	0	4	-.142	4	-.078	3
341		19	max	5577.284	1	4425.996	1	0	1	0	1	0	1	0	1
342			min	-4269.308	3	-315.26	3	-341.619	4	0	4	-.227	4	0	1
343	M8	1	max	2697.809	1	671.824	3	314.052	3	.009	4	1.411	4	6.438	1
344			min	-1690.839	3	-464.754	2	-431.875	4	-.004	3	-.313	3	-.122	5
345		2	max	2695.548	1	671.824	3	314.052	3	.009	4	1.304	4	6.463	1
346			min	-1692.534	3	-464.754	2	-429.915	4	-.004	3	-.235	3	-.098	5
347		3	max	2693.288	1	671.824	3	314.052	3	.009	4	1.197	4	6.488	1
348			min	-1694.23	3	-464.754	2	-427.956	4	-.004	3	-.157	3	-.075	5
349		4	max	2691.027	1	671.824	3	314.052	3	.009	4	1.091	4	6.512	1
350			min	-1695.925	3	-464.754	2	-425.997	4	-.004	3	-.079	3	-.051	5
351		5	max	2038.649	1	1861.264	1	284.891	3	.001	3	1.004	4	6.469	1
352			min	-1467.389	3	-16.848	3	-402.376	4	-.003	1	-.037	3	-.059	3
353		6	max	2036.388	1	1861.264	1	284.891	3	.001	3	.905	4	6.007	1
354			min	-1469.085	3	-16.848	3	-400.417	4	-.003	1	0	10	-.054	3
355		7	max	2034.128	1	1861.264	1	284.891	3	.001	3	.806	4	5.545	1
356			min	-1470.78	3	-16.848	3	-398.457	4	-.003	1	-.054	2	-.05	3
357		8	max	2031.867	1	1861.264	1	284.891	3	.001	3	.713	5	5.083	1
358			min	-1472.475	3	-16.848	3	-396.498	4	-.003	1	-.116	2	-.046	3
359		9	max	2029.606	1	1861.264	1	284.891	3	.001	3	.627	5	4.621	1
360			min	-1474.171	3	-16.848	3	-394.539	4	-.003	1	-.188	1	-.042	3
361		10	max	2027.346	1	1861.264	1	284.891	3	.001	3	.541	5	4.159	1
362			min	-1475.866	3	-16.848	3	-392.58	4	-.003	1	-.261	1	-.038	3
363		11	max	2025.085	1	1861.264	1	284.891	3	.001	3	.455	5	3.697	1
364			min	-1477.562	3	-16.848	3	-390.621	4	-.003	1	-.333	1	-.033	3
365		12	max	2022.825	1	1861.264	1	284.891	3	.001	3	.458	3	3.235	1
366			min	-1479.257	3	-16.848	3	-388.662	4	-.003	1	-.406	1	-.029	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	2020.564	1	1861.264	1	284.891	3	.001	3	.529	3	2.772	1
368			min	-1480.953	3	-16.848	3	-386.702	4	-.003	1	-.479	1	-.025	3
369		14	max	2018.303	1	1861.264	1	284.891	3	.001	3	.599	3	2.31	1
370			min	-1482.648	3	-16.848	3	-384.743	4	-.003	1	-.551	1	-.021	3
371		15	max	2016.043	1	1861.264	1	284.891	3	.001	3	.67	3	1.848	1
372			min	-1484.344	3	-16.848	3	-382.784	4	-.003	1	-.624	1	-.017	3
373		16	max	2013.782	1	1861.264	1	284.891	3	.001	3	.741	3	1.386	1
374			min	-1486.039	3	-16.848	3	-380.825	4	-.003	1	-.696	1	-.013	3
375		17	max	2011.522	1	1861.264	1	284.891	3	.001	3	.812	3	.924	1
376			min	-1487.735	3	-16.848	3	-378.866	4	-.003	1	-.769	1	-.008	3
377		18	max	2009.261	1	1861.264	1	284.891	3	.001	3	.882	3	.462	1
378			min	-1489.43	3	-16.848	3	-376.906	4	-.003	1	-.841	1	-.004	3
379		19	max	2007	1	1861.264	1	284.891	3	.001	3	.953	3	0	1
380			min	-1491.125	3	-16.848	3	-374.947	4	-.003	1	-.914	1	0	1
381	M3	1	max	2100.178	2	4.757	6	70.279	1	.035	3	.014	2	0	1
382			min	-726.19	3	1.118	15	-29.991	3	-.076	1	-.007	3	0	1
383		2	max	2100.039	2	4.229	6	70.279	1	.035	3	.035	1	0	15
384			min	-726.294	3	.994	15	-29.991	3	-.076	1	-.015	3	-.001	6
385		3	max	2099.899	2	3.7	6	70.279	1	.035	3	.056	1	0	15
386			min	-726.399	3	.87	15	-29.991	3	-.076	1	-.024	3	-.002	6
387		4	max	2099.76	2	3.171	6	70.279	1	.035	3	.076	1	0	15
388			min	-726.503	3	.745	15	-29.991	3	-.076	1	-.033	3	-.003	6
389		5	max	2099.621	2	2.643	6	70.279	1	.035	3	.097	1	-.001	15
390			min	-726.608	3	.621	15	-29.991	3	-.076	1	-.042	3	-.004	6
391		6	max	2099.481	2	2.114	6	70.279	1	.035	3	.117	1	-.001	15
392			min	-726.712	3	.497	15	-29.991	3	-.076	1	-.051	3	-.005	6
393		7	max	2099.342	2	1.586	6	70.279	1	.035	3	.138	1	-.001	15
394			min	-726.817	3	.373	15	-29.991	3	-.076	1	-.059	3	-.006	6
395		8	max	2099.202	2	1.057	6	70.279	1	.035	3	.159	1	-.001	15
396			min	-726.921	3	.248	15	-29.991	3	-.076	1	-.068	3	-.006	6
397		9	max	2099.063	2	.529	6	70.279	1	.035	3	.179	1	-.001	15
398			min	-727.026	3	.124	15	-29.991	3	-.076	1	-.077	3	-.006	6
399		10	max	2098.924	2	0	1	70.279	1	.035	3	.2	1	-.001	15
400			min	-727.131	3	0	1	-29.991	3	-.076	1	-.086	3	-.006	6
401		11	max	2098.784	2	-.124	15	70.279	1	.035	3	.22	1	-.001	15
402			min	-727.235	3	-.529	4	-29.991	3	-.076	1	-.095	3	-.006	6
403		12	max	2098.645	2	-.248	15	70.279	1	.035	3	.241	1	-.001	15
404			min	-727.34	3	-1.057	4	-29.991	3	-.076	1	-.103	3	-.006	6
405		13	max	2098.505	2	-.373	15	70.279	1	.035	3	.262	1	-.001	15
406			min	-727.444	3	-1.586	4	-29.991	3	-.076	1	-.112	3	-.006	6
407		14	max	2098.366	2	-.497	15	70.279	1	.035	3	.282	1	-.001	15
408			min	-727.549	3	-2.114	4	-29.991	3	-.076	1	-.121	3	-.005	6
409		15	max	2098.226	2	-.621	15	70.279	1	.035	3	.303	1	-.001	15
410			min	-727.653	3	-2.643	4	-29.991	3	-.076	1	-.13	3	-.004	6
411		16	max	2098.087	2	-.745	15	70.279	1	.035	3	.323	1	0	15
412			min	-727.758	3	-3.171	4	-29.991	3	-.076	1	-.139	3	-.003	6
413		17	max	2097.948	2	-.87	15	70.279	1	.035	3	.344	1	0	15
414			min	-727.862	3	-3.7	4	-29.991	3	-.076	1	-.147	3	-.002	6
415		18	max	2097.808	2	-.994	15	70.279	1	.035	3	.365	1	0	15
416			min	-727.967	3	-4.229	4	-29.991	3	-.076	1	-.156	3	-.001	6
417		19	max	2097.669	2	-1.118	15	70.279	1	.035	3	.385	1	0	1
418			min	-728.072	3	-4.757	4	-29.991	3	-.076	1	-.165	3	0	1
419	M6	1	max	5993.896	2	4.757	6	0	1	.01	4	.006	4	0	1
420			min	-2389.577	3	1.118	15	-13.402	4	0	1	0	1	0	1
421		2	max	5993.756	2	4.229	6	0	1	.01	4	.002	4	0	15
422			min	-2389.682	3	.994	15	-13.025	4	0	1	0	1	-.001	6
423		3	max	5993.617	2	3.7	6	0	1	.01	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	-2389.786	3	.87	15	-12.648	4	0	1	-.002	4	-.002	6
425		4	max	5993.478	2	3.171	6	0	1	.01	4	0	1	0	15
426			min	-2389.891	3	.745	15	-12.271	4	0	1	-.005	4	-.003	6
427		5	max	5993.338	2	2.643	6	0	1	.01	4	0	1	-.001	15
428			min	-2389.996	3	.621	15	-11.894	4	0	1	-.009	4	-.004	6
429		6	max	5993.199	2	2.114	6	0	1	.01	4	0	1	-.001	15
430			min	-2390.1	3	.497	15	-11.517	4	0	1	-.012	4	-.005	6
431		7	max	5993.059	2	1.586	6	0	1	.01	4	0	1	-.001	15
432			min	-2390.205	3	.373	15	-11.14	4	0	1	-.016	4	-.006	6
433		8	max	5992.92	2	1.057	6	0	1	.01	4	0	1	-.001	15
434			min	-2390.309	3	.248	15	-10.764	4	0	1	-.019	4	-.006	6
435		9	max	5992.781	2	.529	6	0	1	.01	4	0	1	-.001	15
436			min	-2390.414	3	.124	15	-10.387	4	0	1	-.022	4	-.006	6
437		10	max	5992.641	2	0	1	0	1	.01	4	0	1	-.001	15
438			min	-2390.518	3	0	1	-10.01	4	0	1	-.025	4	-.006	6
439		11	max	5992.502	2	-.124	15	0	1	.01	4	0	1	-.001	15
440			min	-2390.623	3	-.529	4	-9.633	4	0	1	-.028	4	-.006	6
441		12	max	5992.362	2	-.248	15	0	1	.01	4	0	1	-.001	15
442			min	-2390.727	3	-1.057	4	-9.256	4	0	1	-.031	4	-.006	6
443		13	max	5992.223	2	-.373	15	0	1	.01	4	0	1	-.001	15
444			min	-2390.832	3	-1.586	4	-8.879	4	0	1	-.033	4	-.006	6
445		14	max	5992.084	2	-.497	15	0	1	.01	4	0	1	-.001	15
446			min	-2390.937	3	-2.114	4	-8.503	4	0	1	-.036	4	-.005	6
447		15	max	5991.944	2	-.621	15	0	1	.01	4	0	1	-.001	15
448			min	-2391.041	3	-2.643	4	-8.126	4	0	1	-.038	4	-.004	6
449		16	max	5991.805	2	-.745	15	0	1	.01	4	0	1	0	15
450			min	-2391.146	3	-3.171	4	-7.749	4	0	1	-.041	4	-.003	6
451		17	max	5991.665	2	-.87	15	0	1	.01	4	0	1	0	15
452			min	-2391.25	3	-3.7	4	-7.372	4	0	1	-.043	4	-.002	6
453		18	max	5991.526	2	-.994	15	0	1	.01	4	0	1	0	15
454			min	-2391.355	3	-4.229	4	-6.995	4	0	1	-.045	4	-.001	6
455		19	max	5991.386	2	-1.118	15	0	1	.01	4	0	1	0	1
456			min	-2391.459	3	-4.757	4	-6.618	4	0	1	-.047	4	0	1
457	M9	1	max	2100.178	2	4.757	4	29.991	3	.076	1	.007	3	0	1
458			min	-726.19	3	1.118	15	-70.279	1	-.035	3	-.014	2	0	1
459		2	max	2100.039	2	4.229	4	29.991	3	.076	1	.015	3	0	15
460			min	-726.294	3	.994	15	-70.279	1	-.035	3	-.035	1	-.001	4
461		3	max	2099.899	2	3.7	4	29.991	3	.076	1	.024	3	0	15
462			min	-726.399	3	.87	15	-70.279	1	-.035	3	-.056	1	-.002	4
463		4	max	2099.76	2	3.171	4	29.991	3	.076	1	.033	3	0	15
464			min	-726.503	3	.745	15	-70.279	1	-.035	3	-.076	1	-.003	4
465		5	max	2099.621	2	2.643	4	29.991	3	.076	1	.042	3	-.001	15
466			min	-726.608	3	.621	15	-70.279	1	-.035	3	-.097	1	-.004	4
467		6	max	2099.481	2	2.114	4	29.991	3	.076	1	.051	3	-.001	15
468			min	-726.712	3	.497	15	-70.279	1	-.035	3	-.117	1	-.005	4
469		7	max	2099.342	2	1.586	4	29.991	3	.076	1	.059	3	-.001	15
470			min	-726.817	3	.373	15	-70.279	1	-.035	3	-.138	1	-.006	4
471		8	max	2099.202	2	1.057	4	29.991	3	.076	1	.068	3	-.001	15
472			min	-726.921	3	.248	15	-70.279	1	-.035	3	-.159	1	-.006	4
473		9	max	2099.063	2	.529	4	29.991	3	.076	1	.077	3	-.001	15
474			min	-727.026	3	.124	15	-70.279	1	-.035	3	-.179	1	-.006	4
475		10	max	2098.924	2	0	1	29.991	3	.076	1	.086	3	-.001	15
476			min	-727.131	3	0	1	-70.279	1	-.035	3	-.2	1	-.006	4
477		11	max	2098.784	2	-.124	15	29.991	3	.076	1	.095	3	-.001	15
478			min	-727.235	3	-.529	6	-70.279	1	-.035	3	-.22	1	-.006	4
479		12	max	2098.645	2	-.248	15	29.991	3	.076	1	.103	3	-.001	15
480			min	-727.34	3	-1.057	6	-70.279	1	-.035	3	-.241	1	-.006	4

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	2098.505	2	-.373	15	29.991	3	.076	1	.112	3	-.001	15
482			min	-727.444	3	-1.586	6	-70.279	1	-.035	3	-.262	1	-.006	4
483		14	max	2098.366	2	-.497	15	29.991	3	.076	1	.121	3	-.001	15
484			min	-727.549	3	-2.114	6	-70.279	1	-.035	3	-.282	1	-.005	4
485		15	max	2098.226	2	-.621	15	29.991	3	.076	1	.13	3	-.001	15
486			min	-727.653	3	-2.643	6	-70.279	1	-.035	3	-.303	1	-.004	4
487		16	max	2098.087	2	-.745	15	29.991	3	.076	1	.139	3	0	15
488			min	-727.758	3	-3.171	6	-70.279	1	-.035	3	-.323	1	-.003	4
489		17	max	2097.948	2	-.87	15	29.991	3	.076	1	.147	3	0	15
490			min	-727.862	3	-3.7	6	-70.279	1	-.035	3	-.344	1	-.002	4
491		18	max	2097.808	2	-.994	15	29.991	3	.076	1	.156	3	0	15
492			min	-727.967	3	-4.229	6	-70.279	1	-.035	3	-.365	1	-.001	4
493		19	max	2097.669	2	-1.118	15	29.991	3	.076	1	.165	3	0	1
494			min	-728.072	3	-4.757	6	-70.279	1	-.035	3	-.385	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	-.002	12	.145	3	.029	1	1.325e-2	3	NC	3	NC	3
2			min	-.275	1	-.815	1	-.588	5	-3.352e-2	1	156.025	1	250.242	5
3		2	max	-.002	12	.111	3	.009	1	1.325e-2	3	6381.267	12	NC	3
4			min	-.275	1	-.701	1	-.559	4	-3.352e-2	1	180	1	265.28	5
5		3	max	-.002	12	.077	3	0	12	1.266e-2	3	3188.07	12	NC	2
6			min	-.274	1	-.586	1	-.531	4	-3.144e-2	1	212.717	1	283.015	5
7		4	max	-.002	12	.045	3	0	12	1.175e-2	3	2964.366	15	NC	1
8			min	-.274	1	-.476	1	-.495	4	-2.826e-2	1	257.992	1	306.69	5
9		5	max	-.002	12	.016	3	0	3	1.083e-2	3	3286.45	15	NC	1
10			min	-.274	1	-.375	1	-.455	4	-2.508e-2	1	319.892	1	337.814	5
11		6	max	-.002	12	-.004	12	.002	3	1.085e-2	3	3651.759	15	NC	1
12			min	-.274	1	-.291	1	-.412	4	-2.403e-2	1	400.328	1	378.079	5
13		7	max	-.002	12	-.013	12	.002	3	1.15e-2	3	4065.697	15	NC	2
14			min	-.273	1	-.222	1	-.368	4	-2.447e-2	1	503.194	1	429.07	5
15		8	max	-.002	12	-.012	15	0	3	1.216e-2	3	4549.478	15	NC	2
16			min	-.273	1	-.164	1	-.327	4	-2.49e-2	1	643.898	1	492.73	5
17		9	max	-.002	12	-.009	15	0	9	1.302e-2	3	5138.603	15	NC	2
18			min	-.272	1	-.111	1	-.289	4	-2.425e-2	1	739.425	3	571.487	5
19		10	max	-.003	12	-.005	15	0	1	1.424e-2	3	5885.054	15	NC	2
20			min	-.271	1	-.06	1	-.251	4	-2.169e-2	1	725.341	3	682.567	5
21		11	max	-.003	12	-.002	15	.002	3	1.546e-2	3	NC	10	NC	2
22			min	-.27	1	-.04	3	-.213	4	-1.912e-2	1	725.348	3	844.03	5
23		12	max	-.003	12	.034	1	.008	3	1.25e-2	3	NC	1	NC	2
24			min	-.269	1	-.036	3	-.179	4	-1.424e-2	1	741.44	3	1087.33	5
25		13	max	-.003	12	.071	1	.014	3	7.169e-3	3	NC	9	NC	1
26			min	-.269	1	-.024	3	-.144	4	-8.038e-3	1	795.602	3	1514.472	5
27		14	max	-.003	12	.096	1	.015	3	2.079e-3	3	NC	4	NC	2
28			min	-.268	1	.002	12	-.114	4	-4.678e-3	4	948.618	3	2273.396	5
29		15	max	-.003	12	.102	1	.011	3	7.538e-3	3	NC	4	NC	2
30			min	-.268	1	.009	15	-.091	4	-6.216e-3	1	1430.485	3	3547.416	5
31		16	max	-.003	12	.114	3	.008	1	1.3e-2	3	NC	4	NC	2
32			min	-.268	1	.011	15	-.076	5	-1.037e-2	1	2590.613	1	4300.665	1
33		17	max	-.003	12	.187	3	.006	1	1.846e-2	3	NC	4	NC	2
34			min	-.268	1	.013	15	-.066	5	-1.452e-2	1	3222.345	3	4631.324	1
35		18	max	-.003	12	.263	3	0	12	2.202e-2	3	NC	4	NC	2
36			min	-.268	1	.015	15	-.062	4	-1.722e-2	1	1138.325	3	8411.299	1
37		19	max	-.003	12	.339	3	-.003	10	2.202e-2	3	NC	1	NC	1
38			min	-.268	1	.008	10	-.058	4	-1.722e-2	1	691.734	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	.033	3	.468	3	0	1	1.957e-4	4	NC	3	NC	1
40			min	-.645	1	-1.99	1	-.584	4	0	1	67.412	1	252.793	4
41		2	max	.033	3	.37	3	0	1	1.957e-4	4	3027.525	15	NC	1
42			min	-.645	1	-1.706	1	-.559	4	0	1	78.654	1	265.194	4
43		3	max	.033	3	.271	3	0	1	3.617e-5	5	3613.049	15	NC	1
44			min	-.645	1	-1.421	1	-.532	4	0	1	94.44	1	280.12	4
45		4	max	.033	3	.177	3	0	1	0	1	4446.185	15	NC	1
46			min	-.645	1	-1.146	1	-.497	4	-2.111e-4	4	117.158	1	302.204	4
47		5	max	.033	3	.095	3	0	1	0	1	5629.003	15	NC	1
48			min	-.645	1	-.897	1	-.456	4	-4.573e-4	4	149.672	1	333.004	4
49		6	max	.032	3	.033	3	0	1	0	1	7243.183	15	NC	1
50			min	-.643	1	-.693	1	-.412	4	-4.403e-4	4	193.862	1	374.168	4
51		7	max	.032	3	-.007	12	0	1	0	1	9447.991	15	NC	1
52			min	-.641	1	-.531	1	-.368	4	-2.411e-4	4	253.049	1	426.756	4
53		8	max	.031	3	-.011	15	0	1	0	1	NC	15	NC	1
54			min	-.64	1	-.396	1	-.326	4	-4.189e-5	4	264.013	3	491.422	4
55		9	max	.03	3	-.007	15	0	1	2.352e-5	5	NC	5	NC	1
56			min	-.638	1	-.271	1	-.29	4	0	1	253.209	3	568.119	4
57		10	max	.03	3	-.004	15	0	1	0	1	NC	5	NC	1
58			min	-.636	1	-.149	1	-.251	4	-1.493e-4	4	245.513	3	679.334	4
59		11	max	.029	3	0	15	0	1	0	1	NC	4	NC	1
60			min	-.634	1	-.087	3	-.213	4	-3.217e-4	4	241.512	3	840.633	4
61		12	max	.028	3	.078	1	0	1	0	1	NC	5	NC	1
62			min	-.632	1	-.087	3	-.179	4	-1.343e-3	4	241.61	3	1071.06	4
63		13	max	.028	3	.169	1	0	1	0	1	NC	5	NC	1
64			min	-.629	1	-.065	3	-.144	4	-2.845e-3	4	251.411	3	1479.103	4
65		14	max	.027	3	.224	1	0	1	0	1	NC	5	NC	1
66			min	-.627	1	-.004	3	-.115	4	-4.29e-3	4	284.178	3	2200.728	4
67		15	max	.027	3	.227	1	0	1	0	1	NC	5	NC	1
68			min	-.627	1	.006	15	-.093	4	-3.22e-3	4	377.852	3	3397.49	4
69		16	max	.027	3	.271	3	0	1	0	1	NC	5	NC	1
70			min	-.628	1	.005	15	-.078	4	-2.151e-3	4	681.628	3	5523.51	4
71		17	max	.027	3	.455	3	0	1	0	1	NC	3	NC	1
72			min	-.628	1	.004	15	-.067	4	-1.081e-3	4	996.175	1	9664.212	4
73		18	max	.027	3	.648	3	0	1	0	1	NC	4	NC	1
74			min	-.628	1	.002	15	-.06	4	-3.836e-4	4	745.757	3	NC	1
75		19	max	.027	3	.84	3	0	1	0	1	NC	1	NC	1
76			min	-.628	1	-.008	9	-.054	4	-3.836e-4	4	360.342	3	NC	1
77	M7	1	max	.002	5	.145	3	0	12	3.352e-2	1	NC	3	NC	3
78			min	-.275	1	-.815	1	-.6	4	-1.325e-2	3	156.025	1	242.231	4
79		2	max	.002	5	.111	3	0	3	3.352e-2	1	NC	5	NC	3
80			min	-.275	1	-.701	1	-.564	4	-1.325e-2	3	180	1	259.26	4
81		3	max	.002	5	.077	3	.008	1	3.144e-2	1	NC	5	NC	2
82			min	-.274	1	-.586	1	-.527	4	-1.266e-2	3	212.717	1	279.135	4
83		4	max	.002	5	.045	3	.015	1	2.826e-2	1	NC	5	NC	1
84			min	-.274	1	-.476	1	-.488	5	-1.175e-2	3	257.992	1	303.633	4
85		5	max	.002	5	.016	3	.016	1	2.508e-2	1	NC	5	NC	1
86			min	-.274	1	-.375	1	-.448	5	-1.083e-2	3	319.892	1	334.296	4
87		6	max	.002	5	.002	5	.014	1	2.403e-2	1	NC	5	NC	1
88			min	-.274	1	-.291	1	-.406	4	-1.085e-2	3	400.328	1	372.829	4
89		7	max	.002	5	.002	5	.007	1	2.447e-2	1	NC	5	NC	2
90			min	-.273	1	-.222	1	-.366	4	-1.15e-2	3	503.194	1	419.897	4
91		8	max	.002	5	.003	5	.002	2	2.49e-2	1	NC	5	NC	2
92			min	-.273	1	-.164	1	-.327	4	-1.216e-2	3	643.898	1	478.174	4
93		9	max	.002	5	.003	5	0	3	2.425e-2	1	NC	4	NC	2
94			min	-.272	1	-.111	1	-.289	4	-1.302e-2	3	739.425	3	552.358	4
95		10	max	.002	5	.002	5	0	3	2.169e-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	-.271	1	-.06	1	-.251	4	-1.424e-2	3	725.341	3	655.422	4
97		11	max	.002	5	.002	5	.002	1	1.912e-2	1	NC	4	NC	2
98			min	-.27	1	-.04	3	-.213	4	-1.546e-2	3	725.348	3	805.872	4
99		12	max	.002	5	.034	1	.009	1	1.424e-2	1	NC	1	NC	2
100			min	-.269	1	-.036	3	-.175	4	-1.25e-2	3	741.44	3	1041.125	4
101		13	max	.002	5	.071	1	.012	1	8.038e-3	1	NC	5	NC	1
102			min	-.269	1	-.024	3	-.14	5	-7.169e-3	3	795.602	3	1436.393	4
103		14	max	.002	5	.096	1	.009	2	2.066e-3	1	NC	5	NC	2
104			min	-.268	1	0	5	-.112	4	-4.164e-3	5	948.618	3	2055.169	4
105		15	max	.002	5	.102	1	.002	2	6.216e-3	1	NC	5	NC	2
106			min	-.268	1	-.004	5	-.093	4	-7.538e-3	3	1430.485	3	2882.579	4
107		16	max	.002	5	.114	3	0	10	1.037e-2	1	NC	5	NC	2
108			min	-.268	1	-.007	5	-.08	4	-1.3e-2	3	2590.613	1	4040.357	4
109		17	max	.002	5	.187	3	0	10	1.452e-2	1	NC	5	NC	2
110			min	-.268	1	-.011	5	-.069	4	-1.846e-2	3	3222.345	3	4631.324	1
111		18	max	.002	5	.263	3	.007	1	1.722e-2	1	NC	4	NC	2
112			min	-.268	1	-.016	5	-.058	5	-2.202e-2	3	1138.325	3	8411.299	1
113		19	max	.002	5	.339	3	.023	1	1.722e-2	1	NC	1	NC	1
114			min	-.268	1	-.02	5	-.05	5	-2.202e-2	3	691.734	3	NC	1
115	M10	1	max	.002	1	.236	3	.268	1	1.021e-2	3	NC	1	NC	1
116			min	-.062	4	-.014	5	-.002	5	-2.447e-3	1	NC	1	NC	1
117		2	max	.002	1	.571	3	.337	1	1.194e-2	3	NC	5	NC	3
118			min	-.062	4	-.191	1	.007	12	-3.175e-3	1	789.363	3	3822.778	1
119		3	max	.001	1	.878	3	.449	1	1.368e-2	3	NC	5	NC	3
120			min	-.062	4	-.421	1	.01	12	-3.903e-3	1	411.645	3	1457.827	1
121		4	max	.001	1	1.099	3	.565	1	1.541e-2	3	NC	5	NC	3
122			min	-.062	4	-.571	1	.01	12	-4.631e-3	1	306.046	3	890.032	1
123		5	max	0	1	1.202	3	.656	1	1.715e-2	3	NC	5	NC	3
124			min	-.062	4	-.616	1	.008	12	-5.36e-3	1	273.382	3	680.19	1
125		6	max	0	1	1.18	3	.708	1	1.888e-2	3	NC	5	NC	3
126			min	-.062	4	-.55	1	.004	12	-6.088e-3	1	279.865	3	599.913	1
127		7	max	0	1	1.05	3	.717	1	2.061e-2	3	NC	5	NC	3
128			min	-.062	4	-.394	1	-.005	3	-6.816e-3	1	324.445	3	588.185	1
129		8	max	0	1	.857	3	.691	1	2.235e-2	3	NC	5	NC	3
130			min	-.062	4	-.188	1	-.015	3	-7.545e-3	1	425.505	3	624.376	1
131		9	max	0	1	.669	3	.65	1	2.408e-2	3	NC	4	NC	5
132			min	-.063	4	-.005	14	-.023	3	-8.273e-3	1	610.337	3	690.469	1
133		10	max	0	1	.581	3	.628	1	2.582e-2	3	NC	1	NC	5
134			min	-.063	4	.002	15	-.027	3	-9.001e-3	1	766.456	3	733.919	1
135		11	max	0	3	.669	3	.65	1	2.408e-2	3	NC	4	NC	5
136			min	-.063	4	-.004	9	-.023	3	-8.273e-3	1	610.337	3	690.469	1
137		12	max	0	3	.857	3	.691	1	2.235e-2	3	NC	5	NC	3
138			min	-.063	4	-.188	1	-.015	3	-7.545e-3	1	425.505	3	624.376	1
139		13	max	0	3	1.05	3	.717	1	2.061e-2	3	NC	5	NC	3
140			min	-.063	4	-.394	1	-.005	3	-6.816e-3	1	324.445	3	588.185	1
141		14	max	0	3	1.18	3	.708	1	1.888e-2	3	NC	5	NC	3
142			min	-.063	4	-.55	1	.004	12	-6.088e-3	1	279.865	3	599.913	1
143		15	max	0	3	1.202	3	.656	1	1.715e-2	3	NC	5	NC	3
144			min	-.063	4	-.616	1	.008	12	-5.36e-3	1	273.382	3	680.19	1
145		16	max	0	3	1.099	3	.565	1	1.541e-2	3	NC	5	NC	3
146			min	-.063	4	-.571	1	.01	12	-4.631e-3	1	306.046	3	890.032	1
147		17	max	0	3	.878	3	.449	1	1.368e-2	3	NC	5	NC	3
148			min	-.063	4	-.421	1	.01	12	-3.903e-3	1	411.645	3	1457.827	1
149		18	max	0	3	.571	3	.337	1	1.194e-2	3	NC	5	NC	3
150			min	-.063	4	-.191	1	.007	12	-3.175e-3	1	789.363	3	3822.778	1
151		19	max	0	3	.236	3	.268	1	1.021e-2	3	NC	1	NC	1
152			min	-.063	4	.015	15	.003	12	-2.447e-3	1	7278.448	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	.005	2	.27	1	6.084e-3	1	NC	1	NC	1
154			min	-.199	4	-.039	3	-.002	5	-6.061e-5	5	NC	1	NC	1
155		2	max	.004	1	.211	3	.329	1	7.055e-3	1	NC	5	NC	3
156			min	-.199	4	-.266	1	-.004	3	1.098e-6	15	972.424	1	4324.461	4
157		3	max	.003	1	.444	3	.436	1	8.026e-3	1	NC	5	NC	3
158			min	-.2	4	-.504	1	-.007	3	5.059e-5	15	518.699	1	1592.086	1
159		4	max	.003	1	.602	3	.55	1	8.997e-3	1	NC	5	NC	3
160			min	-.2	4	-.658	1	-.009	3	1.001e-4	15	397.838	1	942.284	1
161		5	max	.002	1	.652	3	.643	1	9.968e-3	1	NC	5	NC	3
162			min	-.2	4	-.704	1	-.011	3	1.496e-4	15	372.164	1	706.905	1
163		6	max	.002	1	.586	3	.699	1	1.094e-2	1	NC	5	NC	3
164			min	-.2	4	-.638	1	-.014	3	1.195e-4	12	410.454	1	615.209	1
165		7	max	.001	1	.423	3	.713	1	1.191e-2	1	NC	5	NC	3
166			min	-.2	4	-.48	1	-.018	3	8.042e-5	12	544.537	1	596.532	1
167		8	max	0	1	.206	3	.691	1	1.288e-2	1	NC	5	NC	3
168			min	-.2	4	-.272	1	-.025	5	4.134e-5	12	953.521	1	626.89	1
169		9	max	0	1	.005	3	.654	1	1.385e-2	1	NC	4	NC	7
170			min	-.2	4	-.08	1	-.027	3	-1.626e-5	3	3111.58	1	687.232	1
171		10	max	0	1	.008	1	.633	1	1.482e-2	1	NC	1	NC	5
172			min	-.201	4	-.088	3	-.029	3	-7.909e-5	3	5352.152	3	727.451	1
173		11	max	0	3	.005	3	.654	1	1.385e-2	1	NC	4	NC	12
174			min	-.201	4	-.08	1	-.027	3	-1.626e-5	3	3111.58	1	687.232	1
175		12	max	0	3	.206	3	.691	1	1.288e-2	1	NC	5	NC	3
176			min	-.201	4	-.272	1	-.023	3	4.134e-5	12	953.521	1	626.89	1
177		13	max	.001	3	.423	3	.713	1	1.191e-2	1	NC	5	NC	3
178			min	-.201	4	-.48	1	-.018	3	8.042e-5	12	544.537	1	596.532	1
179		14	max	.002	3	.586	3	.699	1	1.094e-2	1	NC	15	NC	3
180			min	-.201	4	-.638	1	-.014	3	1.195e-4	12	410.454	1	615.209	1
181		15	max	.002	3	.652	3	.643	1	9.968e-3	1	9138.614	15	NC	3
182			min	-.201	4	-.704	1	-.011	3	1.586e-4	12	372.164	1	706.905	1
183		16	max	.002	3	.602	3	.55	1	8.997e-3	1	8768.847	15	NC	3
184			min	-.201	4	-.658	1	-.012	5	1.977e-4	12	397.838	1	942.284	1
185		17	max	.003	3	.444	3	.436	1	8.026e-3	1	NC	15	NC	3
186			min	-.201	4	-.504	1	-.027	5	2.367e-4	12	518.699	1	1592.086	1
187		18	max	.003	3	.211	3	.329	1	7.055e-3	1	NC	5	NC	3
188			min	-.201	4	-.266	1	-.018	5	2.758e-4	12	972.424	1	4479.58	1
189		19	max	.003	3	.005	2	.27	1	6.084e-3	1	NC	1	NC	1
190			min	-.201	4	-.039	3	.003	12	3.149e-4	12	NC	1	NC	1
191	M12	1	max	0	2	.003	5	.272	1	7.136e-3	1	NC	1	NC	1
192			min	-.303	4	-.13	1	-.002	5	-8.001e-4	3	NC	1	NC	1
193		2	max	0	2	.141	3	.319	1	8.199e-3	1	NC	5	NC	2
194			min	-.303	4	-.499	1	.004	12	-1.026e-3	3	716.015	1	4356.751	4
195		3	max	0	2	.28	3	.42	1	9.262e-3	1	NC	5	NC	3
196			min	-.303	4	-.817	1	.005	12	-1.253e-3	3	384.285	1	1781.759	1
197		4	max	0	2	.362	3	.533	1	1.032e-2	1	NC	5	NC	3
198			min	-.303	4	-1.029	1	.005	12	-1.479e-3	3	293.566	1	1011.021	1
199		5	max	0	2	.377	3	.628	1	1.139e-2	1	NC	5	NC	3
200			min	-.303	4	-1.107	1	.003	3	-1.705e-3	3	270.319	1	740.702	1
201		6	max	0	2	.328	3	.688	1	1.245e-2	1	NC	5	NC	3
202			min	-.303	4	-1.047	1	-.004	3	-1.932e-3	3	288.015	1	634.109	1
203		7	max	0	2	.23	3	.707	1	1.351e-2	1	NC	5	NC	3
204			min	-.303	4	-.874	1	-.015	5	-2.158e-3	3	355.084	1	606.758	1
205		8	max	0	2	.106	3	.691	1	1.458e-2	1	NC	5	NC	3
206			min	-.303	4	-.638	1	-.029	5	-2.384e-3	3	519.659	1	630.196	1
207		9	max	0	2	-.003	12	.658	1	1.564e-2	1	NC	5	NC	4
208			min	-.303	4	-.418	1	-.027	3	-2.611e-3	3	917.852	1	684.032	1
209		10	max	0	1	-.008	15	.638	1	1.67e-2	1	NC	3	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	-.303	4	-.316	1	-.031	3	-2.837e-3	3	1417.234	1	720.701	1
211		11	max	0	9	-.003	12	.658	1	1.564e-2	1	NC	5	NC	12
212			min	-.303	4	-.418	1	-.027	3	-2.611e-3	3	917.852	1	684.032	1
213		12	max	0	9	.106	3	.691	1	1.458e-2	1	NC	5	NC	3
214			min	-.303	4	-.638	1	-.02	3	-2.384e-3	3	519.659	1	630.196	1
215		13	max	0	9	.23	3	.707	1	1.351e-2	1	NC	15	NC	3
216			min	-.303	4	-.874	1	-.012	3	-2.158e-3	3	355.084	1	606.758	1
217		14	max	0	9	.328	3	.688	1	1.245e-2	1	9818.917	15	NC	3
218			min	-.303	4	-1.047	1	-.004	3	-1.932e-3	3	288.015	1	634.109	1
219		15	max	0	9	.377	3	.628	1	1.139e-2	1	8903.683	15	NC	3
220			min	-.303	4	-1.107	1	.003	3	-1.705e-3	3	270.319	1	740.702	1
221		16	max	0	9	.362	3	.533	1	1.032e-2	1	9286.782	15	NC	3
222			min	-.303	4	-1.029	1	-.013	5	-1.479e-3	3	293.566	1	1011.021	1
223		17	max	0	9	.28	3	.42	1	9.262e-3	1	NC	15	NC	3
224			min	-.303	4	-.817	1	-.03	5	-1.253e-3	3	384.285	1	1781.759	1
225		18	max	0	9	.141	3	.319	1	8.199e-3	1	NC	5	NC	2
226			min	-.303	4	-.499	1	-.02	5	-1.026e-3	3	716.015	1	5587.979	1
227		19	max	0	9	-.01	15	.272	1	7.136e-3	1	NC	1	NC	1
228			min	-.303	4	-.13	1	.002	12	-8.001e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.099	3	.275	1	1.537e-2	1	NC	1	NC	1
230			min	-.551	4	-.661	1	-.002	5	-4.564e-3	3	NC	1	NC	1
231		2	max	0	3	.291	3	.35	1	1.79e-2	1	NC	5	NC	3
232			min	-.551	4	-1.152	1	.003	12	-5.52e-3	3	537.156	1	3481.906	1
233		3	max	0	3	.458	3	.467	1	2.043e-2	1	NC	5	NC	3
234			min	-.551	4	-1.592	1	.003	12	-6.477e-3	3	283.586	1	1373.357	1
235		4	max	0	3	.575	3	.585	1	2.297e-2	1	NC	15	NC	3
236			min	-.551	4	-1.92	1	.003	3	-7.434e-3	3	209.627	1	851.133	1
237		5	max	0	3	.63	3	.677	1	2.55e-2	1	9302.476	15	NC	3
238			min	-.551	4	-2.105	1	0	3	-8.391e-3	3	182.773	1	655.794	1
239		6	max	0	3	.621	3	.729	1	2.803e-2	1	8711.541	15	NC	3
240			min	-.551	4	-2.141	1	-.007	3	-9.348e-3	3	178.351	1	581.148	1
241		7	max	0	3	.559	3	.737	1	3.056e-2	1	8910.321	15	NC	3
242			min	-.551	4	-2.049	1	-.014	3	-1.03e-2	3	190.256	1	571.267	1
243		8	max	0	3	.467	3	.709	1	3.31e-2	1	9732.644	15	NC	3
244			min	-.551	4	-1.875	1	-.023	3	-1.126e-2	3	217.479	1	606.99	1
245		9	max	0	3	.378	3	.668	1	3.563e-2	1	NC	15	NC	5
246			min	-.551	4	-1.694	1	-.03	3	-1.222e-2	3	255.537	1	671.008	1
247		10	max	0	1	.336	3	.645	1	3.816e-2	1	NC	15	NC	5
248			min	-.55	4	-1.607	1	-.033	3	-1.318e-2	3	279.135	1	712.812	1
249		11	max	0	1	.378	3	.668	1	3.563e-2	1	NC	15	NC	12
250			min	-.55	4	-1.694	1	-.03	3	-1.222e-2	3	255.537	1	671.008	1
251		12	max	0	1	.467	3	.709	1	3.31e-2	1	8787.492	15	NC	3
252			min	-.55	4	-1.875	1	-.023	3	-1.126e-2	3	217.479	1	606.99	1
253		13	max	0	1	.559	3	.737	1	3.056e-2	1	7533.825	15	NC	3
254			min	-.55	4	-2.049	1	-.014	3	-1.03e-2	3	190.256	1	571.267	1
255		14	max	0	1	.621	3	.729	1	2.803e-2	1	6917.052	15	NC	3
256			min	-.55	4	-2.141	1	-.007	3	-9.348e-3	3	178.351	1	581.148	1
257		15	max	.001	1	.63	3	.677	1	2.55e-2	1	6931.225	15	NC	3
258			min	-.55	4	-2.105	1	0	3	-8.391e-3	3	182.773	1	655.794	1
259		16	max	.001	1	.575	3	.585	1	2.297e-2	1	7747.751	15	NC	3
260			min	-.55	4	-1.92	1	-.01	5	-7.434e-3	3	209.627	1	851.133	1
261		17	max	.002	1	.458	3	.467	1	2.043e-2	1	NC	15	NC	3
262			min	-.55	4	-1.592	1	-.022	5	-6.477e-3	3	283.586	1	1373.357	1
263		18	max	.002	1	.291	3	.35	1	1.79e-2	1	NC	5	NC	3
264			min	-.55	4	-1.152	1	-.013	5	-5.52e-3	3	537.156	1	3481.906	1
265		19	max	.002	1	.099	3	.275	1	1.537e-2	1	NC	1	NC	1
266			min	-.55	4	-.661	1	.002	12	-4.564e-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	15	0	5	2.009e-3	1	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.848e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.002	5	4.017e-3	1	NC	1	NC	1
272			min	0	1	-.004	1	0	1	-3.696e-3	5	NC	1	NC	1
273		4	max	0	3	0	12	.005	5	6.026e-3	1	NC	3	NC	1
274			min	0	1	-.01	1	-.001	1	-5.544e-3	5	5513.269	1	NC	1
275		5	max	0	3	0	12	.008	5	7.656e-3	1	NC	3	NC	1
276			min	0	1	-.017	1	-.002	1	-7.108e-3	5	3088.047	1	6468.609	5
277		6	max	0	3	-.001	12	.013	5	6.97e-3	1	NC	3	NC	1
278			min	0	1	-.027	1	-.003	1	-6.934e-3	5	1959.964	1	4257.199	5
279		7	max	0	3	-.001	12	.018	5	6.316e-3	2	NC	3	NC	2
280			min	0	1	-.039	1	-.004	1	-6.761e-3	5	1362.079	1	3037.318	5
281		8	max	0	3	-.001	12	.023	5	5.671e-3	2	NC	3	NC	2
282			min	0	1	-.053	1	-.004	1	-6.587e-3	5	1007.319	1	2292.045	5
283		9	max	0	3	-.002	12	.03	5	5.026e-3	2	NC	3	NC	2
284			min	0	1	-.069	1	-.005	1	-6.414e-3	5	779.249	1	1802.227	5
285		10	max	0	3	-.002	12	.037	5	4.381e-3	2	NC	3	NC	2
286			min	0	1	-.086	1	-.005	1	-6.24e-3	5	623.957	1	1462.862	5
287		11	max	0	3	-.002	12	.044	5	3.736e-3	2	NC	3	NC	2
288			min	-.001	1	-.104	1	-.006	1	-6.066e-3	5	513.329	1	1217.717	5
289		12	max	0	3	-.002	12	.052	5	3.091e-3	2	NC	3	NC	2
290			min	-.001	1	-.124	1	-.006	1	-5.893e-3	5	431.651	1	1034.671	5
291		13	max	0	3	-.002	12	.06	5	2.446e-3	2	NC	3	NC	2
292			min	-.001	1	-.145	1	-.005	1	-5.719e-3	5	369.62	1	894.353	5
293		14	max	0	3	-.003	12	.068	5	1.801e-3	2	NC	3	NC	2
294			min	-.001	1	-.167	1	-.005	1	-5.546e-3	5	321.372	1	784.378	5
295		15	max	0	3	-.003	12	.077	4	1.157e-3	2	NC	3	NC	2
296			min	-.001	1	-.189	1	-.003	1	-5.372e-3	5	283.101	1	695.021	4
297		16	max	.001	3	-.003	12	.086	4	5.116e-4	2	NC	3	NC	2
298			min	-.002	1	-.213	1	-.004	3	-5.269e-3	4	252.239	1	621.764	4
299		17	max	.001	3	-.003	12	.095	4	5.375e-4	3	NC	3	NC	2
300			min	-.002	1	-.236	1	-.007	3	-5.189e-3	4	226.994	1	561.515	4
301		18	max	.001	3	-.003	12	.105	4	8.611e-4	3	NC	3	NC	1
302			min	-.002	1	-.26	1	-.01	3	-5.109e-3	4	206.098	1	511.395	4
303		19	max	.001	3	-.004	12	.114	4	1.185e-3	3	NC	3	NC	1
304			min	-.002	1	-.284	1	-.015	3	-5.028e-3	4	188.621	1	469.288	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	15	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-1.966e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.002	4	0	1	NC	3	NC	1
310			min	0	1	-.01	1	0	1	-3.932e-3	4	5636.763	1	NC	1
311		4	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
312			min	-.001	1	-.022	1	0	1	-5.898e-3	4	2463.709	1	NC	1
313		5	max	0	3	0	12	.009	4	0	1	NC	3	NC	1
314			min	-.001	1	-.039	1	0	1	-7.559e-3	4	1366.241	1	6163.228	4
315		6	max	.001	3	0	12	.013	4	0	1	NC	3	NC	1
316			min	-.002	1	-.062	1	0	1	-7.353e-3	4	859.013	1	4060.111	4
317		7	max	.001	3	0	3	.018	4	0	1	NC	3	NC	1
318			min	-.002	1	-.09	1	0	1	-7.146e-3	4	593.237	1	2899.43	4
319		8	max	.002	3	.001	3	.024	4	0	1	NC	3	NC	1
320			min	-.002	1	-.123	1	0	1	-6.94e-3	4	436.778	1	2190.242	4
321		9	max	.002	3	.003	3	.031	4	0	1	NC	3	NC	1
322			min	-.002	1	-.159	1	0	1	-6.734e-3	4	336.769	1	1724.162	4
323		10	max	.002	3	.004	3	.038	4	0	1	NC	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
324			min	-.003	1	-.199	1	0	1	-6.528e-3	4	268.972	1	1401.28	4
325		11	max	.002	3	.006	3	.046	4	0	1	NC	12	NC	1
326			min	-.003	1	-.243	1	0	1	-6.321e-3	4	220.84	1	1168.088	4
327		12	max	.002	3	.009	3	.054	4	0	1	NC	12	NC	1
328			min	-.003	1	-.289	1	0	1	-6.115e-3	4	185.402	1	994.023	4
329		13	max	.002	3	.011	3	.062	4	0	1	8561.794	12	NC	1
330			min	-.003	1	-.338	1	0	1	-5.909e-3	4	158.549	1	860.644	4
331		14	max	.003	3	.013	3	.071	4	0	1	6926.411	12	NC	1
332			min	-.004	1	-.389	1	0	1	-5.702e-3	4	137.702	1	756.171	4
333		15	max	.003	3	.016	3	.08	4	0	1	5765.947	12	NC	1
334			min	-.004	1	-.442	1	0	1	-5.496e-3	4	121.193	1	672.85	4
335		16	max	.003	3	.019	3	.089	4	0	1	4909.945	12	NC	1
336			min	-.004	1	-.497	1	0	1	-5.29e-3	4	107.898	1	605.394	4
337		17	max	.003	3	.022	3	.097	4	0	1	4259.04	12	NC	1
338			min	-.004	1	-.553	1	0	1	-5.084e-3	4	97.036	1	550.087	4
339		18	max	.003	3	.024	3	.106	4	0	1	3752.184	12	NC	1
340			min	-.005	1	-.609	1	0	1	-4.877e-3	4	88.055	1	504.267	4
341		19	max	.004	3	.027	3	.115	4	0	1	3349.818	12	NC	1
342			min	-.005	1	-.666	1	0	1	-4.671e-3	4	80.55	1	465.981	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	8.787e-4	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-2.263e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.002	4	1.757e-3	3	NC	1	NC	1
348			min	0	1	-.004	1	0	3	-4.526e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.005	4	2.636e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.001	3	-6.789e-3	4	5513.269	1	NC	1
351		5	max	0	3	0	5	.009	4	3.346e-3	3	NC	3	NC	1
352			min	0	1	-.017	1	-.002	3	-8.689e-3	4	3088.047	1	6058.855	4
353		6	max	0	3	0	5	.013	4	3.022e-3	3	NC	3	NC	1
354			min	0	1	-.027	1	-.002	3	-8.369e-3	4	1959.964	1	4003.342	4
355		7	max	0	3	0	5	.019	4	2.699e-3	3	NC	3	NC	2
356			min	0	1	-.039	1	-.003	3	-8.049e-3	4	1362.079	1	2866.186	4
357		8	max	0	3	0	5	.025	4	2.375e-3	3	NC	3	NC	2
358			min	0	1	-.053	1	-.003	3	-7.729e-3	4	1007.319	1	2170.333	4
359		9	max	0	3	0	5	.031	4	2.051e-3	3	NC	3	NC	2
360			min	0	1	-.069	1	-.003	3	-7.409e-3	4	779.249	1	1712.584	4
361		10	max	0	3	0	5	.038	4	1.728e-3	3	NC	3	NC	2
362			min	0	1	-.086	1	-.004	3	-7.089e-3	4	623.957	1	1395.275	4
363		11	max	0	3	.001	5	.046	4	1.404e-3	3	NC	3	NC	2
364			min	-.001	1	-.104	1	-.003	3	-6.769e-3	4	513.329	1	1166.036	4
365		12	max	0	3	.001	5	.054	4	1.081e-3	3	NC	3	NC	2
366			min	-.001	1	-.124	1	-.003	3	-6.449e-3	4	431.651	1	994.92	4
367		13	max	0	3	.001	5	.062	4	7.569e-4	3	NC	3	NC	2
368			min	-.001	1	-.145	1	-.002	3	-6.129e-3	4	369.62	1	863.839	4
369		14	max	0	3	.002	5	.07	4	4.333e-4	3	NC	3	NC	2
370			min	-.001	1	-.167	1	0	3	-5.809e-3	4	321.372	1	761.235	4
371		15	max	0	3	.002	5	.079	4	1.097e-4	3	NC	3	NC	2
372			min	-.001	1	-.189	1	0	10	-5.49e-3	4	283.101	1	679.498	4
373		16	max	.001	3	.002	5	.087	4	1.23e-4	9	NC	3	NC	2
374			min	-.002	1	-.213	1	0	10	-5.178e-3	5	252.239	1	613.435	4
375		17	max	.001	3	.002	5	.096	4	5.822e-4	1	NC	3	NC	2
376			min	-.002	1	-.236	1	-.003	2	-4.954e-3	5	226.994	1	559.403	4
377		18	max	.001	3	.002	5	.104	4	1.269e-3	1	NC	3	NC	1
378			min	-.002	1	-.26	1	-.006	2	-4.729e-3	5	206.098	1	514.788	4
379		19	max	.001	3	.002	5	.112	4	1.955e-3	1	NC	3	NC	1
380			min	-.002	1	-.284	1	-.009	2	-4.505e-3	5	188.621	1	477.677	4

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	.015	1	0	12	.008	5	2.303e-3	2	NC	1	NC	1
382			min	0	12	-.006	1	-.002	1	-1.094e-3	5	NC	1	NC	1
383		2	max	.014	1	0	12	.033	5	3.201e-3	2	NC	1	NC	5
384			min	0	12	-.03	1	-.028	1	-1.329e-3	3	NC	1	2351.661	1
385		3	max	.014	1	0	12	.058	5	4.099e-3	2	NC	1	NC	5
386			min	.001	15	-.055	1	-.053	1	-1.741e-3	3	NC	1	1192.759	1
387		4	max	.013	1	0	12	.084	5	4.997e-3	2	NC	1	NC	5
388			min	.001	15	-.079	1	-.077	1	-2.153e-3	3	NC	1	811.447	1
389		5	max	.012	1	0	12	.109	5	5.895e-3	2	NC	1	NC	15
390			min	.001	15	-.103	1	-.099	1	-2.564e-3	3	NC	1	624.986	1
391		6	max	.012	1	-.001	12	.134	5	6.793e-3	2	NC	1	NC	15
392			min	.001	15	-.128	1	-.119	1	-2.976e-3	3	NC	1	516.987	1
393		7	max	.011	1	-.001	12	.159	5	7.691e-3	2	NC	1	9139.722	15
394			min	.001	15	-.152	1	-.137	1	-3.388e-3	3	NC	1	448.834	1
395		8	max	.01	1	-.001	3	.184	5	8.589e-3	2	NC	1	8094.096	15
396			min	.001	15	-.176	1	-.152	1	-3.8e-3	3	NC	1	400.388	4
397		9	max	.01	1	-.001	3	.209	5	9.487e-3	2	NC	1	7408.504	15
398			min	.001	15	-.2	1	-.163	1	-4.211e-3	3	NC	1	348.837	4
399		10	max	.009	1	0	3	.233	5	1.039e-2	2	NC	1	6983.422	15
400			min	.001	15	-.224	1	-.17	1	-4.623e-3	3	NC	1	308.718	4
401		11	max	.008	1	0	3	.257	5	1.128e-2	2	NC	1	6770.224	15
402			min	0	15	-.248	1	-.173	1	-5.035e-3	3	NC	1	276.596	4
403		12	max	.007	1	0	3	.281	5	1.218e-2	1	NC	1	6754.767	15
404			min	0	15	-.272	1	-.171	1	-5.446e-3	3	NC	1	250.283	4
405		13	max	.007	1	0	3	.304	5	1.309e-2	1	NC	1	6955.476	15
406			min	0	15	-.295	1	-.163	1	-5.858e-3	3	NC	1	228.323	4
407		14	max	.006	1	0	3	.327	5	1.399e-2	1	NC	1	7436.237	15
408			min	0	10	-.319	1	-.151	2	-6.27e-3	3	NC	1	209.706	4
409		15	max	.005	1	.001	3	.349	5	1.489e-2	1	NC	1	8349.244	15
410			min	0	10	-.342	1	-.132	2	-6.682e-3	3	NC	1	193.712	4
411		16	max	.005	3	.002	3	.371	5	1.579e-2	1	NC	1	NC	15
412			min	0	10	-.366	1	-.107	2	-7.093e-3	3	NC	1	179.813	4
413		17	max	.005	3	.002	3	.392	5	1.669e-2	1	NC	1	NC	15
414			min	0	10	-.389	1	-.076	2	-7.505e-3	3	NC	1	167.613	4
415		18	max	.005	3	.003	3	.412	5	1.759e-2	1	NC	1	NC	5
416			min	0	10	-.412	1	-.036	2	-7.917e-3	3	NC	1	156.81	4
417		19	max	.006	3	.004	3	.438	4	1.85e-2	1	NC	1	NC	1
418			min	-.001	10	-.435	1	-.002	3	-8.328e-3	3	NC	1	147.168	4
419	M6	1	max	.034	1	0	3	.008	4	0	1	NC	1	NC	1
420			min	0	15	-.013	1	0	1	-1.185e-3	4	NC	1	NC	1
421		2	max	.032	1	.004	3	.035	4	0	1	NC	1	NC	1
422			min	0	15	-.07	1	0	1	-1.301e-3	4	NC	1	NC	1
423		3	max	.03	1	.008	3	.062	4	0	1	NC	1	NC	1
424			min	0	15	-.127	1	0	1	-1.417e-3	4	8966.979	3	NC	1
425		4	max	.028	1	.011	3	.089	4	0	1	NC	1	NC	1
426			min	0	15	-.185	1	0	1	-1.534e-3	4	5955.573	3	7156.765	4
427		5	max	.026	1	.015	3	.115	4	0	1	NC	1	NC	1
428			min	0	15	-.242	1	0	1	-1.65e-3	4	4444.427	3	5425.226	4
429		6	max	.024	1	.018	3	.142	4	0	1	NC	1	NC	1
430			min	0	15	-.299	1	0	1	-1.767e-3	4	3534.005	3	4427.535	4
431		7	max	.022	1	.022	3	.168	4	0	1	NC	1	NC	1
432			min	0	15	-.356	1	0	1	-1.883e-3	4	2924.461	3	3800.142	4
433		8	max	.02	1	.026	3	.194	4	0	1	NC	1	NC	1
434			min	0	15	-.413	1	0	1	-2.e-3	4	2487.283	3	3389.334	4
435		9	max	.018	1	.03	3	.22	4	0	1	NC	1	NC	1
436			min	0	15	-.47	1	0	1	-2.116e-3	4	2158.202	3	3120.751	4
437		10	max	.016	1	.034	3	.245	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	15	-.526	1	0	1	-2.233e-3	4	1901.5	3	2956.354	4
439		11	max	.014	1	.038	3	.269	4	0	1	NC	1	NC	1
440			min	0	15	-.583	1	0	1	-2.349e-3	4	1695.728	3	2877.971	4
441		12	max	.012	1	.042	3	.293	4	0	1	NC	1	NC	1
442			min	0	15	-.639	1	0	1	-2.465e-3	4	1527.225	3	2881.193	4
443		13	max	.011	3	.046	3	.316	4	0	1	NC	1	NC	1
444			min	0	15	-.696	1	0	1	-2.582e-3	4	1386.868	3	2975.017	4
445		14	max	.012	3	.05	3	.339	4	0	1	NC	1	NC	1
446			min	0	10	-.752	1	0	1	-2.698e-3	4	1268.328	3	3187.647	4
447		15	max	.013	3	.055	3	.36	4	0	1	NC	1	NC	1
448			min	-.002	10	-.808	1	0	1	-2.815e-3	4	1167.074	3	3585.082	4
449		16	max	.014	3	.059	3	.381	4	0	1	NC	1	NC	1
450			min	-.003	10	-.865	1	0	1	-2.931e-3	4	1079.772	3	4329.781	4
451		17	max	.014	3	.064	3	.401	4	0	1	NC	1	NC	1
452			min	-.004	2	-.921	1	0	1	-3.048e-3	4	1003.915	3	5917.791	4
453		18	max	.015	3	.068	3	.42	4	0	1	NC	1	NC	1
454			min	-.007	2	-.977	1	0	1	-3.164e-3	4	937.578	3	NC	1
455		19	max	.016	3	.072	3	.438	4	0	1	NC	1	NC	1
456			min	-.009	2	-1.033	1	0	1	-3.28e-3	4	879.262	3	NC	1
457	M9	1	max	.015	1	0	5	.008	4	9.177e-4	3	NC	1	NC	1
458			min	0	5	-.006	1	-.001	3	-2.303e-3	2	NC	1	NC	1
459		2	max	.014	1	0	15	.039	4	1.329e-3	3	NC	1	NC	5
460			min	0	5	-.03	1	-.013	3	-3.201e-3	2	NC	1	2351.661	1
461		3	max	.014	1	0	15	.069	4	1.741e-3	3	NC	1	NC	15
462			min	0	5	-.055	1	-.024	3	-4.099e-3	2	NC	1	1192.759	1
463		4	max	.013	1	0	15	.1	4	2.153e-3	3	NC	1	8827.674	15
464			min	0	5	-.079	1	-.035	3	-4.997e-3	2	NC	1	811.447	1
465		5	max	.012	1	0	15	.13	4	2.564e-3	3	NC	1	6704.093	15
466			min	0	5	-.103	1	-.044	3	-5.895e-3	2	NC	1	624.986	1
467		6	max	.012	1	0	15	.159	4	2.976e-3	3	NC	1	5479.32	15
468			min	0	5	-.128	1	-.053	3	-6.793e-3	2	NC	1	516.987	1
469		7	max	.011	1	0	15	.188	4	3.388e-3	3	NC	1	4708.479	15
470			min	0	5	-.152	1	-.061	3	-7.691e-3	2	NC	1	448.834	1
471		8	max	.01	1	0	15	.216	4	3.8e-3	3	NC	1	4203.432	15
472			min	0	5	-.176	1	-.068	3	-8.589e-3	2	NC	1	404.195	1
473		9	max	.01	1	0	15	.243	4	4.211e-3	3	NC	1	3873.157	15
474			min	0	5	-.2	1	-.073	3	-9.487e-3	2	NC	1	375.187	1
475		10	max	.009	1	0	15	.269	4	4.623e-3	3	NC	1	3671.117	15
476			min	0	5	-.224	1	-.076	3	-1.039e-2	2	NC	1	357.816	1
477		11	max	.008	1	0	15	.294	4	5.035e-3	3	NC	1	3575.146	15
478			min	0	5	-.248	1	-.077	3	-1.128e-2	2	NC	1	350.248	1
479		12	max	.007	1	0	15	.317	4	5.446e-3	3	NC	1	3579.998	15
480			min	0	5	-.272	1	-.077	3	-1.218e-2	1	NC	1	352.189	1
481		13	max	.007	1	0	15	.339	4	5.858e-3	3	NC	1	3696.983	15
482			min	0	5	-.295	1	-.074	3	-1.309e-2	1	NC	1	364.908	1
483		14	max	.006	1	0	15	.359	4	6.27e-3	3	NC	1	3961.192	15
484			min	0	5	-.319	1	-.069	3	-1.399e-2	1	NC	1	391.99	1
485		15	max	.005	1	.001	3	.377	4	6.682e-3	3	NC	1	4454.584	15
486			min	0	5	-.342	1	-.061	3	-1.489e-2	1	NC	1	441.641	1
487		16	max	.005	3	.002	3	.394	4	7.093e-3	3	NC	1	5378.797	15
488			min	0	5	-.366	1	-.05	3	-1.579e-2	1	NC	1	533.934	1
489		17	max	.005	3	.002	3	.408	4	7.505e-3	3	NC	1	7349.406	15
490			min	0	5	-.389	1	-.036	3	-1.669e-2	1	NC	1	730.039	1
491		18	max	.005	3	.003	3	.42	4	7.917e-3	3	NC	1	NC	15
492			min	0	10	-.412	1	-.019	3	-1.759e-2	1	NC	1	1337.139	1
493		19	max	.006	3	.004	3	.431	5	8.328e-3	3	NC	1	NC	1
494			min	-.001	10	-.435	1	-.016	1	-1.85e-2	1	NC	1	NC	1