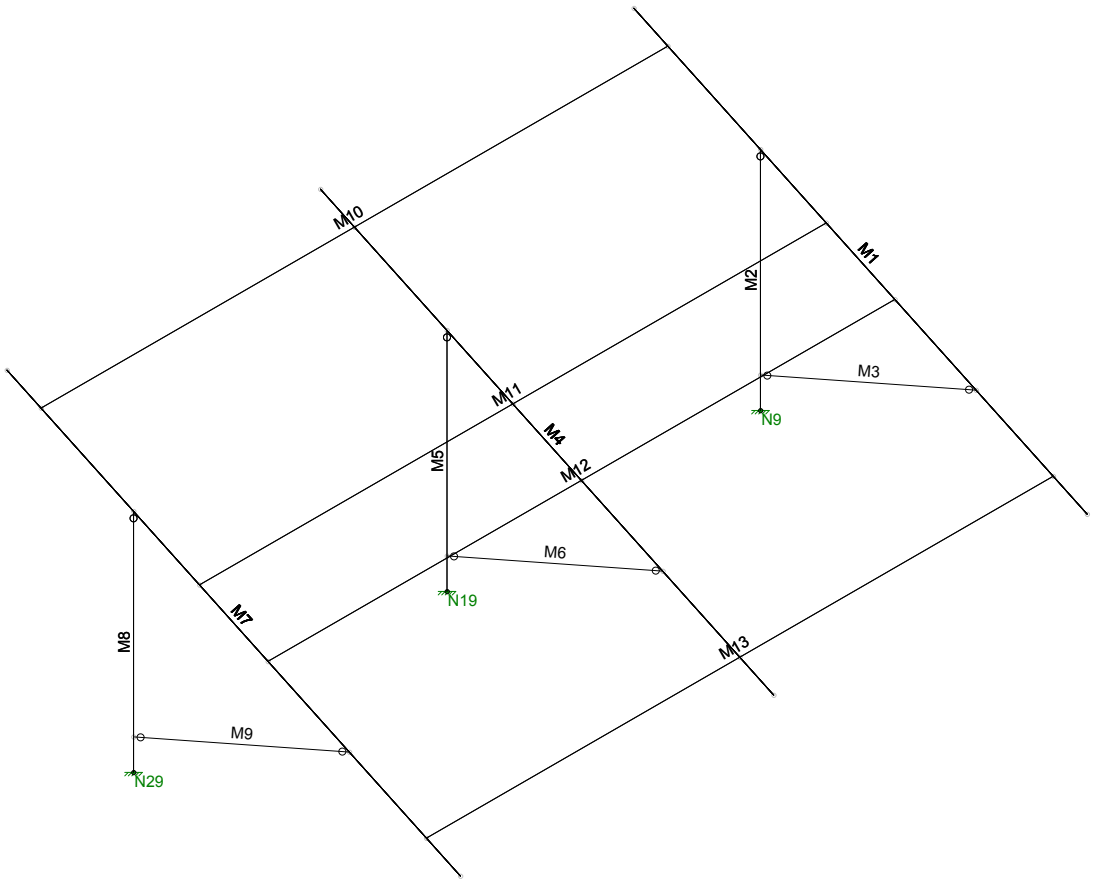


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

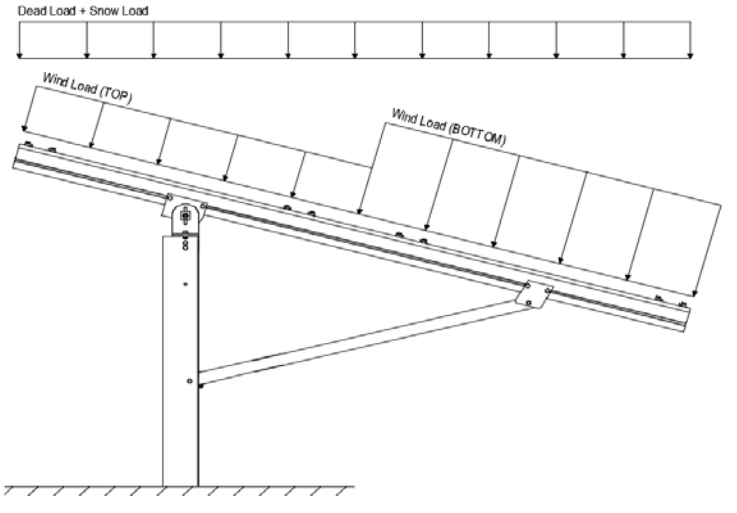
PV modules are required to meet the following specifications:

	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 =	25°
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 =	18.56	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.82		
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

$Cf+_{TOP}$ =	1.1	*(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.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(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 =	0.08	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

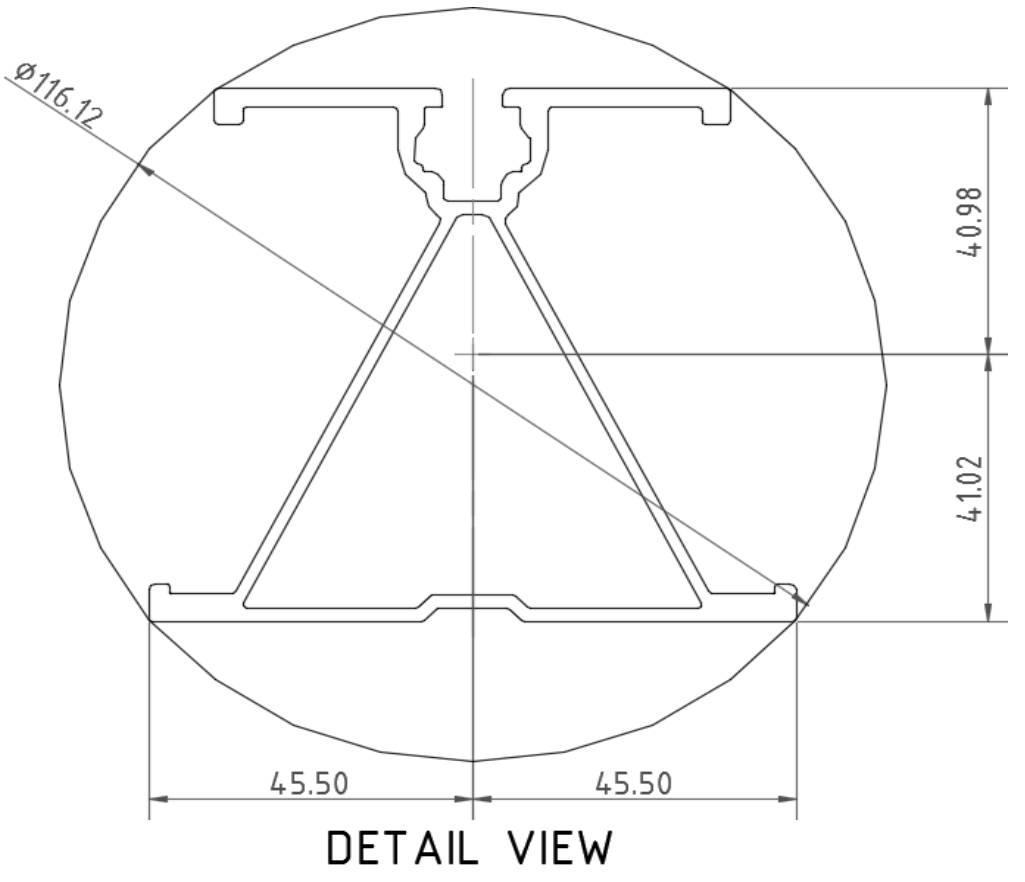
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

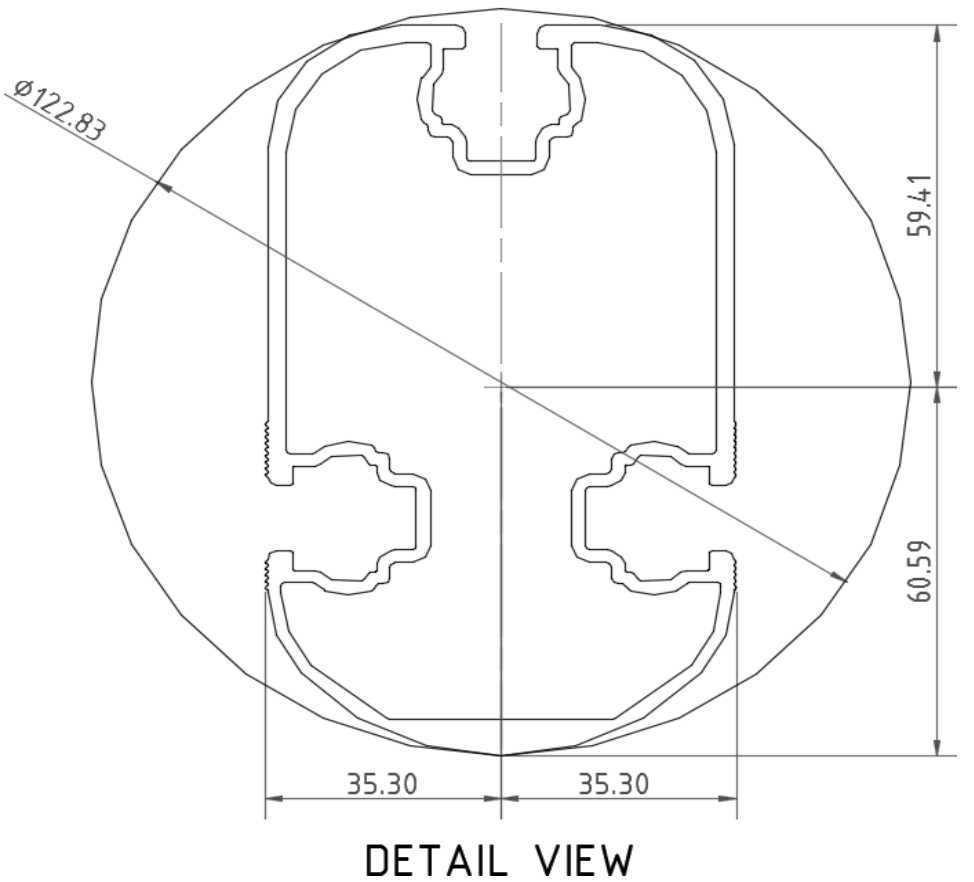
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	132	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.946	k-ft
M_z =	0.278	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	94%	



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).

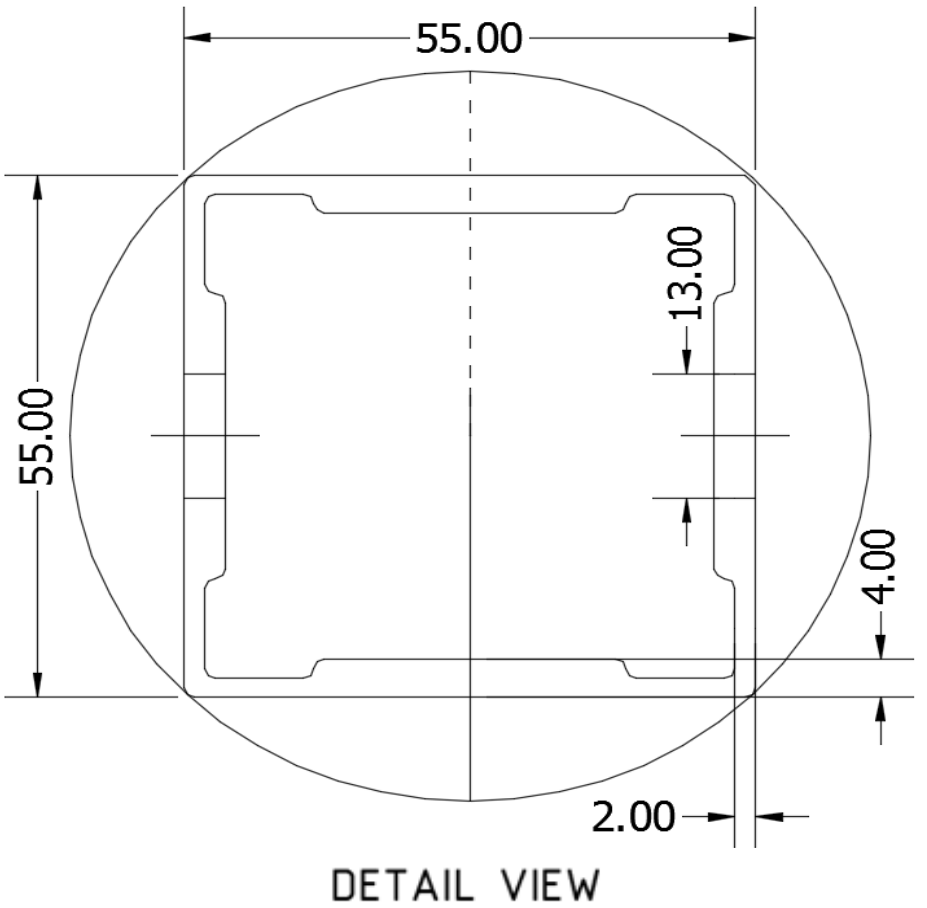
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.251	k-ft
M_z =	0.000	k-ft
P_n =	0.025	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	



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 =	0.000	k-ft
M_z =	0.404	k-ft
P_n =	4.968	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	66%	

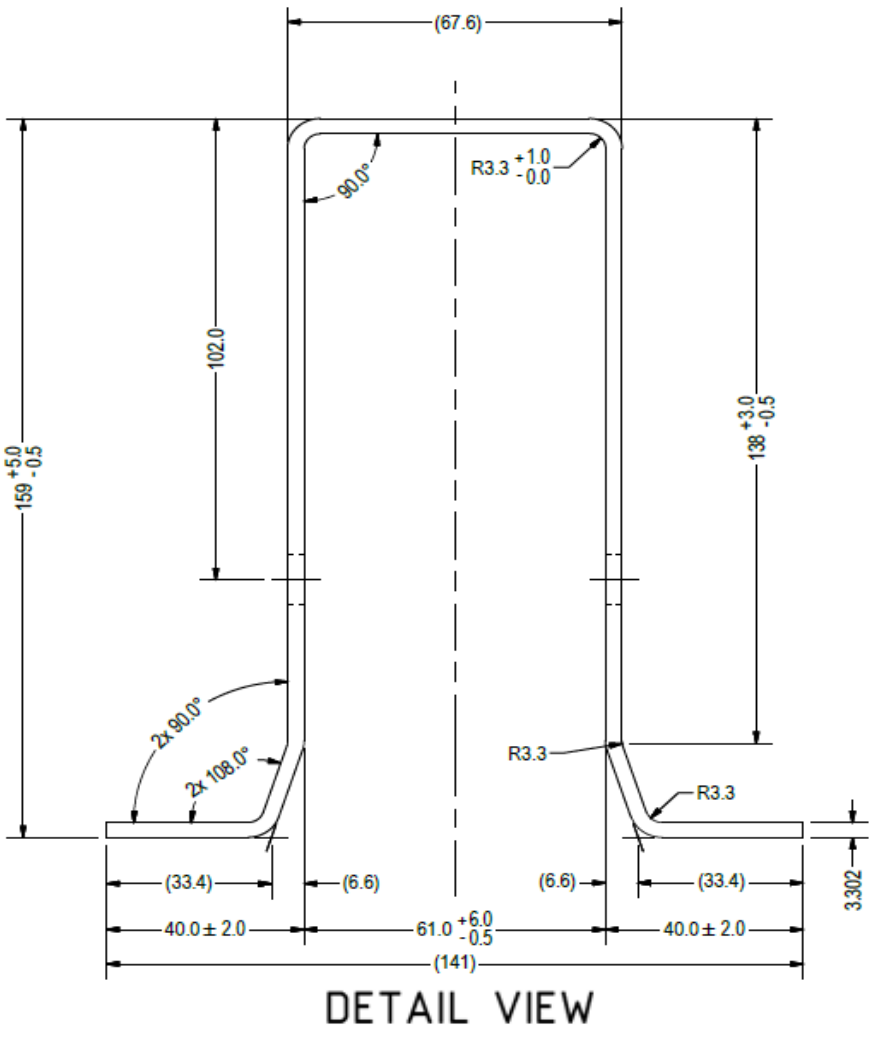


DETAIL VIEW

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 =	72.60	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 =	11.849	k-ft
M_z =	0.000	k-ft
P_r =	6.774	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	78%	



DETAIL VIEW

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 =	6.46	k
Maximum Lateral Load =	3.15	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)

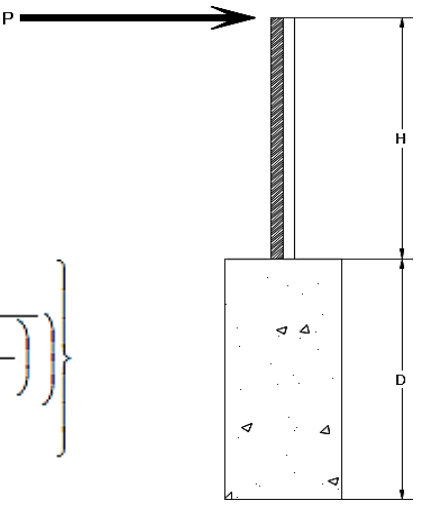
Lateral Force @ Top of Pole, P =	1.32	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.32	k
Height of Pole Above Grade, H =	5.05	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 =	7.13	
Required Footing Depth, D =	10.77	ft

2nd Trial @ D_2 =	7.01	ft
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf
Lateral Soil Bearing @ D, S_3 =	1.40	ksf
Constant 2.34P/(S_1B), A =	3.30	
Required Footing Depth, D =	6.23	ft

3rd Trial @ D_3 =	6.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf
Constant 2.34P/(S_1B), A =	3.50	
Required Footing Depth, D =	6.48	ft

4th Trial @ D_4 =	6.55	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.54	
Required Footing Depth, D =	6.52	ft

5th Trial @ D_5 =	6.54	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.54	
Required Footing Depth, D =	6.75	ft

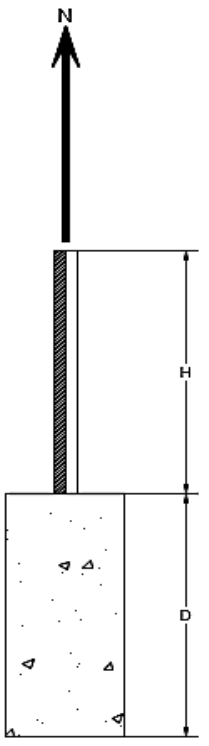
A 2ft diameter x 6.75ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.09	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 =	2.00	k
Required Concrete Volume, V =	13.81	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	6.68
2	0.4	0.2	118.10	6.57
3	0.6	0.2	118.10	6.47
4	0.8	0.2	118.10	6.37
5	1	0.2	118.10	6.26
6	1.2	0.2	118.10	6.16
7	1.4	0.2	118.10	6.06
8	1.6	0.2	118.10	5.95
9	1.8	0.2	118.10	5.85
10	2	0.2	118.10	5.74
11	2.2	0.2	118.10	5.64
12	2.4	0.2	118.10	5.54
13	2.6	0.2	118.10	5.43
14	2.8	0.2	118.10	5.33
15	3	0.2	118.10	5.23
16	3.2	0.2	118.10	5.12
17	3.4	0.2	118.10	5.02
18	3.6	0.2	118.10	4.92
19	3.8	0.2	118.10	4.81
20	4	0.2	118.10	4.71
21	4.2	0.2	118.10	4.60
22	4.4	0.2	118.10	4.50
23	4.6	0.2	118.10	4.40
24	0	0.0	0.00	4.40
25	0	0.0	0.00	4.40
26	0	0.0	0.00	4.40
27	0	0.0	0.00	4.40
28	0	0.0	0.00	4.40
29	0	0.0	0.00	4.40
30	0	0.0	0.00	4.40
31	0	0.0	0.00	4.40
32	0	0.0	0.00	4.40
33	0	0.0	0.00	4.40
34	0	0.0	0.00	4.40
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 =	6.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.52	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	23.56	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

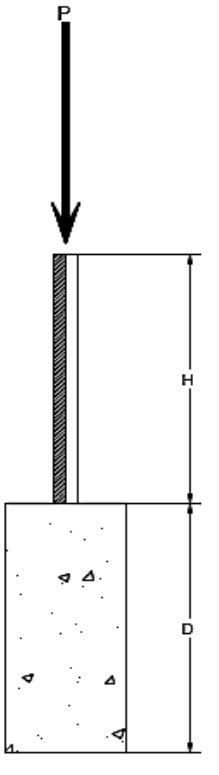
Weight of Concrete

Footing Volume	21.21	ft^3
Weight	3.07	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.53	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.00	k
Applied Force =	7.60	k
Utilization =	69%	

A 2ft diameter footing passes at a depth of 6.75ft.



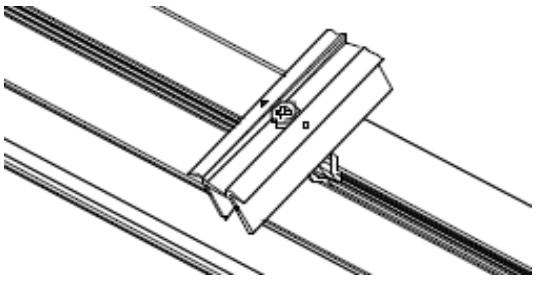
6. DESIGN OF JOINTS AND CONNECTIONS

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.

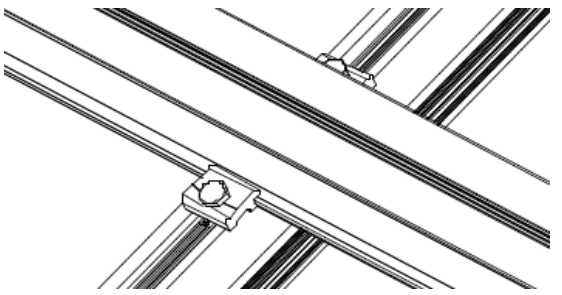
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.516 k
Allowable Uplift	=	1.214 k
Utilization	=	42%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.010 k
Allowable Uplift	=	2.180 k
Utilization	=	92%

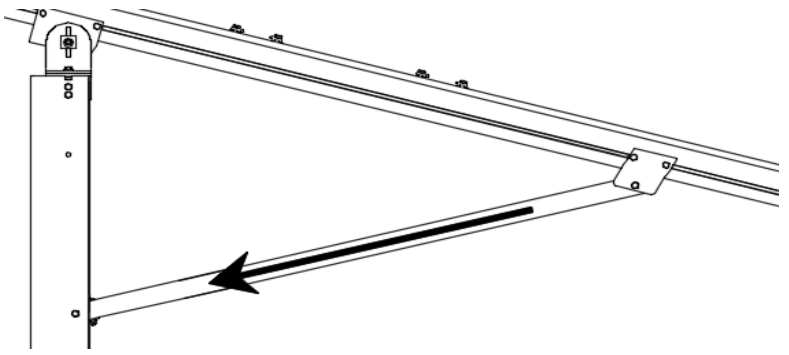


6.2 Strut Connections

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	=	4.968 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	56%

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

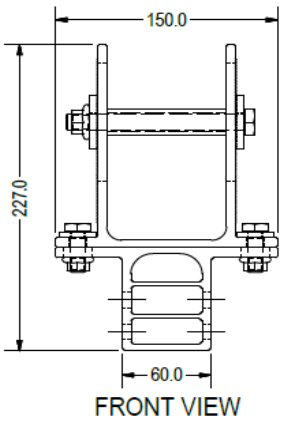


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

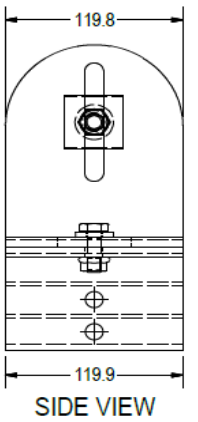
6.3 Girder to Post Connection

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.

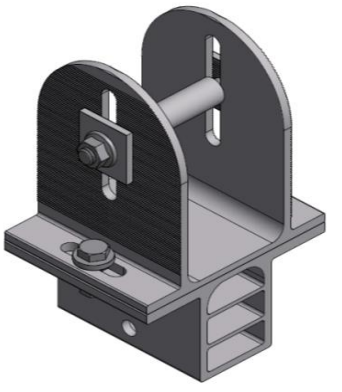
Maximum Tensile Load	=	4.283 k
Allowable Load	=	5.649 k
Utilization	=	76%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

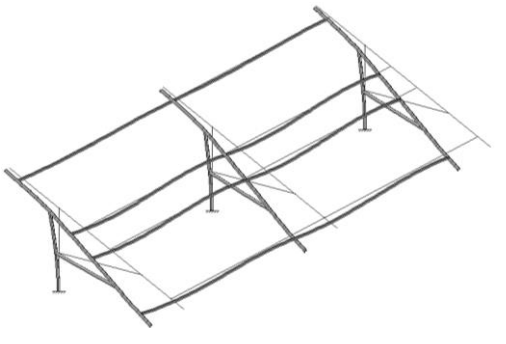
7.1 Seismic Drift

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}	=	58.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.163 in
Max Drift, Δ_{MAX}	=	0.602 in

0.602 ≤ 1.163, 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 = 1.98

65.6618

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

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= 30.8 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

φF_LSt= 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 = 1.98

65.6618

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

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= 30.8

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

φF_LWk= 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 =	72.60	in	
Pr =	6.77	k	(LRFD Factored Load)
Mr (Strong) =	11.85	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	104.47		
4.71√(E/Fy) =	103.55	=> kL/r	> 4.71√(E/Fy)
Fcr =	23.00	ksi	
Fe =	26.23	ksi	
Pn =	51.291	k	

Torsional/Flexural Torsional Buckling:

Fcr =	17.0733	ksi
Fey =	66.8981	ksi
Fez =	21.7595	ksi
Pn =	38.0734	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1977	<	0.2	
Utilization =	0.78	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.198	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 78%

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	-46.9	-46.9	0	0
2	M11	Y	-46.9	-46.9	0	0
3	M12	Y	-46.9	-46.9	0	0
4	M13	Y	-46.9	-46.9	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	-48.164	-48.164	0	0
2	M11	y	-48.164	-48.164	0	0
3	M12	y	-74.435	-74.435	0	0
4	M13	y	-74.435	-74.435	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	96.328	96.328	0	0
2	M11	y	96.328	96.328	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	637.021	2	2507.983	1	313.587	1	.395	1	.012	5	5.363	1
2		min	-871.092	3	-1657.898	3	-354.832	5	-1.447	5	-.012	2	.515	15
3	N19	max	2373.563	2	6795.83	1	0	3	0	3	.013	4	11.048	1
4		min	-2426.504	3	-4961.291	3	-388.896	5	-1.523	4	0	12	.376	15
5	N29	max	637.021	2	2507.983	1	313.016	3	.393	3	.014	4	5.363	1
6		min	-871.092	3	-1657.898	3	-426.127	4	-1.556	4	-.005	3	-.146	5
7	Totals:	max	3647.605	2	11811.797	1	0	12						
8		min	-4168.688	3	-8277.087	3	-1124.193	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	.007	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	-.221	15	-.473	15	0	12	0	1	0	12	0	6
4			min	-.939	4	-2.011	6	-1.499	5	0	1	0	5	0	15
5		3	max	-10.518	12	279.212	3	.478	3	.072	3	.311	1	.297	2
6			min	-211.111	1	-681.299	2	-195.986	1	-.268	2	.022	12	-.119	3
7		4	max	-10.884	12	278.036	3	.478	3	.072	3	.19	1	.72	2
8			min	-211.842	1	-682.868	2	-195.986	1	-.268	2	.021	10	-.292	3
9		5	max	-11.249	12	276.86	3	.478	3	.072	3	.076	4	1.144	2
10			min	-212.573	1	-684.436	2	-195.986	1	-.268	2	-.009	10	-.465	3
11		6	max	371.068	3	603.421	2	33.5	3	.067	2	.139	1	1.096	2
12			min	-1255.893	1	-169.318	3	-267.044	1	-.077	3	-.052	3	-.473	3
13		7	max	370.52	3	601.852	2	33.5	3	.067	2	.016	10	.722	2
14			min	-1256.625	1	-170.494	3	-267.044	1	-.077	3	-.069	4	-.367	3
15		8	max	369.971	3	600.284	2	33.5	3	.067	2	-.007	12	.349	2
16			min	-1257.356	1	-171.67	3	-267.044	1	-.077	3	-.193	1	-.261	3
17		9	max	354.434	3	86.794	3	28.363	3	.018	5	.1	1	.149	1
18			min	-1476.549	1	-68.353	2	-268.98	1	-.227	2	0	10	-.212	3
19		10	max	353.885	3	85.618	3	28.363	3	.018	5	.063	3	.191	1
20			min	-1477.281	1	-69.921	2	-268.98	1	-.227	2	-.067	1	-.266	3
21		11	max	353.337	3	84.442	3	28.363	3	.018	5	.08	3	.235	1
22			min	-1478.012	1	-71.489	2	-268.98	1	-.227	2	-.234	1	-.319	3
23		12	max	334.534	3	774.811	3	161.836	2	.444	3	.177	1	.492	1
24			min	-1692.951	1	-592.765	1	-318.122	3	-.441	1	-.028	5	-.643	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	333.985	3	773.634	3	161.836	2	.444	3	.234	1	.86	1
26			min	-1693.683	1	-594.334	1	-318.122	3	-.441	1	-.179	3	-1.124	3
27		14	max	213.327	1	534.667	1	79.2	5	.312	1	.059	3	1.214	1
28			min	11.046	12	-688.595	3	-148.964	1	-.483	3	-.228	4	-1.584	3
29		15	max	212.596	1	533.099	1	77.7	5	.312	1	.035	3	.883	1
30			min	10.68	12	-689.771	3	-148.964	1	-.483	3	-.199	4	-1.156	3
31		16	max	211.865	1	531.531	1	76.2	5	.312	1	.012	3	.552	1
32			min	10.315	12	-690.948	3	-148.964	1	-.483	3	-.245	1	-.727	3
33		17	max	211.133	1	529.963	1	74.701	5	.312	1	-.008	12	.223	1
34			min	9.949	12	-692.124	3	-148.964	1	-.483	3	-.337	1	-.298	3
35		18	max	.939	6	2.013	6	1.5	4	0	1	0	12	0	6
36			min	.221	15	.473	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.002	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.004	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.016	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	-.221	15	-.473	15	0	1	0	1	0	1	0	6
42			min	-.939	6	-2.009	6	-1.499	5	0	1	0	5	0	15
43		3	max	-14.374	12	868.634	3	0	1	.032	4	.237	4	.755	2
44			min	-389.981	1	-1964.263	2	-114.502	5	0	1	0	1	-.337	3
45		4	max	-14.739	12	867.457	3	0	1	.032	4	.166	4	1.974	2
46			min	-390.712	1	-1965.831	2	-116.002	5	0	1	0	1	-.876	3
47		5	max	-15.105	12	866.281	3	0	1	.032	4	.094	4	3.195	2
48			min	-391.443	1	-1967.399	2	-117.501	5	0	1	0	1	-1.414	3
49		6	max	1307.286	3	1784.511	2	0	1	0	1	0	1	3.039	2
50			min	-3477.345	2	-643.641	3	-108.333	4	-.027	4	-.02	5	-1.397	3
51		7	max	1306.738	3	1782.943	2	0	1	0	1	0	1	1.932	2
52			min	-3478.076	2	-644.818	3	-109.833	4	-.027	4	-.086	4	-.998	3
53		8	max	1306.189	3	1781.374	2	0	1	0	1	0	1	.826	2
54			min	-3478.807	2	-645.994	3	-111.333	4	-.027	4	-.155	4	-.597	3
55		9	max	1285.796	3	262.423	3	0	1	.016	4	.112	4	.191	1
56			min	-3778.912	1	-247.374	1	-230.93	4	0	1	0	1	-.4	3
57		10	max	1285.247	3	261.247	3	0	1	.016	4	0	1	.345	1
58			min	-3779.643	1	-248.942	1	-232.43	4	0	1	-.032	4	-.562	3
59		11	max	1284.699	3	260.071	3	0	1	.016	4	0	1	.5	1
60			min	-3780.374	1	-250.51	1	-233.929	4	0	1	-.176	4	-.724	3
61		12	max	1270.837	3	2150.389	3	0	1	.148	4	.002	5	1.261	1
62			min	-4160.504	1	-1809.768	1	-255.972	5	0	1	0	1	-1.638	3
63		13	max	1270.288	3	2149.213	3	0	1	.148	4	0	1	2.384	1
64			min	-4161.235	1	-1811.336	1	-257.472	5	0	1	-.158	4	-2.972	3
65		14	max	392.13	1	1537.525	1	71.207	5	0	1	0	1	3.463	1
66			min	16.608	12	-1890.005	3	0	1	-.106	4	-.197	5	-4.251	3
67		15	max	391.398	1	1535.957	1	69.707	5	0	1	0	1	2.51	1
68			min	16.243	12	-1891.181	3	0	1	-.106	4	-.153	5	-3.077	3
69		16	max	390.667	1	1534.389	1	68.207	5	0	1	0	1	1.557	1
70			min	15.877	12	-1892.357	3	0	1	-.106	4	-.11	5	-1.903	3
71		17	max	389.936	1	1532.82	1	66.708	5	0	1	0	1	.605	1
72			min	15.511	12	-1893.533	3	0	1	-.106	4	-.069	4	-.728	3
73		18	max	.939	6	2.014	6	1.5	5	0	1	0	1	0	6
74			min	.221	15	.473	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.005	2	0	1	0	1	0	1	0	1
76			min	0	1	-.011	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.007	1	.003	4	0	1	0	1	0	1
78			min	0	1	-.001	3	0	12	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80			min	-.939	6	-2.011	4	-1.499	5	0	1	0	5	0	15
81		3	max	13.153	5	279.212	3	195.986	1	.268	2	.11	5	.297	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	-211.111	1	-681.299	2	-49.027	5	-.072	3	-.311	1	-.119	3
83		4	max	12.812	5	278.036	3	195.986	1	.268	2	.079	5	.72	2
84			min	-211.842	1	-682.868	2	-50.526	5	-.072	3	-.19	1	-.292	3
85		5	max	12.471	5	276.86	3	195.986	1	.268	2	.047	5	1.144	2
86			min	-212.573	1	-684.436	2	-52.026	5	-.072	3	-.068	1	-.465	3
87		6	max	371.068	3	603.421	2	267.044	1	.077	3	.052	3	1.096	2
88			min	-1255.893	1	-169.318	3	-39.844	5	-.067	2	-.139	1	-.473	3
89		7	max	370.52	3	601.852	2	267.044	1	.077	3	.031	3	.722	2
90			min	-1256.625	1	-170.494	3	-41.344	5	-.067	2	-.054	5	-.367	3
91		8	max	369.971	3	600.284	2	267.044	1	.077	3	.193	1	.349	2
92			min	-1257.356	1	-171.67	3	-42.844	5	-.067	2	-.08	5	-.261	3
93		9	max	354.434	3	86.794	3	268.98	1	.227	2	.038	5	.149	1
94			min	-1476.549	1	-68.353	2	-96.03	5	.019	15	-.1	1	-.212	3
95		10	max	353.885	3	85.618	3	268.98	1	.227	2	.067	1	.191	1
96			min	-1477.281	1	-69.921	2	-97.529	5	.019	15	-.063	3	-.266	3
97		11	max	353.337	3	84.442	3	268.98	1	.227	2	.234	1	.235	1
98			min	-1478.012	1	-71.489	2	-99.029	5	.019	15	-.083	5	-.319	3
99		12	max	334.534	3	774.811	3	318.122	3	.441	1	-.012	12	.492	1
100			min	-1692.951	1	-592.765	1	-224.021	4	-.444	3	-.177	1	-.643	3
101		13	max	333.985	3	773.634	3	318.122	3	.441	1	.179	3	.86	1
102			min	-1693.683	1	-594.334	1	-225.521	4	-.444	3	-.234	1	-1.124	3
103		14	max	213.327	1	534.667	1	148.964	1	.483	3	.06	1	1.214	1
104			min	7.029	15	-688.595	3	20.538	10	-.312	1	-.213	5	-1.584	3
105		15	max	212.596	1	533.099	1	148.964	1	.483	3	.152	1	.883	1
106			min	6.809	15	-689.771	3	20.538	10	-.312	1	-.153	5	-1.156	3
107		16	max	211.865	1	531.531	1	148.964	1	.483	3	.245	1	.552	1
108			min	6.588	15	-690.948	3	20.538	10	-.312	1	-.094	5	-.727	3
109		17	max	211.133	1	529.963	1	148.964	1	.483	3	.337	1	.223	1
110			min	6.368	15	-692.124	3	20.538	10	-.312	1	-.035	5	-.298	3
111		18	max	.939	6	2.013	4	1.5	5	0	1	0	1	0	4
112			min	.221	15	.473	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.004	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	148.951	1	526.517	1	-5.93	15	.008	1	.398	1	.312	1
116			min	20.533	10	-694.443	3	-210.016	1	-.019	3	.001	15	-.483	3
117		2	max	148.951	1	383.181	1	-4.085	15	.008	1	.168	1	.255	3
118			min	20.533	10	-512.004	3	-165.137	1	-.019	3	-.007	5	-.244	1
119		3	max	148.951	1	239.845	1	-2.239	15	.008	1	.019	2	.769	3
120			min	20.533	10	-329.565	3	-120.259	1	-.019	3	-.017	4	-.625	1
121		4	max	148.951	1	96.509	1	-.393	15	.008	1	-.005	10	1.06	3
122			min	20.533	10	-147.127	3	-75.38	1	-.019	3	-.126	1	-.831	1
123		5	max	148.951	1	35.312	3	2.096	5	.008	1	-.009	12	1.128	3
124			min	20.533	10	-46.827	1	-30.502	1	-.019	3	-.19	1	-.861	1
125		6	max	148.951	1	217.751	3	14.377	1	.008	1	-.007	15	.974	3
126			min	18.309	15	-190.163	1	-3.523	10	-.019	3	-.2	1	-.716	1
127		7	max	148.951	1	400.19	3	59.256	1	.008	1	-.001	15	.596	3
128			min	9.864	15	-333.499	1	1.575	10	-.019	3	-.155	1	-.396	1
129		8	max	148.951	1	582.629	3	104.134	1	.008	1	.009	5	.099	1
130			min	1.42	15	-476.835	1	3.692	12	-.019	3	-.055	1	-.018	5
131		9	max	148.951	1	765.068	3	149.013	1	.008	1	.099	1	.77	1
132			min	-10.009	5	-620.171	1	5.538	12	-.019	3	-.011	10	-.828	3
133		10	max	148.951	1	947.506	3	193.891	1	0	15	.309	1	1.615	1
134			min	20.533	10	-763.508	1	-105.138	14	-.019	3	.006	10	-1.875	3
135		11	max	148.951	1	620.171	1	-3.822	15	.019	3	.099	1	.77	1
136			min	19.03	15	-765.068	3	-149.013	1	-.008	1	-.011	10	-.828	3
137		12	max	148.951	1	476.835	1	-1.977	15	.019	3	-.006	12	.099	1
138			min	10.586	15	-582.629	3	-104.134	1	-.008	1	-.055	1	-.004	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	148.951	1	333.499	1	-.131	15	.019	3	-.009	12	.596	3
140			min	2.141	15	-400.19	3	-59.256	1	-.008	1	-.155	1	-.396	1
141		14	max	148.951	1	190.163	1	3.523	10	.019	3	-.01	15	.974	3
142			min	-8.994	5	-217.751	3	-14.377	1	-.008	1	-.2	1	-.716	1
143		15	max	148.951	1	46.827	1	30.502	1	.019	3	-.006	15	1.128	3
144			min	-21.541	5	-35.312	3	1.843	12	-.008	1	-.19	1	-.861	1
145		16	max	148.951	1	147.127	3	75.38	1	.019	3	0	15	1.06	3
146			min	-34.087	5	-96.509	1	3.689	12	-.008	1	-.126	1	-.831	1
147		17	max	148.951	1	329.565	3	120.259	1	.019	3	.019	2	.769	3
148			min	-46.634	5	-239.845	1	5.534	12	-.008	1	-.013	9	-.625	1
149		18	max	148.951	1	512.004	3	165.137	1	.019	3	.168	1	.255	3
150			min	-59.18	5	-383.181	1	7.379	12	-.008	1	.008	12	-.244	1
151		19	max	148.951	1	694.443	3	210.016	1	.019	3	.398	1	.312	1
152			min	-71.726	5	-526.517	1	9.225	12	-.008	1	.018	12	-.483	3
153	M11	1	max	361.238	1	518.131	1	16.994	5	0	15	.434	1	.264	1
154			min	-346.376	3	-692.485	3	-215.052	1	-.006	1	-.143	5	-.573	3
155		2	max	361.238	1	374.795	1	19.85	5	0	15	.199	1	.162	3
156			min	-346.376	3	-510.046	3	-170.173	1	-.006	1	-.121	5	-.294	2
157		3	max	361.238	1	231.458	1	22.705	5	0	15	.025	2	.674	3
158			min	-346.376	3	-327.608	3	-125.295	1	-.006	1	-.095	5	-.652	1
159		4	max	361.238	1	88.122	1	25.56	5	0	15	.007	3	.963	3
160			min	-346.376	3	-145.169	3	-80.416	1	-.006	1	-.107	1	-.847	1
161		5	max	361.238	1	37.27	3	28.415	5	0	15	-.002	12	1.029	3
162			min	-346.376	3	-56.567	2	-35.538	1	-.006	1	-.178	1	-.868	1
163		6	max	361.238	1	219.709	3	34.383	4	0	15	.004	5	.872	3
164			min	-346.376	3	-198.55	1	-4.264	3	-.006	1	-.194	1	-.712	1
165		7	max	361.238	1	402.148	3	54.22	1	0	15	.044	5	.492	3
166			min	-346.376	3	-341.886	1	-1.496	3	-.006	1	-.155	1	-.382	1
167		8	max	361.238	1	584.587	3	99.098	1	0	15	.088	5	.123	1
168			min	-346.376	3	-485.222	1	1.037	12	-.006	1	-.062	1	-.111	3
169		9	max	361.238	1	767.025	3	143.977	1	0	15	.159	4	.804	1
170			min	-346.376	3	-628.558	1	2.883	12	-.006	1	-.011	10	-.937	3
171		10	max	361.238	1	949.464	3	188.855	1	0	15	.29	1	1.66	1
172			min	-346.376	3	-771.894	1	-88.629	14	-.006	1	-.004	3	-1.986	3
173		11	max	361.238	1	628.558	1	20.949	5	.006	1	.087	1	.804	1
174			min	-346.376	3	-767.025	3	-143.977	1	0	5	-.121	5	-.937	3
175		12	max	361.238	1	485.222	1	23.804	5	.006	1	-.009	12	.123	1
176			min	-346.376	3	-584.587	3	-99.098	1	0	5	-.104	4	-.111	3
177		13	max	361.238	1	341.886	1	26.659	5	.006	1	-.009	12	.492	3
178			min	-346.376	3	-402.148	3	-54.22	1	0	5	-.155	1	-.382	1
179		14	max	361.238	1	198.55	1	29.514	5	.006	1	-.007	12	.872	3
180			min	-346.376	3	-219.709	3	-9.341	1	0	5	-.194	1	-.712	1
181		15	max	361.238	1	56.567	2	39.316	4	.006	1	.009	5	1.029	3
182			min	-346.376	3	-37.27	3	4.498	12	0	5	-.178	1	-.868	1
183		16	max	361.238	1	145.169	3	80.416	1	.006	1	.051	5	.963	3
184			min	-346.376	3	-88.122	1	6.344	12	0	5	-.107	1	-.847	1
185		17	max	361.238	1	327.608	3	125.295	1	.006	1	.097	4	.674	3
186			min	-346.376	3	-231.458	1	8.189	12	0	5	.004	9	-.652	1
187		18	max	361.238	1	510.046	3	170.173	1	.006	1	.199	1	.162	3
188			min	-346.376	3	-374.795	1	10.034	12	0	5	.024	12	-.294	2
189		19	max	361.238	1	692.485	3	215.052	1	.006	1	.434	1	.264	1
190			min	-346.376	3	-518.131	1	11.88	12	0	5	.038	12	-.573	3
191	M12	1	max	51.578	5	665.215	2	19.6	5	0	3	.459	1	.294	2
192			min	-20.138	9	-260.178	3	-218.46	1	-.007	1	-.157	5	.032	12
193		2	max	47.271	2	480.557	2	22.455	5	0	3	.22	1	.321	3
194			min	-20.138	9	-180.49	3	-173.581	1	-.007	1	-.131	5	-.406	2
195		3	max	47.271	2	295.9	2	25.31	5	0	3	.041	2	.493	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	-20.138	9	-100.802	3	-128.703	1	-.007	1	-.102	5	-.881	2
197		4	max	47.271	2	111.242	2	28.165	5	0	3	0	10	.567	3
198			min	-20.138	9	-21.114	3	-83.824	1	-.007	1	-.095	1	-1.129	2
199		5	max	47.271	2	58.574	3	31.02	5	0	3	-.007	12	.544	3
200			min	-20.138	9	-73.415	2	-38.946	1	-.007	1	-.17	1	-1.152	2
201		6	max	47.271	2	138.262	3	36.546	4	0	3	.007	5	.424	3
202			min	-21.157	14	-258.073	2	-6.056	2	-.007	1	-.19	1	-.95	2
203		7	max	47.271	2	217.95	3	50.812	1	0	3	.05	5	.206	3
204			min	-30.446	4	-442.73	2	-.151	10	-.007	1	-.156	1	-.522	2
205		8	max	47.271	2	297.639	3	95.69	1	0	3	.097	5	.132	2
206			min	-42.992	4	-627.388	2	2.98	12	-.007	1	-.066	1	-.109	3
207		9	max	47.271	2	377.327	3	140.569	1	0	3	.17	4	1.012	2
208			min	-55.538	4	-812.045	2	4.826	12	-.007	1	-.016	10	-.521	3
209		10	max	47.271	2	457.015	3	185.447	1	0	3	.278	1	2.117	2
210			min	-68.085	4	-996.702	2	6.671	12	-.007	1	0	10	-1.031	3
211		11	max	47.271	2	812.045	2	23.838	5	.007	1	.078	1	1.012	2
212			min	-20.138	9	-377.327	3	-140.569	1	0	5	-.134	5	-.521	3
213		12	max	47.271	2	627.388	2	26.693	5	.007	1	-.006	12	.132	2
214			min	-20.138	9	-297.639	3	-95.69	1	0	5	-.114	4	-.109	3
215		13	max	47.271	2	442.73	2	29.548	5	.007	1	-.009	12	.206	3
216			min	-20.138	9	-217.95	3	-50.812	1	0	5	-.156	1	-.522	2
217		14	max	47.271	2	258.073	2	32.403	5	.007	1	-.009	12	.424	3
218			min	-20.138	9	-138.262	3	-7.481	9	0	5	-.19	1	-.95	2
219		15	max	47.271	2	73.415	2	42.723	4	.007	1	.011	5	.544	3
220			min	-20.138	9	-58.574	3	2.556	12	0	5	-.17	1	-1.152	2
221		16	max	47.271	2	21.114	3	83.824	1	.007	1	.056	5	.567	3
222			min	-25.19	4	-111.242	2	4.401	12	0	5	-.095	1	-1.129	2
223		17	max	47.271	2	100.802	3	128.703	1	.007	1	.108	4	.493	3
224			min	-37.736	4	-295.9	2	6.246	12	0	5	.004	12	-.881	2
225		18	max	47.271	2	180.49	3	173.581	1	.007	1	.22	1	.321	3
226			min	-50.282	4	-480.557	2	8.092	12	0	5	.012	12	-.406	2
227		19	max	47.271	2	260.178	3	218.46	1	.007	1	.459	1	.294	2
228			min	-62.829	4	-665.215	2	9.937	12	0	5	.023	12	-.035	5
229	M13	1	max	45.962	5	678.657	2	13.839	5	.007	3	.391	1	.268	2
230			min	-195.812	1	-281.608	3	-209.183	1	-.02	2	-.13	5	-.072	3
231		2	max	33.415	5	494	2	16.694	5	.007	3	.163	1	.224	3
232			min	-195.812	1	-201.92	3	-164.305	1	-.02	2	-.112	5	-.449	2
233		3	max	20.869	5	309.342	2	19.549	5	.007	3	.015	2	.422	3
234			min	-195.812	1	-122.231	3	-119.426	1	-.02	2	-.095	4	-.94	2
235		4	max	8.323	5	124.685	2	22.404	5	.007	3	-.003	12	.523	3
236			min	-195.812	1	-42.543	3	-74.547	1	-.02	2	-.129	1	-1.205	2
237		5	max	.478	3	37.145	3	25.259	5	.007	3	-.007	12	.526	3
238			min	-195.812	1	-59.972	2	-29.669	1	-.02	2	-.193	1	-1.244	2
239		6	max	.478	3	116.833	3	32.526	4	.007	3	-.001	15	.432	3
240			min	-195.812	1	-244.63	2	-3.136	10	-.02	2	-.202	1	-1.058	2
241		7	max	.478	3	196.521	3	60.088	1	.007	3	.034	5	.24	3
242			min	-195.812	1	-429.287	2	1.285	12	-.02	2	-.156	1	-.646	2
243		8	max	.478	3	276.209	3	104.967	1	.007	3	.073	5	0	10
244			min	-195.812	1	-613.945	2	3.131	12	-.02	2	-.055	1	-.048	3
245		9	max	.478	3	355.897	3	149.846	1	.007	3	.143	4	.854	2
246			min	-195.812	1	-798.602	2	4.976	12	-.02	2	-.011	10	-.435	3
247		10	max	.478	3	435.585	3	194.724	1	0	15	.311	1	1.943	2
248			min	-195.812	1	-983.26	2	6.821	12	-.02	2	.006	12	-.918	3
249		11	max	32.129	5	798.602	2	17.022	5	.02	2	.101	1	.854	2
250			min	-195.812	1	-355.897	3	-149.846	1	-.007	3	-.101	5	-.435	3
251		12	max	19.583	5	613.945	2	19.877	5	.02	2	-.006	12	.003	5
252			min	-195.812	1	-276.209	3	-104.967	1	-.007	3	-.087	4	-.048	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
253		13	max	7.036	5	429.287	2	22.732	5	.02	2	-.009	12	.24	3
254			min	-195.812	1	-196.521	3	-60.088	1	-.007	3	-.156	1	-.646	2
255		14	max	.478	3	244.63	2	25.587	5	.02	2	-.009	12	.432	3
256			min	-195.812	1	-116.833	3	-15.21	1	-.007	3	-.202	1	-1.058	2
257		15	max	.478	3	59.972	2	34.001	4	.02	2	.01	5	.526	3
258			min	-195.812	1	-37.145	3	2.405	12	-.007	3	-.193	1	-1.244	2
259		16	max	.478	3	42.543	3	74.547	1	.02	2	.047	5	.523	3
260			min	-195.812	1	-124.685	2	4.251	12	-.007	3	-.129	1	-1.205	2
261		17	max	.478	3	122.231	3	119.426	1	.02	2	.087	5	.422	3
262			min	-195.812	1	-309.342	2	6.096	12	-.007	3	-.015	9	-.94	2
263		18	max	.478	3	201.92	3	164.305	1	.02	2	.163	1	.224	3
264			min	-195.812	1	-494	2	7.941	12	-.007	3	.012	12	-.449	2
265		19	max	.478	3	281.608	3	209.183	1	.02	2	.391	1	.268	2
266			min	-195.812	1	-678.657	2	9.787	12	-.007	3	.022	12	-.072	3
267	M2	1	max	2507.983	1	870.56	3	313.938	1	.012	5	1.447	5	5.363	1
268			min	-1657.898	3	-635.684	2	-354.914	5	-.012	2	-.395	1	.515	15
269		2	max	2505.429	1	870.56	3	313.938	1	.012	5	1.348	5	5.416	1
270			min	-1659.814	3	-635.684	2	-352.7	5	-.012	2	-.307	1	.494	15
271		3	max	2502.874	1	870.56	3	313.938	1	.012	5	1.249	5	5.469	1
272			min	-1661.73	3	-635.684	2	-350.485	5	-.012	2	-.219	1	.473	15
273		4	max	1874.512	1	1258.693	1	241.329	1	.002	2	1.151	5	5.297	1
274			min	-1430.293	3	106.262	15	-333.614	5	-.001	3	-.186	1	.447	15
275		5	max	1871.957	1	1258.693	1	241.329	1	.002	2	1.057	5	4.944	1
276			min	-1432.209	3	106.262	15	-331.4	5	-.001	3	-.118	1	.417	15
277		6	max	1869.402	1	1258.693	1	241.329	1	.002	2	.965	4	4.591	1
278			min	-1434.125	3	106.262	15	-329.186	5	-.001	3	-.051	1	.388	15
279		7	max	1866.847	1	1258.693	1	241.329	1	.002	2	.882	4	4.238	1
280			min	-1436.041	3	106.262	15	-326.972	5	-.001	3	-.078	3	.358	15
281		8	max	1864.292	1	1258.693	1	241.329	1	.002	2	.8	4	3.885	1
282			min	-1437.958	3	106.262	15	-324.757	5	-.001	3	-.157	3	.328	15
283		9	max	1861.737	1	1258.693	1	241.329	1	.002	2	.718	4	3.532	1
284			min	-1439.874	3	106.262	15	-322.543	5	-.001	3	-.236	3	.298	15
285		10	max	1859.182	1	1258.693	1	241.329	1	.002	2	.636	4	3.178	1
286			min	-1441.79	3	106.262	15	-320.329	5	-.001	3	-.314	3	.268	15
287		11	max	1856.627	1	1258.693	1	241.329	1	.002	2	.556	4	2.825	1
288			min	-1443.706	3	106.262	15	-318.115	5	-.001	3	-.393	3	.239	15
289		12	max	1854.073	1	1258.693	1	241.329	1	.002	2	.476	4	2.472	1
290			min	-1445.622	3	106.262	15	-315.9	5	-.001	3	-.472	3	.209	15
291		13	max	1851.518	1	1258.693	1	241.329	1	.002	2	.423	1	2.119	1
292			min	-1447.538	3	106.262	15	-313.686	5	-.001	3	-.55	3	.179	15
293		14	max	1848.963	1	1258.693	1	241.329	1	.002	2	.491	1	1.766	1
294			min	-1449.455	3	106.262	15	-311.472	5	-.001	3	-.629	3	.149	15
295		15	max	1846.408	1	1258.693	1	241.329	1	.002	2	.559	1	1.413	1
296			min	-1451.371	3	106.262	15	-309.258	5	-.001	3	-.708	3	.119	15
297		16	max	1843.853	1	1258.693	1	241.329	1	.002	2	.626	1	1.059	1
298			min	-1453.287	3	106.262	15	-307.043	5	-.001	3	-.786	3	.089	15
299		17	max	1841.298	1	1258.693	1	241.329	1	.002	2	.694	1	.706	1
300			min	-1455.203	3	106.262	15	-304.829	5	-.001	3	-.865	3	.06	15
301		18	max	1838.743	1	1258.693	1	241.329	1	.002	2	.762	1	.353	1
302			min	-1457.119	3	106.262	15	-302.615	5	-.001	3	-.944	3	.03	15
303		19	max	1836.188	1	1258.693	1	241.329	1	.002	2	.83	1	0	1
304			min	-1459.035	3	106.262	15	-300.401	5	-.001	3	-1.022	3	0	1
305	M5	1	max	6795.83	1	2423.234	3	0	1	.013	4	1.523	4	11.048	1
306			min	-4961.291	3	-2365.314	2	-389.08	5	0	1	0	1	.376	15
307		2	max	6793.276	1	2423.234	3	0	1	.013	4	1.415	4	11.45	1
308			min	-4963.207	3	-2365.314	2	-386.866	5	0	1	0	1	.379	15
309		3	max	6790.721	1	2423.234	3	0	1	.013	4	1.307	4	11.852	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	-4965.123	3	-2365.314	2	-384.651	5	0	1	0	1	.383	15
311		4	max	5025.963	1	2757.422	1	0	1	0	1	1.203	4	11.605	1
312			min	-4165.675	3	88.172	15	-368.882	4	0	4	0	1	.371	15
313		5	max	5023.408	1	2757.422	1	0	1	0	1	1.099	4	10.831	1
314			min	-4167.591	3	88.172	15	-366.668	4	0	4	0	1	.346	15
315		6	max	5020.853	1	2757.422	1	0	1	0	1	.997	4	10.058	1
316			min	-4169.507	3	88.172	15	-364.454	4	0	4	0	1	.322	15
317		7	max	5018.298	1	2757.422	1	0	1	0	1	.895	4	9.284	1
318			min	-4171.424	3	88.172	15	-362.24	4	0	4	0	1	.297	15
319		8	max	5015.743	1	2757.422	1	0	1	0	1	.794	4	8.51	1
320			min	-4173.34	3	88.172	15	-360.025	4	0	4	0	1	.272	15
321		9	max	5013.188	1	2757.422	1	0	1	0	1	.693	4	7.737	1
322			min	-4175.256	3	88.172	15	-357.811	4	0	4	0	1	.247	15
323		10	max	5010.633	1	2757.422	1	0	1	0	1	.593	4	6.963	1
324			min	-4177.172	3	88.172	15	-355.597	4	0	4	0	1	.223	15
325		11	max	5008.078	1	2757.422	1	0	1	0	1	.493	4	6.189	1
326			min	-4179.088	3	88.172	15	-353.383	4	0	4	0	1	.198	15
327		12	max	5005.523	1	2757.422	1	0	1	0	1	.394	4	5.416	1
328			min	-4181.004	3	88.172	15	-351.169	4	0	4	0	1	.173	15
329		13	max	5002.969	1	2757.422	1	0	1	0	1	.296	4	4.642	1
330			min	-4182.921	3	88.172	15	-348.954	4	0	4	0	1	.148	15
331		14	max	5000.414	1	2757.422	1	0	1	0	1	.199	4	3.868	1
332			min	-4184.837	3	88.172	15	-346.74	4	0	4	0	1	.124	15
333		15	max	4997.859	1	2757.422	1	0	1	0	1	.102	4	3.095	1
334			min	-4186.753	3	88.172	15	-344.526	4	0	4	0	1	.099	15
335		16	max	4995.304	1	2757.422	1	0	1	0	1	.005	4	2.321	1
336			min	-4188.669	3	88.172	15	-342.312	4	0	4	0	1	.074	15
337		17	max	4992.749	1	2757.422	1	0	1	0	1	0	1	1.547	1
338			min	-4190.585	3	88.172	15	-340.097	4	0	4	-.09	4	.049	15
339		18	max	4990.194	1	2757.422	1	0	1	0	1	0	1	.774	1
340			min	-4192.501	3	88.172	15	-337.883	4	0	4	-.186	4	.025	15
341		19	max	4987.639	1	2757.422	1	0	1	0	1	0	1	0	1
342			min	-4194.418	3	88.172	15	-335.669	4	0	4	-.28	4	0	1
343	M8	1	max	2507.983	1	870.56	3	312.784	3	.014	4	1.556	4	5.363	1
344			min	-1657.898	3	-635.684	2	-426.458	4	-.005	3	-.393	3	-.146	5
345		2	max	2505.429	1	870.56	3	312.784	3	.014	4	1.437	4	5.416	1
346			min	-1659.814	3	-635.684	2	-424.244	4	-.005	3	-.305	3	-.121	5
347		3	max	2502.874	1	870.56	3	312.784	3	.014	4	1.318	4	5.469	1
348			min	-1661.73	3	-635.684	2	-422.03	4	-.005	3	-.217	3	-.095	5
349		4	max	1874.512	1	1258.693	1	280.414	3	.001	3	1.21	4	5.297	1
350			min	-1430.293	3	-19.234	5	-392.501	4	-.002	2	-.158	3	-.081	5
351		5	max	1871.957	1	1258.693	1	280.414	3	.001	3	1.1	4	4.944	1
352			min	-1432.209	3	-19.234	5	-390.287	4	-.002	2	-.079	3	-.076	5
353		6	max	1869.402	1	1258.693	1	280.414	3	.001	3	.991	4	4.591	1
354			min	-1434.125	3	-19.234	5	-388.072	4	-.002	2	0	3	-.07	5
355		7	max	1866.847	1	1258.693	1	280.414	3	.001	3	.882	4	4.238	1
356			min	-1436.041	3	-19.234	5	-385.858	4	-.002	2	-.035	2	-.065	5
357		8	max	1864.292	1	1258.693	1	280.414	3	.001	3	.775	5	3.885	1
358			min	-1437.958	3	-19.234	5	-383.644	4	-.002	2	-.099	2	-.059	5
359		9	max	1861.737	1	1258.693	1	280.414	3	.001	3	.679	5	3.532	1
360			min	-1439.874	3	-19.234	5	-381.43	4	-.002	2	-.163	2	-.054	5
361		10	max	1859.182	1	1258.693	1	280.414	3	.001	3	.583	5	3.178	1
362			min	-1441.79	3	-19.234	5	-379.216	4	-.002	2	-.227	2	-.049	5
363		11	max	1856.627	1	1258.693	1	280.414	3	.001	3	.488	5	2.825	1
364			min	-1443.706	3	-19.234	5	-377.001	4	-.002	2	-.291	2	-.043	5
365		12	max	1854.073	1	1258.693	1	280.414	3	.001	3	.472	3	2.472	1
366			min	-1445.622	3	-19.234	5	-374.787	4	-.002	2	-.356	1	-.038	5

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	1851.518	1	1258.693	1	280.414	3	.001	3	.55	3	2.119	1
368			min	-1447.538	3	-19.234	5	-372.573	4	-.002	2	-.423	1	-.032	5
369		14	max	1848.963	1	1258.693	1	280.414	3	.001	3	.629	3	1.766	1
370			min	-1449.455	3	-19.234	5	-370.359	4	-.002	2	-.491	1	-.027	5
371		15	max	1846.408	1	1258.693	1	280.414	3	.001	3	.708	3	1.413	1
372			min	-1451.371	3	-19.234	5	-368.144	4	-.002	2	-.559	1	-.022	5
373		16	max	1843.853	1	1258.693	1	280.414	3	.001	3	.786	3	1.059	1
374			min	-1453.287	3	-19.234	5	-365.93	4	-.002	2	-.626	1	-.016	5
375		17	max	1841.298	1	1258.693	1	280.414	3	.001	3	.865	3	.706	1
376			min	-1455.203	3	-19.234	5	-363.716	4	-.002	2	-.694	1	-.011	5
377		18	max	1838.743	1	1258.693	1	280.414	3	.001	3	.944	3	.353	1
378			min	-1457.119	3	-19.234	5	-361.502	4	-.002	2	-.762	1	-.005	5
379		19	max	1836.188	1	1258.693	1	280.414	3	.001	3	1.022	3	0	1
380			min	-1459.035	3	-19.234	5	-359.287	4	-.002	2	-.83	1	0	1
381	M3	1	max	1720.633	2	4.588	4	75.101	2	.024	3	.014	4	0	1
382			min	-588.54	3	1.079	15	-33.029	3	-.05	2	-.003	3	0	1
383		2	max	1720.459	2	4.078	4	75.101	2	.024	3	.028	2	0	15
384			min	-588.671	3	.959	15	-33.029	3	-.05	2	-.013	3	-.001	4
385		3	max	1720.285	2	3.569	4	75.101	2	.024	3	.05	2	0	15
386			min	-588.801	3	.839	15	-33.029	3	-.05	2	-.023	3	-.002	4
387		4	max	1720.11	2	3.059	4	75.101	2	.024	3	.072	2	0	15
388			min	-588.932	3	.719	15	-33.029	3	-.05	2	-.032	3	-.003	4
389		5	max	1719.936	2	2.549	4	75.101	2	.024	3	.094	2	0	15
390			min	-589.063	3	.599	15	-33.029	3	-.05	2	-.042	3	-.004	4
391		6	max	1719.761	2	2.039	4	75.101	2	.024	3	.116	2	-.001	15
392			min	-589.194	3	.479	15	-33.029	3	-.05	2	-.052	3	-.005	4
393		7	max	1719.587	2	1.529	4	75.101	2	.024	3	.138	2	-.001	15
394			min	-589.325	3	.36	15	-33.029	3	-.05	2	-.061	3	-.005	4
395		8	max	1719.413	2	1.02	4	75.101	2	.024	3	.16	2	-.001	15
396			min	-589.455	3	.24	15	-33.029	3	-.05	2	-.071	3	-.006	4
397		9	max	1719.238	2	.51	4	75.101	2	.024	3	.182	2	-.001	15
398			min	-589.586	3	.12	15	-33.029	3	-.05	2	-.081	3	-.006	4
399		10	max	1719.064	2	0	1	75.101	2	.024	3	.204	2	-.001	15
400			min	-589.717	3	0	1	-33.029	3	-.05	2	-.09	3	-.006	4
401		11	max	1718.89	2	-.12	15	75.101	2	.024	3	.226	2	-.001	15
402			min	-589.848	3	-.51	6	-33.029	3	-.05	2	-.1	3	-.006	4
403		12	max	1718.715	2	-.24	15	75.101	2	.024	3	.248	2	-.001	15
404			min	-589.978	3	-1.02	6	-33.029	3	-.05	2	-.11	3	-.006	4
405		13	max	1718.541	2	-.36	15	75.101	2	.024	3	.27	2	-.001	15
406			min	-590.109	3	-1.529	6	-33.029	3	-.05	2	-.119	3	-.005	4
407		14	max	1718.366	2	-.479	15	75.101	2	.024	3	.292	2	-.001	15
408			min	-590.24	3	-2.039	6	-33.029	3	-.05	2	-.129	3	-.005	4
409		15	max	1718.192	2	-.599	15	75.101	2	.024	3	.314	2	0	15
410			min	-590.371	3	-2.549	6	-33.029	3	-.05	2	-.139	3	-.004	4
411		16	max	1718.018	2	-.719	15	75.101	2	.024	3	.336	2	0	15
412			min	-590.502	3	-3.059	6	-33.029	3	-.05	2	-.148	3	-.003	4
413		17	max	1717.843	2	-.839	15	75.101	2	.024	3	.358	2	0	15
414			min	-590.632	3	-3.569	6	-33.029	3	-.05	2	-.158	3	-.002	4
415		18	max	1717.669	2	-.959	15	75.101	2	.024	3	.38	2	0	15
416			min	-590.763	3	-4.078	6	-33.029	3	-.05	2	-.168	3	-.001	4
417		19	max	1717.494	2	-1.079	15	75.101	2	.024	3	.402	2	0	1
418			min	-590.894	3	-4.588	6	-33.029	3	-.05	2	-.177	3	0	1
419	M6	1	max	4987.159	2	4.588	4	0	1	.006	5	.012	4	0	1
420			min	-2010.789	3	1.079	15	-19.469	4	0	1	0	1	0	1
421		2	max	4986.985	2	4.078	4	0	1	.006	5	.006	4	0	15
422			min	-2010.92	3	.959	15	-19.093	4	0	1	0	1	-.001	4
423		3	max	4986.81	2	3.569	4	0	1	.006	5	0	4	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	-2011.051	3	.839	15	-18.717	4	0	1	0	1	-.002	4
425		4	max	4986.636	2	3.059	4	0	1	.006	5	0	1	0	15
426			min	-2011.182	3	.719	15	-18.341	4	0	1	-.004	4	-.003	4
427		5	max	4986.462	2	2.549	4	0	1	.006	5	0	1	0	15
428			min	-2011.312	3	.599	15	-17.965	4	0	1	-.01	4	-.004	4
429		6	max	4986.287	2	2.039	4	0	1	.006	5	0	1	-.001	15
430			min	-2011.443	3	.479	15	-17.589	4	0	1	-.015	4	-.005	4
431		7	max	4986.113	2	1.529	4	0	1	.006	5	0	1	-.001	15
432			min	-2011.574	3	.36	15	-17.213	4	0	1	-.02	4	-.005	4
433		8	max	4985.938	2	1.02	4	0	1	.006	5	0	1	-.001	15
434			min	-2011.705	3	.24	15	-16.837	4	0	1	-.025	4	-.006	4
435		9	max	4985.764	2	.51	4	0	1	.006	5	0	1	-.001	15
436			min	-2011.836	3	.12	15	-16.461	4	0	1	-.03	4	-.006	4
437		10	max	4985.59	2	0	1	0	1	.006	5	0	1	-.001	15
438			min	-2011.966	3	0	1	-16.085	4	0	1	-.035	4	-.006	4
439		11	max	4985.415	2	-.12	15	0	1	.006	5	0	1	-.001	15
440			min	-2012.097	3	-.51	6	-15.709	4	0	1	-.039	4	-.006	4
441		12	max	4985.241	2	-.24	15	0	1	.006	5	0	1	-.001	15
442			min	-2012.228	3	-1.02	6	-15.333	4	0	1	-.044	4	-.006	4
443		13	max	4985.066	2	-.36	15	0	1	.006	5	0	1	-.001	15
444			min	-2012.359	3	-1.529	6	-14.957	4	0	1	-.048	4	-.005	4
445		14	max	4984.892	2	-.479	15	0	1	.006	5	0	1	-.001	15
446			min	-2012.49	3	-2.039	6	-14.581	4	0	1	-.053	4	-.005	4
447		15	max	4984.718	2	-.599	15	0	1	.006	5	0	1	0	15
448			min	-2012.62	3	-2.549	6	-14.205	4	0	1	-.057	4	-.004	4
449		16	max	4984.543	2	-.719	15	0	1	.006	5	0	1	0	15
450			min	-2012.751	3	-3.059	6	-13.829	4	0	1	-.061	4	-.003	4
451		17	max	4984.369	2	-.839	15	0	1	.006	5	0	1	0	15
452			min	-2012.882	3	-3.569	6	-13.453	4	0	1	-.065	4	-.002	4
453		18	max	4984.195	2	-.959	15	0	1	.006	5	0	1	0	15
454			min	-2013.013	3	-4.078	6	-13.077	4	0	1	-.069	4	-.001	4
455		19	max	4984.02	2	-1.079	15	0	1	.006	5	0	1	0	1
456			min	-2013.143	3	-4.588	6	-12.701	4	0	1	-.073	4	0	1
457	M9	1	max	1720.633	2	4.588	4	33.029	3	.05	2	.012	5	0	1
458			min	-588.54	3	1.079	15	-75.101	2	-.024	3	-.006	2	0	1
459		2	max	1720.459	2	4.078	4	33.029	3	.05	2	.013	3	0	15
460			min	-588.671	3	.959	15	-75.101	2	-.024	3	-.028	2	-.001	4
461		3	max	1720.285	2	3.569	4	33.029	3	.05	2	.023	3	0	15
462			min	-588.801	3	.839	15	-75.101	2	-.024	3	-.05	2	-.002	4
463		4	max	1720.11	2	3.059	4	33.029	3	.05	2	.032	3	0	15
464			min	-588.932	3	.719	15	-75.101	2	-.024	3	-.072	2	-.003	4
465		5	max	1719.936	2	2.549	4	33.029	3	.05	2	.042	3	0	15
466			min	-589.063	3	.599	15	-75.101	2	-.024	3	-.094	2	-.004	4
467		6	max	1719.761	2	2.039	4	33.029	3	.05	2	.052	3	-.001	15
468			min	-589.194	3	.479	15	-75.101	2	-.024	3	-.116	2	-.005	4
469		7	max	1719.587	2	1.529	4	33.029	3	.05	2	.061	3	-.001	15
470			min	-589.325	3	.36	15	-75.101	2	-.024	3	-.138	2	-.005	4
471		8	max	1719.413	2	1.02	4	33.029	3	.05	2	.071	3	-.001	15
472			min	-589.455	3	.24	15	-75.101	2	-.024	3	-.16	2	-.006	4
473		9	max	1719.238	2	.51	4	33.029	3	.05	2	.081	3	-.001	15
474			min	-589.586	3	.12	15	-75.101	2	-.024	3	-.182	2	-.006	4
475		10	max	1719.064	2	0	1	33.029	3	.05	2	.09	3	-.001	15
476			min	-589.717	3	0	1	-75.101	2	-.024	3	-.204	2	-.006	4
477		11	max	1718.89	2	-.12	15	33.029	3	.05	2	.1	3	-.001	15
478			min	-589.848	3	-.51	6	-75.101	2	-.024	3	-.226	2	-.006	4
479		12	max	1718.715	2	-.24	15	33.029	3	.05	2	.11	3	-.001	15
480			min	-589.978	3	-1.02	6	-75.101	2	-.024	3	-.248	2	-.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	1718.541	2	-.36	15	33.029	3	.05	2	.119	3	-.001	15
482			min	-590.109	3	-1.529	6	-75.101	2	-.024	3	-.27	2	-.005	4
483		14	max	1718.366	2	-.479	15	33.029	3	.05	2	.129	3	-.001	15
484			min	-590.24	3	-2.039	6	-75.101	2	-.024	3	-.292	2	-.005	4
485		15	max	1718.192	2	-.599	15	33.029	3	.05	2	.139	3	0	15
486			min	-590.371	3	-2.549	6	-75.101	2	-.024	3	-.314	2	-.004	4
487		16	max	1718.018	2	-.719	15	33.029	3	.05	2	.148	3	0	15
488			min	-590.502	3	-3.059	6	-75.101	2	-.024	3	-.336	2	-.003	4
489		17	max	1717.843	2	-.839	15	33.029	3	.05	2	.158	3	0	15
490			min	-590.632	3	-3.569	6	-75.101	2	-.024	3	-.358	2	-.002	4
491		18	max	1717.669	2	-.959	15	33.029	3	.05	2	.168	3	0	15
492			min	-590.763	3	-4.078	6	-75.101	2	-.024	3	-.38	2	-.001	4
493		19	max	1717.494	2	-1.079	15	33.029	3	.05	2	.177	3	0	1
494			min	-590.894	3	-4.588	6	-75.101	2	-.024	3	-.402	2	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	-.023	15	.036	3	.03	1	1.181e-2	3	NC	3	NC	3
2			min	-.267	1	-.655	1	-.613	5	-3.039e-2	2	189.819	1	268.203	5
3		2	max	-.023	15	.013	3	.009	1	1.181e-2	3	9450.946	12	NC	3
4			min	-.267	1	-.555	1	-.584	4	-3.039e-2	2	221.197	1	285.334	5
5		3	max	-.023	15	-.008	12	0	12	1.125e-2	3	4719.391	12	NC	2
6			min	-.267	1	-.455	1	-.556	4	-2.828e-2	2	265.057	1	305.712	5
7		4	max	-.023	15	-.021	12	0	12	1.039e-2	3	3218.278	12	NC	1
8			min	-.267	1	-.358	1	-.522	4	-2.506e-2	2	327.708	1	333.256	5
9		5	max	-.023	15	-.021	15	0	3	9.529e-3	3	3016.391	15	NC	1
10			min	-.267	1	-.271	1	-.482	4	-2.183e-2	2	416.899	1	369.993	5
11		6	max	-.023	15	-.017	15	.002	3	9.727e-3	3	3331.883	15	NC	1
12			min	-.266	1	-.198	1	-.439	4	-2.099e-2	2	538.43	1	418.264	5
13		7	max	-.023	15	-.013	15	.002	3	1.066e-2	3	5000.809	10	NC	2
14			min	-.266	1	-.14	1	-.396	4	-2.179e-2	2	702.636	1	480.127	5
15		8	max	-.023	15	-.01	15	0	3	1.159e-2	3	NC	10	NC	2
16			min	-.265	1	-.091	1	-.355	4	-2.26e-2	2	944.276	1	558.473	5
17		9	max	-.023	15	-.006	15	0	9	1.274e-2	3	NC	2	NC	2
18			min	-.265	1	-.06	3	-.319	4	-2.212e-2	2	1372.398	1	657.018	5
19		10	max	-.023	15	.004	2	0	1	1.429e-2	3	7818.379	11	NC	2
20			min	-.264	1	-.052	3	-.283	4	-1.938e-2	2	1518.63	3	799.259	5
21		11	max	-.023	15	.036	1	.002	3	1.584e-2	3	NC	11	NC	2
22			min	-.264	1	-.042	3	-.248	4	-1.682e-2	1	1732.174	3	1012.488	5
23		12	max	-.023	15	.072	1	.008	3	1.298e-2	3	NC	9	NC	2
24			min	-.263	1	-.026	3	-.216	4	-1.266e-2	1	1800.733	2	1346.574	5
25		13	max	-.023	15	.102	1	.014	3	7.628e-3	3	NC	9	NC	2
26			min	-.262	1	-.003	3	-.184	4	-7.349e-3	1	1416.791	2	1967.14	5
27		14	max	-.023	15	.12	1	.014	3	2.523e-3	3	NC	3	NC	2
28			min	-.262	1	.011	15	-.157	4	-5.59e-3	4	1293.258	2	3146.419	5
29		15	max	-.023	15	.122	1	.009	3	8.335e-3	3	NC	4	NC	2
30			min	-.262	1	.013	15	-.138	5	-5.99e-3	1	1376.392	2	3998.822	1
31		16	max	-.023	15	.174	3	.012	1	1.415e-2	3	NC	4	NC	3
32			min	-.262	1	.016	15	-.127	5	-9.742e-3	1	968.142	3	3517.038	1
33		17	max	-.023	15	.261	3	.007	1	1.996e-2	3	NC	4	NC	3
34			min	-.262	1	.012	10	-.121	5	-1.349e-2	1	594.957	3	3952.023	1
35		18	max	-.023	15	.352	3	-.001	12	2.375e-2	3	NC	4	NC	2
36			min	-.262	1	-.004	10	-.12	4	-1.594e-2	1	424.115	3	7265.881	1
37		19	max	-.023	15	.443	3	-.003	12	2.375e-2	3	NC	1	NC	1
38			min	-.262	1	-.02	10	-.12	4	-1.594e-2	1	329.608	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	-.019	15	.204	3	0	1	1.773e-4	4	NC	3	NC	1
40			min	-.581	1	-1.54	1	-.609	4	0	1	88.883	1	270.269	4
41		2	max	-.019	15	.13	3	0	1	1.773e-4	4	3379.142	15	NC	1
42			min	-.581	1	-1.296	1	-.584	4	0	1	106.042	1	284.431	4
43		3	max	-.019	15	.056	3	0	1	0	1	4072.224	15	NC	1
44			min	-.58	1	-1.051	1	-.557	4	-7.146e-5	4	131.488	1	301.582	4
45		4	max	-.019	15	-.011	12	0	1	0	1	5080.921	15	NC	1
46			min	-.58	1	-.816	1	-.523	4	-4.53e-4	4	171.026	1	327.133	4
47		5	max	-.019	15	-.019	15	0	1	0	1	6556.596	15	NC	1
48			min	-.58	1	-.605	1	-.482	4	-8.346e-4	4	234	1	363.176	4
49		6	max	-.019	15	-.014	15	0	1	0	1	8647.351	15	NC	1
50			min	-.579	1	-.435	1	-.438	4	-7.991e-4	4	332.591	1	412.033	4
51		7	max	-.019	15	-.01	15	0	1	0	1	NC	15	NC	1
52			min	-.578	1	-.304	1	-.395	4	-4.75e-4	4	407.431	3	475.156	4
53		8	max	-.019	15	-.007	15	0	1	0	1	NC	5	NC	1
54			min	-.577	1	-.198	1	-.355	4	-1.51e-4	4	402.919	3	553.918	4
55		9	max	-.019	15	-.003	15	0	1	0	1	NC	5	NC	1
56			min	-.575	1	-.125	3	-.32	4	-1.41e-5	4	408.202	3	648.891	4
57		10	max	-.019	15	.004	10	0	1	0	1	NC	4	NC	1
58			min	-.574	1	-.115	3	-.283	4	-2.08e-4	4	420.478	3	789.282	4
59		11	max	-.018	15	.08	1	0	1	0	1	NC	4	NC	1
60			min	-.573	1	-.098	3	-.247	4	-4.019e-4	4	444.703	3	998.63	4
61		12	max	-.018	15	.162	1	0	1	0	1	NC	5	NC	1
62			min	-.571	1	-.071	3	-.216	4	-1.613e-3	4	488.228	3	1307.262	4
63		13	max	-.018	15	.227	1	0	1	0	1	NC	5	NC	1
64			min	-.569	1	-.022	3	-.185	4	-3.399e-3	4	442.463	2	1872.668	4
65		14	max	-.018	15	.26	1	0	1	0	1	NC	5	NC	1
66			min	-.568	1	.008	15	-.159	4	-5.118e-3	4	415.709	2	2895.16	4
67		15	max	-.018	15	.245	1	0	1	0	1	NC	3	NC	1
68			min	-.568	1	.008	15	-.142	4	-3.844e-3	4	448.939	2	4582.306	4
69		16	max	-.018	15	.406	3	0	1	0	1	NC	5	NC	1
70			min	-.568	1	.007	15	-.131	4	-2.57e-3	4	552.785	2	7576.538	4
71		17	max	-.018	15	.623	3	0	1	0	1	NC	5	NC	1
72			min	-.568	1	.005	15	-.123	4	-1.296e-3	4	319.968	3	NC	1
73		18	max	-.018	15	.849	3	0	1	0	1	NC	4	NC	1
74			min	-.568	1	-.033	10	-.118	4	-4.652e-4	4	207.818	3	NC	1
75		19	max	-.018	15	1.074	3	0	1	0	1	NC	1	NC	1
76			min	-.568	1	-.114	2	-.113	4	-4.652e-4	4	153.991	3	NC	1
77	M7	1	max	.004	5	.036	3	-.001	12	3.039e-2	2	NC	3	NC	3
78			min	-.267	1	-.655	1	-.626	4	-1.181e-2	3	189.819	1	257.638	4
79		2	max	.004	5	.013	3	0	12	3.039e-2	2	NC	5	NC	3
80			min	-.267	1	-.555	1	-.589	4	-1.181e-2	3	221.197	1	277.277	4
81		3	max	.004	5	0	15	.009	1	2.828e-2	2	NC	5	NC	2
82			min	-.267	1	-.455	1	-.552	4	-1.125e-2	3	265.057	1	300.402	4
83		4	max	.004	5	.001	15	.016	1	2.506e-2	2	NC	5	NC	1
84			min	-.267	1	-.358	1	-.513	5	-1.039e-2	3	327.708	1	328.955	4
85		5	max	.004	5	.003	5	.017	1	2.183e-2	2	NC	5	NC	1
86			min	-.267	1	-.271	1	-.473	5	-9.529e-3	3	416.899	1	364.855	4
87		6	max	.004	5	.003	5	.014	1	2.099e-2	2	NC	5	NC	1
88			min	-.266	1	-.198	1	-.432	4	-9.727e-3	3	538.43	1	410.293	4
89		7	max	.004	5	.004	5	.007	1	2.179e-2	2	NC	5	NC	2
90			min	-.266	1	-.14	1	-.393	4	-1.066e-2	3	702.636	1	466.219	4
91		8	max	.004	5	.003	5	.002	2	2.26e-2	2	NC	4	NC	2
92			min	-.265	1	-.091	1	-.355	4	-1.159e-2	3	944.276	1	536.367	4
93		9	max	.004	5	.003	5	0	3	2.212e-2	2	NC	2	NC	2
94			min	-.265	1	-.06	3	-.319	4	-1.274e-2	3	1372.398	1	627.451	4
95		10	max	.004	5	.004	2	0	3	1.938e-2	2	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	-.264	1	-.052	3	-.283	4	-1.429e-2	3	1518.63	3	755.929	4
97		11	max	.004	5	.036	1	.001	1	1.682e-2	1	NC	5	NC	2
98			min	-.264	1	-.042	3	-.247	4	-1.584e-2	3	1732.174	3	947.531	4
99		12	max	.004	5	.072	1	.008	1	1.266e-2	1	NC	5	NC	2
100			min	-.263	1	-.026	3	-.212	4	-1.298e-2	3	1800.733	2	1256.06	4
101		13	max	.005	5	.102	1	.01	2	7.349e-3	1	NC	5	NC	2
102			min	-.262	1	-.003	3	-.181	4	-7.628e-3	3	1416.791	2	1783.991	4
103		14	max	.005	5	.12	1	.006	2	2.238e-3	1	NC	3	NC	2
104			min	-.262	1	-.002	5	-.157	4	-5.017e-3	5	1293.258	2	2595.36	4
105		15	max	.004	5	.122	1	0	10	5.99e-3	1	NC	5	NC	2
106			min	-.262	1	-.005	5	-.143	4	-8.335e-3	3	1376.392	2	3594.471	4
107		16	max	.004	5	.174	3	-.001	10	9.742e-3	1	NC	5	NC	3
108			min	-.262	1	-.009	5	-.133	4	-1.415e-2	3	968.142	3	3517.038	1
109		17	max	.004	5	.261	3	-.001	10	1.349e-2	1	NC	5	NC	3
110			min	-.262	1	-.014	5	-.125	4	-1.996e-2	3	594.957	3	3952.023	1
111		18	max	.004	5	.352	3	.008	1	1.594e-2	1	NC	4	NC	2
112			min	-.262	1	-.019	5	-.116	5	-2.375e-2	3	424.115	3	7265.881	1
113		19	max	.004	5	.443	3	.026	1	1.594e-2	1	NC	1	NC	1
114			min	-.262	1	-.023	5	-.11	5	-2.375e-2	3	329.608	3	NC	1
115	M10	1	max	.002	1	.32	3	.262	1	1.217e-2	3	NC	1	NC	1
116			min	-.119	4	-.017	5	-.004	5	-3.681e-3	2	NC	1	NC	1
117		2	max	.001	1	.681	3	.336	1	1.418e-2	3	NC	5	NC	3
118			min	-.119	4	-.204	2	.004	15	-4.51e-3	2	731.617	3	3564.169	1
119		3	max	.001	1	1.014	3	.451	1	1.619e-2	3	NC	5	NC	3
120			min	-.119	4	-.404	2	.011	15	-5.34e-3	2	380.557	3	1394.342	1
121		4	max	.001	1	1.258	3	.566	1	1.821e-2	3	NC	5	NC	5
122			min	-.119	4	-.538	2	.016	15	-6.169e-3	2	281.553	3	867.691	1
123		5	max	0	1	1.378	3	.652	1	2.022e-2	3	NC	5	NC	5
124			min	-.119	4	-.581	2	.018	15	-6.999e-3	2	249.497	3	676.315	1
125		6	max	0	1	1.367	3	.694	1	2.223e-2	3	NC	5	NC	5
126			min	-.119	4	-.531	2	.018	15	-7.828e-3	2	252.142	3	610.815	1
127		7	max	0	1	1.243	3	.69	1	2.424e-2	3	NC	5	NC	5
128			min	-.119	4	-.403	2	.017	15	-8.657e-3	2	286.119	3	617.566	1
129		8	max	0	1	1.05	3	.649	1	2.625e-2	3	NC	5	NC	5
130			min	-.119	4	-.233	2	.015	15	-9.487e-3	2	361.7	3	682.357	1
131		9	max	0	1	.86	3	.596	1	2.826e-2	3	NC	4	NC	5
132			min	-.119	4	-.075	2	.015	15	-1.032e-2	2	489.064	3	789.894	1
133		10	max	0	1	.77	3	.568	1	3.028e-2	3	NC	1	NC	5
134			min	-.12	4	-.017	10	.018	15	-1.115e-2	2	586.556	3	861.858	1
135		11	max	0	10	.86	3	.596	1	2.826e-2	3	NC	4	NC	5
136			min	-.12	4	-.075	2	.024	15	-1.032e-2	2	489.064	3	789.894	1
137		12	max	0	10	1.05	3	.649	1	2.625e-2	3	NC	5	NC	5
138			min	-.12	4	-.233	2	.029	15	-9.487e-3	2	361.7	3	682.357	1
139		13	max	0	10	1.243	3	.69	1	2.424e-2	3	NC	5	NC	15
140			min	-.12	4	-.403	2	.032	15	-8.657e-3	2	286.119	3	617.566	1
141		14	max	0	10	1.367	3	.694	1	2.223e-2	3	NC	15	NC	5
142			min	-.12	4	-.531	2	.032	15	-7.828e-3	2	252.142	3	610.815	1
143		15	max	0	10	1.378	3	.652	1	2.022e-2	3	8484.599	15	NC	5
144			min	-.12	4	-.581	2	.03	15	-6.999e-3	2	249.497	3	676.315	1
145		16	max	0	10	1.258	3	.566	1	1.821e-2	3	8215.391	15	NC	5
146			min	-.12	4	-.538	2	.026	15	-6.169e-3	2	281.553	3	867.691	1
147		17	max	0	10	1.014	3	.451	1	1.619e-2	3	9587.002	15	NC	3
148			min	-.12	4	-.404	2	.023	15	-5.34e-3	2	380.557	3	1394.342	1
149		18	max	0	10	.681	3	.336	1	1.418e-2	3	NC	5	NC	3
150			min	-.12	4	-.204	2	.021	15	-4.51e-3	2	731.617	3	3564.169	1
151		19	max	0	10	.32	3	.262	1	1.217e-2	3	NC	1	NC	1
152			min	-.12	4	.002	10	.023	15	-3.681e-3	2	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
153	M11	1	max	.004	1	.049	1	.263	1	4.963e-3	1	NC	1	NC	1
154			min	-.234	4	-.037	3	-.004	5	-1.078e-4	5	NC	1	NC	1
155		2	max	.003	1	.222	3	.322	1	5.647e-3	1	NC	5	NC	3
156			min	-.235	4	-.19	1	.029	15	-3.41e-5	5	1021.59	3	4483.473	1
157		3	max	.003	1	.463	3	.43	1	6.331e-3	1	NC	5	NC	3
158			min	-.235	4	-.397	1	.043	15	1.751e-5	15	528.15	3	1588.061	1
159		4	max	.003	1	.627	3	.543	1	7.014e-3	1	NC	5	NC	3
160			min	-.235	4	-.529	1	.041	15	6.627e-5	15	397.812	3	946.019	1
161		5	max	.002	1	.679	3	.631	1	7.698e-3	1	NC	5	NC	3
162			min	-.235	4	-.562	1	.029	15	1.15e-4	15	368.98	3	718.542	1
163		6	max	.002	1	.611	3	.678	1	8.382e-3	1	NC	5	NC	5
164			min	-.235	4	-.494	1	.012	15	1.638e-4	15	407.651	3	637.062	1
165		7	max	.001	1	.442	3	.68	1	9.065e-3	1	NC	5	NC	5
166			min	-.235	4	-.343	1	-.005	5	2.125e-4	15	551.581	3	634.273	1
167		8	max	0	1	.217	3	.646	1	9.749e-3	1	NC	5	NC	13
168			min	-.235	4	-.149	1	-.019	5	2.613e-4	15	1041.136	3	690.863	1
169		9	max	0	1	.029	1	.598	1	1.043e-2	1	NC	1	NC	5
170			min	-.236	4	-.001	5	-.011	5	3.101e-4	15	6009.501	3	789.386	1
171		10	max	0	1	.11	1	.572	1	1.112e-2	1	NC	4	NC	5
172			min	-.236	4	-.089	3	.018	15	3.588e-4	15	4333.046	1	855.681	1
173		11	max	0	3	.029	1	.598	1	1.043e-2	1	NC	1	7238.136	15
174			min	-.236	4	.003	15	.048	15	3.689e-4	15	6009.501	3	789.386	1
175		12	max	0	3	.217	3	.646	1	9.749e-3	1	NC	5	7616.375	12
176			min	-.236	4	-.149	1	.057	15	3.789e-4	15	1041.136	3	690.863	1
177		13	max	.001	3	.442	3	.68	1	9.065e-3	1	NC	5	8591.248	12
178			min	-.236	4	-.343	1	.052	15	3.89e-4	15	551.581	3	634.273	1
179		14	max	.002	3	.611	3	.678	1	8.382e-3	1	NC	15	NC	12
180			min	-.236	4	-.494	1	.037	15	3.99e-4	15	407.651	3	637.062	1
181		15	max	.002	3	.679	3	.631	1	7.698e-3	1	8826.968	15	NC	3
182			min	-.236	4	-.562	1	.017	15	4.091e-4	15	368.98	3	718.542	1
183		16	max	.002	3	.627	3	.543	1	7.014e-3	1	8286.35	15	NC	3
184			min	-.236	4	-.529	1	-.001	15	4.192e-4	15	397.812	3	946.019	1
185		17	max	.003	3	.463	3	.43	1	6.331e-3	1	9452.799	15	NC	3
186			min	-.236	4	-.397	1	-.015	5	4.292e-4	15	528.15	3	1588.061	1
187		18	max	.003	3	.222	3	.322	1	5.647e-3	1	NC	5	NC	3
188			min	-.236	4	-.19	1	-.008	5	4.393e-4	15	1021.59	3	4483.473	1
189		19	max	.004	3	.049	1	.263	1	4.963e-3	1	NC	1	NC	1
190			min	-.236	4	-.037	3	.023	15	4.493e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.003	5	.265	1	5.932e-3	1	NC	1	NC	1
192			min	-.332	4	-.062	1	-.004	5	-5.745e-5	5	NC	1	NC	1
193		2	max	0	2	.108	3	.314	1	6.702e-3	1	NC	5	NC	2
194			min	-.332	4	-.383	1	.031	15	4.143e-6	15	774.41	2	4417.318	4
195		3	max	0	2	.24	3	.416	1	7.472e-3	1	NC	5	NC	3
196			min	-.332	4	-.676	2	.045	15	5.572e-5	15	415.156	2	1748.778	1
197		4	max	0	2	.315	3	.528	1	8.243e-3	1	NC	5	NC	12
198			min	-.332	4	-.869	2	.042	15	1.073e-4	15	318.551	2	1005.67	1
199		5	max	0	2	.324	3	.618	1	9.013e-3	1	NC	5	NC	12
200			min	-.332	4	-.93	2	.029	15	1.589e-4	15	296.645	2	748.929	1
201		6	max	0	2	.27	3	.668	1	9.783e-3	1	NC	5	NC	5
202			min	-.332	4	-.857	2	.01	15	2.104e-4	15	323.226	2	654.977	1
203		7	max	0	2	.165	3	.674	1	1.055e-2	1	NC	5	NC	5
204			min	-.332	4	-.673	2	-.01	5	2.62e-4	15	416.925	2	644.849	1
205		8	max	0	2	.038	3	.645	1	1.132e-2	1	NC	5	NC	13
206			min	-.332	4	-.439	1	-.024	5	3.136e-4	15	676.852	2	695.183	1
207		9	max	0	2	-.006	15	.6	1	1.209e-2	1	NC	3	NC	4
208			min	-.332	4	-.232	1	-.015	5	3.652e-4	15	1557.092	1	786.966	1
209		10	max	0	1	-.005	15	.576	1	1.286e-2	1	NC	4	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	-.332	4	-.137	1	.019	15	4.167e-4	15	3528.541	1	849.104	1
211		11	max	0	9	-.008	15	.6	1	1.209e-2	1	NC	3	7189.296	12
212			min	-.332	4	-.232	1	.051	15	4.236e-4	15	1557.092	1	786.966	1
213		12	max	0	9	.038	3	.645	1	1.132e-2	1	NC	5	7185.506	12
214			min	-.332	4	-.439	1	.061	15	4.305e-4	15	676.852	2	695.183	1
215		13	max	0	9	.165	3	.674	1	1.055e-2	1	NC	15	7479.174	12
216			min	-.332	4	-.673	2	.055	15	4.374e-4	15	416.925	2	644.849	1
217		14	max	0	9	.27	3	.668	1	9.783e-3	1	NC	15	NC	15
218			min	-.332	4	-.857	2	.038	15	4.344e-4	12	323.226	2	654.977	1
219		15	max	0	9	.324	3	.618	1	9.013e-3	1	8918.703	15	NC	5
220			min	-.332	4	-.93	2	.017	15	4.298e-4	12	296.645	2	748.929	1
221		16	max	0	9	.315	3	.528	1	8.243e-3	1	9114.332	15	NC	4
222			min	-.332	4	-.869	2	-.003	5	4.253e-4	12	318.551	2	1005.67	1
223		17	max	0	9	.24	3	.416	1	7.472e-3	1	NC	15	NC	3
224			min	-.332	4	-.676	2	-.02	5	4.207e-4	12	415.156	2	1748.778	1
225		18	max	0	9	.108	3	.314	1	6.702e-3	1	NC	5	NC	2
226			min	-.332	4	-.383	1	-.011	5	4.161e-4	12	774.41	2	5410.738	1
227		19	max	0	9	-.007	15	.265	1	5.932e-3	1	NC	1	NC	1
228			min	-.332	4	-.062	1	.023	15	4.116e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.005	3	.267	1	1.345e-2	1	NC	1	NC	1
230			min	-.576	4	-.52	1	-.004	5	-3.101e-3	3	NC	1	NC	1
231		2	max	0	3	.176	3	.345	1	1.56e-2	1	NC	5	NC	3
232			min	-.576	4	-.941	1	.029	15	-3.854e-3	3	592.174	2	3374.916	1
233		3	max	0	3	.321	3	.463	1	1.774e-2	1	NC	5	NC	3
234			min	-.576	4	-1.315	1	.044	15	-4.608e-3	3	314.03	2	1345.245	1
235		4	max	0	3	.417	3	.58	1	1.989e-2	1	NC	15	NC	12
236			min	-.576	4	-1.59	1	.045	15	-5.361e-3	3	234.374	2	844.076	1
237		5	max	0	3	.453	3	.666	1	2.204e-2	1	NC	15	9997.529	12
238			min	-.576	4	-1.735	1	.036	15	-6.115e-3	3	207.621	2	660.738	1
239		6	max	0	3	.427	3	.708	1	2.418e-2	1	NC	15	NC	5
240			min	-.576	4	-1.746	1	.021	15	-6.868e-3	3	207.644	2	598.053	1
241		7	max	0	3	.35	3	.703	1	2.633e-2	1	NC	15	NC	5
242			min	-.576	4	-1.643	1	.005	15	-7.621e-3	3	229.952	2	605.087	1
243		8	max	0	3	.246	3	.662	1	2.848e-2	1	NC	15	NC	5
244			min	-.576	4	-1.47	1	-.005	5	-8.375e-3	3	277.796	2	668.153	1
245		9	max	0	3	.149	3	.609	1	3.062e-2	1	NC	15	NC	5
246			min	-.576	4	-1.295	1	-.002	15	-9.128e-3	3	340.893	1	772.126	1
247		10	max	0	1	.105	3	.581	1	3.277e-2	1	NC	15	NC	5
248			min	-.576	4	-1.211	1	.019	15	-9.882e-3	3	382.036	1	841.374	1
249		11	max	0	1	.149	3	.609	1	3.062e-2	1	NC	15	8541.635	15
250			min	-.576	4	-1.295	1	.042	15	-9.128e-3	3	340.893	1	772.126	1
251		12	max	0	1	.246	3	.662	1	2.848e-2	1	NC	15	7278.891	12
252			min	-.576	4	-1.47	1	.049	15	-8.375e-3	3	277.796	2	668.153	1
253		13	max	0	1	.35	3	.703	1	2.633e-2	1	8303.414	15	8835.095	15
254			min	-.576	4	-1.643	1	.044	15	-7.621e-3	3	229.952	2	605.087	1
255		14	max	0	1	.427	3	.708	1	2.418e-2	1	7389.087	15	NC	5
256			min	-.575	4	-1.746	1	.03	15	-6.868e-3	3	207.644	2	598.053	1
257		15	max	.001	1	.453	3	.666	1	2.204e-2	1	7224.422	15	NC	5
258			min	-.575	4	-1.735	1	.013	15	-6.115e-3	3	207.621	2	660.738	1
259		16	max	.001	1	.417	3	.58	1	1.989e-2	1	7909.628	15	NC	12
260			min	-.575	4	-1.59	1	-.002	15	-5.361e-3	3	234.374	2	844.076	1
261		17	max	.002	1	.321	3	.463	1	1.774e-2	1	NC	15	NC	3
262			min	-.575	4	-1.315	1	-.014	5	-4.608e-3	3	314.03	2	1345.245	1
263		18	max	.002	1	.176	3	.345	1	1.56e-2	1	NC	5	NC	3
264			min	-.575	4	-.941	1	-.005	5	-3.854e-3	3	592.174	2	3374.916	1
265		19	max	.002	1	.005	3	.267	1	1.345e-2	1	NC	1	NC	1
266			min	-.575	4	-.52	1	.023	15	-3.101e-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	3.316e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-3.291e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	6.631e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-6.582e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.007	5	7.763e-3	2	NC	3	NC	1
274			min	0	1	-.01	1	-.002	1	-7.94e-3	5	5781.501	1	8985.294	5
275		5	max	0	3	-.002	15	.012	5	7.124e-3	2	NC	5	NC	1
276			min	0	1	-.019	1	-.003	1	-7.728e-3	5	3235.2	1	5209.527	5
277		6	max	0	3	-.003	15	.018	5	6.484e-3	2	NC	5	NC	1
278			min	0	1	-.029	1	-.004	1	-7.517e-3	5	2081.732	1	3428.326	5
279		7	max	0	3	-.004	15	.025	5	5.844e-3	2	NC	5	NC	1
280			min	0	1	-.041	1	-.005	1	-7.305e-3	5	1461.844	1	2446.718	5
281		8	max	0	3	-.005	15	.033	5	5.204e-3	2	NC	15	NC	9
282			min	0	1	-.056	1	-.006	1	-7.094e-3	5	1089.672	1	1847.131	5
283		9	max	0	3	-.006	15	.042	5	4.564e-3	2	9627.407	15	NC	9
284			min	0	1	-.071	1	-.007	1	-6.882e-3	5	848.321	1	1453.361	5
285		10	max	0	3	-.008	15	.051	5	3.924e-3	2	7778.366	15	NC	9
286			min	0	1	-.089	1	-.008	1	-6.67e-3	5	682.635	1	1180.421	5
287		11	max	0	3	-.009	15	.062	5	3.284e-3	2	6445.118	15	NC	9
288			min	-.001	1	-.107	1	-.009	1	-6.459e-3	5	563.836	1	983.234	5
289		12	max	0	3	-.011	15	.072	5	2.644e-3	2	5451.512	15	NC	9
290			min	-.001	1	-.127	1	-.009	1	-6.247e-3	5	475.698	1	836.05	5
291		13	max	0	3	-.013	15	.084	5	2.004e-3	2	4690.672	15	NC	9
292			min	-.001	1	-.148	1	-.009	1	-6.036e-3	5	408.455	1	723.217	5
293		14	max	.001	3	-.015	15	.095	5	1.364e-3	2	4094.88	15	NC	9
294			min	-.001	1	-.17	1	-.009	1	-5.824e-3	5	355.96	1	634.798	5
295		15	max	.001	3	-.017	15	.107	5	7.238e-4	2	3619.466	15	NC	9
296			min	-.001	1	-.193	1	-.008	1	-5.686e-3	4	314.18	1	564.231	5
297		16	max	.001	3	-.019	15	.12	4	6.994e-4	3	3234.11	15	NC	9
298			min	-.002	1	-.216	1	-.006	1	-5.56e-3	4	280.389	1	506.755	4
299		17	max	.001	3	-.021	15	.132	4	1.042e-3	3	2917.529	15	NC	9
300			min	-.002	1	-.24	1	-.004	1	-5.434e-3	4	252.683	1	458.403	4
301		18	max	.001	3	-.023	15	.145	4	1.384e-3	3	2654.427	15	NC	1
302			min	-.002	1	-.264	1	-.008	3	-5.308e-3	4	229.696	1	418.208	4
303		19	max	.001	3	-.025	15	.158	4	1.726e-3	3	2433.601	15	NC	1
304			min	-.002	1	-.288	1	-.014	3	-5.182e-3	4	210.431	1	384.471	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	-3.522e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	3	NC	1
310			min	0	1	-.009	1	0	1	-7.045e-3	4	6504.893	1	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
312			min	-.001	1	-.022	1	0	1	-8.483e-3	4	2777.284	1	8553.523	4
313		5	max	0	3	-.001	15	.012	4	0	1	NC	5	NC	1
314			min	-.001	1	-.04	1	0	1	-8.229e-3	4	1533.228	1	4963.573	4
315		6	max	.001	3	-.002	15	.019	4	0	1	NC	5	NC	1
316			min	-.002	1	-.062	1	0	1	-7.975e-3	4	979.102	1	3269.574	4
317		7	max	.001	3	-.003	15	.026	4	0	1	NC	5	NC	1
318			min	-.002	1	-.089	1	0	1	-7.721e-3	4	684.223	1	2335.907	4
319		8	max	.002	3	-.004	15	.034	4	0	1	NC	5	NC	1
320			min	-.002	1	-.119	1	0	1	-7.467e-3	4	508.318	1	1765.562	4
321		9	max	.002	3	-.005	15	.044	4	0	1	NC	15	NC	1
322			min	-.002	1	-.154	1	0	1	-7.213e-3	4	394.762	1	1390.981	4
323		10	max	.002	3	-.006	15	.054	4	0	1	9745.332	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	-.003	1	-.191	1	0	1	-6.959e-3	4	317.069	1	1131.35	4
325		11	max	.002	3	-.008	15	.064	4	0	1	8049.323	15	NC	1
326			min	-.003	1	-.232	1	0	1	-6.705e-3	4	261.508	1	943.798	4
327		12	max	.002	3	-.009	15	.075	4	0	1	6791.045	15	NC	1
328			min	-.003	1	-.275	1	0	1	-6.451e-3	4	220.372	1	803.833	4
329		13	max	.003	3	-.01	15	.087	4	0	1	5831.073	15	NC	1
330			min	-.003	1	-.321	1	0	1	-6.197e-3	4	189.041	1	696.572	4
331		14	max	.003	3	-.012	15	.099	4	0	1	5081.648	15	NC	1
332			min	-.004	1	-.368	1	0	1	-5.943e-3	4	164.616	1	612.565	4
333		15	max	.003	3	-.014	15	.111	4	0	1	4485.187	15	NC	1
334			min	-.004	1	-.417	1	0	1	-5.689e-3	4	145.199	1	545.572	4
335		16	max	.003	3	-.015	15	.123	4	0	1	4002.789	15	NC	1
336			min	-.004	1	-.468	1	0	1	-5.435e-3	4	129.511	1	491.347	4
337		17	max	.004	3	-.017	15	.136	4	0	1	3607.25	15	NC	1
338			min	-.004	1	-.52	1	0	1	-5.181e-3	4	116.66	1	446.909	4
339		18	max	.004	3	-.018	15	.148	4	0	1	3279.087	15	NC	1
340			min	-.005	1	-.572	1	0	1	-4.927e-3	4	106.005	1	410.114	4
341		19	max	.004	3	-.02	15	.16	4	0	1	3004.069	15	NC	1
342			min	-.005	1	-.624	1	0	1	-4.673e-3	4	97.082	1	379.394	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	1.469e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-3.938e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	2.937e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	0	3	-7.875e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.007	4	3.406e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.002	3	-9.446e-3	4	5781.501	1	8407.434	4
351		5	max	0	3	0	5	.012	4	3.064e-3	3	NC	4	NC	1
352			min	0	1	-.019	1	-.003	3	-9.096e-3	4	3235.2	1	4888.937	4
353		6	max	0	3	0	5	.019	4	2.722e-3	3	NC	4	NC	1
354			min	0	1	-.029	1	-.004	3	-8.745e-3	4	2081.732	1	3226	4
355		7	max	0	3	0	5	.026	4	2.38e-3	3	NC	5	NC	1
356			min	0	1	-.041	1	-.005	3	-8.394e-3	4	1461.844	1	2308.52	4
357		8	max	0	3	.001	5	.035	4	2.038e-3	3	NC	5	NC	9
358			min	0	1	-.056	1	-.006	3	-8.044e-3	4	1089.672	1	1747.666	4
359		9	max	0	3	.001	5	.044	4	1.696e-3	3	NC	5	NC	9
360			min	0	1	-.071	1	-.007	3	-7.693e-3	4	848.321	1	1379.134	4
361		10	max	0	3	.002	5	.054	4	1.354e-3	3	NC	5	NC	9
362			min	0	1	-.089	1	-.007	3	-7.342e-3	4	682.635	1	1123.612	4
363		11	max	0	3	.002	5	.065	4	1.011e-3	3	NC	5	NC	9
364			min	-.001	1	-.107	1	-.007	3	-6.992e-3	4	563.836	1	939.001	4
365		12	max	0	3	.002	5	.076	4	6.692e-4	3	NC	5	NC	9
366			min	-.001	1	-.127	1	-.007	3	-6.641e-3	4	475.698	1	801.234	4
367		13	max	0	3	.003	5	.087	4	3.27e-4	3	NC	5	NC	9
368			min	-.001	1	-.148	1	-.006	3	-6.29e-3	4	408.455	1	695.681	4
369		14	max	.001	3	.003	5	.099	4	-1.024e-5	12	NC	5	NC	9
370			min	-.001	1	-.17	1	-.005	3	-5.94e-3	4	355.96	1	613.051	4
371		15	max	.001	3	.003	5	.111	4	1.123e-4	9	NC	5	NC	9
372			min	-.001	1	-.193	1	-.003	3	-5.591e-3	5	314.18	1	547.212	4
373		16	max	.001	3	.004	5	.123	4	4.112e-4	1	NC	5	NC	9
374			min	-.002	1	-.216	1	0	3	-5.329e-3	5	280.389	1	493.986	4
375		17	max	.001	3	.004	5	.135	4	1.048e-3	1	NC	5	NC	9
376			min	-.002	1	-.24	1	0	10	-5.067e-3	5	252.683	1	450.441	4
377		18	max	.001	3	.005	5	.146	4	1.685e-3	1	NC	5	NC	1
378			min	-.002	1	-.264	1	-.003	2	-4.805e-3	5	229.696	1	414.471	4
379		19	max	.001	3	.005	5	.158	4	2.322e-3	1	NC	5	NC	1
380			min	-.002	1	-.288	1	-.007	2	-4.543e-3	5	210.431	1	384.538	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	.006	1	0	15	.005	5	3.083e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	-.001	1	-2.278e-3	5	NC	1	NC	1
383		2	max	.006	1	-.002	15	.032	5	3.672e-3	2	NC	1	NC	5
384			min	0	15	-.023	1	-.027	2	-2.304e-3	5	NC	1	2344.886	2
385		3	max	.005	1	-.004	15	.06	5	4.26e-3	2	NC	1	NC	5
386			min	0	15	-.044	1	-.053	2	-2.33e-3	5	NC	1	1186.065	2
387		4	max	.005	1	-.006	15	.088	5	4.849e-3	2	NC	1	NC	13
388			min	0	15	-.064	1	-.078	2	-2.356e-3	5	NC	1	804.88	2
389		5	max	.004	1	-.008	15	.115	5	5.437e-3	2	NC	1	NC	13
390			min	0	15	-.084	1	-.1	2	-2.383e-3	5	NC	1	618.512	2
391		6	max	.004	1	-.009	15	.143	5	6.026e-3	2	NC	1	NC	13
392			min	0	10	-.104	1	-.121	2	-2.638e-3	3	NC	1	505.657	4
393		7	max	.004	3	-.011	15	.17	5	6.614e-3	2	NC	1	NC	13
394			min	0	10	-.124	1	-.14	2	-2.918e-3	3	NC	1	419.946	4
395		8	max	.004	3	-.013	15	.198	5	7.203e-3	2	NC	1	NC	13
396			min	0	10	-.144	1	-.155	2	-3.198e-3	3	NC	1	358.865	4
397		9	max	.004	3	-.015	15	.225	5	7.791e-3	2	NC	1	NC	13
398			min	0	10	-.164	1	-.167	2	-3.478e-3	3	NC	1	313.167	4
399		10	max	.004	3	-.016	15	.251	5	8.38e-3	2	NC	1	NC	13
400			min	-.001	2	-.184	1	-.175	2	-3.758e-3	3	NC	1	277.717	4
401		11	max	.004	3	-.018	15	.277	5	8.968e-3	2	NC	1	NC	13
402			min	-.002	2	-.204	1	-.179	2	-4.038e-3	3	NC	1	249.433	4
403		12	max	.005	3	-.019	15	.302	5	9.557e-3	2	NC	1	NC	13
404			min	-.002	2	-.223	1	-.177	2	-4.318e-3	3	NC	1	226.355	4
405		13	max	.005	3	-.021	15	.327	5	1.015e-2	2	NC	1	NC	13
406			min	-.003	2	-.243	1	-.17	2	-4.598e-3	3	NC	1	207.176	4
407		14	max	.005	3	-.023	15	.351	5	1.073e-2	2	NC	1	NC	13
408			min	-.003	2	-.262	1	-.158	2	-4.878e-3	3	NC	1	190.991	4
409		15	max	.005	3	-.024	15	.374	5	1.132e-2	2	NC	1	NC	13
410			min	-.004	2	-.281	1	-.139	2	-5.158e-3	3	NC	1	177.154	4
411		16	max	.005	3	-.026	15	.397	5	1.191e-2	2	NC	1	NC	13
412			min	-.005	2	-.3	1	-.113	2	-5.438e-3	3	NC	1	165.191	4
413		17	max	.006	3	-.027	15	.418	5	1.25e-2	2	NC	1	NC	13
414			min	-.005	2	-.32	1	-.079	2	-5.718e-3	3	NC	1	154.748	4
415		18	max	.006	3	-.029	15	.439	5	1.309e-2	2	NC	1	NC	5
416			min	-.006	2	-.339	1	-.038	2	-5.998e-3	3	NC	1	145.552	4
417		19	max	.006	3	-.03	15	.464	4	1.368e-2	2	NC	1	NC	1
418			min	-.006	2	-.358	1	0	3	-6.278e-3	3	NC	1	137.392	4
419	M6	1	max	.013	1	0	15	.005	4	0	1	NC	1	NC	1
420			min	0	15	-.006	1	0	1	-2.459e-3	4	NC	1	NC	1
421		2	max	.011	1	-.002	15	.034	4	0	1	NC	1	NC	1
422			min	0	15	-.05	1	0	1	-2.531e-3	4	NC	1	NC	1
423		3	max	.01	1	-.003	15	.064	4	0	1	NC	1	NC	1
424			min	0	15	-.094	1	0	1	-2.604e-3	4	NC	1	8046.427	4
425		4	max	.008	1	-.005	15	.093	4	0	1	NC	1	NC	1
426			min	0	15	-.138	1	0	1	-2.677e-3	4	NC	1	5323.345	4
427		5	max	.008	3	-.006	15	.123	4	0	1	NC	1	NC	1
428			min	0	15	-.182	1	0	1	-2.749e-3	4	NC	1	4001.959	4
429		6	max	.009	3	-.008	15	.152	4	0	1	NC	1	NC	1
430			min	0	10	-.225	1	0	1	-2.822e-3	4	NC	1	3241.216	4
431		7	max	.009	3	-.009	15	.181	4	0	1	NC	1	NC	1
432			min	-.001	10	-.269	1	0	1	-2.895e-3	4	NC	1	2762.388	4
433		8	max	.01	3	-.011	15	.209	4	0	1	NC	1	NC	1
434			min	-.003	2	-.313	1	0	1	-2.968e-3	4	NC	1	2447.611	4
435		9	max	.011	3	-.012	15	.237	4	0	1	NC	1	NC	1
436			min	-.004	2	-.356	1	0	1	-3.04e-3	4	NC	1	2239.751	4
437		10	max	.011	3	-.014	15	.265	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	-.006	2	-.399	1	0	1	-3.113e-3	4	NC	1	2109.363	4
439		11	max	.012	3	-.015	15	.291	4	0	1	NC	1	NC	1
440			min	-.008	2	-.442	1	0	1	-3.186e-3	4	NC	1	2041.995	4
441		12	max	.013	3	-.016	15	.317	4	0	1	NC	1	NC	1
442			min	-.009	2	-.486	1	0	1	-3.258e-3	4	NC	1	2033.36	4
443		13	max	.013	3	-.018	15	.341	4	0	1	NC	1	NC	1
444			min	-.011	2	-.529	1	0	1	-3.331e-3	4	NC	1	2088.769	4
445		14	max	.014	3	-.019	15	.365	4	0	1	NC	1	NC	1
446			min	-.013	2	-.572	1	0	1	-3.404e-3	4	NC	1	2226.908	4
447		15	max	.015	3	-.02	15	.388	4	0	1	NC	1	NC	1
448			min	-.014	2	-.614	1	0	1	-3.477e-3	4	NC	1	2492.434	4
449		16	max	.015	3	-.021	15	.409	4	0	1	NC	1	NC	1
450			min	-.016	2	-.657	1	0	1	-3.549e-3	4	NC	1	2995.953	4
451		17	max	.016	3	-.023	15	.429	4	0	1	NC	1	NC	1
452			min	-.018	2	-.7	1	0	1	-3.622e-3	4	NC	1	4075.842	4
453		18	max	.017	3	-.024	15	.447	4	0	1	NC	1	NC	1
454			min	-.019	2	-.742	1	0	1	-3.695e-3	4	NC	1	7433.142	4
455		19	max	.017	3	-.025	15	.464	4	0	1	NC	1	NC	1
456			min	-.021	2	-.785	1	0	1	-3.767e-3	4	NC	1	NC	1
457	M9	1	max	.006	1	0	5	.005	4	1.238e-3	3	NC	1	NC	1
458			min	0	5	-.003	1	-.001	3	-3.083e-3	2	NC	1	NC	1
459		2	max	.006	1	0	15	.038	4	1.518e-3	3	NC	1	NC	5
460			min	0	5	-.023	1	-.013	3	-3.672e-3	2	NC	1	2344.886	2
461		3	max	.005	1	0	15	.07	4	1.798e-3	3	NC	1	NC	15
462			min	0	5	-.044	1	-.025	3	-4.26e-3	2	NC	1	1186.065	2
463		4	max	.005	1	0	15	.103	4	2.078e-3	3	NC	1	7293.187	15
464			min	0	5	-.064	1	-.036	3	-4.849e-3	2	NC	1	804.88	2
465		5	max	.004	1	0	15	.135	4	2.358e-3	3	NC	1	5488.727	15
466			min	0	5	-.084	1	-.046	3	-5.437e-3	2	NC	1	618.512	2
467		6	max	.004	1	0	15	.167	4	2.638e-3	3	NC	1	4449.335	15
468			min	0	5	-.104	1	-.055	3	-6.026e-3	2	NC	1	510.559	2
469		7	max	.004	3	0	15	.198	4	2.918e-3	3	NC	1	3794.862	15
470			min	0	5	-.124	1	-.064	3	-6.614e-3	2	NC	1	442.397	2
471		8	max	.004	3	0	15	.228	4	3.198e-3	3	NC	1	3364.529	15
472			min	0	5	-.144	1	-.071	3	-7.203e-3	2	NC	1	397.687	2
473		9	max	.004	3	0	15	.258	4	3.478e-3	3	NC	1	3080.4	15
474			min	0	10	-.164	1	-.076	3	-7.791e-3	2	NC	1	368.535	2
475		10	max	.004	3	.001	5	.286	4	3.758e-3	3	NC	1	2902.323	15
476			min	-.001	2	-.184	1	-.08	3	-8.38e-3	2	NC	1	350.93	2
477		11	max	.004	3	.001	5	.312	4	4.038e-3	3	NC	1	2810.628	15
478			min	-.002	2	-.204	1	-.081	3	-8.968e-3	2	NC	1	343.014	2
479		12	max	.005	3	.002	5	.338	4	4.318e-3	3	NC	1	2799.551	15
480			min	-.002	2	-.223	1	-.081	3	-9.557e-3	2	NC	1	344.452	2
481		13	max	.005	3	.002	5	.361	4	4.598e-3	3	NC	1	2876.503	15
482			min	-.003	2	-.243	1	-.078	3	-1.015e-2	2	NC	1	356.444	2
483		14	max	.005	3	.003	5	.382	4	4.878e-3	3	NC	1	3067.293	15
484			min	-.003	2	-.262	1	-.073	3	-1.073e-2	2	NC	1	382.446	2
485		15	max	.005	3	.003	5	.402	4	5.158e-3	3	NC	1	3433.486	15
486			min	-.004	2	-.281	1	-.064	3	-1.132e-2	2	NC	1	430.411	2
487		16	max	.005	3	.004	5	.419	4	5.438e-3	3	NC	1	4127.509	15
488			min	-.005	2	-.3	1	-.053	3	-1.191e-2	2	NC	1	519.814	2
489		17	max	.006	3	.004	5	.434	4	5.718e-3	3	NC	1	5615.596	15
490			min	-.005	2	-.32	1	-.039	3	-1.25e-2	2	NC	1	710.032	2
491		18	max	.006	3	.005	5	.447	4	5.998e-3	3	NC	1	NC	15
492			min	-.006	2	-.339	1	-.021	3	-1.309e-2	2	NC	1	1299.283	2
493		19	max	.006	3	.005	5	.456	5	6.278e-3	3	NC	1	NC	1
494			min	-.006	2	-.358	1	-.017	1	-1.368e-2	2	NC	1	NC	1