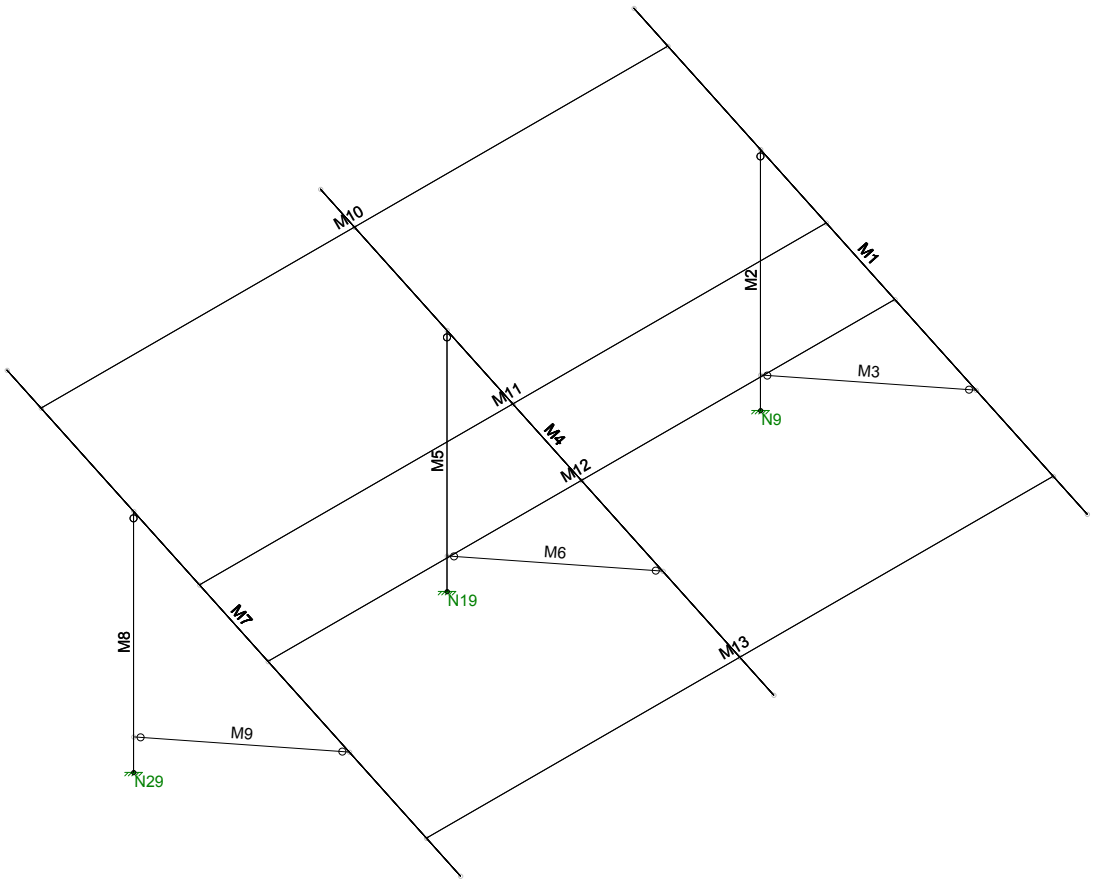


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

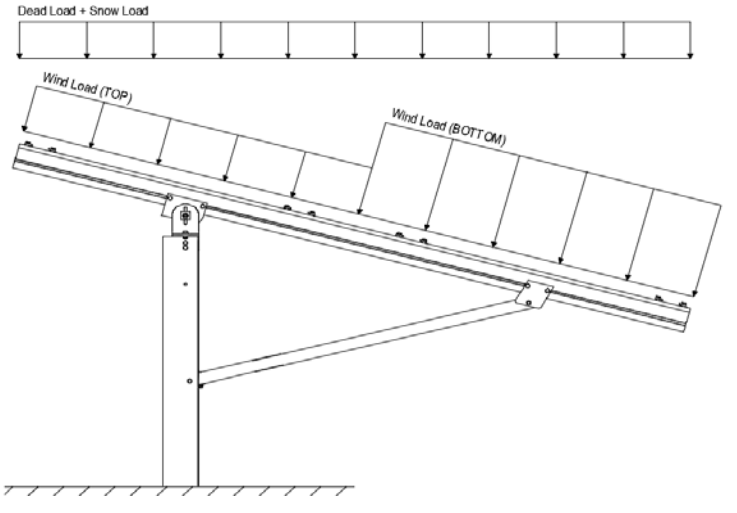
PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	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 =	120	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z =	22.61	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

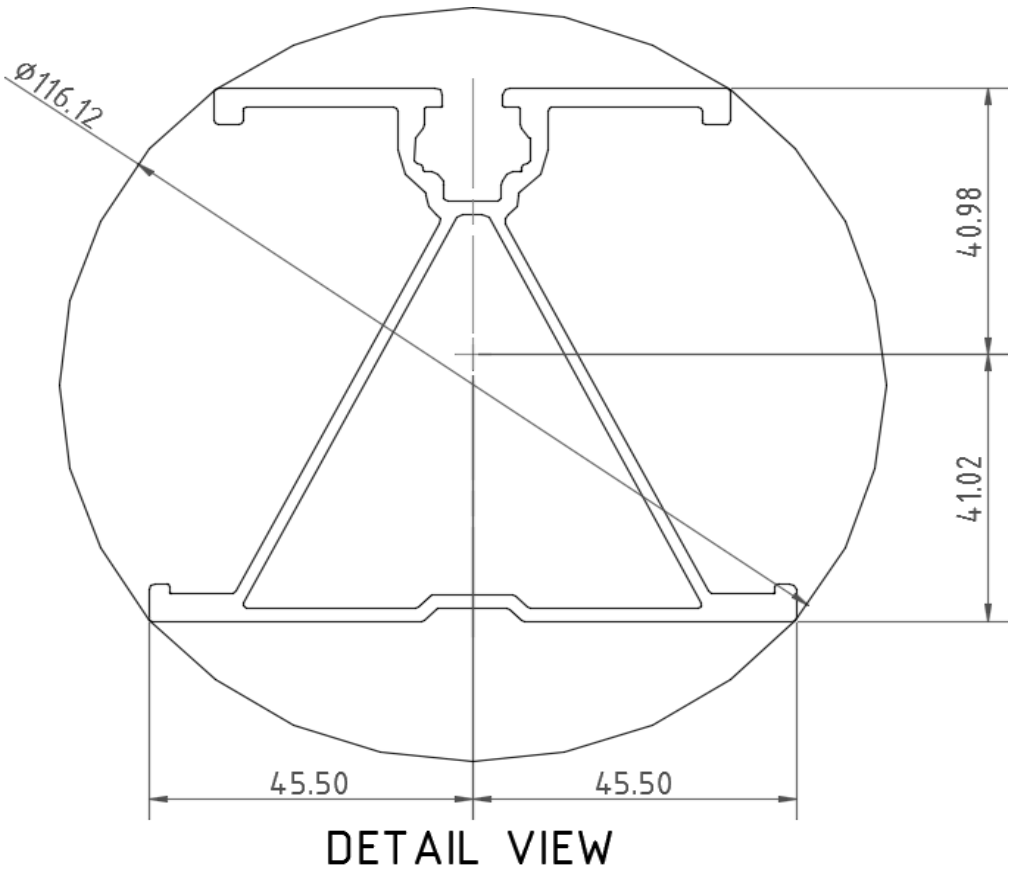
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

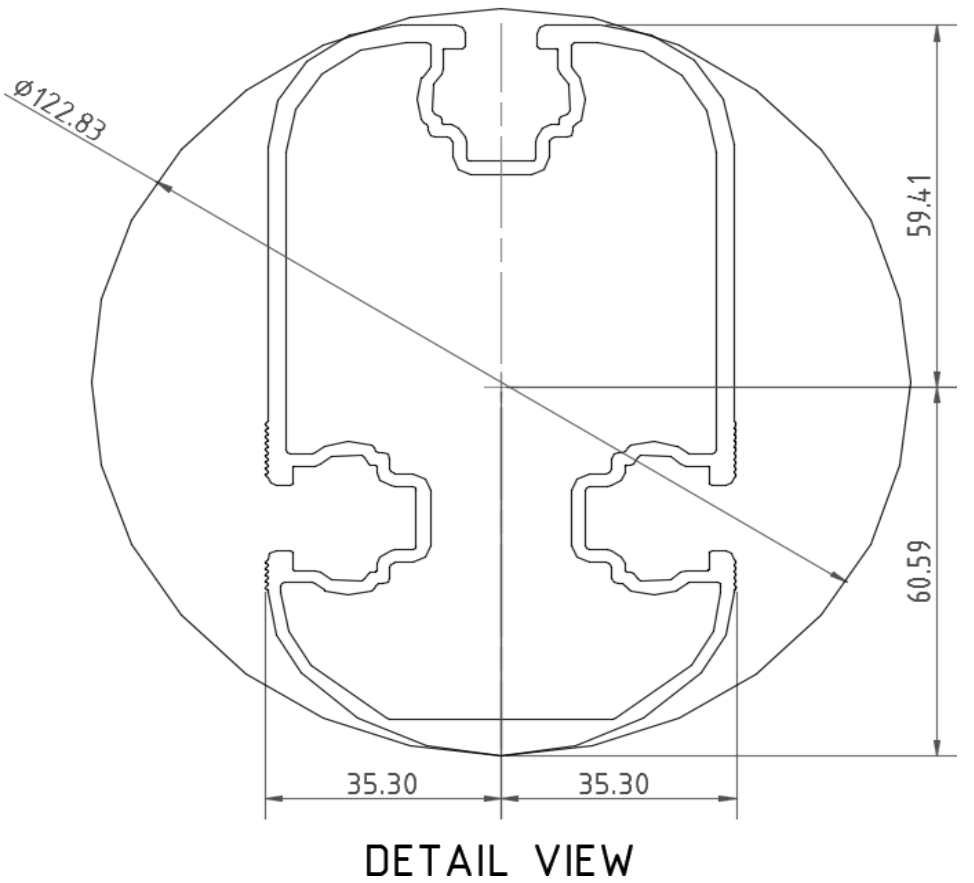
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	96	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.573	k-ft
M_z =	0.043	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	60%	



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).

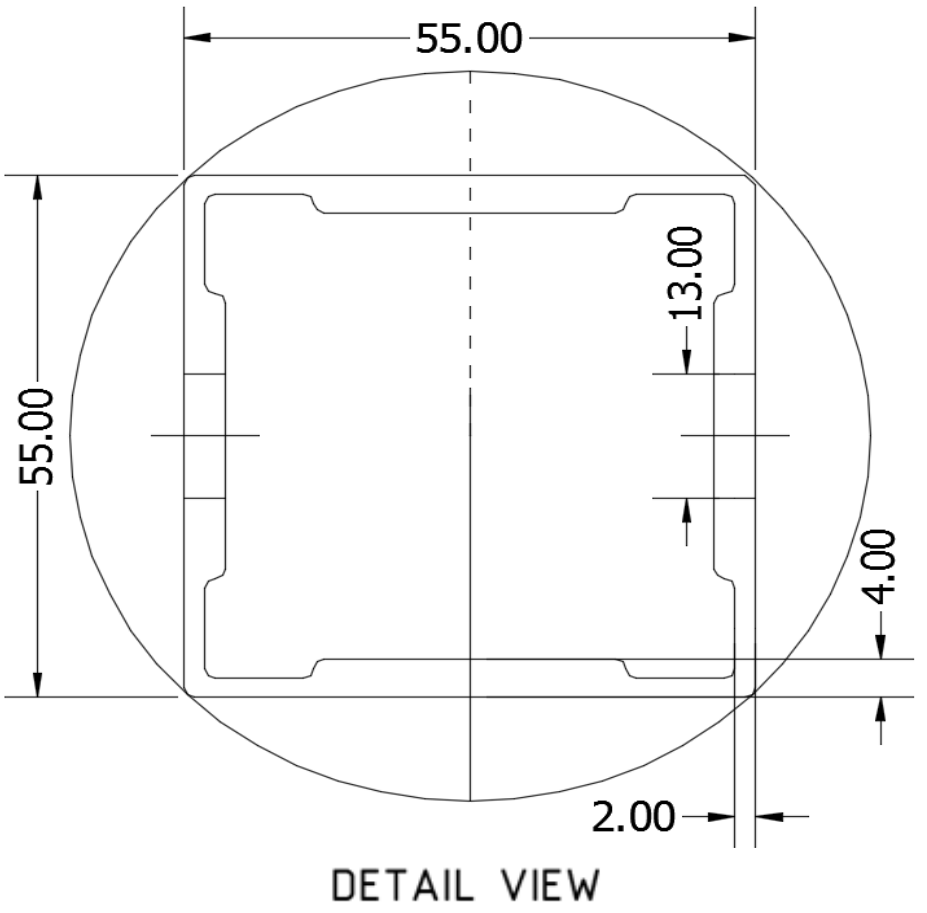
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.420	k-ft
M_z =	0.000	k-ft
P_n =	0.013	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	



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).

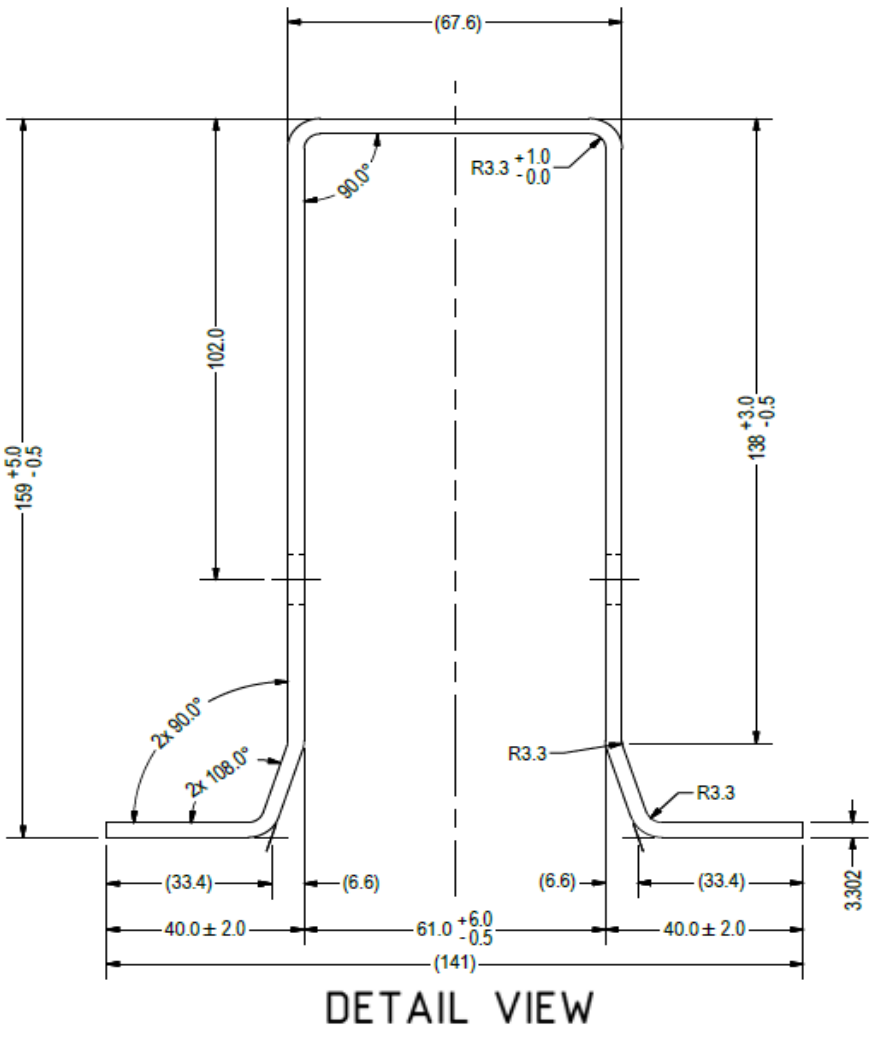
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	4.832	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	36%	



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 =	9.806	k-ft
M_z =	0.000	k-ft
P_r =	-5.332	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	61%	



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 =	6.90	k
Maximum Lateral Load =	3.34	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)

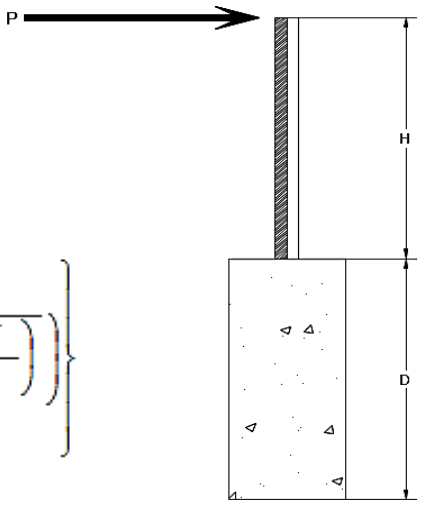
Lateral Force @ Top of Pole, P =	1.00	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.00	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 =	5.40	
Required Footing Depth, D =	8.79	ft
2nd Trial @ D_2 =	6.02	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.20	ksf
Constant 2.34P/(S_1B), A =	2.92	
Required Footing Depth, D =	5.72	ft
3rd Trial @ D_3 =	5.87	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant 2.34P/(S_1B), A =	2.99	
Required Footing Depth, D =	5.82	ft
4th Trial @ D_4 =	5.84	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant 2.34P/(S_1B), A =	3.00	
Required Footing Depth, D =	5.84	ft
5th Trial @ D_5 =	5.84	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant 2.34P/(S_1B), A =	3.01	
Required Footing Depth, D =	6.00	ft

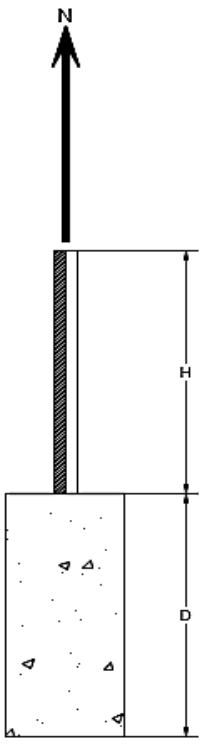
A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.31	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 =	2.17	k
Required Concrete Volume, V =	14.99	ft^3
Required Footing Depth, D =	5.00	ft

A 2ft diameter x 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	7.16
2	0.4	0.2	118.10	7.05
3	0.6	0.2	118.10	6.95
4	0.8	0.2	118.10	6.85
5	1	0.2	118.10	6.74
6	1.2	0.2	118.10	6.64
7	1.4	0.2	118.10	6.54
8	1.6	0.2	118.10	6.43
9	1.8	0.2	118.10	6.33
10	2	0.2	118.10	6.22
11	2.2	0.2	118.10	6.12
12	2.4	0.2	118.10	6.02
13	2.6	0.2	118.10	5.91
14	2.8	0.2	118.10	5.81
15	3	0.2	118.10	5.71
16	3.2	0.2	118.10	5.60
17	3.4	0.2	118.10	5.50
18	3.6	0.2	118.10	5.39
19	3.8	0.2	118.10	5.29
20	4	0.2	118.10	5.19
21	4.2	0.2	118.10	5.08
22	4.4	0.2	118.10	4.98
23	4.6	0.2	118.10	4.88
24	4.8	0.2	118.10	4.77
25	0	0.0	0.00	4.77
26	0	0.0	0.00	4.77
27	0	0.0	0.00	4.77
28	0	0.0	0.00	4.77
29	0	0.0	0.00	4.77
30	0	0.0	0.00	4.77
31	0	0.0	0.00	4.77
32	0	0.0	0.00	4.77
33	0	0.0	0.00	4.77
34	0	0.0	0.00	4.77
Max	4.8	Sum	1.13	

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 =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.97	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

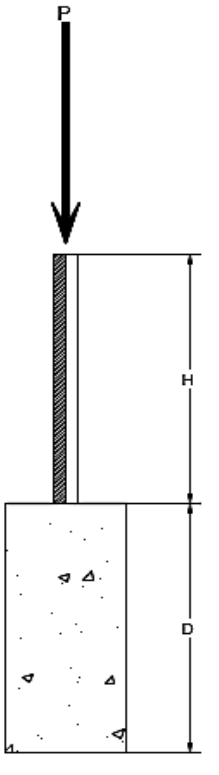
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.70	k
Utilization =	67%	

A 2ft diameter footing passes at a depth of 6ft.



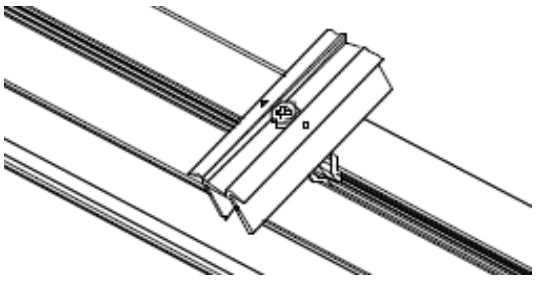
6. DESIGN OF JOINTS AND CONNECTIONS

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.

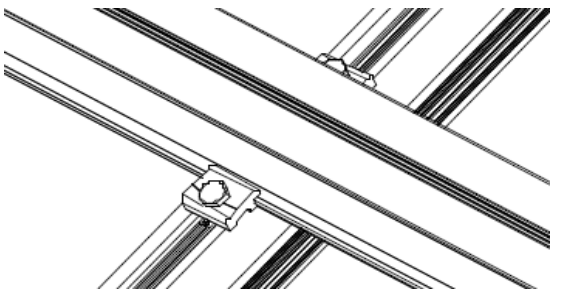
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.749 k
Allowable Uplift	=	1.214 k
Utilization	=	62%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.140 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

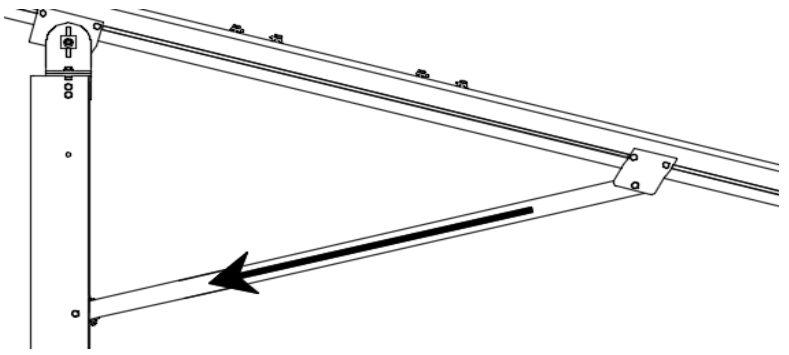


6.2 Strut Connections

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	=	4.832 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	54%

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

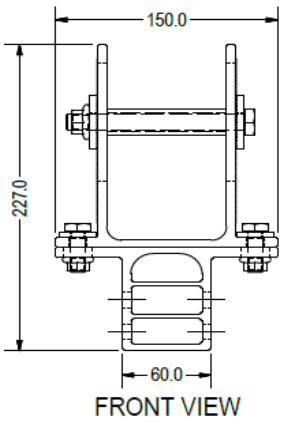


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

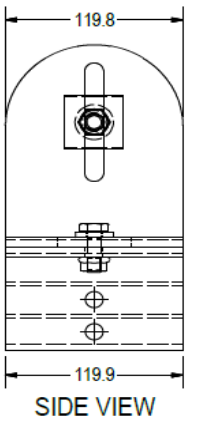
6.3 Girder to Post Connection

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.

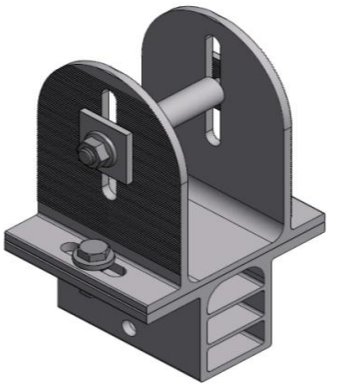
Maximum Tensile Load	=	4.525 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

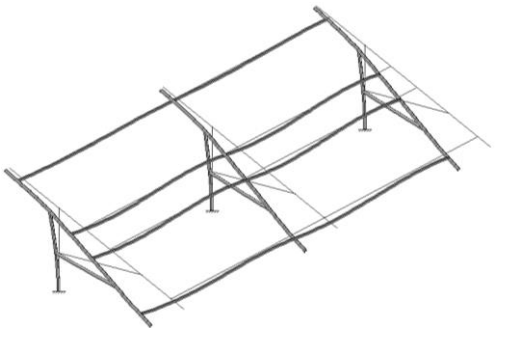
7.1 Seismic Drift

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}	=	70.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.403 in
Max Drift, Δ_{MAX}	=	0.483 in

0.483 ≤ 1.403, 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 = 96 in

J = 0.432

265.581

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

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= 28.0 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

$\varphi F_L St$= 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 = 96

J = 0.432

168.894

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

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= 29.1

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

$\varphi F_L Wk$= 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:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	61 in	L_b =	61
J =	0.942	J =	0.942
	95.1963		95.1963
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	30.2 ksi	φF_L=	30.2
3.4.16		**3.4.16**	
b/t =	24.5	b/t =	24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	28.2 ksi	φF_L=	28.2 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =	0.0	N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	24.5	h/t =	24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	27.5	C_0 =	27.5
Cc =	27.5	Cc =	27.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.3	S2 =	77.3
φF_L=	1.3φyFcy	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	28.2 ksi	φF_LWk=	28.2 ksi
Ix =	279836 mm^4	Iy =	279836 mm^4
	0.672 in^4		0.672 in^4
y =	27.5 mm	x =	27.5 mm
Sx =	0.621 in^3	Sy =	0.621 in^3
M_{max}St =	1.460 k-ft	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 =	-5.33	k	(LRFD Factored Load)
Mr (Strong) =	9.81	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 =	0.104	<	0.2	
Utilization =	0.61	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.104	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 61%

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	-69.356	-69.356	0	0
2	M11	y	-69.356	-69.356	0	0
3	M12	y	-107.187	-107.187	0	0
4	M13	y	-107.187	-107.187	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	138.712	138.712	0	0
2	M11	y	138.712	138.712	0	0
3	M12	y	63.051	63.051	0	0
4	M13	y	63.051	63.051	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	641.406	2	2257.847	2	176.193	2	.208	2	.008	5	4.571	1
2		min	-918.355	3	-1764.575	3	-282.178	5	-1.12	5	-.007	2	.487	15
3	N19	max	2537.236	2	6190.082	2	0	1	0	2	.009	4	8.036	1
4		min	-2529.048	3	-5299.167	3	-302.12	5	-1.168	4	0	10	.263	15
5	N29	max	641.406	2	2257.847	2	208.394	3	.267	3	.009	4	4.571	1
6		min	-918.355	3	-1764.575	3	-313.871	4	-1.171	4	-.003	3	-.225	5
7	Totals:	max	3820.047	2	10705.777	2	0	1						
8		min	-4365.759	3	-8828.317	3	-877.828	4						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	2	.001	4	0	1	0	1	0	1
2			min	0	1	-.001	3	0	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	6	-2.011	6	-1.499	5	0	1	0	5	0	15
5		3	max	-9.827	12	304.877	3	-2.77	12	.058	3	.2	1	.304	2
6			min	-166.442	1	-690.324	2	-123.541	1	-.199	2	.018	12	-.132	3
7		4	max	-10.193	12	303.7	3	-2.77	12	.058	3	.124	1	.732	2
8			min	-167.174	1	-691.892	2	-123.541	1	-.199	2	.016	12	-.321	3
9		5	max	-10.559	12	302.524	3	-2.77	12	.058	3	.055	4	1.162	2
10			min	-167.905	1	-693.46	2	-123.541	1	-.199	2	0	10	-.509	3
11		6	max	394.973	3	593.773	2	16.18	3	.01	2	.085	2	1.12	2
12			min	-1226.356	2	-169.563	3	-163.221	1	-.032	3	-.032	3	-.524	3
13		7	max	394.425	3	592.205	2	16.18	3	.01	2	.005	10	.752	2
14			min	-1227.087	2	-170.739	3	-163.221	1	-.032	3	-.052	4	-.418	3
15		8	max	393.876	3	590.637	2	16.18	3	.01	2	-.008	12	.385	2
16			min	-1227.819	2	-171.915	3	-163.221	1	-.032	3	-.125	1	-.312	3
17		9	max	379.008	3	99.393	3	16.865	3	.014	5	.078	1	.17	2
18			min	-1317.36	2	-56.862	2	-179.727	1	-.146	2	.011	10	-.266	3
19		10	max	378.459	3	98.217	3	16.865	3	.014	5	.04	3	.206	2
20			min	-1318.092	2	-58.43	2	-179.727	1	-.146	2	-.037	2	-.327	3
21		11	max	377.911	3	97.041	3	16.865	3	.014	5	.051	3	.243	2
22			min	-1318.823	2	-59.999	2	-179.727	1	-.146	2	-.145	1	-.388	3
23		12	max	359.051	3	810.568	3	72.081	2	.266	3	.113	1	.463	2
24			min	-1445.423	1	-506.178	2	-217.786	3	-.231	2	-.008	5	-.73	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	358.502	3	809.392	3	72.081	2	.266	3	.127	1	.777	2
26			min	-1446.154	1	-507.746	2	-217.786	3	-.231	2	-.115	3	-1.233	3
27		14	max	168.441	1	474.043	2	59.946	5	.173	2	.041	3	1.08	2
28			min	8.454	15	-743.237	3	-98.156	1	-.355	3	-.154	4	-1.713	3
29		15	max	167.71	1	472.475	2	58.446	5	.173	2	.023	3	.786	2
30			min	8.233	15	-744.414	3	-98.156	1	-.355	3	-.129	4	-1.252	3
31		16	max	166.978	1	470.906	2	56.947	5	.173	2	.005	3	.493	2
32			min	8.013	15	-745.59	3	-98.156	1	-.355	3	-.152	1	-.789	3
33		17	max	166.247	1	469.338	2	55.447	5	.173	2	-.009	12	.201	2
34			min	7.792	15	-746.766	3	-98.156	1	-.355	3	-.213	1	-.326	3
35		18	max	.939	4	2.012	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	0	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.014	2	.001	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	4
42			min	-.939	6	-2.01	4	-1.499	5	0	1	0	5	0	15
43		3	max	-6.696	12	919.403	3	0	1	.024	4	.174	4	.715	2
44			min	-259.004	1	-1880.565	2	-84.096	5	0	1	0	1	-.353	3
45		4	max	-7.061	12	918.227	3	0	1	.024	4	.122	4	1.882	2
46			min	-259.736	1	-1882.134	2	-85.596	5	0	1	0	1	-.923	3
47		5	max	-7.427	12	917.051	3	0	1	.024	4	.068	4	3.051	2
48			min	-260.467	1	-1883.702	2	-87.095	5	0	1	0	1	-1.492	3
49		6	max	1430.107	3	1750.5	2	0	1	0	1	0	1	2.886	2
50			min	-3299.907	2	-719.291	3	-81.635	4	-.018	4	-.015	5	-1.461	3
51		7	max	1429.559	3	1748.932	2	0	1	0	1	0	1	1.8	2
52			min	-3300.639	2	-720.467	3	-83.135	4	-.018	4	-.066	4	-1.014	3
53		8	max	1429.01	3	1747.363	2	0	1	0	1	0	1	.716	2
54			min	-3301.37	2	-721.643	3	-84.634	4	-.018	4	-.118	4	-.567	3
55		9	max	1420.867	3	262.621	3	0	1	.01	4	.094	4	.084	1
56			min	-3363.136	2	-233.929	2	-179.427	4	0	1	0	1	-.339	3
57		10	max	1420.318	3	261.445	3	0	1	.01	4	0	1	.221	1
58			min	-3363.867	2	-235.498	2	-180.926	4	0	1	-.018	4	-.502	3
59		11	max	1419.77	3	260.269	3	0	1	.01	4	0	1	.359	1
60			min	-3364.598	2	-237.066	2	-182.426	4	0	1	-.131	4	-.664	3
61		12	max	1419.609	3	2292.553	3	0	1	.111	4	.015	5	1.051	2
62			min	-3434.587	2	-1653.001	2	-189.21	5	0	1	0	1	-1.634	3
63		13	max	1419.061	3	2291.377	3	0	1	.111	4	0	1	2.078	2
64			min	-3435.318	2	-1654.57	2	-190.71	5	0	1	-.103	4	-3.056	3
65		14	max	261.589	1	1363.761	2	55.59	5	0	1	0	1	3.064	2
66			min	8.648	12	-1969.847	3	0	1	-.076	4	-.133	5	-4.42	3
67		15	max	260.858	1	1362.193	2	54.091	5	0	1	0	1	2.218	2
68			min	8.283	12	-1971.023	3	0	1	-.076	4	-.099	5	-3.197	3
69		16	max	260.127	1	1360.624	2	52.591	5	0	1	0	1	1.373	2
70			min	7.917	12	-1972.199	3	0	1	-.076	4	-.066	5	-1.973	3
71		17	max	259.395	1	1359.056	2	51.091	5	0	1	0	1	.529	2
72			min	7.551	12	-1973.375	3	0	1	-.076	4	-.034	4	-.749	3
73		18	max	.939	4	2.013	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	.006	2	.002	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	0	1	0	1	0	1	0	4
80			min	-.939	4	-2.012	4	-1.499	5	0	1	0	5	0	15
81		3	max	16.954	5	304.877	3	123.541	1	.199	2	.086	5	.304	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	-166.442	1	-690.324	2	-38.147	5	-.058	3	-.2	1	-.132	3
83		4	max	16.613	5	303.7	3	123.541	1	.199	2	.062	5	.732	2
84			min	-167.174	1	-691.892	2	-39.647	5	-.058	3	-.124	1	-.321	3
85		5	max	16.271	5	302.524	3	123.541	1	.199	2	.037	5	1.162	2
86			min	-167.905	1	-693.46	2	-41.146	5	-.058	3	-.047	1	-.509	3
87		6	max	394.973	3	593.773	2	163.221	1	.032	3	.032	3	1.12	2
88			min	-1226.356	2	-169.563	3	-34.153	5	-.015	4	-.085	2	-.524	3
89		7	max	394.425	3	592.205	2	163.221	1	.032	3	.023	1	.752	2
90			min	-1227.087	2	-170.739	3	-35.652	5	-.015	4	-.041	5	-.418	3
91		8	max	393.876	3	590.637	2	163.221	1	.032	3	.125	1	.385	2
92			min	-1227.819	2	-171.915	3	-37.152	5	-.015	4	-.064	5	-.312	3
93		9	max	379.008	3	99.393	3	179.727	1	.146	2	.034	5	.17	2
94			min	-1317.36	2	-56.862	2	-72.036	5	.013	15	-.078	1	-.266	3
95		10	max	378.459	3	98.217	3	179.727	1	.146	2	.037	2	.206	2
96			min	-1318.092	2	-58.43	2	-73.536	5	.013	15	-.04	3	-.327	3
97		11	max	377.911	3	97.041	3	179.727	1	.146	2	.145	1	.243	2
98			min	-1318.823	2	-59.999	2	-75.036	5	.013	15	-.057	5	-.388	3
99		12	max	359.051	3	810.568	3	217.786	3	.231	2	-.013	12	.463	2
100			min	-1445.423	1	-506.178	2	-164.425	5	-.266	3	-.113	1	-.73	3
101		13	max	358.502	3	809.392	3	217.786	3	.231	2	.115	3	.777	2
102			min	-1446.154	1	-507.746	2	-165.925	5	-.266	3	-.143	4	-1.233	3
103		14	max	168.441	1	474.043	2	98.156	1	.355	3	.031	1	1.08	2
104			min	6.537	15	-743.237	3	18.623	12	-.173	2	-.147	5	-1.713	3
105		15	max	167.71	1	472.475	2	98.156	1	.355	3	.092	1	.786	2
106			min	6.316	15	-744.414	3	18.623	12	-.173	2	-.104	5	-1.252	3
107		16	max	166.978	1	470.906	2	98.156	1	.355	3	.152	1	.493	2
108			min	6.095	15	-745.59	3	18.623	12	-.173	2	-.061	5	-.789	3
109		17	max	166.247	1	469.338	2	98.156	1	.355	3	.213	1	.201	2
110			min	5.875	15	-746.766	3	18.623	12	-.173	2	-.019	5	-.326	3
111		18	max	.939	4	2.013	4	1.5	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	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	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	98.159	1	466.038	2	-5.437	15	.011	2	.253	1	.173	2
116			min	18.625	12	-749.077	3	-164.99	1	-.025	3	.005	15	-.355	3
117		2	max	98.159	1	338.965	2	-4.094	15	.011	2	.121	1	.226	3
118			min	18.625	12	-556.115	3	-132.351	1	-.025	3	.001	15	-.184	2
119		3	max	98.159	1	211.892	2	-2.752	15	.011	2	.037	2	.634	3
120			min	18.625	12	-363.153	3	-99.712	1	-.025	3	-.003	4	-.429	2
121		4	max	98.159	1	84.819	2	-1.41	15	.011	2	.005	10	.871	3
122			min	18.625	12	-170.19	3	-67.073	1	-.025	3	-.056	1	-.561	2
123		5	max	98.159	1	22.772	3	-.068	15	.011	2	-.004	15	.937	3
124			min	18.121	15	-42.254	2	-34.434	1	-.025	3	-.101	1	-.58	2
125		6	max	98.159	1	215.734	3	5.008	9	.011	2	-.004	15	.831	3
126			min	11.98	15	-169.327	2	-15.524	2	-.025	3	-.118	1	-.486	2
127		7	max	98.159	1	408.696	3	30.844	1	.011	2	-.002	15	.553	3
128			min	5.838	15	-296.4	2	-6.866	10	-.025	3	-.105	1	-.279	2
129		8	max	98.159	1	601.659	3	63.483	1	.011	2	.001	5	.104	3
130			min	-.303	15	-423.472	2	-3.158	10	-.025	3	-.063	1	-.014	5
131		9	max	98.159	1	794.621	3	96.122	1	.011	2	.026	9	.474	2
132			min	-9.317	5	-550.545	2	.55	10	-.025	3	-.046	2	-.517	3
133		10	max	98.159	1	208.351	14	128.761	1	0	15	.108	1	1.02	2
134			min	18.625	12	-987.583	3	-73.73	14	-.025	3	-.031	10	-1.309	3
135		11	max	98.159	1	550.545	2	-.55	10	.025	3	.026	9	.474	2
136			min	13.67	15	-794.621	3	-96.122	1	-.011	2	-.046	2	-.517	3
137		12	max	98.159	1	423.472	2	3.158	10	.025	3	-.004	15	.104	3
138			min	7.529	15	-601.659	3	-63.483	1	-.011	2	-.063	1	.012	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
139		13	max	98.159	1	296.4	2	6.866	10	.025	3	-.005	15	.553	3
140			min	1.387	15	-408.696	3	-30.844	1	-.011	2	-.105	1	-.279	2
141		14	max	98.159	1	169.327	2	15.524	2	.025	3	-.005	15	.831	3
142			min	-6.833	5	-215.734	3	-5.008	9	-.011	2	-.118	1	-.486	2
143		15	max	98.159	1	42.254	2	34.434	1	.025	3	-.004	15	.937	3
144			min	-15.958	5	-22.772	3	1.983	15	-.011	2	-.101	1	-.58	2
145		16	max	98.159	1	170.19	3	67.073	1	.025	3	.005	10	.871	3
146			min	-25.083	5	-84.819	2	3.325	15	-.011	2	-.056	1	-.561	2
147		17	max	98.159	1	363.153	3	99.712	1	.025	3	.037	2	.634	3
148			min	-34.207	5	-211.892	2	4.667	15	-.011	2	0	9	-.429	2
149		18	max	98.159	1	556.115	3	132.351	1	.025	3	.121	1	.226	3
150			min	-43.332	5	-338.965	2	6.009	15	-.011	2	.006	15	-.184	2
151		19	max	98.159	1	749.077	3	164.99	1	.025	3	.253	1	.173	2
152			min	-52.457	5	-466.038	2	7.352	15	-.011	2	.012	15	-.355	3
153	M11	1	max	201.194	1	442.349	2	22.816	5	0	15	.29	1	.101	1
154			min	-234.56	3	-715.806	3	-171.986	1	-.006	1	-.119	5	-.36	3
155		2	max	201.194	1	315.276	2	24.892	5	0	15	.152	1	.191	3
156			min	-234.56	3	-522.844	3	-139.347	1	-.006	1	-.098	5	-.251	2
157		3	max	201.194	1	188.203	2	26.969	5	0	15	.048	2	.57	3
158			min	-234.56	3	-329.882	3	-106.708	1	-.006	1	-.075	5	-.475	2
159		4	max	201.194	1	61.13	2	29.045	5	0	15	.012	3	.777	3
160			min	-234.56	3	-136.919	3	-74.069	1	-.006	1	-.061	4	-.586	2
161		5	max	201.194	1	56.043	3	31.122	5	0	15	.002	3	.813	3
162			min	-234.56	3	-65.943	2	-41.43	1	-.006	1	-.089	1	-.583	2
163		6	max	201.194	1	249.005	3	33.515	4	0	15	.006	5	.678	3
164			min	-234.56	3	-193.016	2	-18.798	2	-.006	1	-.112	1	-.468	2
165		7	max	201.194	1	441.967	3	42.749	4	0	15	.036	5	.371	3
166			min	-234.56	3	-320.089	2	-7.941	10	-.006	1	-.105	1	-.24	2
167		8	max	201.194	1	634.93	3	56.487	1	0	15	.068	5	.101	2
168			min	-234.56	3	-447.162	2	-4.233	10	-.006	1	-.069	1	-.108	3
169		9	max	201.194	1	827.892	3	89.126	1	0	15	.109	4	.555	2
170			min	-234.56	3	-574.234	2	-2.1	3	-.006	1	-.052	2	-.758	3
171		10	max	201.194	1	1020.854	3	34.237	2	0	15	.167	4	1.122	2
172			min	-234.56	3	-701.307	2	-121.765	1	-.006	1	-.034	10	-1.58	3
173		11	max	201.194	1	574.234	2	26.826	5	.006	1	.018	9	.555	2
174			min	-234.56	3	-827.892	3	-89.126	1	0	5	-.099	5	-.758	3
175		12	max	201.194	1	447.162	2	28.902	5	.006	1	-.011	12	.101	2
176			min	-234.56	3	-634.93	3	-56.487	1	0	5	-.084	4	-.108	3
177		13	max	201.194	1	320.089	2	30.979	5	.006	1	-.008	12	.371	3
178			min	-234.56	3	-441.967	3	-23.848	1	0	5	-.105	1	-.24	2
179		14	max	201.194	1	193.016	2	33.055	5	.006	1	-.004	12	.678	3
180			min	-234.56	3	-249.005	3	-.631	9	0	5	-.112	1	-.468	2
181		15	max	201.194	1	65.943	2	42.156	4	.006	1	.011	5	.813	3
182			min	-234.56	3	-56.043	3	6.472	12	0	5	-.089	1	-.583	2
183		16	max	201.194	1	136.919	3	74.069	1	.006	1	.043	5	.777	3
184			min	-234.56	3	-61.13	2	7.814	12	0	5	-.038	1	-.586	2
185		17	max	201.194	1	329.882	3	106.708	1	.006	1	.082	4	.57	3
186			min	-234.56	3	-188.203	2	9.156	12	0	5	.015	9	-.475	2
187		18	max	201.194	1	522.844	3	139.347	1	.006	1	.152	1	.191	3
188			min	-234.56	3	-315.276	2	10.499	12	0	5	.024	12	-.251	2
189		19	max	201.194	1	715.806	3	171.986	1	.006	1	.29	1	.101	1
190			min	-234.56	3	-442.349	2	11.841	12	0	5	.034	12	-.36	3
191	M12	1	max	33.303	5	643.815	2	25.54	5	0	3	.308	1	.156	2
192			min	-20.429	9	-273.172	3	-175.361	1	-.006	1	-.129	5	.022	15
193		2	max	24.178	5	462.938	2	27.616	5	0	3	.166	1	.266	3
194			min	-20.429	9	-187.817	3	-142.722	1	-.006	1	-.105	5	-.336	2
195		3	max	17.981	2	282.061	2	29.692	5	0	3	.061	2	.395	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	-20.429	9	-102.461	3	-110.083	1	-.006	1	-.08	5	-.667	2
197		4	max	17.981	2	101.184	2	31.769	5	0	3	.013	10	.448	3
198			min	-20.429	9	-17.106	3	-77.444	1	-.006	1	-.062	4	-.838	2
199		5	max	17.981	2	68.25	3	33.845	5	0	3	-.003	12	.426	3
200			min	-20.429	9	-79.693	2	-44.805	1	-.006	1	-.084	1	-.847	2
201		6	max	17.981	2	153.605	3	35.922	5	0	3	.008	5	.327	3
202			min	-22.005	14	-260.57	2	-22.555	2	-.006	1	-.109	1	-.696	2
203		7	max	17.981	2	238.961	3	45.094	4	0	3	.041	5	.153	3
204			min	-28.296	4	-441.447	2	-10.026	10	-.006	1	-.105	1	-.384	2
205		8	max	17.981	2	324.316	3	54.328	4	0	3	.075	5	.089	2
206			min	-37.421	4	-622.324	2	-6.318	10	-.006	1	-.073	1	-.098	3
207		9	max	17.981	2	409.672	3	85.751	1	0	3	.118	4	.722	2
208			min	-46.546	4	-803.201	2	-2.611	10	-.006	1	-.059	2	-.424	3
209		10	max	17.981	2	984.078	2	88.145	14	0	3	.178	4	1.517	2
210			min	-55.67	4	-561.443	10	-118.39	1	-.006	1	-.04	10	-.826	3
211		11	max	35.353	5	803.201	2	29.795	5	.006	1	.016	9	.722	2
212			min	-20.429	9	-409.672	3	-85.751	1	0	5	-.109	5	-.424	3
213		12	max	26.229	5	622.324	2	31.871	5	.006	1	-.009	12	.089	2
214			min	-20.429	9	-324.316	3	-53.112	1	0	5	-.092	4	-.098	3
215		13	max	17.981	2	441.447	2	33.948	5	.006	1	-.008	12	.153	3
216			min	-20.429	9	-238.961	3	-20.729	9	0	5	-.105	1	-.384	2
217		14	max	17.981	2	260.57	2	36.338	4	.006	1	-.006	12	.327	3
218			min	-20.429	9	-153.605	3	.597	9	0	5	-.109	1	-.696	2
219		15	max	17.981	2	79.693	2	45.571	4	.006	1	.012	5	.426	3
220			min	-20.429	9	-68.25	3	4.049	12	0	5	-.084	1	-.847	2
221		16	max	17.981	2	17.106	3	77.444	1	.006	1	.047	5	.448	3
222			min	-20.986	14	-101.184	2	5.391	12	0	5	-.029	1	-.838	2
223		17	max	17.981	2	102.461	3	110.083	1	.006	1	.09	4	.395	3
224			min	-26.255	4	-282.061	2	6.733	12	0	5	.006	12	-.667	2
225		18	max	17.981	2	187.817	3	142.722	1	.006	1	.166	1	.266	3
226			min	-35.38	4	-462.938	2	8.075	12	0	5	.013	12	-.336	2
227		19	max	17.981	2	273.172	3	175.361	1	.006	1	.308	1	.156	2
228			min	-44.504	4	-643.815	2	9.418	12	0	5	.021	12	-.028	5
229	M13	1	max	35.095	5	687.673	2	17.638	5	.01	3	.25	1	.199	2
230			min	-123.459	1	-307.273	3	-164.714	1	-.024	2	-.102	5	-.058	3
231		2	max	25.971	5	506.796	2	19.715	5	.01	3	.119	1	.177	3
232			min	-123.459	1	-221.917	3	-132.075	1	-.024	2	-.086	5	-.331	2
233		3	max	16.846	5	325.919	2	21.791	5	.01	3	.035	2	.336	3
234			min	-123.459	1	-136.562	3	-99.436	1	-.024	2	-.068	4	-.702	2
235		4	max	7.721	5	145.042	2	23.867	5	.01	3	.004	10	.42	3
236			min	-123.459	1	-51.206	3	-66.797	1	-.024	2	-.062	4	-.911	2
237		5	max	-.755	15	34.15	3	25.944	5	.01	3	-.004	12	.427	3
238			min	-123.459	1	-35.834	2	-34.158	1	-.024	2	-.103	1	-.959	2
239		6	max	-2.77	12	119.505	3	29.812	4	.01	3	0	15	.359	3
240			min	-123.459	1	-216.711	2	-15.31	2	-.024	2	-.119	1	-.847	2
241		7	max	-2.77	12	204.861	3	39.046	4	.01	3	.025	5	.215	3
242			min	-123.459	1	-397.588	2	-6.76	10	-.024	2	-.106	1	-.574	2
243		8	max	-2.77	12	290.216	3	63.759	1	.01	3	.053	5	-.004	12
244			min	-123.459	1	-578.465	2	-3.052	10	-.024	2	-.064	1	-.14	2
245		9	max	-2.77	12	375.572	3	96.398	1	.01	3	.091	4	.454	2
246			min	-123.459	1	-759.342	2	.656	10	-.024	2	-.047	2	-.301	3
247		10	max	-2.77	12	940.219	2	88.536	14	.01	3	.146	4	1.21	2
248			min	-123.459	1	-190.097	14	-129.037	1	-.024	2	-.032	10	-.673	3
249		11	max	25.001	5	759.342	2	20.778	5	.024	2	.026	9	.454	2
250			min	-123.459	1	-375.572	3	-96.398	1	-.01	3	-.077	5	-.301	3
251		12	max	15.877	5	578.465	2	22.855	5	.024	2	-.008	12	0	15
252			min	-123.459	1	-290.216	3	-63.759	1	-.01	3	-.067	4	-.14	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
253		13	max	6.752	5	397.588	2	24.931	5	.024	2	-.008	12	.215	3
254			min	-123.459	1	-204.861	3	-31.12	1	-.01	3	-.106	1	-.574	2
255		14	max	-1.402	15	216.711	2	27.007	5	.024	2	-.006	12	.359	3
256			min	-123.459	1	-119.505	3	-5.149	9	-.01	3	-.119	1	-.847	2
257		15	max	-2.77	12	35.834	2	34.554	4	.024	2	.011	5	.427	3
258			min	-123.459	1	-34.15	3	3.727	12	-.01	3	-.103	1	-.959	2
259		16	max	-2.77	12	51.206	3	66.797	1	.024	2	.038	5	.42	3
260			min	-123.459	1	-145.042	2	5.069	12	-.01	3	-.058	1	-.911	2
261		17	max	-2.77	12	136.562	3	99.436	1	.024	2	.067	5	.336	3
262			min	-123.459	1	-325.919	2	6.411	12	-.01	3	-.002	9	-.702	2
263		18	max	-2.77	12	221.917	3	132.075	1	.024	2	.119	1	.177	3
264			min	-123.459	1	-506.796	2	7.753	12	-.01	3	.012	12	-.331	2
265		19	max	-2.77	12	307.273	3	164.714	1	.024	2	.25	1	.199	2
266			min	-123.459	1	-687.673	2	9.095	12	-.01	3	.019	12	-.058	3
267	M2	1	max	2257.847	2	917.761	3	176.359	2	.008	5	1.12	5	4.571	1
268			min	-1764.575	3	-640.124	2	-282.231	5	-.007	2	-.208	2	.487	15
269		2	max	2255.293	2	917.761	3	176.359	2	.008	5	1.041	5	4.628	1
270			min	-1766.491	3	-640.124	2	-280.016	5	-.007	2	-.16	1	.466	15
271		3	max	2252.738	2	917.761	3	176.359	2	.008	5	.963	5	4.685	1
272			min	-1768.407	3	-640.124	2	-277.802	5	-.007	2	-.115	1	.445	15
273		4	max	1562.328	2	1079.591	1	128.835	2	.001	2	.885	5	4.544	1
274			min	-1523.101	3	99.677	15	-263.132	5	0	3	-.101	1	.42	15
275		5	max	1559.773	2	1079.591	1	128.835	2	.001	2	.812	5	4.241	1
276			min	-1525.017	3	99.677	15	-260.917	5	0	3	-.067	1	.392	15
277		6	max	1557.218	2	1079.591	1	128.835	2	.001	2	.739	5	3.938	1
278			min	-1526.934	3	99.677	15	-258.703	5	0	3	-.034	1	.364	15
279		7	max	1554.663	2	1079.591	1	128.835	2	.001	2	.67	4	3.635	1
280			min	-1528.85	3	99.677	15	-256.489	5	0	3	-.049	3	.336	15
281		8	max	1552.108	2	1079.591	1	128.835	2	.001	2	.602	4	3.332	1
282			min	-1530.766	3	99.677	15	-254.275	5	0	3	-.102	3	.308	15
283		9	max	1549.554	2	1079.591	1	128.835	2	.001	2	.535	4	3.029	1
284			min	-1532.682	3	99.677	15	-252.06	5	0	3	-.155	3	.28	15
285		10	max	1546.999	2	1079.591	1	128.835	2	.001	2	.468	4	2.726	1
286			min	-1534.598	3	99.677	15	-249.846	5	0	3	-.208	3	.252	15
287		11	max	1544.444	2	1079.591	1	128.835	2	.001	2	.402	4	2.423	1
288			min	-1536.514	3	99.677	15	-247.632	5	0	3	-.261	3	.224	15
289		12	max	1541.889	2	1079.591	1	128.835	2	.001	2	.337	4	2.12	1
290			min	-1538.431	3	99.677	15	-245.418	5	0	3	-.314	3	.196	15
291		13	max	1539.334	2	1079.591	1	128.835	2	.001	2	.272	4	1.817	1
292			min	-1540.347	3	99.677	15	-243.203	5	0	3	-.367	3	.168	15
293		14	max	1536.779	2	1079.591	1	128.835	2	.001	2	.265	2	1.515	1
294			min	-1542.263	3	99.677	15	-240.989	5	0	3	-.42	3	.14	15
295		15	max	1534.224	2	1079.591	1	128.835	2	.001	2	.301	2	1.212	1
296			min	-1544.179	3	99.677	15	-238.775	5	0	3	-.473	3	.112	15
297		16	max	1531.669	2	1079.591	1	128.835	2	.001	2	.337	2	.909	1
298			min	-1546.095	3	99.677	15	-236.561	5	0	3	-.525	3	.084	15
299		17	max	1529.114	2	1079.591	1	128.835	2	.001	2	.374	2	.606	1
300			min	-1548.011	3	99.677	15	-234.347	5	0	3	-.578	3	.056	15
301		18	max	1526.56	2	1079.591	1	128.835	2	.001	2	.41	2	.303	1
302			min	-1549.928	3	99.677	15	-232.132	5	0	3	-.631	3	.028	15
303		19	max	1524.005	2	1079.591	1	128.835	2	.001	2	.446	2	0	1
304			min	-1551.844	3	99.677	15	-229.918	5	0	3	-.684	3	0	1
305	M5	1	max	6190.082	2	2525.681	3	0	1	.009	4	1.168	4	8.036	1
306			min	-5299.167	3	-2530.836	2	-302.226	5	0	1	0	1	.263	15
307		2	max	6187.528	2	2525.681	3	0	1	.009	4	1.084	4	8.454	1
308			min	-5301.083	3	-2530.836	2	-300.012	5	0	1	0	1	.266	15
309		3	max	6184.973	2	2525.681	3	0	1	.009	4	1.001	4	8.873	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	-5302.999	3	-2530.836	2	-297.798	5	0	1	0	1	.269	15
311		4	max	4275.291	2	2076.586	1	0	1	0	1	.92	4	8.74	1
312			min	-4435.74	3	62.082	15	-283.837	4	0	4	0	1	.261	15
313		5	max	4272.736	2	2076.586	1	0	1	0	1	.84	4	8.157	1
314			min	-4437.657	3	62.082	15	-281.623	4	0	4	0	1	.244	15
315		6	max	4270.181	2	2076.586	1	0	1	0	1	.762	4	7.574	1
316			min	-4439.573	3	62.082	15	-279.409	4	0	4	0	1	.226	15
317		7	max	4267.627	2	2076.586	1	0	1	0	1	.683	4	6.992	1
318			min	-4441.489	3	62.082	15	-277.194	4	0	4	0	1	.209	15
319		8	max	4265.072	2	2076.586	1	0	1	0	1	.606	4	6.409	1
320			min	-4443.405	3	62.082	15	-274.98	4	0	4	0	1	.192	15
321		9	max	4262.517	2	2076.586	1	0	1	0	1	.529	4	5.826	1
322			min	-4445.321	3	62.082	15	-272.766	4	0	4	0	1	.174	15
323		10	max	4259.962	2	2076.586	1	0	1	0	1	.453	4	5.244	1
324			min	-4447.237	3	62.082	15	-270.552	4	0	4	0	1	.157	15
325		11	max	4257.407	2	2076.586	1	0	1	0	1	.377	4	4.661	1
326			min	-4449.154	3	62.082	15	-268.338	4	0	4	0	1	.139	15
327		12	max	4254.852	2	2076.586	1	0	1	0	1	.302	4	4.078	1
328			min	-4451.07	3	62.082	15	-266.123	4	0	4	0	1	.122	15
329		13	max	4252.297	2	2076.586	1	0	1	0	1	.228	4	3.496	1
330			min	-4452.986	3	62.082	15	-263.909	4	0	4	0	1	.105	15
331		14	max	4249.742	2	2076.586	1	0	1	0	1	.154	4	2.913	1
332			min	-4454.902	3	62.082	15	-261.695	4	0	4	0	1	.087	15
333		15	max	4247.187	2	2076.586	1	0	1	0	1	.081	4	2.331	1
334			min	-4456.818	3	62.082	15	-259.481	4	0	4	0	1	.07	15
335		16	max	4244.633	2	2076.586	1	0	1	0	1	.009	4	1.748	1
336			min	-4458.734	3	62.082	15	-257.266	4	0	4	0	1	.052	15
337		17	max	4242.078	2	2076.586	1	0	1	0	1	0	1	1.165	1
338			min	-4460.651	3	62.082	15	-255.052	4	0	4	-.063	4	.035	15
339		18	max	4239.523	2	2076.586	1	0	1	0	1	0	1	.583	1
340			min	-4462.567	3	62.082	15	-252.838	4	0	4	-.135	4	.017	15
341		19	max	4236.968	2	2076.586	1	0	1	0	1	0	1	0	1
342			min	-4464.483	3	62.082	15	-250.624	4	0	4	-.205	4	0	1
343	M8	1	max	2257.847	2	917.761	3	208.226	3	.009	4	1.171	4	4.571	1
344			min	-1764.575	3	-640.124	2	-314.066	4	-.003	3	-.267	3	-.225	5
345		2	max	2255.293	2	917.761	3	208.226	3	.009	4	1.083	4	4.628	1
346			min	-1766.491	3	-640.124	2	-311.852	4	-.003	3	-.209	3	-.199	5
347		3	max	2252.738	2	917.761	3	208.226	3	.009	4	.996	4	4.685	1
348			min	-1768.407	3	-640.124	2	-309.638	4	-.003	3	-.151	3	-.172	5
349		4	max	1562.328	2	1079.591	1	188.582	3	0	3	.915	4	4.544	1
350			min	-1523.101	3	-36.612	5	-288.985	4	-.001	2	-.11	3	-.154	5
351		5	max	1559.773	2	1079.591	1	188.582	3	0	3	.834	4	4.241	1
352			min	-1525.017	3	-36.612	5	-286.771	4	-.001	2	-.057	3	-.144	5
353		6	max	1557.218	2	1079.591	1	188.582	3	0	3	.754	4	3.938	1
354			min	-1526.934	3	-36.612	5	-284.556	4	-.001	2	-.004	3	-.134	5
355		7	max	1554.663	2	1079.591	1	188.582	3	0	3	.674	4	3.635	1
356			min	-1528.85	3	-36.612	5	-282.342	4	-.001	2	-.012	2	-.123	5
357		8	max	1552.108	2	1079.591	1	188.582	3	0	3	.595	4	3.332	1
358			min	-1530.766	3	-36.612	5	-280.128	4	-.001	2	-.048	2	-.113	5
359		9	max	1549.554	2	1079.591	1	188.582	3	0	3	.52	5	3.029	1
360			min	-1532.682	3	-36.612	5	-277.914	4	-.001	2	-.084	2	-.103	5
361		10	max	1546.999	2	1079.591	1	188.582	3	0	3	.447	5	2.726	1
362			min	-1534.598	3	-36.612	5	-275.7	4	-.001	2	-.12	2	-.092	5
363		11	max	1544.444	2	1079.591	1	188.582	3	0	3	.375	5	2.423	1
364			min	-1536.514	3	-36.612	5	-273.485	4	-.001	2	-.157	2	-.082	5
365		12	max	1541.889	2	1079.591	1	188.582	3	0	3	.314	3	2.12	1
366			min	-1538.431	3	-36.612	5	-271.271	4	-.001	2	-.193	2	-.072	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	1539.334	2	1079.591	1	188.582	3	0	3	.367	3	1.817	1
368			min	-1540.347	3	-36.612	5	-269.057	4	-.001	2	-.229	2	-.062	5
369		14	max	1536.779	2	1079.591	1	188.582	3	0	3	.42	3	1.515	1
370			min	-1542.263	3	-36.612	5	-266.843	4	-.001	2	-.265	2	-.051	5
371		15	max	1534.224	2	1079.591	1	188.582	3	0	3	.473	3	1.212	1
372			min	-1544.179	3	-36.612	5	-264.628	4	-.001	2	-.301	2	-.041	5
373		16	max	1531.669	2	1079.591	1	188.582	3	0	3	.525	3	.909	1
374			min	-1546.095	3	-36.612	5	-262.414	4	-.001	2	-.337	2	-.031	5
375		17	max	1529.114	2	1079.591	1	188.582	3	0	3	.578	3	.606	1
376			min	-1548.011	3	-36.612	5	-260.2	4	-.001	2	-.374	2	-.021	5
377		18	max	1526.56	2	1079.591	1	188.582	3	0	3	.631	3	.303	1
378			min	-1549.928	3	-36.612	5	-257.986	4	-.001	2	-.41	2	-.01	5
379		19	max	1524.005	2	1079.591	1	188.582	3	0	3	.684	3	0	1
380			min	-1551.844	3	-36.612	5	-255.771	4	-.001	2	-.446	2	0	1
381	M3	1	max	1719.536	2	4.588	6	47.041	2	.015	3	.009	4	0	1
382			min	-623.246	3	1.079	15	-20.098	3	-.031	2	-.002	3	0	1
383		2	max	1719.361	2	4.078	6	47.041	2	.015	3	.018	2	0	15
384			min	-623.377	3	.959	15	-20.098	3	-.031	2	-.008	3	-.001	6
385		3	max	1719.187	2	3.569	6	47.041	2	.015	3	.031	2	0	15
386			min	-623.508	3	.839	15	-20.098	3	-.031	2	-.014	3	-.002	6
387		4	max	1719.013	2	3.059	6	47.041	2	.015	3	.045	2	0	15
388			min	-623.639	3	.719	15	-20.098	3	-.031	2	-.02	3	-.003	6
389		5	max	1718.838	2	2.549	6	47.041	2	.015	3	.059	2	0	15
390			min	-623.769	3	.599	15	-20.098	3	-.031	2	-.026	3	-.004	6
391		6	max	1718.664	2	2.039	6	47.041	2	.015	3	.073	2	-.001	15
392			min	-623.9	3	.479	15	-20.098	3	-.031	2	-.032	3	-.005	6
393		7	max	1718.49	2	1.529	6	47.041	2	.015	3	.086	2	-.001	15
394			min	-624.031	3	.36	15	-20.098	3	-.031	2	-.037	3	-.005	6
395		8	max	1718.315	2	1.02	6	47.041	2	.015	3	.1	2	-.001	15
396			min	-624.162	3	.24	15	-20.098	3	-.031	2	-.043	3	-.006	6
397		9	max	1718.141	2	.51	6	47.041	2	.015	3	.114	2	-.001	15
398			min	-624.293	3	.12	15	-20.098	3	-.031	2	-.049	3	-.006	6
399		10	max	1717.966	2	0	1	47.041	2	.015	3	.128	2	-.001	15
400			min	-624.423	3	0	1	-20.098	3	-.031	2	-.055	3	-.006	6
401		11	max	1717.792	2	-.12	15	47.041	2	.015	3	.141	2	-.001	15
402			min	-624.554	3	-.51	4	-20.098	3	-.031	2	-.061	3	-.006	6
403		12	max	1717.618	2	-.24	15	47.041	2	.015	3	.155	2	-.001	15
404			min	-624.685	3	-1.02	4	-20.098	3	-.031	2	-.067	3	-.006	6
405		13	max	1717.443	2	-.36	15	47.041	2	.015	3	.169	2	-.001	15
406			min	-624.816	3	-1.529	4	-20.098	3	-.031	2	-.073	3	-.005	6
407		14	max	1717.269	2	-.479	15	47.041	2	.015	3	.183	2	-.001	15
408			min	-624.947	3	-2.039	4	-20.098	3	-.031	2	-.079	3	-.005	6
409		15	max	1717.094	2	-.599	15	47.041	2	.015	3	.197	2	0	15
410			min	-625.077	3	-2.549	4	-20.098	3	-.031	2	-.084	3	-.004	6
411		16	max	1716.92	2	-.719	15	47.041	2	.015	3	.21	2	0	15
412			min	-625.208	3	-3.059	4	-20.098	3	-.031	2	-.09	3	-.003	6
413		17	max	1716.746	2	-.839	15	47.041	2	.015	3	.224	2	0	15
414			min	-625.339	3	-3.569	4	-20.098	3	-.031	2	-.096	3	-.002	6
415		18	max	1716.571	2	-.959	15	47.041	2	.015	3	.238	2	0	15
416			min	-625.47	3	-4.078	4	-20.098	3	-.031	2	-.102	3	-.001	6
417		19	max	1716.397	2	-1.079	15	47.041	2	.015	3	.252	2	0	1
418			min	-625.6	3	-4.588	4	-20.098	3	-.031	2	-.108	3	0	1
419	M6	1	max	4831.956	2	4.588	6	0	1	.004	5	.008	4	0	1
420			min	-2179.242	3	1.079	15	-14.804	4	0	1	0	1	0	1
421		2	max	4831.782	2	4.078	6	0	1	.004	5	.004	4	0	15
422			min	-2179.373	3	.959	15	-14.428	4	0	1	0	1	-.001	6
423		3	max	4831.607	2	3.569	6	0	1	.004	5	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	-2179.503	3	.839	15	-14.052	4	0	1	0	5	-.002	6
425		4	max	4831.433	2	3.059	6	0	1	.004	5	0	1	0	15
426			min	-2179.634	3	.719	15	-13.676	4	0	1	-.004	4	-.003	6
427		5	max	4831.258	2	2.549	6	0	1	.004	5	0	1	0	15
428			min	-2179.765	3	.599	15	-13.3	4	0	1	-.008	4	-.004	6
429		6	max	4831.084	2	2.039	6	0	1	.004	5	0	1	-.001	15
430			min	-2179.896	3	.479	15	-12.924	4	0	1	-.012	4	-.005	6
431		7	max	4830.91	2	1.529	6	0	1	.004	5	0	1	-.001	15
432			min	-2180.027	3	.36	15	-12.548	4	0	1	-.016	4	-.005	6
433		8	max	4830.735	2	1.02	6	0	1	.004	5	0	1	-.001	15
434			min	-2180.157	3	.24	15	-12.172	4	0	1	-.019	4	-.006	6
435		9	max	4830.561	2	.51	6	0	1	.004	5	0	1	-.001	15
436			min	-2180.288	3	.12	15	-11.796	4	0	1	-.023	4	-.006	6
437		10	max	4830.386	2	0	1	0	1	.004	5	0	1	-.001	15
438			min	-2180.419	3	0	1	-11.42	4	0	1	-.026	4	-.006	6
439		11	max	4830.212	2	-.12	15	0	1	.004	5	0	1	-.001	15
440			min	-2180.55	3	-.51	4	-11.044	4	0	1	-.029	4	-.006	6
441		12	max	4830.038	2	-.24	15	0	1	.004	5	0	1	-.001	15
442			min	-2180.681	3	-1.02	4	-10.668	4	0	1	-.033	4	-.006	6
443		13	max	4829.863	2	-.36	15	0	1	.004	5	0	1	-.001	15
444			min	-2180.811	3	-1.529	4	-10.292	4	0	1	-.036	4	-.005	6
445		14	max	4829.689	2	-.479	15	0	1	.004	5	0	1	-.001	15
446			min	-2180.942	3	-2.039	4	-9.916	4	0	1	-.039	4	-.005	6
447		15	max	4829.515	2	-.599	15	0	1	.004	5	0	1	0	15
448			min	-2181.073	3	-2.549	4	-9.54	4	0	1	-.042	4	-.004	6
449		16	max	4829.34	2	-.719	15	0	1	.004	5	0	1	0	15
450			min	-2181.204	3	-3.059	4	-9.164	4	0	1	-.044	4	-.003	6
451		17	max	4829.166	2	-.839	15	0	1	.004	5	0	1	0	15
452			min	-2181.335	3	-3.569	4	-8.788	4	0	1	-.047	4	-.002	6
453		18	max	4828.991	2	-.959	15	0	1	.004	5	0	1	0	15
454			min	-2181.465	3	-4.078	4	-8.412	4	0	1	-.049	4	-.001	6
455		19	max	4828.817	2	-1.079	15	0	1	.004	5	0	1	0	1
456			min	-2181.596	3	-4.588	4	-8.036	4	0	1	-.052	4	0	1
457	M9	1	max	1719.536	2	4.588	6	20.098	3	.031	2	.009	5	0	1
458			min	-623.246	3	1.079	15	-47.041	2	-.015	3	-.004	2	0	1
459		2	max	1719.361	2	4.078	6	20.098	3	.031	2	.008	3	0	15
460			min	-623.377	3	.959	15	-47.041	2	-.015	3	-.018	2	-.001	6
461		3	max	1719.187	2	3.569	6	20.098	3	.031	2	.014	3	0	15
462			min	-623.508	3	.839	15	-47.041	2	-.015	3	-.031	2	-.002	6
463		4	max	1719.013	2	3.059	6	20.098	3	.031	2	.02	3	0	15
464			min	-623.639	3	.719	15	-47.041	2	-.015	3	-.045	2	-.003	6
465		5	max	1718.838	2	2.549	6	20.098	3	.031	2	.026	3	0	15
466			min	-623.769	3	.599	15	-47.041	2	-.015	3	-.059	2	-.004	6
467		6	max	1718.664	2	2.039	6	20.098	3	.031	2	.032	3	-.001	15
468			min	-623.9	3	.479	15	-47.041	2	-.015	3	-.073	2	-.005	6
469		7	max	1718.49	2	1.529	6	20.098	3	.031	2	.037	3	-.001	15
470			min	-624.031	3	.36	15	-47.041	2	-.015	3	-.086	2	-.005	6
471		8	max	1718.315	2	1.02	6	20.098	3	.031	2	.043	3	-.001	15
472			min	-624.162	3	.24	15	-47.041	2	-.015	3	-.1	2	-.006	6
473		9	max	1718.141	2	.51	6	20.098	3	.031	2	.049	3	-.001	15
474			min	-624.293	3	.12	15	-47.041	2	-.015	3	-.114	2	-.006	6
475		10	max	1717.966	2	0	1	20.098	3	.031	2	.055	3	-.001	15
476			min	-624.423	3	0	1	-47.041	2	-.015	3	-.128	2	-.006	6
477		11	max	1717.792	2	-.12	15	20.098	3	.031	2	.061	3	-.001	15
478			min	-624.554	3	-.51	4	-47.041	2	-.015	3	-.141	2	-.006	6
479		12	max	1717.618	2	-.24	15	20.098	3	.031	2	.067	3	-.001	15
480			min	-624.685	3	-1.02	4	-47.041	2	-.015	3	-.155	2	-.006	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1717.443	2	-.36	15	20.098	3	.031	2	.073	3	-.001	15
482			min	-624.816	3	-1.529	4	-47.041	2	-.015	3	-.169	2	-.005	6
483		14	max	1717.269	2	-.479	15	20.098	3	.031	2	.079	3	-.001	15
484			min	-624.947	3	-2.039	4	-47.041	2	-.015	3	-.183	2	-.005	6
485		15	max	1717.094	2	-.599	15	20.098	3	.031	2	.084	3	0	15
486			min	-625.077	3	-2.549	4	-47.041	2	-.015	3	-.197	2	-.004	6
487		16	max	1716.92	2	-.719	15	20.098	3	.031	2	.09	3	0	15
488			min	-625.208	3	-3.059	4	-47.041	2	-.015	3	-.21	2	-.003	6
489		17	max	1716.746	2	-.839	15	20.098	3	.031	2	.096	3	0	15
490			min	-625.339	3	-3.569	4	-47.041	2	-.015	3	-.224	2	-.002	6
491		18	max	1716.571	2	-.959	15	20.098	3	.031	2	.102	3	0	15
492			min	-625.47	3	-4.078	4	-47.041	2	-.015	3	-.238	2	-.001	6
493		19	max	1716.397	2	-1.079	15	20.098	3	.031	2	.108	3	0	1
494			min	-625.6	3	-4.588	4	-47.041	2	-.015	3	-.252	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	-.022	15	.05	3	.019	1	7.753e-3	3	NC	3	NC	3
2			min	-.229	1	-.576	1	-.402	5	-2.014e-2	2	216.583	1	440.217	5
3		2	max	-.022	15	.023	3	.006	1	7.753e-3	3	8008.57	12	NC	3
4			min	-.229	1	-.487	1	-.385	4	-2.014e-2	2	253.122	1	467.467	5
5		3	max	-.021	15	-.004	12	0	12	7.295e-3	3	3999.952	12	NC	1
6			min	-.229	1	-.397	1	-.368	4	-1.858e-2	2	304.55	1	500.087	5
7		4	max	-.021	15	-.02	12	0	12	6.594e-3	3	2838.59	15	NC	1
8			min	-.228	1	-.311	1	-.347	4	-1.618e-2	2	378.683	1	545.509	5
9		5	max	-.021	15	-.02	15	0	12	5.892e-3	3	3105.648	15	NC	1
10			min	-.228	1	-.233	1	-.322	4	-1.377e-2	2	485.498	1	607.445	5
11		6	max	-.021	15	-.016	15	.001	3	5.836e-3	3	3408.369	15	NC	1
12			min	-.228	1	-.169	1	-.294	4	-1.286e-2	2	633.236	1	690.171	5
13		7	max	-.021	15	-.012	15	.001	3	6.227e-3	3	4297.892	10	NC	1
14			min	-.228	1	-.117	1	-.268	4	-1.298e-2	2	836.136	1	796.946	5
15		8	max	-.021	15	-.009	15	0	3	6.618e-3	3	NC	10	NC	2
16			min	-.227	1	-.075	1	-.242	4	-1.31e-2	2	1101.609	3	932.16	5
17		9	max	-.021	15	-.006	15	0	10	7.277e-3	3	NC	2	NC	2
18			min	-.227	1	-.068	3	-.22	4	-1.255e-2	2	1135.209	3	1100.634	5
19		10	max	-.021	15	.007	2	0	2	8.407e-3	3	NC	11	NC	2
20			min	-.226	1	-.061	3	-.198	4	-1.079e-2	2	1209.025	3	1348.339	5
21		11	max	-.021	15	.036	2	0	3	9.537e-3	3	NC	1	NC	2
22			min	-.226	1	-.049	3	-.176	4	-9.037e-3	2	1352.19	3	1728.824	5
23		12	max	-.021	15	.064	1	.004	3	7.902e-3	3	NC	9	NC	1
24			min	-.225	1	-.032	3	-.156	4	-6.625e-3	2	1630.226	3	2345.375	5
25		13	max	-.021	15	.088	1	.008	3	4.702e-3	3	NC	9	NC	1
26			min	-.225	1	-.005	3	-.136	4	-3.839e-3	2	1444.285	2	3584.093	5
27		14	max	-.021	15	.103	1	.008	3	1.666e-3	3	NC	3	NC	2
28			min	-.224	1	.01	15	-.12	4	-3.907e-3	4	1326.769	2	6187.147	5
29		15	max	-.021	15	.106	3	.006	1	5.935e-3	3	NC	4	NC	2
30			min	-.224	1	.013	15	-.109	5	-3.477e-3	4	1416.06	2	5893.352	1
31		16	max	-.021	15	.19	3	.008	1	1.02e-2	3	NC	4	NC	3
32			min	-.224	1	.015	15	-.103	5	-5.334e-3	2	958.165	3	5319.54	1
33		17	max	-.021	15	.285	3	.005	1	1.447e-2	3	NC	4	NC	2
34			min	-.224	1	.015	10	-.1	5	-7.42e-3	2	569.924	3	6042.795	1
35		18	max	-.021	15	.385	3	0	12	1.726e-2	3	NC	4	NC	1
36			min	-.225	1	-.001	10	-.101	4	-8.781e-3	2	400.404	3	NC	1
37		19	max	-.021	15	.484	3	-.002	12	1.726e-2	3	NC	1	NC	1
38			min	-.225	1	-.017	10	-.102	4	-8.781e-3	2	308.703	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	-.013	15	.228	3	0	1	2.622e-4	4	NC	3	NC	1
40			min	-.436	1	-1.277	2	-.398	4	0	1	118.396	1	444.353	4
41		2	max	-.013	15	.151	3	0	1	2.622e-4	4	4885.658	15	NC	1
42			min	-.436	1	-1.059	2	-.385	4	0	1	142.963	1	465.746	4
43		3	max	-.013	15	.073	3	0	1	7.804e-5	5	5903.579	15	NC	1
44			min	-.436	1	-.839	2	-.369	4	0	1	180.519	1	492.079	4
45		4	max	-.013	15	0	3	0	1	0	1	7394.51	15	NC	1
46			min	-.435	1	-.629	2	-.348	4	-2.054e-4	4	241.541	1	533.637	4
47		5	max	-.013	15	-.013	15	0	1	0	1	9593.446	15	NC	1
48			min	-.435	1	-.461	1	-.322	4	-4.884e-4	4	345.325	1	594.136	4
49		6	max	-.013	15	-.01	15	0	1	0	1	NC	15	NC	1
50			min	-.435	1	-.329	1	-.295	4	-4.758e-4	4	411.811	3	677.752	4
51		7	max	-.013	15	-.007	15	0	1	0	1	NC	5	NC	1
52			min	-.434	1	-.229	1	-.267	4	-2.588e-4	4	390.236	3	786.716	4
53		8	max	-.013	15	-.005	15	0	1	0	1	NC	5	NC	1
54			min	-.433	1	-.15	1	-.242	4	-4.186e-5	4	385.788	3	922.143	4
55		9	max	-.013	15	-.003	15	0	1	5.174e-5	4	NC	1	NC	1
56			min	-.431	1	-.116	3	-.221	4	0	1	389.813	3	1081.972	4
57		10	max	-.013	15	.002	10	0	1	0	1	NC	4	NC	1
58			min	-.43	1	-.108	3	-.198	4	-7.284e-5	4	399.116	3	1324.845	4
59		11	max	-.013	15	.062	2	0	1	0	1	NC	4	NC	1
60			min	-.429	1	-.093	3	-.176	4	-1.974e-4	4	417.725	3	1694.141	4
61		12	max	-.013	15	.122	1	0	1	0	1	NC	5	NC	1
62			min	-.428	1	-.07	3	-.157	4	-1.093e-3	4	450.88	3	2239.393	4
63		13	max	-.013	15	.172	1	0	1	0	1	NC	5	NC	1
64			min	-.427	1	-.024	3	-.137	4	-2.423e-3	4	429.048	2	3294.354	4
65		14	max	-.013	15	.194	1	0	1	0	1	NC	5	NC	1
66			min	-.425	1	.006	15	-.122	4	-3.705e-3	4	409.907	2	5310.147	4
67		15	max	-.013	15	.212	3	0	1	0	1	NC	5	NC	1
68			min	-.425	1	.006	15	-.112	4	-2.794e-3	4	446.423	2	8690.338	4
69		16	max	-.013	15	.404	3	0	1	0	1	NC	5	NC	1
70			min	-.426	1	.005	15	-.106	4	-1.883e-3	4	552.053	2	NC	1
71		17	max	-.013	15	.623	3	0	1	0	1	NC	5	NC	1
72			min	-.426	1	-.002	10	-.102	4	-9.726e-4	4	339.304	3	NC	1
73		18	max	-.013	15	.852	3	0	1	0	1	NC	4	NC	1
74			min	-.426	1	-.067	2	-.099	4	-3.788e-4	4	214.784	3	NC	1
75		19	max	-.013	15	1.08	3	0	1	0	1	NC	1	NC	1
76			min	-.426	1	-.15	2	-.097	4	-3.788e-4	4	157.247	3	NC	1
77	M7	1	max	.008	5	.05	3	-.001	12	2.014e-2	2	NC	3	NC	3
78			min	-.229	1	-.576	1	-.409	4	-7.753e-3	3	216.583	1	424.027	4
79		2	max	.008	5	.023	3	0	12	2.014e-2	2	NC	5	NC	3
80			min	-.229	1	-.487	1	-.388	4	-7.753e-3	3	253.122	1	455.284	4
81		3	max	.008	5	.005	5	.006	1	1.858e-2	2	NC	5	NC	1
82			min	-.229	1	-.397	1	-.365	4	-7.295e-3	3	304.55	1	492.237	4
83		4	max	.008	5	.006	5	.011	1	1.618e-2	2	NC	5	NC	1
84			min	-.228	1	-.311	1	-.342	5	-6.594e-3	3	378.683	1	539.182	4
85		5	max	.008	5	.006	5	.011	1	1.377e-2	2	NC	5	NC	1
86			min	-.228	1	-.233	1	-.317	5	-5.892e-3	3	485.498	1	599.614	4
87		6	max	.008	5	.006	5	.009	1	1.286e-2	2	NC	4	NC	1
88			min	-.228	1	-.169	1	-.291	4	-5.836e-3	3	633.236	1	677.494	4
89		7	max	.008	5	.006	5	.004	2	1.298e-2	2	NC	4	NC	1
90			min	-.228	1	-.117	1	-.266	4	-6.227e-3	3	836.136	1	774.518	4
91		8	max	.008	5	.005	5	0	2	1.31e-2	2	NC	4	NC	2
92			min	-.227	1	-.075	1	-.243	4	-6.618e-3	3	1101.609	3	896.415	4
93		9	max	.008	5	.004	5	0	3	1.255e-2	2	NC	2	NC	2
94			min	-.227	1	-.068	3	-.22	4	-7.277e-3	3	1135.209	3	1052.951	4
95		10	max	.008	5	.007	2	0	3	1.079e-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	-.226	1	-.061	3	-.198	4	-8.407e-3	3	1209.025	3	1276.848	4
97		11	max	.008	5	.036	2	0	2	9.037e-3	2	NC	1	NC	2
98			min	-.226	1	-.049	3	-.176	4	-9.537e-3	3	1352.19	3	1616.592	4
99		12	max	.008	5	.064	1	.004	1	6.625e-3	2	NC	5	NC	1
100			min	-.225	1	-.032	3	-.155	4	-7.902e-3	3	1630.226	3	2176.024	4
101		13	max	.008	5	.088	1	.005	2	3.839e-3	2	NC	5	NC	1
102			min	-.225	1	-.005	3	-.135	4	-4.702e-3	3	1444.285	2	3197.41	4
103		14	max	.008	5	.103	1	.002	2	1.161e-3	2	NC	3	NC	2
104			min	-.224	1	-.004	5	-.12	4	-3.652e-3	5	1326.769	2	4897.519	4
105		15	max	.008	5	.106	3	0	10	3.248e-3	2	NC	5	NC	2
106			min	-.224	1	-.007	5	-.112	4	-5.935e-3	3	1416.06	2	5893.352	1
107		16	max	.008	5	.19	3	-.002	10	5.334e-3	2	NC	7	NC	3
108			min	-.224	1	-.011	5	-.107	4	-1.02e-2	3	958.165	3	5319.54	1
109		17	max	.008	5	.285	3	0	12	7.42e-3	2	NC	4	NC	2
110			min	-.224	1	-.016	5	-.103	4	-1.447e-2	3	569.924	3	6042.795	1
111		18	max	.008	5	.385	3	.005	1	8.781e-3	2	NC	4	NC	1
112			min	-.225	1	-.02	5	-.098	5	-1.726e-2	3	400.404	3	NC	1
113		19	max	.008	5	.484	3	.017	1	8.781e-3	2	NC	1	NC	1
114			min	-.225	1	-.025	5	-.096	5	-1.726e-2	3	308.703	3	NC	1
115	M10	1	max	0	1	.35	3	.225	1	1.335e-2	3	NC	1	NC	1
116			min	-.1	4	-.019	5	-.008	5	-3.575e-3	2	NC	1	NC	1
117		2	max	0	1	.539	3	.255	1	1.528e-2	3	NC	4	NC	2
118			min	-.1	4	-.072	2	-.004	5	-4.415e-3	2	1019.105	3	6336.695	1
119		3	max	0	1	.714	3	.301	1	1.72e-2	3	NC	4	NC	3
120			min	-.1	4	-.156	2	0	15	-5.256e-3	2	528.113	3	2521.68	1
121		4	max	0	1	.85	3	.349	1	1.912e-2	3	NC	4	NC	5
122			min	-.1	4	-.213	2	.003	15	-6.097e-3	2	384.11	3	1541.845	1
123		5	max	0	1	.933	3	.391	1	2.105e-2	3	NC	4	NC	5
124			min	-.1	4	-.236	2	.005	15	-6.937e-3	2	329.652	3	1155.791	1
125		6	max	0	1	.957	3	.42	1	2.297e-2	3	NC	4	NC	5
126			min	-.1	4	-.223	2	.007	15	-7.778e-3	2	316.217	3	983.417	1
127		7	max	0	1	.931	3	.434	1	2.49e-2	3	NC	4	NC	5
128			min	-.1	4	-.18	2	.009	15	-8.619e-3	2	330.614	3	914.937	1
129		8	max	0	1	.871	3	.436	1	2.682e-2	3	NC	4	NC	5
130			min	-.1	4	-.121	2	.01	15	-9.46e-3	2	368.864	3	907.436	1
131		9	max	0	1	.805	3	.43	1	2.874e-2	3	NC	4	NC	5
132			min	-.1	4	-.064	2	.011	15	-1.03e-2	2	422.287	3	933.293	1
133		10	max	0	1	.772	3	.426	1	3.067e-2	3	NC	4	NC	5
134			min	-.1	4	-.038	2	.013	15	-1.114e-2	2	454.869	3	954.269	1
135		11	max	0	12	.805	3	.43	1	2.874e-2	3	NC	4	NC	5
136			min	-.1	4	-.064	2	.015	15	-1.03e-2	2	422.287	3	933.293	1
137		12	max	0	12	.871	3	.436	1	2.682e-2	3	NC	4	NC	5
138			min	-.1	4	-.121	2	.018	15	-9.46e-3	2	368.864	3	907.436	1
139		13	max	0	12	.931	3	.434	1	2.49e-2	3	NC	4	NC	5
140			min	-.1	4	-.18	2	.019	15	-8.619e-3	2	330.614	3	914.937	1
141		14	max	0	12	.957	3	.42	1	2.297e-2	3	NC	4	NC	5
142			min	-.1	4	-.223	2	.021	15	-7.778e-3	2	316.217	3	983.417	1
143		15	max	0	12	.933	3	.391	1	2.105e-2	3	NC	4	NC	5
144			min	-.1	4	-.236	2	.021	15	-6.937e-3	2	329.652	3	1155.791	1
145		16	max	0	12	.85	3	.349	1	1.912e-2	3	NC	4	NC	5
146			min	-.1	4	-.213	2	.021	15	-6.097e-3	2	384.11	3	1541.845	1
147		17	max	0	12	.714	3	.301	1	1.72e-2	3	NC	4	NC	3
148			min	-.1	4	-.156	2	.021	15	-5.256e-3	2	528.113	3	2521.68	1
149		18	max	0	12	.539	3	.255	1	1.528e-2	3	NC	14	NC	2
150			min	-.1	4	-.072	2	.021	15	-4.415e-3	2	1019.105	3	6336.695	1
151		19	max	0	12	.35	3	.225	1	1.335e-2	3	NC	1	NC	1
152			min	-.1	4	.004	10	.021	15	-3.575e-3	2	3956.596	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	.002	1	.045	2	.226	1	4.14e-3	1	NC	1	NC	1
154			min	-.168	4	-.044	3	-.008	5	-1.814e-4	5	NC	1	NC	1
155		2	max	.001	1	.067	3	.248	1	4.624e-3	1	NC	4	NC	2
156			min	-.168	4	-.043	2	.009	15	-1.17e-4	5	1732.573	3	8102.034	4
157		3	max	.001	1	.167	3	.29	1	5.107e-3	1	NC	4	NC	3
158			min	-.168	4	-.116	2	.015	15	-5.271e-5	5	911.824	3	2999.72	1
159		4	max	.001	1	.232	3	.337	1	5.591e-3	1	NC	5	NC	3
160			min	-.168	4	-.16	2	.015	15	3.276e-7	15	696.954	3	1724.162	1
161		5	max	0	1	.249	3	.38	1	6.074e-3	1	NC	5	NC	3
162			min	-.169	4	-.168	2	.011	15	4.31e-5	15	656.27	3	1244.9	1
163		6	max	0	1	.216	3	.412	1	6.558e-3	1	NC	5	NC	5
164			min	-.169	4	-.139	2	.005	15	8.588e-5	15	739.75	3	1031.419	1
165		7	max	0	1	.141	3	.43	1	7.041e-3	1	NC	4	NC	5
166			min	-.169	4	-.082	2	0	15	1.287e-4	15	1038.181	3	939.737	1
167		8	max	0	1	.044	3	.435	1	7.525e-3	1	NC	4	NC	5
168			min	-.169	4	-.011	2	-.003	5	1.714e-4	15	2181.989	3	916.223	1
169		9	max	0	1	.055	1	.432	1	8.008e-3	1	NC	1	NC	5
170			min	-.169	4	-.045	3	0	15	2.142e-4	15	NC	1	930.323	1
171		10	max	0	1	.083	2	.429	1	8.492e-3	1	NC	4	NC	5
172			min	-.169	4	-.086	3	.013	15	2.57e-4	15	4558.574	3	946.102	1
173		11	max	0	3	.055	1	.432	1	8.008e-3	1	NC	1	NC	15
174			min	-.169	4	-.045	3	.026	15	2.752e-4	15	NC	1	930.323	1
175		12	max	0	3	.044	3	.435	1	7.525e-3	1	NC	4	NC	15
176			min	-.169	4	-.011	2	.03	15	2.935e-4	15	2181.989	3	916.223	1
177		13	max	0	3	.141	3	.43	1	7.041e-3	1	NC	5	NC	15
178			min	-.169	4	-.082	2	.028	15	3.117e-4	15	1038.181	3	939.737	1
179		14	max	0	3	.216	3	.412	1	6.558e-3	1	NC	5	NC	5
180			min	-.169	4	-.139	2	.022	15	3.299e-4	15	739.75	3	1031.419	1
181		15	max	0	3	.249	3	.38	1	6.074e-3	1	NC	5	NC	3
182			min	-.169	4	-.168	2	.014	15	3.482e-4	15	656.27	3	1244.9	1
183		16	max	.001	3	.232	3	.337	1	5.591e-3	1	NC	5	NC	3
184			min	-.169	4	-.16	2	.008	15	3.664e-4	15	696.954	3	1724.162	1
185		17	max	.001	3	.167	3	.29	1	5.107e-3	1	NC	5	NC	3
186			min	-.169	4	-.116	2	.005	15	3.847e-4	15	911.824	3	2999.72	1
187		18	max	.002	3	.067	3	.248	1	4.624e-3	1	NC	5	NC	2
188			min	-.169	4	-.043	2	.008	15	4.029e-4	15	1732.573	3	8612.167	1
189		19	max	.002	3	.045	2	.226	1	4.14e-3	1	NC	1	NC	1
190			min	-.169	4	-.044	3	.021	15	4.212e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.004	5	.227	1	5.12e-3	1	NC	1	NC	1
192			min	-.228	4	-.07	3	-.008	5	-1.386e-4	5	NC	1	NC	1
193		2	max	0	2	.003	5	.246	1	5.619e-3	1	NC	4	NC	1
194			min	-.228	4	-.176	2	.01	15	-7.291e-5	5	1376.243	2	7911.517	4
195		3	max	0	2	.051	3	.286	1	6.118e-3	1	NC	5	NC	3
196			min	-.228	4	-.295	2	.016	15	-1.307e-5	15	741.953	2	3278.83	1
197		4	max	0	2	.08	3	.333	1	6.617e-3	1	NC	5	NC	3
198			min	-.228	4	-.373	2	.016	15	3.056e-5	15	569.668	2	1818.591	1
199		5	max	0	2	.08	3	.376	1	7.116e-3	1	NC	5	NC	5
200			min	-.228	4	-.4	2	.011	15	7.419e-5	15	528.03	2	1286.838	1
201		6	max	0	2	.054	3	.41	1	7.615e-3	1	NC	5	NC	5
202			min	-.228	4	-.374	2	.004	15	1.178e-4	15	568.199	2	1051.522	1
203		7	max	0	2	.008	3	.43	1	8.114e-3	1	NC	5	NC	5
204			min	-.228	4	-.306	2	-.002	15	1.615e-4	15	712.688	2	947.892	1
205		8	max	0	2	-.003	15	.437	1	8.613e-3	1	NC	5	NC	4
206			min	-.228	4	-.214	2	-.005	5	2.051e-4	15	1080.734	2	916.227	1
207		9	max	0	2	-.003	15	.435	1	9.112e-3	1	NC	4	NC	5
208			min	-.228	4	-.136	1	0	15	2.487e-4	15	2079.787	2	924.351	1
209		10	max	0	1	-.003	15	.432	1	9.611e-3	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	-.228	4	-.118	3	.013	15	2.923e-4	15	3515.61	1	937.476	1
211		11	max	0	9	-.005	15	.435	1	9.112e-3	1	NC	4	NC	15
212			min	-.228	4	-.136	1	.027	15	3.097e-4	15	2079.787	2	924.351	1
213		12	max	0	9	-.008	15	.437	1	8.613e-3	1	NC	5	9268.216	15
214			min	-.228	4	-.214	2	.032	15	3.27e-4	15	1080.734	2	916.227	1
215		13	max	0	9	.008	3	.43	1	8.114e-3	1	NC	5	NC	15
216			min	-.228	4	-.306	2	.029	15	3.444e-4	15	712.688	2	947.892	1
217		14	max	0	9	.054	3	.41	1	7.615e-3	1	NC	5	NC	5
218			min	-.228	4	-.374	2	.023	15	3.617e-4	15	568.199	2	1051.522	1
219		15	max	0	9	.08	3	.376	1	7.116e-3	1	NC	5	NC	5
220			min	-.228	4	-.4	2	.014	15	3.637e-4	12	528.03	2	1286.838	1
221		16	max	0	9	.08	3	.333	1	6.617e-3	1	NC	5	NC	3
222			min	-.228	4	-.373	2	.007	15	3.621e-4	12	569.668	2	1818.591	1
223		17	max	0	9	.051	3	.286	1	6.118e-3	1	NC	5	NC	3
224			min	-.228	4	-.295	2	.004	15	3.604e-4	12	741.953	2	3278.83	1
225		18	max	0	9	0	12	.246	1	5.619e-3	1	NC	5	NC	1
226			min	-.228	4	-.176	2	.007	15	3.588e-4	12	1376.243	2	NC	1
227		19	max	0	9	-.007	15	.227	1	5.12e-3	1	NC	1	NC	1
228			min	-.228	4	-.07	3	.021	15	3.571e-4	12	NC	1	NC	1
229	M13	1	max	0	12	.013	3	.229	1	1.282e-2	2	NC	1	NC	1
230			min	-.38	4	-.456	1	-.008	5	-3.644e-3	3	NC	1	NC	1
231		2	max	0	12	.095	3	.26	1	1.466e-2	2	NC	5	NC	3
232			min	-.38	4	-.661	2	.008	15	-4.388e-3	3	893.662	2	6026.604	1
233		3	max	0	12	.166	3	.308	1	1.65e-2	2	NC	5	NC	3
234			min	-.38	4	-.856	2	.015	15	-5.131e-3	3	468.577	2	2431.662	1
235		4	max	0	12	.216	3	.357	1	1.834e-2	2	NC	5	NC	3
236			min	-.38	4	-1.007	2	.017	15	-5.875e-3	3	341.935	2	1496.075	1
237		5	max	0	12	.241	3	.399	1	2.017e-2	2	NC	5	NC	12
238			min	-.38	4	-1.103	2	.014	15	-6.618e-3	3	292.237	2	1124.891	1
239		6	max	0	12	.239	3	.429	1	2.201e-2	2	NC	5	NC	5
240			min	-.38	4	-1.139	2	.01	15	-7.362e-3	3	276.986	2	958.333	1
241		7	max	0	12	.215	3	.444	1	2.385e-2	2	NC	5	NC	5
242			min	-.38	4	-1.123	2	.005	15	-8.105e-3	3	283.572	2	891.646	1
243		8	max	0	12	.178	3	.446	1	2.569e-2	2	NC	5	NC	5
244			min	-.38	4	-1.072	2	.002	15	-8.849e-3	3	306.798	2	883.597	1
245		9	max	0	12	.141	3	.44	1	2.753e-2	2	NC	5	NC	5
246			min	-.38	4	-1.012	2	.004	15	-9.593e-3	3	338.861	2	907.61	1
247		10	max	0	1	.124	3	.436	1	2.937e-2	2	NC	5	NC	5
248			min	-.38	4	-.983	2	.013	15	-1.034e-2	3	357.734	2	927.299	1
249		11	max	0	1	.141	3	.44	1	2.753e-2	2	NC	5	NC	15
250			min	-.38	4	-1.012	2	.023	15	-9.593e-3	3	338.861	2	907.61	1
251		12	max	0	1	.178	3	.446	1	2.569e-2	2	NC	15	NC	15
252			min	-.38	4	-1.072	2	.026	15	-8.849e-3	3	306.798	2	883.597	1
253		13	max	0	1	.215	3	.444	1	2.385e-2	2	NC	15	NC	5
254			min	-.38	4	-1.123	2	.024	15	-8.105e-3	3	283.572	2	891.646	1
255		14	max	0	1	.239	3	.429	1	2.201e-2	2	NC	15	NC	5
256			min	-.38	4	-1.139	2	.019	15	-7.362e-3	3	276.986	2	958.333	1
257		15	max	0	1	.241	3	.399	1	2.017e-2	2	NC	15	NC	5
258			min	-.38	4	-1.103	2	.013	15	-6.618e-3	3	292.237	2	1124.891	1
259		16	max	0	1	.216	3	.357	1	1.834e-2	2	NC	15	NC	3
260			min	-.38	4	-1.007	2	.007	15	-5.875e-3	3	341.935	2	1496.075	1
261		17	max	0	1	.166	3	.308	1	1.65e-2	2	NC	5	NC	3
262			min	-.38	4	-.856	2	.006	15	-5.131e-3	3	468.577	2	2431.662	1
263		18	max	0	1	.095	3	.26	1	1.466e-2	2	NC	5	NC	3
264			min	-.38	4	-.661	2	.009	15	-4.388e-3	3	893.662	2	6026.604	1
265		19	max	0	1	.013	3	.229	1	1.282e-2	2	NC	1	NC	1
266			min	-.38	4	-.456	1	.022	15	-3.644e-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	2.068e-3	2	NC	1	NC	1
270			min	0	2	0	1	0	2	-2.267e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.002	5	4.135e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	2	-4.534e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.005	5	4.843e-3	2	NC	3	NC	1
274			min	0	2	-.009	1	0	1	-5.463e-3	5	6776.346	1	NC	1
275		5	max	0	3	-.002	15	.009	5	4.446e-3	2	NC	4	NC	1
276			min	0	2	-.016	1	-.001	1	-5.306e-3	5	3786.677	1	6746.593	5
277		6	max	0	3	-.002	15	.014	5	4.049e-3	2	NC	5	NC	1
278			min	0	2	-.025	1	-.002	1	-5.149e-3	5	2434.684	1	4442.802	5
279		7	max	0	3	-.003	15	.019	5	3.652e-3	2	NC	5	NC	1
280			min	0	2	-.035	1	-.003	1	-4.992e-3	5	1708.839	1	3172.709	5
281		8	max	0	3	-.005	15	.025	5	3.255e-3	2	NC	15	NC	1
282			min	0	2	-.048	1	-.003	1	-4.835e-3	5	1273.342	1	2396.671	5
283		9	max	0	3	-.006	15	.032	5	2.858e-3	2	NC	15	NC	1
284			min	0	2	-.061	1	-.004	1	-4.677e-3	5	991.057	1	1886.884	5
285		10	max	0	3	-.007	15	.04	5	2.46e-3	2	8267.631	15	NC	1
286			min	0	2	-.076	1	-.004	1	-4.52e-3	5	797.338	1	1533.45	5
287		11	max	0	3	-.009	15	.047	5	2.063e-3	2	6852.156	15	NC	1
288			min	0	2	-.092	1	-.005	1	-4.363e-3	5	658.477	1	1278.059	5
289		12	max	0	3	-.01	15	.056	5	1.666e-3	2	5796.914	15	NC	1
290			min	0	2	-.109	1	-.005	1	-4.206e-3	5	555.478	1	1087.397	5
291		13	max	0	3	-.012	15	.064	5	1.269e-3	2	4988.653	15	NC	1
292			min	-.001	2	-.127	1	-.005	1	-4.048e-3	5	476.91	1	941.213	5
293		14	max	.001	3	-.014	15	.073	5	8.722e-4	2	4355.582	15	NC	1
294			min	-.001	2	-.146	1	-.005	1	-3.891e-3	5	415.583	1	826.648	5
295		15	max	.001	3	-.016	15	.082	5	4.752e-4	2	3850.322	15	NC	1
296			min	-.001	2	-.165	1	-.005	1	-3.775e-3	4	366.779	1	735.207	5
297		16	max	.001	3	-.018	15	.092	5	4.773e-4	3	3440.705	15	NC	1
298			min	-.001	2	-.185	1	-.004	1	-3.659e-3	4	327.312	1	661.111	5
299		17	max	.001	3	-.02	15	.101	4	6.895e-4	3	3104.143	15	NC	1
300			min	-.001	2	-.205	1	-.003	1	-3.543e-3	4	294.955	1	599.635	4
301		18	max	.001	3	-.021	15	.111	4	9.016e-4	3	2824.401	15	NC	1
302			min	-.001	2	-.226	1	-.005	3	-3.427e-3	4	268.111	1	548.238	4
303		19	max	.001	3	-.023	15	.12	4	1.114e-3	3	2589.579	15	NC	1
304			min	-.002	2	-.247	1	-.009	3	-3.311e-3	4	245.616	1	505.15	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	2	-.002	1	0	1	-2.385e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	2	NC	1
310			min	0	2	-.007	1	0	1	-4.77e-3	4	9009.788	1	NC	1
311		4	max	0	3	0	15	.005	4	0	1	NC	4	NC	1
312			min	0	2	-.016	1	0	1	-5.74e-3	4	3794.917	1	NC	1
313		5	max	.001	3	0	15	.009	4	0	1	NC	5	NC	1
314			min	-.001	2	-.029	1	0	1	-5.56e-3	4	2078.725	1	6478.326	4
315		6	max	.001	3	-.001	15	.014	4	0	1	NC	5	NC	1
316			min	-.001	2	-.046	1	0	1	-5.381e-3	4	1321.732	1	4268.761	4
317		7	max	.001	3	-.002	15	.02	4	0	1	NC	5	NC	1
318			min	-.002	2	-.066	1	0	1	-5.202e-3	4	921.147	1	3050.559	4
319		8	max	.002	3	-.003	15	.026	4	0	1	NC	5	NC	1
320			min	-.002	2	-.089	1	0	1	-5.023e-3	4	683.051	1	2306.214	4
321		9	max	.002	3	-.004	15	.033	4	0	1	NC	5	NC	1
322			min	-.002	2	-.114	1	0	1	-4.844e-3	4	529.737	1	1817.251	4
323		10	max	.002	3	-.004	15	.041	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.143	1	0	1	-4.665e-3	4	425.041	1	1478.268	4
325		11	max	.002	3	-.005	15	.049	4	0	1	NC	15	NC	1
326			min	-.002	2	-.173	1	0	1	-4.486e-3	4	350.276	1	1233.344	4
327		12	max	.003	3	-.006	15	.058	4	0	1	9660.751	15	NC	1
328			min	-.003	2	-.205	1	0	1	-4.307e-3	4	294.987	1	1050.529	4
329		13	max	.003	3	-.007	15	.067	4	0	1	8294.255	15	NC	1
330			min	-.003	2	-.24	1	0	1	-4.128e-3	4	252.915	1	910.397	4
331		14	max	.003	3	-.008	15	.076	4	0	1	7227.631	15	NC	1
332			min	-.003	2	-.275	1	0	1	-3.949e-3	4	220.142	1	800.619	4
333		15	max	.003	3	-.01	15	.085	4	0	1	6378.825	15	NC	1
334			min	-.003	2	-.312	1	0	1	-3.77e-3	4	194.106	1	713.051	4
335		16	max	.004	3	-.011	15	.094	4	0	1	5692.415	15	NC	1
336			min	-.004	2	-.35	1	0	1	-3.591e-3	4	173.082	1	642.149	4
337		17	max	.004	3	-.012	15	.104	4	0	1	5129.651	15	NC	1
338			min	-.004	2	-.389	1	0	1	-3.412e-3	4	155.866	1	584.02	4
339		18	max	.004	3	-.013	15	.113	4	0	1	4662.787	15	NC	1
340			min	-.004	2	-.428	1	0	1	-3.233e-3	4	141.601	1	535.867	4
341		19	max	.004	3	-.014	15	.122	4	0	1	4271.561	15	NC	1
342			min	-.004	2	-.467	1	0	1	-3.054e-3	4	129.658	1	495.639	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	8.927e-4	3	NC	1	NC	1
346			min	0	2	0	1	0	3	-2.576e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	1.785e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-5.153e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.005	4	2.068e-3	3	NC	3	NC	1
350			min	0	2	-.009	1	-.001	3	-6.183e-3	4	6776.346	1	NC	1
351		5	max	0	3	0	5	.009	4	1.856e-3	3	NC	4	NC	1
352			min	0	2	-.016	1	-.002	3	-5.959e-3	4	3786.677	1	6483.931	4
353		6	max	0	3	.001	5	.014	4	1.644e-3	3	NC	4	NC	1
354			min	0	2	-.025	1	-.003	3	-5.735e-3	4	2434.684	1	4276.036	4
355		7	max	0	3	.001	5	.02	4	1.432e-3	3	NC	4	NC	1
356			min	0	2	-.035	1	-.003	3	-5.51e-3	4	1708.839	1	3058.052	4
357		8	max	0	3	.002	5	.026	4	1.22e-3	3	NC	5	NC	1
358			min	0	2	-.048	1	-.004	3	-5.286e-3	4	1273.342	1	2313.542	4
359		9	max	0	3	.002	5	.033	4	1.008e-3	3	NC	5	NC	1
360			min	0	2	-.061	1	-.005	3	-5.062e-3	4	991.057	1	1824.328	4
361		10	max	0	3	.003	5	.041	4	7.955e-4	3	NC	5	NC	1
362			min	0	2	-.076	1	-.005	3	-4.837e-3	4	797.338	1	1485.103	4
363		11	max	0	3	.003	5	.049	4	5.834e-4	3	NC	5	NC	1
364			min	0	2	-.092	1	-.005	3	-4.613e-3	4	658.477	1	1239.977	4
365		12	max	0	3	.004	5	.057	4	3.712e-4	3	NC	5	NC	1
366			min	0	2	-.109	1	-.005	3	-4.389e-3	4	555.478	1	1057.001	4
367		13	max	0	3	.005	5	.066	4	1.591e-4	3	NC	5	NC	1
368			min	-.001	2	-.127	1	-.005	3	-4.164e-3	4	476.91	1	916.754	4
369		14	max	.001	3	.005	5	.075	4	-3.355e-5	12	NC	5	NC	1
370			min	-.001	2	-.146	1	-.004	3	-3.94e-3	4	415.583	1	806.901	4
371		15	max	.001	3	.006	5	.084	4	6.877e-5	9	NC	7	NC	1
372			min	-.001	2	-.165	1	-.002	3	-3.721e-3	5	366.779	1	719.297	4
373		16	max	.001	3	.007	5	.093	4	1.975e-4	1	NC	15	NC	1
374			min	-.001	2	-.185	1	0	3	-3.539e-3	5	327.312	1	648.398	4
375		17	max	.001	3	.008	5	.103	4	5.487e-4	1	NC	15	NC	1
376			min	-.001	2	-.205	1	0	10	-3.358e-3	5	294.955	1	590.307	4
377		18	max	.001	3	.008	5	.112	4	9.e-4	1	NC	15	NC	1
378			min	-.001	2	-.226	1	0	10	-3.176e-3	5	268.111	1	542.226	4
379		19	max	.001	3	.009	5	.121	4	1.251e-3	1	9431.406	15	NC	1
380			min	-.002	2	-.247	1	-.002	2	-2.995e-3	5	245.616	1	502.107	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	.005	1	0	15	.004	5	1.928e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	0	2	-1.489e-3	5	NC	1	NC	1
383		2	max	.005	1	-.002	15	.023	5	2.292e-3	2	NC	1	NC	4
384			min	0	15	-.02	1	-.017	2	-1.51e-3	5	NC	1	3749.114	2
385		3	max	.004	1	-.004	15	.042	5	2.656e-3	2	NC	1	NC	4
386			min	0	15	-.038	1	-.033	2	-1.53e-3	5	NC	1	1896.204	2
387		4	max	.004	1	-.005	15	.061	5	3.019e-3	2	NC	1	NC	4
388			min	0	15	-.055	1	-.048	2	-1.55e-3	5	NC	1	1286.708	2
389		5	max	.003	3	-.007	15	.08	5	3.383e-3	2	NC	1	NC	4
390			min	0	15	-.072	1	-.063	2	-1.57e-3	5	NC	1	988.717	2
391		6	max	.004	3	-.009	15	.099	5	3.747e-3	2	NC	1	NC	4
392			min	0	10	-.09	1	-.076	2	-1.601e-3	3	NC	1	816.107	2
393		7	max	.004	3	-.01	15	.118	5	4.111e-3	2	NC	1	NC	4
394			min	0	10	-.107	1	-.087	2	-1.774e-3	3	NC	1	707.118	2
395		8	max	.004	3	-.012	15	.137	5	4.474e-3	2	NC	1	NC	4
396			min	0	10	-.124	1	-.097	2	-1.946e-3	3	NC	1	635.626	2
397		9	max	.004	3	-.014	15	.155	5	4.838e-3	2	NC	1	NC	4
398			min	0	10	-.141	1	-.104	2	-2.119e-3	3	NC	1	589.007	2
399		10	max	.005	3	-.015	15	.173	5	5.202e-3	2	NC	1	NC	6
400			min	-.001	2	-.158	1	-.109	2	-2.292e-3	3	NC	1	560.849	2
401		11	max	.005	3	-.017	15	.19	5	5.566e-3	2	NC	1	NC	6
402			min	-.002	2	-.175	1	-.111	2	-2.465e-3	3	NC	1	548.178	2
403		12	max	.005	3	-.018	15	.207	5	5.929e-3	2	NC	1	9860.731	6
404			min	-.002	2	-.192	1	-.11	2	-2.638e-3	3	NC	1	550.458	2
405		13	max	.005	3	-.02	15	.224	5	6.293e-3	2	NC	1	NC	6
406			min	-.003	2	-.208	1	-.106	2	-2.811e-3	3	NC	1	569.604	2
407		14	max	.005	3	-.021	15	.239	5	6.657e-3	2	NC	1	NC	6
408			min	-.003	2	-.225	1	-.098	2	-2.983e-3	3	NC	1	611.138	2
409		15	max	.006	3	-.023	15	.255	5	7.021e-3	2	NC	1	NC	4
410			min	-.004	2	-.241	1	-.086	2	-3.156e-3	3	NC	1	569.395	14
411		16	max	.006	3	-.024	15	.269	5	7.384e-3	2	NC	1	NC	4
412			min	-.005	2	-.258	1	-.07	2	-3.329e-3	3	NC	1	517.819	14
413		17	max	.006	3	-.025	15	.283	5	7.748e-3	2	NC	1	NC	4
414			min	-.005	2	-.274	1	-.049	2	-3.502e-3	3	NC	1	472.6	14
415		18	max	.006	3	-.027	15	.296	4	8.112e-3	2	NC	1	NC	4
416			min	-.006	2	-.291	1	-.023	2	-3.675e-3	3	NC	1	432.661	14
417		19	max	.006	3	-.028	15	.311	4	8.476e-3	2	NC	1	NC	1
418			min	-.006	2	-.307	1	0	3	-3.848e-3	3	NC	1	397.162	14
419	M6	1	max	.009	1	0	15	.004	4	0	1	NC	1	NC	1
420			min	0	15	-.005	1	0	1	-1.575e-3	4	NC	1	NC	1
421		2	max	.008	1	-.001	15	.024	4	0	1	NC	1	NC	1
422			min	0	15	-.038	1	0	1	-1.621e-3	4	NC	1	NC	1
423		3	max	.007	3	-.002	15	.044	4	0	1	NC	1	NC	1
424			min	0	15	-.071	1	0	1	-1.668e-3	4	NC	1	NC	1
425		4	max	.007	3	-.004	15	.064	4	0	1	NC	1	NC	1
426			min	0	15	-.104	1	0	1	-1.715e-3	4	NC	1	6989.191	4
427		5	max	.008	3	-.005	15	.084	4	0	1	NC	1	NC	1
428			min	0	10	-.138	1	0	1	-1.761e-3	4	NC	1	5269.546	4
429		6	max	.009	3	-.006	15	.104	4	0	1	NC	1	NC	1
430			min	0	10	-.171	1	0	1	-1.808e-3	4	NC	1	4279.666	4
431		7	max	.009	3	-.007	15	.123	4	0	1	NC	1	NC	1
432			min	-.002	2	-.204	1	0	1	-1.854e-3	4	NC	1	3657.155	4
433		8	max	.01	3	-.008	15	.143	4	0	1	NC	1	NC	1
434			min	-.004	2	-.236	1	0	1	-1.901e-3	4	NC	1	3248.795	4
435		9	max	.011	3	-.009	15	.162	4	0	1	NC	1	NC	1
436			min	-.006	2	-.269	1	0	1	-1.948e-3	4	NC	1	2980.389	4
437		10	max	.012	3	-.01	15	.18	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	-.007	2	-.302	1	0	1	-1.994e-3	4	NC	1	2813.815	4
439		11	max	.012	3	-.011	15	.198	4	0	1	NC	1	NC	1
440			min	-.009	2	-.334	1	0	1	-2.041e-3	4	NC	1	2730.567	4
441		12	max	.013	3	-.012	15	.215	4	0	1	NC	1	NC	1
442			min	-.01	2	-.367	1	0	1	-2.088e-3	4	NC	1	2725.543	4
443		13	max	.014	3	-.013	15	.231	4	0	1	NC	1	NC	1
444			min	-.012	2	-.399	1	0	1	-2.134e-3	4	NC	1	2806.466	4
445		14	max	.015	3	-.014	15	.247	4	0	1	NC	1	NC	1
446			min	-.014	2	-.432	1	0	1	-2.181e-3	4	NC	1	2999.128	4
447		15	max	.015	3	-.014	15	.262	4	0	1	NC	1	NC	1
448			min	-.015	2	-.464	1	0	1	-2.227e-3	4	NC	1	3364.611	4
449		16	max	.016	3	-.015	15	.275	4	0	1	NC	1	NC	1
450			min	-.017	2	-.496	1	0	1	-2.274e-3	4	NC	1	4053.796	4
451		17	max	.017	3	-.016	15	.288	4	0	1	NC	1	NC	1
452			min	-.019	2	-.528	1	0	1	-2.321e-3	4	NC	1	5527.88	4
453		18	max	.018	3	-.017	15	.3	4	0	1	NC	1	NC	1
454			min	-.02	2	-.56	1	0	1	-2.367e-3	4	NC	1	NC	1
455		19	max	.018	3	-.018	15	.311	4	0	1	NC	1	NC	1
456			min	-.022	2	-.592	1	0	1	-2.414e-3	4	NC	1	NC	1
457	M9	1	max	.005	1	0	5	.004	4	7.365e-4	3	NC	1	NC	1
458			min	0	5	-.003	1	0	3	-1.928e-3	2	NC	1	NC	1
459		2	max	.005	1	0	5	.025	4	9.094e-4	3	NC	1	NC	4
460			min	0	5	-.02	1	-.008	3	-2.292e-3	2	NC	1	3749.114	2
461		3	max	.004	1	0	5	.047	4	1.082e-3	3	NC	1	NC	7
462			min	0	5	-.038	1	-.015	3	-2.656e-3	2	NC	1	1896.204	2
463		4	max	.004	1	0	5	.068	4	1.255e-3	3	NC	1	9910.942	15
464			min	0	5	-.055	1	-.022	3	-3.019e-3	2	NC	1	1286.708	2
465		5	max	.003	3	.001	5	.09	4	1.428e-3	3	NC	1	7473.547	15
466			min	0	5	-.072	1	-.028	3	-3.383e-3	2	NC	1	988.717	2
467		6	max	.004	3	.002	5	.111	4	1.601e-3	3	NC	1	6070.215	15
468			min	0	5	-.09	1	-.034	3	-3.747e-3	2	NC	1	816.107	2
469		7	max	.004	3	.002	5	.131	4	1.774e-3	3	NC	1	5187.491	15
470			min	0	5	-.107	1	-.039	3	-4.111e-3	2	NC	1	707.118	2
471		8	max	.004	3	.003	5	.151	4	1.946e-3	3	NC	1	4608.277	15
472			min	0	5	-.124	1	-.043	3	-4.474e-3	2	NC	1	635.626	2
473		9	max	.004	3	.003	5	.171	4	2.119e-3	3	NC	1	4227.431	15
474			min	0	10	-.141	1	-.046	3	-4.838e-3	2	NC	1	589.007	2
475		10	max	.005	3	.004	5	.189	4	2.292e-3	3	NC	1	3990.924	15
476			min	-.001	2	-.158	1	-.049	3	-5.202e-3	2	NC	1	560.849	2
477		11	max	.005	3	.004	5	.207	4	2.465e-3	3	NC	1	3872.52	15
478			min	-.002	2	-.175	1	-.05	3	-5.566e-3	2	NC	1	548.178	2
479		12	max	.005	3	.005	5	.224	4	2.638e-3	3	NC	1	3864.974	15
480			min	-.002	2	-.192	1	-.049	3	-5.929e-3	2	NC	1	550.458	2
481		13	max	.005	3	.005	5	.24	4	2.811e-3	3	NC	1	3979.21	15
482			min	-.003	2	-.208	1	-.048	3	-6.293e-3	2	NC	1	569.604	2
483		14	max	.005	3	.006	5	.254	4	2.983e-3	3	NC	1	4251.749	15
484			min	-.003	2	-.225	1	-.044	3	-6.657e-3	2	NC	1	611.138	2
485		15	max	.006	3	.007	5	.268	4	3.156e-3	3	NC	1	4769.089	15
486			min	-.004	2	-.241	1	-.039	3	-7.021e-3	2	9226.924	5	687.764	2
487		16	max	.006	3	.008	5	.28	4	3.329e-3	3	NC	1	5744.914	15
488			min	-.005	2	-.258	1	-.033	3	-7.384e-3	2	8268.336	5	830.602	2
489		17	max	.006	3	.009	5	.29	4	3.502e-3	3	NC	1	7832.404	15
490			min	-.005	2	-.274	1	-.024	3	-7.748e-3	2	7466.751	5	1134.521	2
491		18	max	.006	3	.009	5	.299	4	3.675e-3	3	NC	1	NC	13
492			min	-.006	2	-.291	1	-.013	3	-8.112e-3	2	6793.099	5	2076.004	2
493		19	max	.006	3	.01	5	.306	5	3.848e-3	3	NC	1	NC	1
494			min	-.006	2	-.307	1	-.01	1	-8.476e-3	2	6224.841	5	NC	1