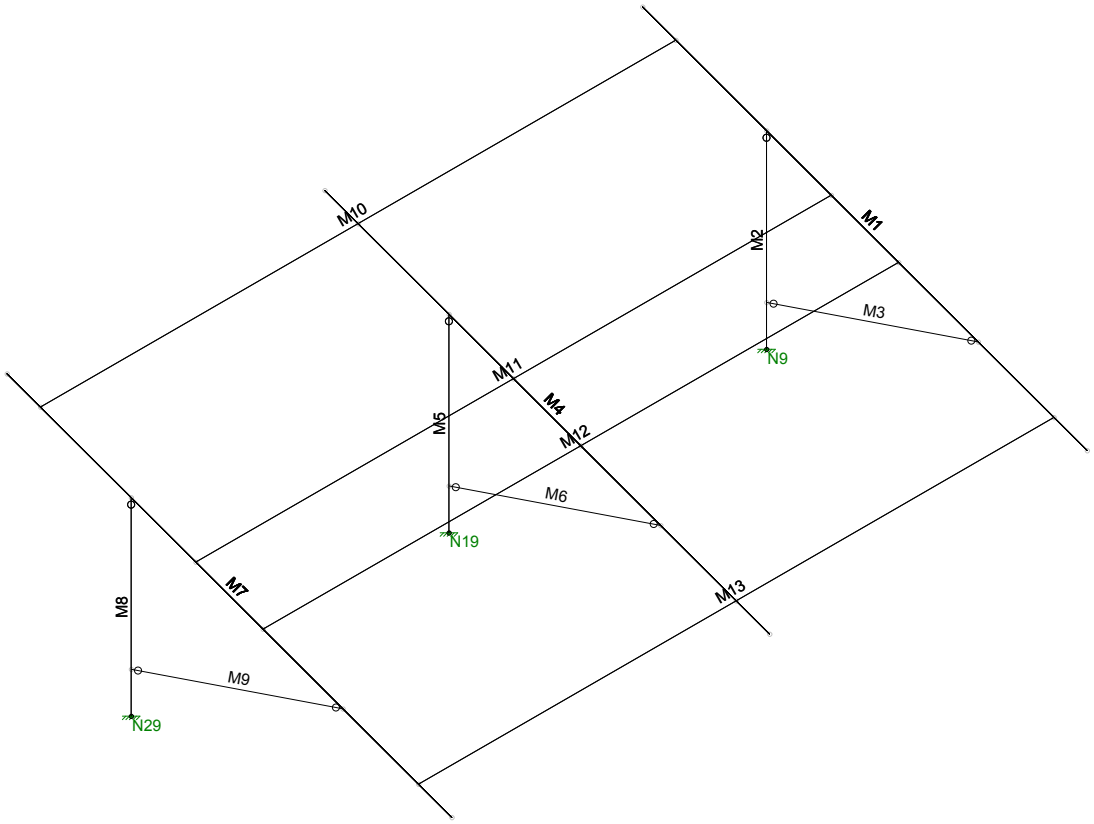


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

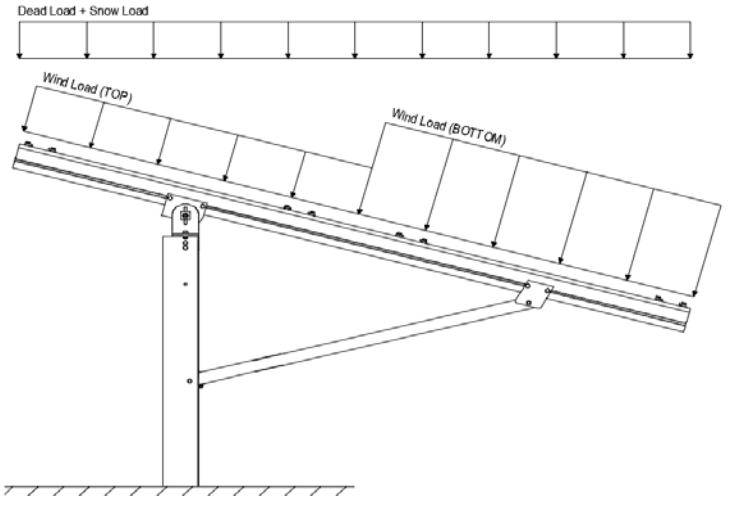
1.2 Construction

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

PV modules are required to meet the following specifications:

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

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



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	20.62	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.91		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	150	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z =	35.33	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

Allowable Stress Design, ASD

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

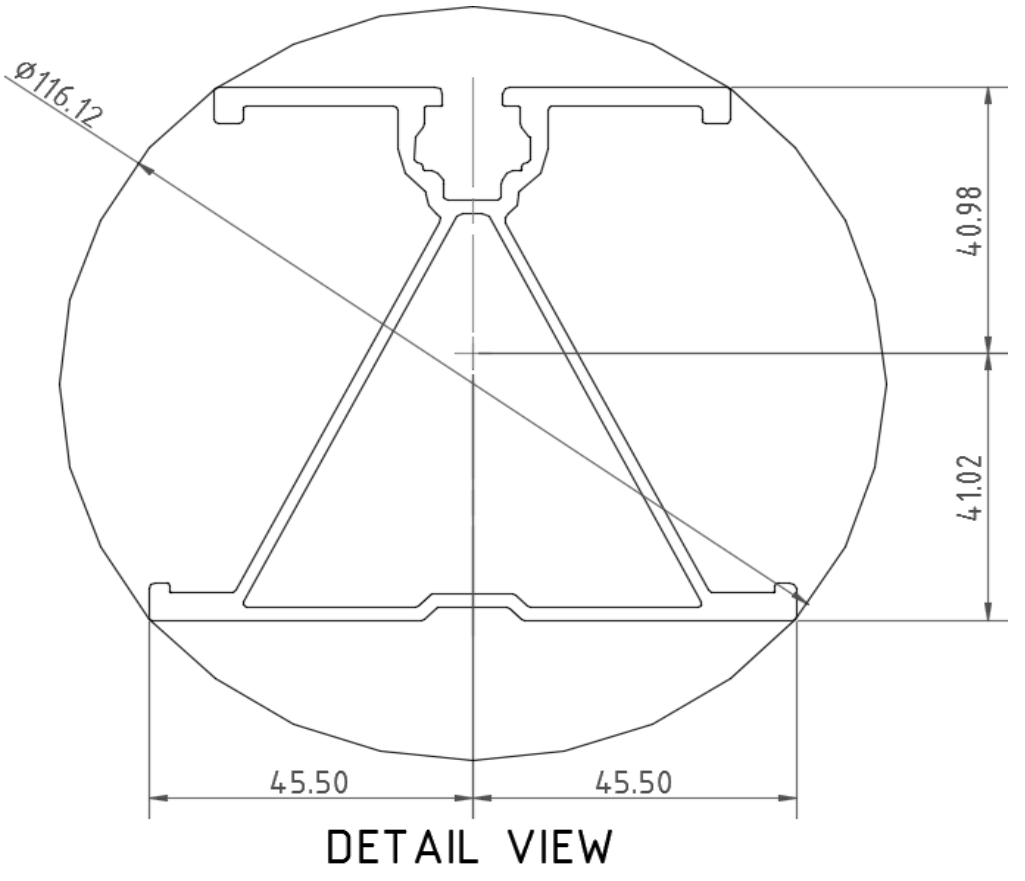
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

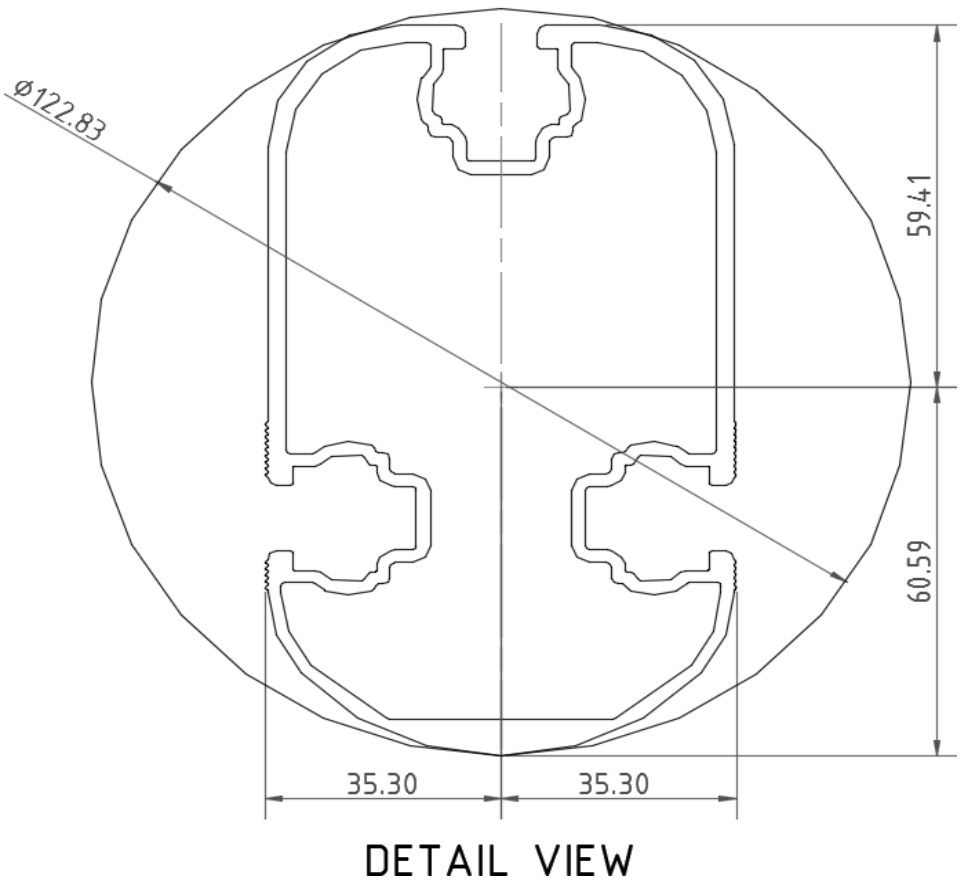
Purlin Type	=	**S1.5**	
Aluminum Type	=	6105-T5	
F_{ty}	=	35	ksi
L_b	=	102	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$	=	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$	=	23.08	ksi
S_y	=	1.33	in^3
S_x	=	0.6	in^3
E	=	10100	ksi
I_y	=	2.16	in^4
I_x	=	1.07	in^4
A	=	1.25	in^2
g	=	1.50	lbs/ft
M_y	=	1.614	k-ft
M_z	=	0.104	k-ft
$M_{y\ allowable}$	=	2.779	k-ft
$M_{z\ allowable}$	=	1.154	k-ft
Utilization	=	67%	



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).

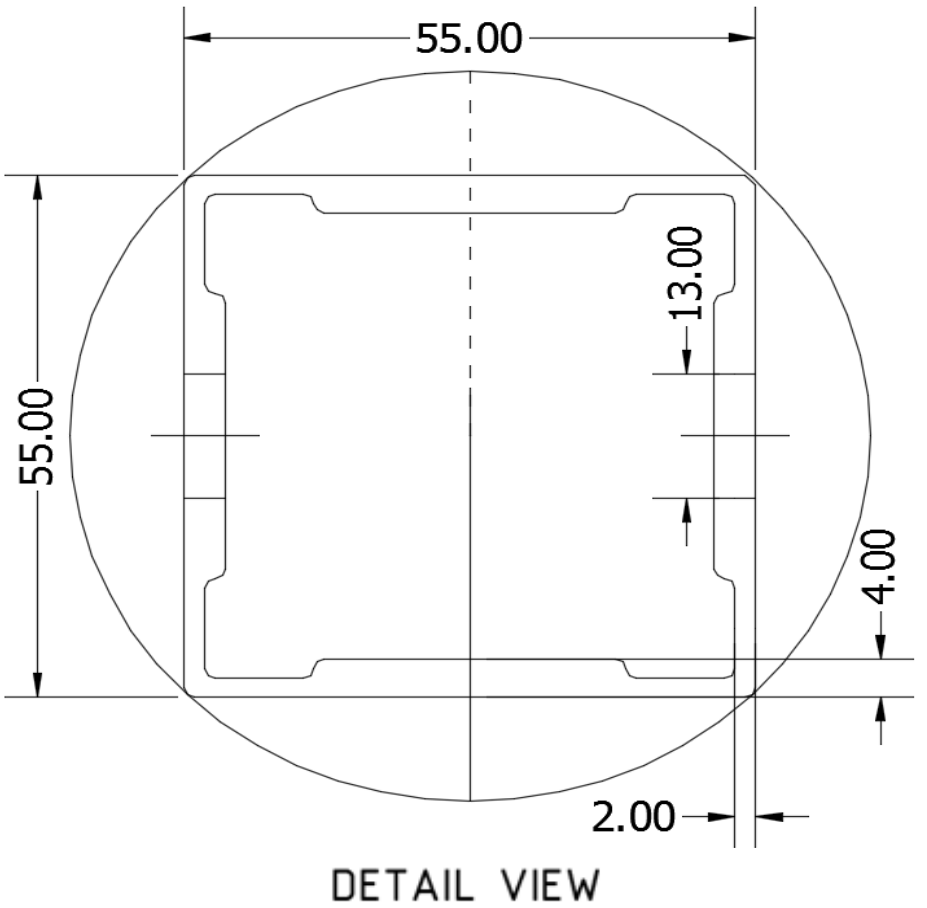
Girder Type	=	**T5**	
Aluminum Type	=	6105-T5	
F_{ty}	=	35	ksi
L_b	=	63.82	in
$\Phi F_{ty\ AXIAL}$	=	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$	=	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$	=	31.56	ksi
S_y	=	1.98	in^3
S_x	=	1.32	in^3
E	=	10100	ksi
I_y	=	4.74	in^4
I_x	=	1.83	in^4
A	=	1.93	in^2
g	=	2.32	lbs/ft
M_y	=	4.468	k-ft
M_z	=	0.000	k-ft
P_n	=	0.029	k
$M_{y\ allowable}$	=	5.026	k-ft
$M_{z\ allowable}$	=	3.472	k-ft
$P_{n\ allowable}$	=	59.439	k
Utilization	=	89%	



4.3 Strut Design

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

Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	5.969	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	45%	

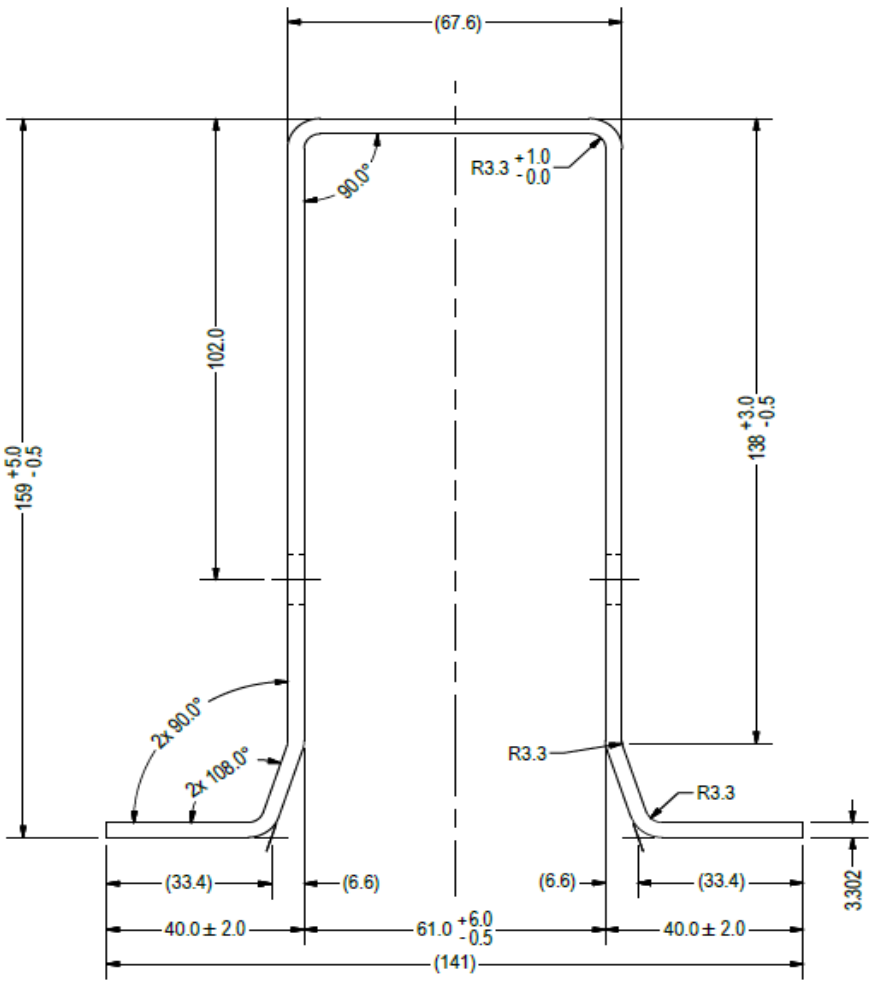


DETAIL VIEW

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 =	65.62	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	12.251	k-ft
M_z =	0.000	k-ft
P_r =	6.377	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	46.025	k
Utilization =	79%	



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 =	7.18	k
Maximum Lateral Load =	2.86	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)

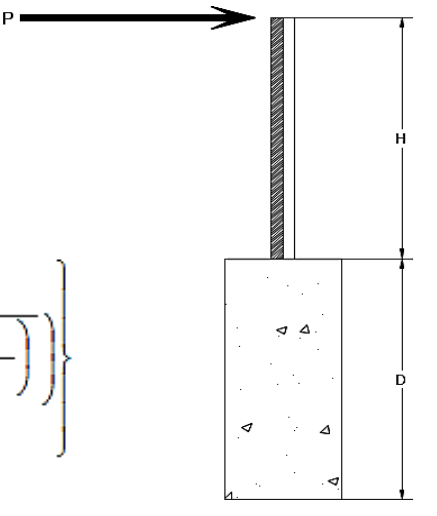
Lateral Force @ Top of Pole, P =	1.64	k
Height of Pole Above Grade, H =	4.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.64	k
Height of Pole Above Grade, H =	4.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	8.86	
Required Footing Depth, D =	12.36	ft

2nd Trial @ D_2 =	7.80	ft
Lateral Soil Bearing @ D/3, S_1 =	0.52	ksf
Lateral Soil Bearing @ D, S_3 =	1.56	ksf
Constant 2.34P/(S_1B), A =	3.69	
Required Footing Depth, D =	6.47	ft

3rd Trial @ D_3 =	7.14	ft
Lateral Soil Bearing @ D/3, S_1 =	0.48	ksf
Lateral Soil Bearing @ D, S_3 =	1.43	ksf
Constant 2.34P/(S_1B), A =	4.04	
Required Footing Depth, D =	6.89	ft

4th Trial @ D_4 =	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 =	4.11	
Required Footing Depth, D =	6.98	ft

5th Trial @ D_5 =	6.99	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 =	4.12	
Required Footing Depth, D =	7.00	ft

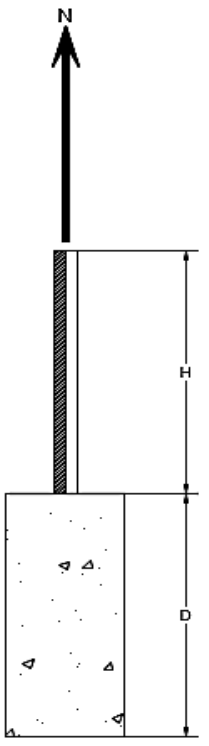
A 2ft diameter x 7ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.30	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 =	2.16	k
Required Concrete Volume, V =	14.93	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	7.14
2	0.4	0.2	118.10	7.03
3	0.6	0.2	118.10	6.93
4	0.8	0.2	118.10	6.82
5	1	0.2	118.10	6.72
6	1.2	0.2	118.10	6.62
7	1.4	0.2	118.10	6.51
8	1.6	0.2	118.10	6.41
9	1.8	0.2	118.10	6.31
10	2	0.2	118.10	6.20
11	2.2	0.2	118.10	6.10
12	2.4	0.2	118.10	6.00
13	2.6	0.2	118.10	5.89
14	2.8	0.2	118.10	5.79
15	3	0.2	118.10	5.68
16	3.2	0.2	118.10	5.58
17	3.4	0.2	118.10	5.48
18	3.6	0.2	118.10	5.37
19	3.8	0.2	118.10	5.27
20	4	0.2	118.10	5.17
21	4.2	0.2	118.10	5.06
22	4.4	0.2	118.10	4.96
23	4.6	0.2	118.10	4.85
24	4.8	0.2	118.10	4.75
25	0	0.0	0.00	4.75
26	0	0.0	0.00	4.75
27	0	0.0	0.00	4.75
28	0	0.0	0.00	4.75
29	0	0.0	0.00	4.75
30	0	0.0	0.00	4.75
31	0	0.0	0.00	4.75
32	0	0.0	0.00	4.75
33	0	0.0	0.00	4.75
34	0	0.0	0.00	4.75
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 =	7.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.28	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	25.13	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

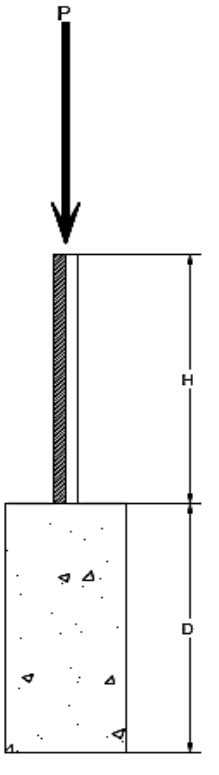
Weight of Concrete

Footing Volume	21.99	ft^3
Weight	3.19	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.77	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.31	k
Applied Force =	7.47	k
Utilization =	66%	

A 2ft diameter footing passes at a depth of 7ft.



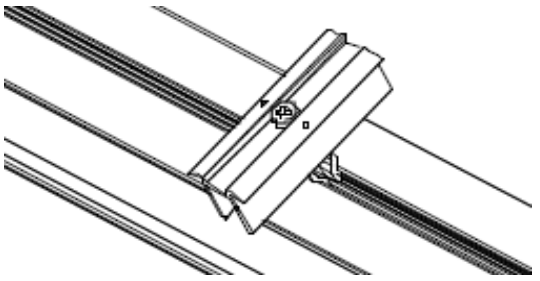
6. DESIGN OF JOINTS AND CONNECTIONS

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.

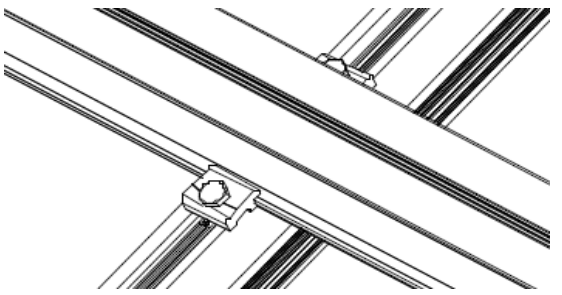
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.704 k
Allowable Uplift	=	1.214 k
Utilization	=	58%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.131 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

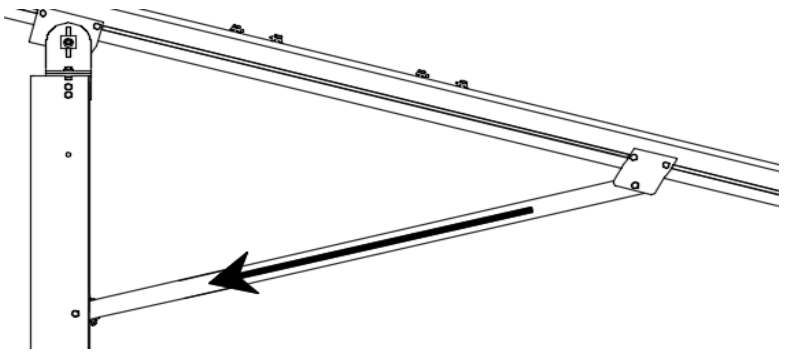


6.2 Strut Connections

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	=	5.969 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	67%

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

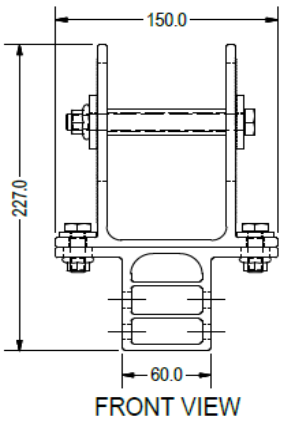


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

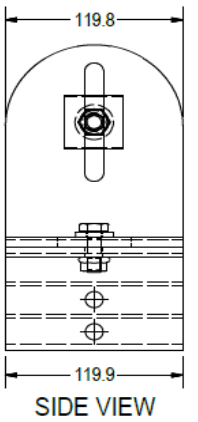
6.3 Girder to Post Connection

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

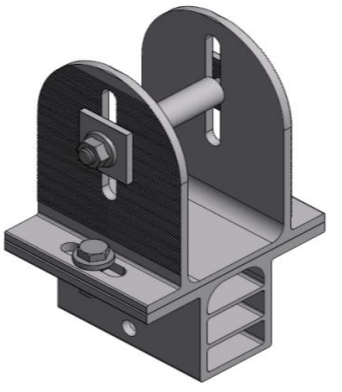
Maximum Tensile Load	=	4.519 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

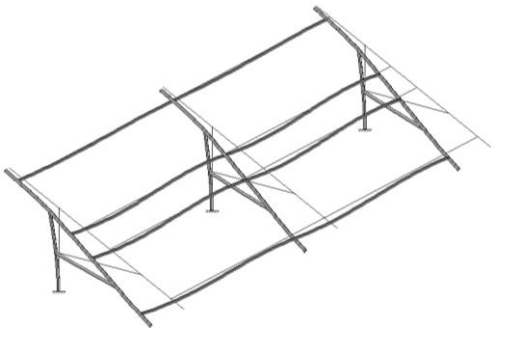
7.1 Seismic Drift

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}	=	53.92 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.078 in
Max Drift, Δ_{MAX}	=	0.4 in

0.4 ≤ 1.078, OK.

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



APPENDIX A

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

Purlin = **S1.5**

Strong Axis:

3.4.14

L_b = 102 in

J = 0.432

282.18

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

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= 27.9 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 = 102

J = 0.432

179.449

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

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= 29.0

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

M_{max}Wk = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

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

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

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

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

S1* = 0.33515

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

S2* = 1.23671

φcc = 0.77756

φF_L = (φccFcy)/(λ²)

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	65.62	in	
Pr =	6.38	k	(LRFD Factored Load)
Mr (Strong) =	12.25	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.154	<	0.2	
Utilization =	0.79	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.154	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 79%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-54.031	-54.031	0	0
2	M11	Y	-54.031	-54.031	0	0
3	M12	Y	-54.031	-54.031	0	0
4	M13	Y	-54.031	-54.031	0	0

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-103.443	-103.443	0	0
2	M11	y	-103.443	-103.443	0	0
3	M12	y	-162.554	-162.554	0	0
4	M13	y	-162.554	-162.554	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	208.857	208.857	0	0
2	M11	y	208.857	208.857	0	0
3	M12	y	98.517	98.517	0	0
4	M13	y	98.517	98.517	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	479.365	2	2398.326	2	214.376	2	.234	1	.005	5	5.824	1
2		min	-720.188	3	-1875.101	3	-289.351	5	-1.059	5	-.006	2	.321	12
3	N19	max	2134.466	2	6583.284	2	0	3	0	3	.006	4	11.52	1
4		min	-2133.979	3	-5526.62	3	-311.634	5	-1.108	4	0	3	.303	15
5	N29	max	479.365	2	2398.326	2	236.922	3	.243	3	.006	4	5.824	1
6		min	-720.188	3	-1875.101	3	-332.591	4	-1.116	4	-.003	3	-.185	5
7	Totals:	max	3093.195	2	11379.937	2	0	3						
8		min	-3574.355	3	-9276.821	3	-905.163	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	2	.001	4	0	1	0	1	0	1
2			min	0	1	-.002	3	0	1	0	1	0	1	0	1
3		2	max	-.179	15	-.49	15	0	3	0	1	0	3	0	6
4			min	-.76	6	-2.085	6	-1.499	5	0	1	0	5	0	15
5		3	max	-3.272	12	323.491	3	15.453	3	.074	3	.22	1	.32	2
6			min	-166.289	1	-724.597	2	-144.102	1	-.222	2	0	3	-.142	3
7		4	max	-3.568	12	322.271	3	15.453	3	.074	3	.13	1	.77	2
8			min	-166.88	1	-726.223	2	-144.102	1	-.222	2	.006	12	-.342	3
9		5	max	-3.864	12	321.051	3	15.453	3	.074	3	.056	4	1.222	2
10			min	-167.472	1	-727.849	2	-144.102	1	-.222	2	-.002	10	-.542	3
11		6	max	630.295	3	630.886	2	37.618	3	-.002	9	.101	2	1.175	2
12			min	-1794.716	2	-192.148	3	-188.865	1	-.022	3	-.042	3	-.553	3
13		7	max	629.851	3	629.26	2	37.618	3	-.002	9	.007	10	.784	2
14			min	-1795.308	2	-193.368	3	-188.865	1	-.022	3	-.046	4	-.433	3
15		8	max	629.407	3	627.634	2	37.618	3	-.002	9	.004	3	.394	2
16			min	-1795.9	2	-194.587	3	-188.865	1	-.022	3	-.136	1	-.313	3
17		9	max	626.217	3	90.408	3	45.653	3	.012	5	.081	1	.174	1
18			min	-1886.691	2	-52.885	2	-203.031	1	-.189	2	.011	12	-.259	3
19		10	max	625.773	3	89.189	3	45.653	3	.012	5	.047	3	.207	1
20			min	-1887.282	2	-54.511	2	-203.031	1	-.189	2	-.046	2	-.314	3
21		11	max	625.329	3	87.969	3	45.653	3	.012	5	.075	3	.241	1
22			min	-1887.874	2	-56.137	2	-203.031	1	-.189	2	-.171	1	-.369	3
23		12	max	618.246	3	800.712	3	82.333	2	.309	3	.116	1	.479	1
24			min	-2004.139	1	-544.788	1	-208.401	3	-.297	2	.003	15	-.708	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	617.803	3	799.492	3	82.333	2	.309	3	.144	1	.817	1
26			min	-2004.731	1	-546.414	1	-208.401	3	-.297	2	-.116	3	-1.204	3
27		14	max	168.19	1	502.876	1	64.264	5	.194	1	0	3	1.142	1
28			min	3.252	12	-729.448	3	-123.533	1	-.361	3	-.173	4	-1.679	3
29		15	max	167.598	1	501.25	1	62.765	5	.194	1	.005	3	.831	1
30			min	2.956	12	-730.667	3	-123.533	1	-.361	3	-.147	4	-1.226	3
31		16	max	167.006	1	499.624	1	61.265	5	.194	1	.009	3	.52	1
32			min	2.66	12	-731.887	3	-123.533	1	-.361	3	-.158	1	-.772	3
33		17	max	166.414	1	497.998	1	59.765	5	.194	1	.013	3	.211	1
34			min	2.364	12	-733.106	3	-123.533	1	-.361	3	-.234	1	-.318	3
35		18	max	.76	4	2.087	6	1.5	4	0	1	0	12	0	6
36			min	.179	15	.49	15	0	12	0	1	0	4	0	15
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.003	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	-.179	15	-.49	15	0	1	0	1	0	1	0	4
42			min	-.76	6	-2.084	4	-1.499	5	0	1	0	5	0	15
43		3	max	-.981	10	934.519	3	0	1	.016	4	.186	4	.733	2
44			min	-242.488	1	-1940.549	2	-89.803	5	0	1	0	1	-.354	3
45		4	max	-1.474	10	933.299	3	0	1	.016	4	.13	4	1.938	2
46			min	-243.079	1	-1942.175	2	-91.302	5	0	1	0	1	-.934	3
47		5	max	-1.967	10	932.08	3	0	1	.016	4	.073	4	3.144	2
48			min	-243.671	1	-1943.801	2	-92.802	5	0	1	0	1	-1.513	3
49		6	max	2041.604	3	1799.14	2	0	1	0	1	0	1	2.977	2
50			min	-4769.85	2	-722.786	3	-91.288	4	-.012	4	-.007	5	-1.484	3
51		7	max	2041.161	3	1797.514	2	0	1	0	1	0	1	1.861	2
52			min	-4770.442	2	-724.005	3	-92.788	4	-.012	4	-.063	4	-1.035	3
53		8	max	2040.717	3	1795.887	2	0	1	0	1	0	1	.746	2
54			min	-4771.034	2	-725.225	3	-94.288	4	-.012	4	-.121	4	-.586	3
55		9	max	2014.608	3	281.16	3	0	1	.01	4	.11	4	.106	1
56			min	-4817.172	2	-258.43	1	-196.742	4	0	1	0	1	-.356	3
57		10	max	2014.164	3	279.94	3	0	1	.01	4	0	1	.267	1
58			min	-4817.764	2	-260.056	1	-198.242	4	0	1	-.013	4	-.53	3
59		11	max	2013.72	3	278.721	3	0	1	.01	4	0	1	.429	1
60			min	-4818.355	2	-261.682	1	-199.741	4	0	1	-.136	4	-.703	3
61		12	max	1995.396	3	2298.824	3	0	1	.098	4	.035	5	1.166	1
62			min	-4873.812	2	-1759.381	1	-206.115	5	0	1	0	1	-1.675	3
63		13	max	1994.952	3	2297.605	3	0	1	.098	4	0	1	2.259	1
64			min	-4874.404	2	-1761.007	1	-207.615	5	0	1	-.093	4	-3.101	3
65		14	max	244.012	1	1469.495	1	56.734	5	0	1	0	1	3.308	1
66			min	2.03	10	-1988.493	3	0	1	-.067	4	-.16	5	-4.468	3
67		15	max	243.42	1	1467.869	1	55.235	5	0	1	0	1	2.396	1
68			min	1.537	10	-1989.712	3	0	1	-.067	4	-.125	5	-3.234	3
69		16	max	242.828	1	1466.243	1	53.735	5	0	1	0	1	1.486	1
70			min	1.044	10	-1990.932	3	0	1	-.067	4	-.091	4	-1.998	3
71		17	max	242.236	1	1464.617	1	52.235	5	0	1	0	1	.576	1
72			min	.551	10	-1992.151	3	0	1	-.067	4	-.059	4	-.762	3
73		18	max	.76	4	2.088	6	1.5	5	0	1	0	1	0	6
74			min	.179	15	.491	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.003	1	0	1	0	1	0	1	0	1
76			min	0	1	-.008	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
78			min	0	1	-.002	3	0	3	0	1	0	1	0	1
79		2	max	-.179	15	-.491	15	0	1	0	1	0	1	0	4
80			min	-.76	6	-2.086	4	-1.499	5	0	1	0	5	0	15
81		3	max	18.445	5	323.491	3	144.102	1	.222	2	.093	5	.32	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	-166.289	1	-724.597	2	-40.445	5	-.074	3	-.22	1	-.142	3
83		4	max	18.169	5	322.271	3	144.102	1	.222	2	.068	5	.77	2
84			min	-166.88	1	-726.223	2	-41.944	5	-.074	3	-.13	1	-.342	3
85		5	max	17.893	5	321.051	3	144.102	1	.222	2	.041	5	1.222	2
86			min	-167.472	1	-727.849	2	-43.444	5	-.074	3	-.041	1	-.542	3
87		6	max	630.295	3	630.886	2	188.865	1	.022	3	.042	3	1.175	2
88			min	-1794.716	2	-192.148	3	-39.831	5	-.009	5	-.101	2	-.553	3
89		7	max	629.851	3	629.26	2	188.865	1	.022	3	.019	1	.784	2
90			min	-1795.308	2	-193.368	3	-41.331	5	-.009	5	-.037	5	-.433	3
91		8	max	629.407	3	627.634	2	188.865	1	.022	3	.136	1	.394	2
92			min	-1795.9	2	-194.587	3	-42.83	5	-.009	5	-.063	5	-.313	3
93		9	max	626.217	3	90.408	3	203.031	1	.189	2	.045	5	.174	1
94			min	-1886.691	2	-52.885	2	-79.44	5	.013	15	-.081	1	-.259	3
95		10	max	625.773	3	89.189	3	203.031	1	.189	2	.046	2	.207	1
96			min	-1887.282	2	-54.511	2	-80.94	5	.013	15	-.047	3	-.314	3
97		11	max	625.329	3	87.969	3	203.031	1	.189	2	.171	1	.241	1
98			min	-1887.874	2	-56.137	2	-82.439	5	.013	15	-.075	3	-.369	3
99		12	max	618.246	3	800.712	3	208.401	3	.297	2	-.004	15	.479	1
100			min	-2004.139	1	-544.788	1	-180.041	4	-.309	3	-.116	1	-.708	3
101		13	max	617.803	3	799.492	3	208.401	3	.297	2	.116	3	.817	1
102			min	-2004.731	1	-546.414	1	-181.541	4	-.309	3	-.144	1	-1.204	3
103		14	max	168.19	1	502.876	1	123.533	1	.361	3	.004	1	1.142	1
104			min	3.252	12	-729.448	3	-6.662	3	-.194	1	-.172	5	-1.679	3
105		15	max	167.598	1	501.25	1	123.533	1	.361	3	.081	1	.831	1
106			min	2.956	12	-730.667	3	-6.662	3	-.194	1	-.125	5	-1.226	3
107		16	max	167.006	1	499.624	1	123.533	1	.361	3	.158	1	.52	1
108			min	2.66	12	-731.887	3	-6.662	3	-.194	1	-.08	5	-.772	3
109		17	max	166.414	1	497.998	1	123.533	1	.361	3	.234	1	.211	1
110			min	2.364	12	-733.106	3	-6.662	3	-.194	1	-.035	5	-.318	3
111		18	max	.76	4	2.087	4	1.5	5	0	1	0	1	0	4
112			min	.179	15	.491	15	0	1	0	1	0	5	0	15
113		19	max	0	1	0	2	0	12	0	1	0	1	0	1
114			min	0	1	-.003	3	0	1	0	1	0	1	0	1
115	M10	1	max	123.523	1	494.649	1	-1.773	12	.008	1	.284	1	.194	1
116			min	-6.661	3	-735.489	3	-165.556	1	-.022	3	-.016	3	-.361	3
117		2	max	123.523	1	358.566	1	-.318	3	.008	1	.143	1	.242	3
118			min	-6.661	3	-542.991	3	-133.806	1	-.022	3	-.017	3	-.208	1
119		3	max	123.523	1	222.484	1	1.413	3	.008	1	.053	2	.664	3
120			min	-6.661	3	-350.493	3	-102.055	1	-.022	3	-.016	3	-.483	1
121		4	max	123.523	1	86.401	1	3.144	3	.008	1	.011	10	.904	3
122			min	-6.661	3	-157.995	3	-70.304	1	-.022	3	-.05	1	-.629	1
123		5	max	123.523	1	34.503	3	4.875	3	.008	1	-.005	15	.963	3
124			min	-6.661	3	-49.755	2	-38.553	1	-.022	3	-.101	1	-.646	1
125		6	max	123.523	1	227.001	3	6.606	3	.008	1	-.003	15	.839	3
126			min	-6.661	3	-185.764	1	-20.961	2	-.022	3	-.123	1	-.535	1
127		7	max	123.523	1	419.499	3	24.948	1	.008	1	.002	3	.534	3
128			min	-6.661	3	-321.847	1	-9.83	10	-.022	3	-.114	1	-.295	1
129		8	max	123.523	1	611.997	3	56.699	1	.008	1	.011	3	.077	2
130			min	-6.661	3	-457.929	1	-6.642	10	-.022	3	-.076	2	-.012	5
131		9	max	123.523	1	804.495	3	88.45	1	.008	1	.025	14	.57	1
132			min	-9.086	5	-594.012	1	-3.453	10	-.022	3	-.066	2	-.622	3
133		10	max	123.523	1	996.993	3	120.2	1	.022	3	.093	9	1.195	1
134			min	-6.661	3	-730.094	1	-67.702	14	-.003	14	-.045	10	-1.473	3
135		11	max	123.523	1	594.012	1	3.453	10	.022	3	.022	9	.57	1
136			min	-6.661	3	-804.495	3	-88.45	1	-.008	1	-.066	2	-.622	3
137		12	max	123.523	1	457.929	1	6.642	10	.022	3	.011	3	.077	2
138			min	-6.661	3	-611.997	3	-56.699	1	-.008	1	-.076	2	.011	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	123.523	1	321.847	1	9.83	10	.022	3	.002	3	.534	3
140			min	-6.661	3	-419.499	3	-24.948	1	-.008	1	-.114	1	-.295	1
141		14	max	123.523	1	185.764	1	20.961	2	.022	3	-.003	12	.839	3
142			min	-8.307	5	-227.001	3	-6.606	3	-.008	1	-.123	1	-.535	1
143		15	max	123.523	1	49.755	2	38.553	1	.022	3	-.002	15	.963	3
144			min	-18.002	5	-34.503	3	-4.875	3	-.008	1	-.101	1	-.646	1
145		16	max	123.523	1	157.995	3	70.304	1	.022	3	.011	10	.904	3
146			min	-27.697	5	-86.401	1	-3.144	3	-.008	1	-.05	1	-.629	1
147		17	max	123.523	1	350.493	3	102.055	1	.022	3	.053	2	.664	3
148			min	-37.391	5	-222.484	1	-1.413	3	-.008	1	-.016	3	-.483	1
149		18	max	123.523	1	542.991	3	133.806	1	.022	3	.143	1	.242	3
150			min	-47.086	5	-358.566	1	.318	3	-.008	1	-.017	3	-.208	1
151		19	max	123.523	1	735.489	3	165.556	1	.022	3	.284	1	.194	1
152			min	-56.781	5	-494.649	1	1.773	12	-.008	1	-.016	3	-.361	3
153	M11	1	max	247.83	1	484.943	1	26.556	5	.001	3	.315	1	.144	1
154			min	-253.858	3	-715.782	3	-171.099	1	-.009	2	-.138	5	-.389	3
155		2	max	247.83	1	348.86	1	28.341	5	.001	3	.169	1	.196	3
156			min	-253.858	3	-523.284	3	-139.348	1	-.009	2	-.112	5	-.269	2
157		3	max	247.83	1	212.778	1	30.127	5	.001	3	.061	2	.6	3
158			min	-253.858	3	-330.786	3	-107.597	1	-.009	2	-.085	5	-.522	2
159		4	max	247.83	1	76.695	1	31.912	5	.001	3	.012	10	.821	3
160			min	-253.858	3	-138.288	3	-75.847	1	-.009	2	-.066	4	-.651	1
161		5	max	247.83	1	54.21	3	33.697	5	.001	3	-.001	12	.861	3
162			min	-253.858	3	-63.111	2	-44.096	1	-.009	2	-.091	1	-.66	1
163		6	max	247.83	1	246.709	3	35.483	5	.001	3	.008	5	.719	3
164			min	-253.858	3	-195.47	1	-23.369	2	-.009	2	-.118	1	-.539	1
165		7	max	247.83	1	439.207	3	43.871	4	.001	3	.043	5	.395	3
166			min	-253.858	3	-331.553	1	-10.817	2	-.009	2	-.115	1	-.29	1
167		8	max	247.83	1	631.705	3	52.271	4	.001	3	.079	5	.088	2
168			min	-253.858	3	-467.635	1	-7.319	10	-.009	2	-.081	1	-.111	3
169		9	max	247.83	1	824.203	3	82.907	1	.001	3	.121	4	.593	1
170			min	-253.858	3	-603.718	1	-4.131	10	-.009	2	-.071	2	-.798	3
171		10	max	247.83	1	1016.701	3	114.658	1	.009	1	.183	4	1.227	1
172			min	-253.858	3	-739.8	1	-49.055	14	-.009	2	-.052	2	-1.668	3
173		11	max	247.83	1	603.718	1	30.175	5	.009	2	.015	9	.593	1
174			min	-253.858	3	-824.203	3	-82.907	1	-.001	3	-.114	5	-.798	3
175		12	max	247.83	1	467.635	1	31.961	5	.009	2	.007	3	.088	2
176			min	-253.858	3	-631.705	3	-51.156	1	-.001	3	-.095	4	-.111	3
177		13	max	247.83	1	331.553	1	33.746	5	.009	2	.002	3	.395	3
178			min	-253.858	3	-439.207	3	-20.242	9	-.001	3	-.115	1	-.29	1
179		14	max	247.83	1	195.47	1	35.746	4	.009	2	0	3	.719	3
180			min	-253.858	3	-246.709	3	-1.931	3	-.001	3	-.118	1	-.539	1
181		15	max	247.83	1	63.111	2	44.146	4	.009	2	.014	5	.861	3
182			min	-253.858	3	-54.21	3	-.2	3	-.001	3	-.091	1	-.66	1
183		16	max	247.83	1	138.288	3	75.847	1	.009	2	.05	5	.821	3
184			min	-253.858	3	-76.695	1	1.134	12	-.001	3	-.035	1	-.651	1
185		17	max	247.83	1	330.786	3	107.597	1	.009	2	.093	4	.6	3
186			min	-253.858	3	-212.778	1	2.288	12	-.001	3	0	12	-.522	2
187		18	max	247.83	1	523.284	3	139.348	1	.009	2	.169	1	.196	3
188			min	-253.858	3	-348.86	1	3.442	12	-.001	3	.004	12	-.269	2
189		19	max	247.83	1	715.782	3	171.099	1	.009	2	.315	1	.144	1
190			min	-253.858	3	-484.943	1	4.596	12	-.001	3	.007	12	-.389	3
191	M12	1	max	35.006	5	675.725	2	27.984	5	.003	3	.338	1	.179	2
192			min	-18.727	9	-287.343	3	-175.138	1	-.01	2	-.143	5	.018	15
193		2	max	25.311	5	487.714	2	29.769	5	.003	3	.187	1	.287	3
194			min	-18.727	9	-199.055	3	-143.387	1	-.01	2	-.116	5	-.37	2
195		3	max	19.674	2	299.703	2	31.555	5	.003	3	.076	2	.433	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-18.727	9	-110.767	3	-111.636	1	-.01	2	-.087	5	-.742	2
197		4	max	19.674	2	111.693	2	33.34	5	.003	3	.021	2	.496	3
198			min	-18.727	9	-22.479	3	-79.886	1	-.01	2	-.066	4	-.936	2
199		5	max	19.674	2	65.809	3	35.126	5	.003	3	-.002	10	.476	3
200			min	-18.727	9	-76.318	2	-48.135	1	-.01	2	-.084	1	-.953	2
201		6	max	19.674	2	154.097	3	36.911	5	.003	3	.01	5	.372	3
202			min	-21.239	14	-264.329	2	-27.49	2	-.01	2	-.115	1	-.792	2
203		7	max	19.674	2	242.385	3	44.81	4	.003	3	.045	5	.185	3
204			min	-29.192	4	-452.339	2	-14.938	2	-.01	2	-.115	1	-.454	2
205		8	max	19.674	2	330.673	3	53.211	4	.003	3	.083	5	.062	2
206			min	-38.887	4	-640.35	2	-9.454	10	-.01	2	-.086	1	-.086	3
207		9	max	19.674	2	418.961	3	78.868	1	.003	3	.126	4	.756	2
208			min	-48.582	4	-828.361	2	-6.266	10	-.01	2	-.079	2	-.44	3
209		10	max	19.674	2	507.249	3	110.619	1	.003	3	.188	4	1.627	2
210			min	-58.277	4	-1016.371	2	-3.078	10	-.01	2	-.064	2	-.877	3
211		11	max	38.901	5	828.361	2	31.888	5	.01	2	.02	3	.756	2
212			min	-18.727	9	-418.961	3	-78.868	1	-.003	3	-.12	5	-.44	3
213		12	max	29.206	5	640.35	2	33.674	5	.01	2	.011	3	.062	2
214			min	-18.727	9	-330.673	3	-47.117	1	-.003	3	-.1	4	-.086	3
215		13	max	19.674	2	452.339	2	35.459	5	.01	2	.002	3	.185	3
216			min	-18.727	9	-242.385	3	-18.638	9	-.003	3	-.115	1	-.454	2
217		14	max	19.674	2	264.329	2	37.999	4	.01	2	-.003	12	.372	3
218			min	-18.727	9	-154.097	3	-5.911	3	-.003	3	-.115	1	-.792	2
219		15	max	19.674	2	76.318	2	48.135	1	.01	2	.014	5	.476	3
220			min	-18.727	9	-65.809	3	-4.18	3	-.003	3	-.084	1	-.953	2
221		16	max	19.674	2	22.479	3	79.886	1	.01	2	.052	5	.496	3
222			min	-19.235	14	-111.693	2	-2.449	3	-.003	3	-.028	9	-.936	2
223		17	max	19.674	2	110.767	3	111.636	1	.01	2	.099	4	.433	3
224			min	-25.259	4	-299.703	2	-.719	3	-.003	3	-.013	3	-.742	2
225		18	max	19.674	2	199.055	3	143.387	1	.01	2	.187	1	.287	3
226			min	-34.954	4	-487.714	2	1.012	3	-.003	3	-.013	3	-.37	2
227		19	max	19.674	2	287.343	3	175.138	1	.01	2	.338	1	.179	2
228			min	-44.649	4	-675.725	2	2.217	12	-.003	3	-.011	3	-.021	5
229	M13	1	max	37.383	5	721.685	2	18.999	5	.012	3	.278	1	.222	2
230			min	-144.01	1	-325.99	3	-164.713	1	-.026	2	-.11	5	-.074	3
231		2	max	27.688	5	533.675	2	20.785	5	.012	3	.137	1	.192	3
232			min	-144.01	1	-237.702	3	-132.962	1	-.026	2	-.091	5	-.37	2
233		3	max	17.993	5	345.664	2	22.57	5	.012	3	.048	2	.375	3
234			min	-144.01	1	-149.414	3	-101.211	1	-.026	2	-.071	5	-.786	2
235		4	max	15.453	3	157.653	2	24.356	5	.012	3	.009	10	.474	3
236			min	-144.01	1	-61.126	3	-69.46	1	-.026	2	-.063	4	-1.023	2
237		5	max	15.453	3	27.162	3	26.141	5	.012	3	-.004	12	.49	3
238			min	-144.01	1	-30.357	2	-37.71	1	-.026	2	-.104	1	-1.083	2
239		6	max	15.453	3	115.45	3	29.116	4	.012	3	0	5	.423	3
240			min	-144.01	1	-218.368	2	-20.275	2	-.026	2	-.125	1	-.966	2
241		7	max	15.453	3	203.738	3	37.517	4	.012	3	.028	5	.272	3
242			min	-144.01	1	-406.379	2	-9.5	10	-.026	2	-.116	1	-.671	2
243		8	max	15.453	3	292.026	3	57.543	1	.012	3	.057	5	.038	3
244			min	-144.01	1	-594.39	2	-6.312	10	-.026	2	-.077	2	-.198	2
245		9	max	15.453	3	380.314	3	89.293	1	.012	3	.094	4	.452	2
246			min	-144.01	1	-782.4	2	-3.123	10	-.026	2	-.066	2	-.279	3
247		10	max	15.453	3	468.602	3	121.044	1	.012	3	.15	4	1.28	2
248			min	-144.01	1	-970.411	2	.065	10	-.026	2	-.045	10	-.68	3
249		11	max	27.288	5	782.4	2	21.952	5	.026	2	.022	9	.452	2
250			min	-144.01	1	-380.314	3	-89.293	1	-.012	3	-.083	5	-.279	3
251		12	max	17.594	5	594.39	2	23.738	5	.026	2	.01	3	.038	3
252			min	-144.01	1	-292.026	3	-57.543	1	-.012	3	-.077	2	-.198	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	15.453	3	406.379	2	25.523	5	.026	2	.003	3	.272	3
254			min	-144.01	1	-203.738	3	-25.792	1	-.012	3	-.116	1	-.671	2
255		14	max	15.453	3	218.368	2	27.309	5	.026	2	-.002	12	.423	3
256			min	-144.01	1	-115.45	3	-5.094	3	-.012	3	-.125	1	-.966	2
257		15	max	15.453	3	30.357	2	37.71	1	.026	2	.013	5	.49	3
258			min	-144.01	1	-27.162	3	-3.363	3	-.012	3	-.104	1	-1.083	2
259		16	max	15.453	3	61.126	3	69.46	1	.026	2	.041	5	.474	3
260			min	-144.01	1	-157.653	2	-1.632	3	-.012	3	-.054	1	-1.023	2
261		17	max	15.453	3	149.414	3	101.211	1	.026	2	.072	4	.375	3
262			min	-144.01	1	-345.664	2	.099	3	-.012	3	-.01	3	-.786	2
263		18	max	15.453	3	237.702	3	132.962	1	.026	2	.137	1	.192	3
264			min	-144.01	1	-533.675	2	1.524	12	-.012	3	-.009	3	-.37	2
265		19	max	15.453	3	325.99	3	164.713	1	.026	2	.278	1	.222	2
266			min	-144.01	1	-721.685	2	2.678	12	-.012	3	-.006	3	-.074	3
267	M2	1	max	2398.326	2	720.022	3	214.589	2	.005	5	1.059	5	5.824	1
268			min	-1875.101	3	-476.653	2	-289.418	5	-.006	2	-.234	1	.321	12
269		2	max	2396.066	2	720.022	3	214.589	2	.005	5	.987	5	5.852	1
270			min	-1876.796	3	-476.653	2	-287.458	5	-.006	2	-.18	1	.213	12
271		3	max	2393.805	2	720.022	3	214.589	2	.005	5	.916	5	5.881	1
272			min	-1878.491	3	-476.653	2	-285.499	5	-.006	2	-.127	1	.106	12
273		4	max	2391.545	2	720.022	3	214.589	2	.005	5	.845	5	5.909	1
274			min	-1880.187	3	-476.653	2	-283.54	5	-.006	2	-.074	1	-.033	3
275		5	max	1770.287	1	1690.324	1	168.353	1	.002	2	.778	5	5.875	1
276			min	-1622.908	3	-53.058	3	-272.787	5	0	3	-.071	1	-.184	3
277		6	max	1768.027	1	1690.324	1	168.353	1	.002	2	.711	4	5.455	1
278			min	-1624.603	3	-53.058	3	-270.828	5	0	3	-.03	1	-.171	3
279		7	max	1765.766	1	1690.324	1	168.353	1	.002	2	.649	4	5.036	1
280			min	-1626.299	3	-53.058	3	-268.869	5	0	3	-.072	3	-.158	3
281		8	max	1763.505	1	1690.324	1	168.353	1	.002	2	.588	4	4.616	1
282			min	-1627.994	3	-53.058	3	-266.91	5	0	3	-.126	3	-.145	3
283		9	max	1761.245	1	1690.324	1	168.353	1	.002	2	.527	4	4.196	1
284			min	-1629.69	3	-53.058	3	-264.95	5	0	3	-.179	3	-.132	3
285		10	max	1758.984	1	1690.324	1	168.353	1	.002	2	.466	4	3.777	1
286			min	-1631.385	3	-53.058	3	-262.991	5	0	3	-.232	3	-.119	3
287		11	max	1756.724	1	1690.324	1	168.353	1	.002	2	.406	4	3.357	1
288			min	-1633.08	3	-53.058	3	-261.032	5	0	3	-.286	3	-.105	3
289		12	max	1754.463	1	1690.324	1	168.353	1	.002	2	.347	4	2.937	1
290			min	-1634.776	3	-53.058	3	-259.073	5	0	3	-.339	3	-.092	3
291		13	max	1752.202	1	1690.324	1	168.353	1	.002	2	.287	4	2.518	1
292			min	-1636.471	3	-53.058	3	-257.114	5	0	3	-.393	3	-.079	3
293		14	max	1749.942	1	1690.324	1	168.353	1	.002	2	.308	2	2.098	1
294			min	-1638.167	3	-53.058	3	-255.155	5	0	3	-.446	3	-.066	3
295		15	max	1747.681	1	1690.324	1	168.353	1	.002	2	.349	2	1.679	1
296			min	-1639.862	3	-53.058	3	-253.195	5	0	3	-.5	3	-.053	3
297		16	max	1745.421	1	1690.324	1	168.353	1	.002	2	.39	2	1.259	1
298			min	-1641.558	3	-53.058	3	-251.236	5	0	3	-.553	3	-.04	3
299		17	max	1743.16	1	1690.324	1	168.353	1	.002	2	.431	2	.839	1
300			min	-1643.253	3	-53.058	3	-249.277	5	0	3	-.606	3	-.026	3
301		18	max	1740.899	1	1690.324	1	168.353	1	.002	2	.472	1	.42	1
302			min	-1644.949	3	-53.058	3	-247.318	5	0	3	-.66	3	-.013	3
303		19	max	1738.639	1	1690.324	1	168.353	1	.002	2	.514	1	0	1
304			min	-1646.644	3	-53.058	3	-245.359	5	0	3	-.713	3	0	1
305	M5	1	max	6583.284	2	2133.447	3	0	1	.006	4	1.108	4	11.52	1
306			min	-5526.62	3	-2118.892	2	-311.776	5	0	1	0	1	.303	15
307		2	max	6581.023	2	2133.447	3	0	1	.006	4	1.031	4	11.842	1
308			min	-5528.315	3	-2118.892	2	-309.817	5	0	1	0	1	.148	12
309		3	max	6578.763	2	2133.447	3	0	1	.006	4	.954	4	12.163	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	-5530.011	3	-2118.892	2	-307.857	5	0	1	0	1	-.33	3
311		4	max	6576.502	2	2133.447	3	0	1	.006	4	.878	4	12.485	1
312			min	-5531.706	3	-2118.892	2	-305.898	5	0	1	0	1	-.86	3
313		5	max	4817.621	1	3635.119	1	0	1	0	1	.809	4	12.634	1
314			min	-4682.104	3	-374.616	3	-296.884	4	0	4	0	1	-1.302	3
315		6	max	4815.361	1	3635.119	1	0	1	0	1	.735	4	11.732	1
316			min	-4683.8	3	-374.616	3	-294.925	4	0	4	0	1	-1.209	3
317		7	max	4813.1	1	3635.119	1	0	1	0	1	.662	4	10.829	1
318			min	-4685.495	3	-374.616	3	-292.966	4	0	4	0	1	-1.116	3
319		8	max	4810.84	1	3635.119	1	0	1	0	1	.59	4	9.927	1
320			min	-4687.191	3	-374.616	3	-291.007	4	0	4	0	1	-1.023	3
321		9	max	4808.579	1	3635.119	1	0	1	0	1	.518	4	9.024	1
322			min	-4688.886	3	-374.616	3	-289.047	4	0	4	0	1	-.93	3
323		10	max	4806.318	1	3635.119	1	0	1	0	1	.446	4	8.122	1
324			min	-4690.582	3	-374.616	3	-287.088	4	0	4	0	1	-.837	3
325		11	max	4804.058	1	3635.119	1	0	1	0	1	.375	4	7.22	1
326			min	-4692.277	3	-374.616	3	-285.129	4	0	4	0	1	-.744	3
327		12	max	4801.797	1	3635.119	1	0	1	0	1	.305	4	6.317	1
328			min	-4693.972	3	-374.616	3	-283.17	4	0	4	0	1	-.651	3
329		13	max	4799.537	1	3635.119	1	0	1	0	1	.235	4	5.415	1
330			min	-4695.668	3	-374.616	3	-281.211	4	0	4	0	1	-.558	3
331		14	max	4797.276	1	3635.119	1	0	1	0	1	.165	4	4.512	1
332			min	-4697.363	3	-374.616	3	-279.251	4	0	4	0	1	-.465	3
333		15	max	4795.015	1	3635.119	1	0	1	0	1	.096	4	3.61	1
334			min	-4699.059	3	-374.616	3	-277.292	4	0	4	0	1	-.372	3
335		16	max	4792.755	1	3635.119	1	0	1	0	1	.027	4	2.707	1
336			min	-4700.754	3	-374.616	3	-275.333	4	0	4	0	1	-.279	3
337		17	max	4790.494	1	3635.119	1	0	1	0	1	0	1	1.805	1
338			min	-4702.45	3	-374.616	3	-273.374	4	0	4	-.041	4	-.186	3
339		18	max	4788.234	1	3635.119	1	0	1	0	1	0	1	.902	1
340			min	-4704.145	3	-374.616	3	-271.415	4	0	4	-.108	4	-.093	3
341		19	max	4785.973	1	3635.119	1	0	1	0	1	0	1	0	1
342			min	-4705.841	3	-374.616	3	-269.455	4	0	4	-.175	4	0	1
343	M8	1	max	2398.326	2	720.022	3	236.73	3	.006	4	1.116	4	5.824	1
344			min	-1875.101	3	-476.653	2	-332.856	4	-.003	3	-.243	3	-.185	5
345		2	max	2396.066	2	720.022	3	236.73	3	.006	4	1.034	4	5.852	1
346			min	-1876.796	3	-476.653	2	-330.897	4	-.003	3	-.184	3	-.161	5
347		3	max	2393.805	2	720.022	3	236.73	3	.006	4	.952	4	5.881	1
348			min	-1878.491	3	-476.653	2	-328.938	4	-.003	3	-.126	3	-.136	5
349		4	max	2391.545	2	720.022	3	236.73	3	.006	4	.871	4	5.909	1
350			min	-1880.187	3	-476.653	2	-326.979	4	-.003	3	-.067	3	-.111	5
351		5	max	1770.287	1	1690.324	1	215.245	3	0	3	.801	4	5.875	1
352			min	-1622.908	3	-53.058	3	-309.478	4	-.002	2	-.035	3	-.184	3
353		6	max	1768.027	1	1690.324	1	215.245	3	0	3	.725	4	5.455	1
354			min	-1624.603	3	-53.058	3	-307.519	4	-.002	2	.007	10	-.171	3
355		7	max	1765.766	1	1690.324	1	215.245	3	0	3	.648	4	5.036	1
356			min	-1626.299	3	-53.058	3	-305.56	4	-.002	2	-.023	2	-.158	3
357		8	max	1763.505	1	1690.324	1	215.245	3	0	3	.574	5	4.616	1
358			min	-1627.994	3	-53.058	3	-303.6	4	-.002	2	-.064	2	-.145	3
359		9	max	1761.245	1	1690.324	1	215.245	3	0	3	.505	5	4.196	1
360			min	-1629.69	3	-53.058	3	-301.641	4	-.002	2	-.105	2	-.132	3
361		10	max	1758.984	1	1690.324	1	215.245	3	0	3	.436	5	3.777	1
362			min	-1631.385	3	-53.058	3	-299.682	4	-.002	2	-.145	2	-.119	3
363		11	max	1756.724	1	1690.324	1	215.245	3	0	3	.368	5	3.357	1
364			min	-1633.08	3	-53.058	3	-297.723	4	-.002	2	-.186	2	-.105	3
365		12	max	1754.463	1	1690.324	1	215.245	3	0	3	.339	3	2.937	1
366			min	-1634.776	3	-53.058	3	-295.764	4	-.002	2	-.227	2	-.092	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
367		13	max	1752.202	1	1690.324	1	215.245	3	0	3	.393	3	2.518	1
368			min	-1636.471	3	-53.058	3	-293.805	4	-.002	2	-.268	2	-.079	3
369		14	max	1749.942	1	1690.324	1	215.245	3	0	3	.446	3	2.098	1
370			min	-1638.167	3	-53.058	3	-291.845	4	-.002	2	-.308	2	-.066	3
371		15	max	1747.681	1	1690.324	1	215.245	3	0	3	.5	3	1.679	1
372			min	-1639.862	3	-53.058	3	-289.886	4	-.002	2	-.349	2	-.053	3
373		16	max	1745.421	1	1690.324	1	215.245	3	0	3	.553	3	1.259	1
374			min	-1641.558	3	-53.058	3	-287.927	4	-.002	2	-.39	2	-.04	3
375		17	max	1743.16	1	1690.324	1	215.245	3	0	3	.606	3	.839	1
376			min	-1643.253	3	-53.058	3	-285.968	4	-.002	2	-.431	2	-.026	3
377		18	max	1740.899	1	1690.324	1	215.245	3	0	3	.66	3	.42	1
378			min	-1644.949	3	-53.058	3	-284.009	4	-.002	2	-.472	1	-.013	3
379		19	max	1738.639	1	1690.324	1	215.245	3	0	3	.713	3	0	1
380			min	-1646.644	3	-53.058	3	-282.049	4	-.002	2	-.514	1	0	1
381	M3	1	max	2178.496	2	4.757	4	49.721	2	.026	3	.01	2	0	1
382			min	-815.507	3	1.118	15	-22.157	3	-.055	2	-.005	3	0	1
383		2	max	2178.357	2	4.229	4	49.721	2	.026	3	.025	2	0	15
384			min	-815.611	3	.994	15	-22.157	3	-.055	2	-.011	3	-.001	4
385		3	max	2178.217	2	3.7	4	49.721	2	.026	3	.04	2	0	15
386			min	-815.716	3	.87	15	-22.157	3	-.055	2	-.018	3	-.002	4
387		4	max	2178.078	2	3.171	4	49.721	2	.026	3	.054	2	0	15
388			min	-815.82	3	.745	15	-22.157	3	-.055	2	-.024	3	-.003	4
389		5	max	2177.938	2	2.643	4	49.721	2	.026	3	.069	2	-.001	15
390			min	-815.925	3	.621	15	-22.157	3	-.055	2	-.031	3	-.004	4
391		6	max	2177.799	2	2.114	4	49.721	2	.026	3	.083	2	-.001	15
392			min	-816.029	3	.497	15	-22.157	3	-.055	2	-.037	3	-.005	4
393		7	max	2177.66	2	1.586	4	49.721	2	.026	3	.098	2	-.001	15
394			min	-816.134	3	.373	15	-22.157	3	-.055	2	-.044	3	-.006	4
395		8	max	2177.52	2	1.057	4	49.721	2	.026	3	.112	2	-.001	15
396			min	-816.238	3	.248	15	-22.157	3	-.055	2	-.05	3	-.006	4
397		9	max	2177.381	2	.529	4	49.721	2	.026	3	.127	2	-.001	15
398			min	-816.343	3	.124	15	-22.157	3	-.055	2	-.057	3	-.006	4
399		10	max	2177.241	2	0	1	49.721	2	.026	3	.142	2	-.001	15
400			min	-816.448	3	0	1	-22.157	3	-.055	2	-.063	3	-.006	4
401		11	max	2177.102	2	-.124	15	49.721	2	.026	3	.156	2	-.001	15
402			min	-816.552	3	-.529	6	-22.157	3	-.055	2	-.07	3	-.006	4
403		12	max	2176.963	2	-.248	15	49.721	2	.026	3	.171	2	-.001	15
404			min	-816.657	3	-1.057	6	-22.157	3	-.055	2	-.076	3	-.006	4
405		13	max	2176.823	2	-.373	15	49.721	2	.026	3	.185	2	-.001	15
406			min	-816.761	3	-1.586	6	-22.157	3	-.055	2	-.083	3	-.006	4
407		14	max	2176.684	2	-.497	15	49.721	2	.026	3	.2	2	-.001	15
408			min	-816.866	3	-2.114	6	-22.157	3	-.055	2	-.089	3	-.005	4
409		15	max	2176.544	2	-.621	15	49.721	2	.026	3	.214	2	-.001	15
410			min	-816.97	3	-2.643	6	-22.157	3	-.055	2	-.096	3	-.004	4
411		16	max	2176.405	2	-.745	15	49.721	2	.026	3	.229	2	0	15
412			min	-817.075	3	-3.171	6	-22.157	3	-.055	2	-.102	3	-.003	4
413		17	max	2176.265	2	-.87	15	49.721	2	.026	3	.244	2	0	15
414			min	-817.179	3	-3.7	6	-22.157	3	-.055	2	-.109	3	-.002	4
415		18	max	2176.126	2	-.994	15	49.721	2	.026	3	.258	2	0	15
416			min	-817.284	3	-4.229	6	-22.157	3	-.055	2	-.115	3	-.001	4
417		19	max	2175.987	2	-1.118	15	49.721	2	.026	3	.273	2	0	1
418			min	-817.389	3	-4.757	6	-22.157	3	-.055	2	-.122	3	0	1
419	M6	1	max	5969.207	2	4.757	4	0	1	.007	4	.004	4	0	1
420			min	-2652.843	3	1.118	15	-10.833	4	0	1	0	1	0	1
421		2	max	5969.067	2	4.229	4	0	1	.007	4	.001	4	0	15
422			min	-2652.947	3	.994	15	-10.456	4	0	1	0	1	-.001	4
423		3	max	5968.928	2	3.7	4	0	1	.007	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-2653.052	3	.87	15	-10.079	4	0	1	-.002	4	-.002	4
425		4	max	5968.788	2	3.171	4	0	1	.007	4	0	1	0	15
426			min	-2653.156	3	.745	15	-9.702	4	0	1	-.005	4	-.003	4
427		5	max	5968.649	2	2.643	4	0	1	.007	4	0	1	-.001	15
428			min	-2653.261	3	.621	15	-9.325	4	0	1	-.008	4	-.004	4
429		6	max	5968.509	2	2.114	4	0	1	.007	4	0	1	-.001	15
430			min	-2653.366	3	.497	15	-8.948	4	0	1	-.01	4	-.005	4
431		7	max	5968.37	2	1.586	4	0	1	.007	4	0	1	-.001	15
432			min	-2653.47	3	.373	15	-8.571	4	0	1	-.013	4	-.006	4
433		8	max	5968.231	2	1.057	4	0	1	.007	4	0	1	-.001	15
434			min	-2653.575	3	.248	15	-8.195	4	0	1	-.015	4	-.006	4
435		9	max	5968.091	2	.529	4	0	1	.007	4	0	1	-.001	15
436			min	-2653.679	3	.124	15	-7.818	4	0	1	-.018	4	-.006	4
437		10	max	5967.952	2	0	1	0	1	.007	4	0	1	-.001	15
438			min	-2653.784	3	0	1	-7.441	4	0	1	-.02	4	-.006	4
439		11	max	5967.812	2	-.124	15	0	1	.007	4	0	1	-.001	15
440			min	-2653.888	3	-.529	6	-7.064	4	0	1	-.022	4	-.006	4
441		12	max	5967.673	2	-.248	15	0	1	.007	4	0	1	-.001	15
442			min	-2653.993	3	-1.057	6	-6.687	4	0	1	-.024	4	-.006	4
443		13	max	5967.534	2	-.373	15	0	1	.007	4	0	1	-.001	15
444			min	-2654.097	3	-1.586	6	-6.31	4	0	1	-.026	4	-.006	4
445		14	max	5967.394	2	-.497	15	0	1	.007	4	0	1	-.001	15
446			min	-2654.202	3	-2.114	6	-5.934	4	0	1	-.028	4	-.005	4
447		15	max	5967.255	2	-.621	15	0	1	.007	4	0	1	-.001	15
448			min	-2654.307	3	-2.643	6	-5.557	4	0	1	-.029	4	-.004	4
449		16	max	5967.115	2	-.745	15	0	1	.007	4	0	1	0	15
450			min	-2654.411	3	-3.171	6	-5.18	4	0	1	-.031	4	-.003	4
451		17	max	5966.976	2	-.87	15	0	1	.007	4	0	1	0	15
452			min	-2654.516	3	-3.7	6	-4.803	4	0	1	-.033	4	-.002	4
453		18	max	5966.837	2	-.994	15	0	1	.007	4	0	1	0	15
454			min	-2654.62	3	-4.229	6	-4.426	4	0	1	-.034	4	-.001	4
455		19	max	5966.697	2	-1.118	15	0	1	.007	4	0	1	0	1
456			min	-2654.725	3	-4.757	6	-4.049	4	0	1	-.035	4	0	1
457	M9	1	max	2178.496	2	4.757	4	22.157	3	.055	2	.005	3	0	1
458			min	-815.507	3	1.118	15	-49.721	2	-.026	3	-.01	2	0	1
459		2	max	2178.357	2	4.229	4	22.157	3	.055	2	.011	3	0	15
460			min	-815.611	3	.994	15	-49.721	2	-.026	3	-.025	2	-.001	4
461		3	max	2178.217	2	3.7	4	22.157	3	.055	2	.018	3	0	15
462			min	-815.716	3	.87	15	-49.721	2	-.026	3	-.04	2	-.002	4
463		4	max	2178.078	2	3.171	4	22.157	3	.055	2	.024	3	0	15
464			min	-815.82	3	.745	15	-49.721	2	-.026	3	-.054	2	-.003	4
465		5	max	2177.938	2	2.643	4	22.157	3	.055	2	.031	3	-.001	15
466			min	-815.925	3	.621	15	-49.721	2	-.026	3	-.069	2	-.004	4
467		6	max	2177.799	2	2.114	4	22.157	3	.055	2	.037	3	-.001	15
468			min	-816.029	3	.497	15	-49.721	2	-.026	3	-.083	2	-.005	4
469		7	max	2177.66	2	1.586	4	22.157	3	.055	2	.044	3	-.001	15
470			min	-816.134	3	.373	15	-49.721	2	-.026	3	-.098	2	-.006	4
471		8	max	2177.52	2	1.057	4	22.157	3	.055	2	.05	3	-.001	15
472			min	-816.238	3	.248	15	-49.721	2	-.026	3	-.112	2	-.006	4
473		9	max	2177.381	2	.529	4	22.157	3	.055	2	.057	3	-.001	15
474			min	-816.343	3	.124	15	-49.721	2	-.026	3	-.127	2	-.006	4
475		10	max	2177.241	2	0	1	22.157	3	.055	2	.063	3	-.001	15
476			min	-816.448	3	0	1	-49.721	2	-.026	3	-.142	2	-.006	4
477		11	max	2177.102	2	-.124	15	22.157	3	.055	2	.07	3	-.001	15
478			min	-816.552	3	-.529	6	-49.721	2	-.026	3	-.156	2	-.006	4
479		12	max	2176.963	2	-.248	15	22.157	3	.055	2	.076	3	-.001	15
480			min	-816.657	3	-1.057	6	-49.721	2	-.026	3	-.171	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	2176.823	2	-.373	15	22.157	3	.055	2	.083	3	-.001	15
482			min	-816.761	3	-1.586	6	-49.721	2	-.026	3	-.185	2	-.006	4
483		14	max	2176.684	2	-.497	15	22.157	3	.055	2	.089	3	-.001	15
484			min	-816.866	3	-2.114	6	-49.721	2	-.026	3	-.2	2	-.005	4
485		15	max	2176.544	2	-.621	15	22.157	3	.055	2	.096	3	-.001	15
486			min	-816.97	3	-2.643	6	-49.721	2	-.026	3	-.214	2	-.004	4
487		16	max	2176.405	2	-.745	15	22.157	3	.055	2	.102	3	0	15
488			min	-817.075	3	-3.171	6	-49.721	2	-.026	3	-.229	2	-.003	4
489		17	max	2176.265	2	-.87	15	22.157	3	.055	2	.109	3	0	15
490			min	-817.179	3	-3.7	6	-49.721	2	-.026	3	-.244	2	-.002	4
491		18	max	2176.126	2	-.994	15	22.157	3	.055	2	.115	3	0	15
492			min	-817.284	3	-4.229	6	-49.721	2	-.026	3	-.258	2	-.001	4
493		19	max	2175.987	2	-1.118	15	22.157	3	.055	2	.122	3	0	1
494			min	-817.389	3	-4.757	6	-49.721	2	-.026	3	-.273	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	.003	3	.18	3	.021	1	1.044e-2	3	NC	3	NC	3
2			min	-.249	1	-.749	1	-.408	5	-2.516e-2	2	168.204	1	380.012	5
3		2	max	.003	3	.139	3	.006	1	1.044e-2	3	5561.642	12	NC	3
4			min	-.249	1	-.643	1	-.389	4	-2.516e-2	2	193.991	1	402.188	5
5		3	max	.003	3	.098	3	0	3	9.862e-3	3	2797.318	15	NC	1
6			min	-.249	1	-.537	1	-.371	4	-2.341e-2	2	229.153	1	428.485	5
7		4	max	.003	3	.059	3	0	3	8.972e-3	3	3066.468	15	NC	1
8			min	-.249	1	-.434	1	-.347	4	-2.073e-2	2	277.74	1	464.515	5
9		5	max	.003	3	.025	3	.001	3	8.081e-3	3	3378.423	15	NC	1
10			min	-.249	1	-.341	1	-.32	4	-1.806e-2	2	344.002	1	512.775	5
11		6	max	.003	3	-.001	3	.002	3	7.875e-3	3	3731.756	15	NC	1
12			min	-.248	1	-.263	1	-.291	4	-1.69e-2	2	429.751	1	576.049	5
13		7	max	.002	3	-.013	12	.002	3	8.144e-3	3	4132.26	15	NC	1
14			min	-.248	1	-.2	1	-.261	4	-1.679e-2	2	538.598	1	656.658	5
15		8	max	.002	3	-.012	15	0	3	8.412e-3	3	4598.881	15	NC	2
16			min	-.247	1	-.147	1	-.234	4	-1.667e-2	2	631.217	3	757.239	5
17		9	max	.002	3	-.008	15	0	10	8.929e-3	3	5161.892	15	NC	2
18			min	-.247	1	-.099	1	-.209	4	-1.578e-2	2	607.089	3	880.606	5
19		10	max	.002	3	-.005	15	0	2	9.885e-3	3	5864.76	15	NC	2
20			min	-.246	1	-.052	1	-.183	4	-1.351e-2	2	593.788	3	1057.226	5
21		11	max	.001	3	-.002	15	0	3	1.084e-2	3	7344.715	10	NC	2
22			min	-.245	1	-.047	3	-.158	4	-1.124e-2	2	592.225	3	1318.756	5
23		12	max	.001	3	.031	1	.005	3	8.809e-3	3	NC	2	NC	1
24			min	-.244	1	-.042	3	-.135	4	-8.144e-3	2	603.753	3	1722.591	5
25		13	max	.001	3	.065	1	.01	3	5.086e-3	3	NC	9	NC	1
26			min	-.244	1	-.028	3	-.111	4	-4.574e-3	2	644.087	3	2473.77	5
27		14	max	0	3	.087	1	.01	3	1.541e-3	3	NC	4	NC	2
28			min	-.243	1	.002	12	-.091	4	-3.455e-3	4	755.13	3	3902.207	5
29		15	max	0	3	.094	1	.007	3	5.892e-3	3	NC	4	NC	2
30			min	-.243	1	.009	15	-.076	5	-3.505e-3	1	1079.248	3	6317.586	1
31		16	max	0	3	.126	3	.007	1	1.024e-2	3	NC	4	NC	3
32			min	-.243	1	.011	15	-.067	5	-5.845e-3	1	2486.035	3	5450.534	1
33		17	max	0	3	.207	3	.005	1	1.459e-2	3	NC	4	NC	2
34			min	-.243	1	.013	15	-.062	5	-8.186e-3	1	4255.409	2	6007.328	1
35		18	max	0	3	.292	3	0	12	1.743e-2	3	NC	4	NC	1
36			min	-.243	1	.015	15	-.06	4	-9.712e-3	1	1194.934	3	NC	1
37		19	max	0	3	.377	3	-.002	12	1.743e-2	3	NC	1	NC	1
38			min	-.243	1	.015	10	-.059	4	-9.712e-3	1	679.835	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	.04	3	.508	3	0	1	2.538e-4	4	NC	3	NC	1
40			min	-.527	1	-1.719	2	-.404	4	0	1	79.029	2	384.483	4
41		2	max	.04	3	.403	3	0	1	2.538e-4	4	4077.319	15	NC	1
42			min	-.527	1	-1.463	2	-.389	4	0	1	93.1	2	401.991	4
43		3	max	.04	3	.297	3	0	1	1.282e-4	5	4874.293	15	NC	1
44			min	-.527	1	-1.206	2	-.372	4	0	1	113.331	2	423.371	4
45		4	max	.04	3	.197	3	0	1	0	1	6013.058	15	NC	1
46			min	-.527	1	-.959	2	-.349	4	-6.509e-5	4	143.306	2	456.628	4
47		5	max	.04	3	.109	3	0	1	0	1	7638.456	15	NC	1
48			min	-.527	1	-.739	1	-.321	4	-2.581e-4	4	187.529	2	504.274	4
49		6	max	.04	3	.042	3	0	1	0	1	9869.837	15	NC	1
50			min	-.526	1	-.569	1	-.291	4	-2.544e-4	4	248.243	1	568.98	4
51		7	max	.039	3	-.003	12	0	1	0	1	NC	15	NC	1
52			min	-.524	1	-.437	1	-.261	4	-1.146e-4	4	262.155	3	652.231	4
53		8	max	.038	3	-.008	15	0	1	2.556e-5	5	NC	5	NC	1
54			min	-.523	1	-.327	1	-.233	4	0	1	247.129	3	754.223	4
55		9	max	.037	3	-.006	15	0	1	7.151e-5	4	NC	5	NC	1
56			min	-.521	1	-.225	1	-.209	4	0	1	236.954	3	873.019	4
57		10	max	.037	3	-.003	15	0	1	0	1	NC	5	NC	1
58			min	-.519	1	-.125	1	-.183	4	-4.738e-5	4	229.399	3	1049.35	4
59		11	max	.036	3	0	15	0	1	0	1	NC	1	NC	1
60			min	-.517	1	-.088	3	-.158	4	-1.663e-4	4	225.047	3	1309.015	4
61		12	max	.035	3	.063	1	0	1	0	1	NC	5	NC	1
62			min	-.516	1	-.09	3	-.135	4	-9.609e-4	4	224.244	3	1680.314	4
63		13	max	.034	3	.138	1	0	1	0	1	NC	5	NC	1
64			min	-.514	1	-.069	3	-.112	4	-2.138e-3	4	232.183	3	2369.088	4
65		14	max	.034	3	.182	1	0	1	0	1	NC	5	NC	1
66			min	-.512	1	-.006	3	-.092	4	-3.271e-3	4	260.852	3	3648.69	4
67		15	max	.034	3	.182	1	0	1	0	1	NC	5	NC	1
68			min	-.512	1	.005	15	-.078	4	-2.46e-3	4	343.626	3	5835.682	4
69		16	max	.034	3	.287	3	0	1	0	1	NC	5	NC	1
70			min	-.512	1	.004	15	-.069	4	-1.648e-3	4	605.042	3	9795.346	4
71		17	max	.034	3	.483	3	0	1	0	1	NC	5	NC	1
72			min	-.512	1	.002	15	-.063	4	-8.374e-4	4	1087.826	1	NC	1
73		18	max	.034	3	.689	3	0	1	0	1	NC	4	NC	1
74			min	-.512	1	0	15	-.059	4	-3.086e-4	4	741.293	3	NC	1
75		19	max	.034	3	.894	3	0	1	0	1	NC	1	NC	1
76			min	-.512	1	-.029	1	-.055	4	-3.086e-4	4	346.95	3	NC	1
77	M7	1	max	.005	5	.18	3	0	3	2.516e-2	2	NC	3	NC	3
78			min	-.249	1	-.749	1	-.415	4	-1.044e-2	3	168.204	1	368.05	4
79		2	max	.005	5	.139	3	0	3	2.516e-2	2	NC	5	NC	3
80			min	-.249	1	-.643	1	-.392	4	-1.044e-2	3	193.991	1	393.298	4
81		3	max	.005	5	.098	3	.006	1	2.341e-2	2	NC	5	NC	1
82			min	-.249	1	-.537	1	-.368	4	-9.862e-3	3	229.153	1	422.866	4
83		4	max	.005	5	.059	3	.011	1	2.073e-2	2	NC	5	NC	1
84			min	-.249	1	-.434	1	-.343	5	-8.972e-3	3	277.74	1	460.108	4
85		5	max	.005	5	.025	3	.012	1	1.806e-2	2	NC	5	NC	1
86			min	-.249	1	-.341	1	-.316	5	-8.081e-3	3	344.002	1	507.533	4
87		6	max	.005	5	.005	5	.01	1	1.69e-2	2	NC	5	NC	1
88			min	-.248	1	-.263	1	-.287	5	-7.875e-3	3	429.751	1	567.892	4
89		7	max	.005	5	.005	5	.005	1	1.679e-2	2	NC	5	NC	1
90			min	-.248	1	-.2	1	-.26	4	-8.144e-3	3	538.598	1	642.276	4
91		8	max	.005	5	.004	5	0	2	1.667e-2	2	NC	4	NC	2
92			min	-.247	1	-.147	1	-.234	4	-8.412e-3	3	631.217	3	734.444	4
93		9	max	.005	5	.004	5	0	3	1.578e-2	2	NC	4	NC	2
94			min	-.247	1	-.099	1	-.209	4	-8.929e-3	3	607.089	3	850.746	4
95		10	max	.005	5	.003	5	0	3	1.351e-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	-.246	1	-.052	1	-.183	4	-9.885e-3	3	593.788	3	1014.029	4
97		11	max	.005	5	.002	5	0	2	1.124e-2	2	NC	4	NC	2
98			min	-.245	1	-.047	3	-.158	4	-1.084e-2	3	592.225	3	1255.329	4
99		12	max	.005	5	.031	1	.005	1	8.144e-3	2	NC	2	NC	1
100			min	-.244	1	-.042	3	-.133	4	-8.809e-3	3	603.753	3	1638.478	4
101		13	max	.005	5	.065	1	.007	2	4.574e-3	2	NC	5	NC	1
102			min	-.244	1	-.028	3	-.109	4	-5.086e-3	3	644.087	3	2312.099	4
103		14	max	.005	5	.087	1	.004	2	1.164e-3	1	NC	5	NC	2
104			min	-.243	1	-.002	5	-.09	4	-3.192e-3	5	755.13	3	3424.823	4
105		15	max	.005	5	.094	1	0	10	3.505e-3	1	NC	5	NC	2
106			min	-.243	1	-.005	5	-.078	4	-5.892e-3	3	1079.248	3	4949.956	4
107		16	max	.005	5	.126	3	-.001	10	5.845e-3	1	NC	5	NC	3
108			min	-.243	1	-.008	5	-.07	4	-1.024e-2	3	2486.035	3	5450.534	1
109		17	max	.005	5	.207	3	0	12	8.186e-3	1	NC	4	NC	2
110			min	-.243	1	-.012	5	-.064	4	-1.459e-2	3	4255.409	2	6007.328	1
111		18	max	.005	5	.292	3	.005	1	9.712e-3	1	NC	4	NC	1
112			min	-.243	1	-.016	5	-.058	5	-1.743e-2	3	1194.934	3	NC	1
113		19	max	.005	5	.377	3	.017	1	9.712e-3	1	NC	1	NC	1
114			min	-.243	1	-.02	5	-.054	5	-1.743e-2	3	679.835	3	NC	1
115	M10	1	max	0	1	.262	3	.243	1	1.141e-2	3	NC	1	NC	1
116			min	-.06	4	-.015	5	-.005	5	-2.107e-3	2	NC	1	NC	1
117		2	max	0	1	.465	3	.278	1	1.321e-2	3	NC	4	NC	3
118			min	-.06	4	-.05	2	0	15	-2.748e-3	2	1008.11	3	5773.252	1
119		3	max	0	1	.651	3	.334	1	1.501e-2	3	NC	5	NC	3
120			min	-.06	4	-.143	2	0	3	-3.389e-3	2	524.912	3	2233.167	1
121		4	max	0	1	.791	3	.395	1	1.681e-2	3	NC	5	NC	3
122			min	-.06	4	-.205	1	-.002	3	-4.043e-3	1	385.656	3	1340.313	1
123		5	max	0	1	.869	3	.449	1	1.861e-2	3	NC	5	NC	3
124			min	-.06	4	-.226	1	-.007	3	-4.743e-3	1	336.434	3	988.759	1
125		6	max	0	1	.879	3	.49	1	2.041e-2	3	NC	5	NC	3
126			min	-.06	4	-.201	1	-.013	3	-5.443e-3	1	330.803	3	827.967	1
127		7	max	0	1	.831	3	.513	1	2.22e-2	3	NC	5	NC	3
128			min	-.06	4	-.139	1	-.02	3	-6.143e-3	1	358.73	3	757.353	1
129		8	max	0	1	.746	3	.52	1	2.4e-2	3	NC	4	NC	5
130			min	-.06	4	-.057	1	-.026	3	-6.843e-3	1	421.535	3	737.911	1
131		9	max	0	1	.659	3	.516	1	2.58e-2	3	NC	4	NC	5
132			min	-.06	4	-.001	5	-.032	3	-7.543e-3	1	513.884	3	746.814	1
133		10	max	0	1	.617	3	.512	1	2.76e-2	3	NC	1	NC	5
134			min	-.06	4	.001	15	-.034	3	-8.243e-3	1	574.465	3	747.699	2
135		11	max	0	3	.659	3	.516	1	2.58e-2	3	NC	4	NC	5
136			min	-.06	4	.002	15	-.032	3	-7.543e-3	1	513.884	3	746.814	1
137		12	max	0	3	.746	3	.52	1	2.4e-2	3	NC	4	NC	5
138			min	-.06	4	-.057	1	-.026	3	-6.843e-3	1	421.535	3	737.911	1
139		13	max	0	3	.831	3	.513	1	2.22e-2	3	NC	4	NC	3
140			min	-.06	4	-.139	1	-.02	3	-6.143e-3	1	358.73	3	757.353	1
141		14	max	0	3	.879	3	.49	1	2.041e-2	3	NC	5	NC	3
142			min	-.06	4	-.201	1	-.013	3	-5.443e-3	1	330.803	3	827.967	1
143		15	max	0	3	.869	3	.449	1	1.861e-2	3	NC	5	NC	3
144			min	-.06	4	-.226	1	-.007	3	-4.743e-3	1	336.434	3	988.759	1
145		16	max	0	3	.791	3	.395	1	1.681e-2	3	NC	5	NC	3
146			min	-.06	4	-.205	1	-.002	3	-4.043e-3	1	385.656	3	1340.313	1
147		17	max	0	3	.651	3	.334	1	1.501e-2	3	NC	4	NC	3
148			min	-.06	4	-.143	2	0	3	-3.389e-3	2	524.912	3	2233.167	1
149		18	max	0	3	.465	3	.278	1	1.321e-2	3	NC	4	NC	3
150			min	-.06	4	-.05	2	.001	3	-2.748e-3	2	1008.11	3	5773.252	1
151		19	max	0	3	.262	3	.243	1	1.141e-2	3	NC	1	NC	1
152			min	-.06	4	.015	15	0	3	-2.107e-3	2	5505.214	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	.007	2	.245	1	5.435e-3	1	NC	1	NC	1
154			min	-.149	4	-.046	3	-.005	5	-1.196e-4	5	NC	1	NC	1
155		2	max	.002	1	.087	3	.273	1	6.196e-3	1	NC	4	NC	2
156			min	-.149	4	-.11	2	-.006	3	-5.425e-5	5	1536.755	3	6884.88	4
157		3	max	.002	1	.207	3	.325	1	6.956e-3	1	NC	5	NC	3
158			min	-.149	4	-.209	2	-.011	3	-2.148e-7	15	807.397	3	2543.294	1
159		4	max	.001	1	.286	3	.385	1	7.717e-3	1	NC	5	NC	3
160			min	-.149	4	-.271	1	-.015	3	4.309e-5	15	615.938	3	1454.644	1
161		5	max	.001	1	.307	3	.441	1	8.478e-3	1	NC	5	NC	3
162			min	-.149	4	-.289	1	-.019	3	8.317e-5	12	578.422	3	1042.39	1
163		6	max	0	1	.269	3	.483	1	9.239e-3	1	NC	5	NC	5
164			min	-.149	4	-.261	1	-.023	3	1.317e-5	3	649.066	3	855.181	1
165		7	max	0	1	.18	3	.51	1	1.e-2	1	NC	5	NC	5
166			min	-.149	4	-.195	1	-.027	3	-8.677e-5	3	902.242	3	769.883	1
167		8	max	0	1	.065	3	.52	1	1.076e-2	1	NC	4	NC	5
168			min	-.149	4	-.11	2	-.031	3	-1.867e-4	3	1744.493	2	740.561	1
169		9	max	0	1	-.001	15	.52	1	1.152e-2	1	NC	3	NC	5
170			min	-.15	4	-.041	3	-.034	3	-2.866e-4	3	5164.901	2	742.468	1
171		10	max	0	1	.005	1	.517	1	1.228e-2	1	NC	1	NC	5
172			min	-.15	4	-.089	3	-.036	3	-3.866e-4	3	4665.678	3	739.761	2
173		11	max	0	3	0	15	.52	1	1.152e-2	1	NC	3	NC	12
174			min	-.15	4	-.041	3	-.034	3	-2.866e-4	3	5164.901	2	742.468	1
175		12	max	0	3	.065	3	.52	1	1.076e-2	1	NC	4	NC	12
176			min	-.15	4	-.11	2	-.031	3	-1.867e-4	3	1744.493	2	740.561	1
177		13	max	0	3	.18	3	.51	1	1.e-2	1	NC	5	NC	12
178			min	-.15	4	-.195	1	-.027	3	-8.677e-5	3	902.242	3	769.883	1
179		14	max	0	3	.269	3	.483	1	9.239e-3	1	NC	5	NC	5
180			min	-.15	4	-.261	1	-.023	3	1.317e-5	3	649.066	3	855.181	1
181		15	max	.001	3	.307	3	.441	1	8.478e-3	1	NC	5	NC	3
182			min	-.15	4	-.289	1	-.019	3	8.317e-5	12	578.422	3	1042.39	1
183		16	max	.001	3	.286	3	.385	1	7.717e-3	1	NC	5	NC	3
184			min	-.15	4	-.271	1	-.015	3	1.429e-4	12	615.938	3	1454.644	1
185		17	max	.002	3	.207	3	.325	1	6.956e-3	1	NC	5	NC	3
186			min	-.15	4	-.209	2	-.011	3	2.025e-4	12	807.397	3	2543.294	1
187		18	max	.002	3	.087	3	.273	1	6.196e-3	1	NC	5	NC	2
188			min	-.15	4	-.11	2	-.006	3	2.622e-4	12	1536.755	3	7302.489	1
189		19	max	.002	3	.007	2	.245	1	5.435e-3	1	NC	1	NC	1
190			min	-.15	4	-.046	3	-.001	3	3.219e-4	12	NC	1	NC	1
191	M12	1	max	0	2	.004	5	.247	1	6.484e-3	1	NC	1	NC	1
192			min	-.218	4	-.116	1	-.005	5	-1.076e-3	3	NC	1	NC	1
193		2	max	0	2	.054	3	.27	1	7.278e-3	1	NC	5	NC	2
194			min	-.218	4	-.294	2	-.002	3	-1.297e-3	3	1090.282	2	6951.822	4
195		3	max	0	2	.126	3	.319	1	8.073e-3	1	NC	5	NC	3
196			min	-.218	4	-.456	2	-.003	3	-1.518e-3	3	584.416	2	2816.254	1
197		4	max	0	2	.168	3	.379	1	8.867e-3	1	NC	5	NC	3
198			min	-.218	4	-.566	2	-.007	3	-1.739e-3	3	443.906	2	1545.39	1
199		5	max	0	2	.175	3	.435	1	9.662e-3	1	NC	5	NC	3
200			min	-.218	4	-.612	2	-.012	3	-1.96e-3	3	404.098	2	1081.831	1
201		6	max	0	2	.15	3	.48	1	1.046e-2	1	NC	5	NC	3
202			min	-.218	4	-.59	2	-.018	3	-2.182e-3	3	421.751	2	873.551	1
203		7	max	0	2	.098	3	.509	1	1.125e-2	1	NC	5	NC	5
204			min	-.218	4	-.514	2	-.024	3	-2.403e-3	3	500.551	2	776.984	1
205		8	max	0	2	.034	3	.522	1	1.204e-2	1	NC	5	NC	4
206			min	-.218	4	-.407	2	-.031	3	-2.624e-3	3	679.221	2	740.277	1
207		9	max	0	2	-.006	15	.524	1	1.284e-2	1	NC	3	NC	5
208			min	-.218	4	-.305	2	-.036	3	-2.845e-3	3	1027.193	2	737.039	1
209		10	max	0	1	-.006	15	.521	1	1.363e-2	1	NC	3	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.218	4	-.262	1	-.038	3	-3.066e-3	3	1347.342	2	731.69	2
211		11	max	0	9	-.008	15	.524	1	1.284e-2	1	NC	3	NC	12
212			min	-.218	4	-.305	2	-.036	3	-2.845e-3	3	1027.193	2	737.039	1
213		12	max	0	9	.034	3	.522	1	1.204e-2	1	NC	5	NC	12
214			min	-.218	4	-.407	2	-.031	3	-2.624e-3	3	679.221	2	740.277	1
215		13	max	0	9	.098	3	.509	1	1.125e-2	1	NC	5	NC	12
216			min	-.218	4	-.514	2	-.024	3	-2.403e-3	3	500.551	2	776.984	1
217		14	max	0	9	.15	3	.48	1	1.046e-2	1	NC	5	NC	3
218			min	-.218	4	-.59	2	-.018	3	-2.182e-3	3	421.751	2	873.551	1
219		15	max	0	9	.175	3	.435	1	9.662e-3	1	NC	5	NC	3
220			min	-.218	4	-.612	2	-.012	3	-1.96e-3	3	404.098	2	1081.831	1
221		16	max	0	9	.168	3	.379	1	8.867e-3	1	NC	5	NC	3
222			min	-.218	4	-.566	2	-.007	3	-1.739e-3	3	443.906	2	1545.39	1
223		17	max	0	9	.126	3	.319	1	8.073e-3	1	NC	5	NC	3
224			min	-.218	4	-.456	2	-.005	5	-1.518e-3	3	584.416	2	2816.254	1
225		18	max	0	9	.054	3	.27	1	7.278e-3	1	NC	5	NC	2
226			min	-.218	4	-.294	2	-.002	3	-1.297e-3	3	1090.282	2	8820.951	5
227		19	max	0	9	-.009	15	.247	1	6.484e-3	1	NC	1	NC	1
228			min	-.218	4	-.116	1	-.002	3	-1.076e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.125	3	.249	1	1.477e-2	2	NC	1	NC	1
230			min	-.384	4	-.606	1	-.005	5	-5.465e-3	3	NC	1	NC	1
231		2	max	0	3	.242	3	.287	1	1.696e-2	2	NC	5	NC	3
232			min	-.384	4	-.884	2	-.004	3	-6.427e-3	3	715.327	2	5314.361	1
233		3	max	0	3	.347	3	.346	1	1.914e-2	2	NC	5	NC	3
234			min	-.384	4	-1.144	2	-.006	3	-7.389e-3	3	374.174	2	2110.299	1
235		4	max	0	3	.425	3	.408	1	2.132e-2	2	NC	5	NC	3
236			min	-.384	4	-1.349	2	-.01	3	-8.351e-3	3	271.762	2	1282.058	1
237		5	max	0	3	.47	3	.463	1	2.351e-2	2	NC	15	NC	3
238			min	-.384	4	-1.483	2	-.015	3	-9.313e-3	3	230.578	2	952.047	1
239		6	max	0	3	.481	3	.504	1	2.569e-2	2	NC	15	NC	3
240			min	-.384	4	-1.542	2	-.021	3	-1.028e-2	3	216.292	2	800.191	1
241		7	max	0	3	.462	3	.527	1	2.787e-2	2	NC	15	NC	5
242			min	-.384	4	-1.533	2	-.028	3	-1.124e-2	3	218.35	2	733.343	1
243		8	max	0	3	.425	3	.534	1	3.006e-2	2	NC	15	NC	5
244			min	-.384	4	-1.477	2	-.034	3	-1.22e-2	3	232.095	2	714.976	1
245		9	max	0	3	.386	3	.531	1	3.224e-2	2	NC	15	NC	5
246			min	-.384	4	-1.409	2	-.038	3	-1.316e-2	3	251.657	2	723.471	1
247		10	max	0	1	.366	3	.527	1	3.442e-2	2	NC	15	NC	5
248			min	-.384	4	-1.374	2	-.04	3	-1.412e-2	3	263.112	2	722.272	2
249		11	max	0	1	.386	3	.531	1	3.224e-2	2	NC	15	NC	15
250			min	-.384	4	-1.409	2	-.038	3	-1.316e-2	3	251.657	2	723.471	1
251		12	max	0	1	.425	3	.534	1	3.006e-2	2	NC	15	NC	12
252			min	-.384	4	-1.477	2	-.034	3	-1.22e-2	3	232.095	2	714.976	1
253		13	max	0	1	.462	3	.527	1	2.787e-2	2	NC	15	NC	5
254			min	-.384	4	-1.533	2	-.028	3	-1.124e-2	3	218.35	2	733.343	1
255		14	max	0	1	.481	3	.504	1	2.569e-2	2	NC	15	NC	3
256			min	-.383	4	-1.542	2	-.021	3	-1.028e-2	3	216.292	2	800.191	1
257		15	max	0	1	.47	3	.463	1	2.351e-2	2	NC	15	NC	3
258			min	-.383	4	-1.483	2	-.015	3	-9.313e-3	3	230.578	2	952.047	1
259		16	max	0	1	.425	3	.408	1	2.132e-2	2	NC	15	NC	3
260			min	-.383	4	-1.349	2	-.01	3	-8.351e-3	3	271.762	2	1282.058	1
261		17	max	0	1	.347	3	.346	1	1.914e-2	2	NC	5	NC	3
262			min	-.383	4	-1.144	2	-.006	3	-7.389e-3	3	374.174	2	2110.299	1
263		18	max	.001	1	.242	3	.287	1	1.696e-2	2	NC	5	NC	3
264			min	-.383	4	-.884	2	-.004	3	-6.427e-3	3	715.327	2	5314.361	1
265		19	max	.001	1	.125	3	.249	1	1.477e-2	2	NC	1	NC	1
266			min	-.383	4	-.606	1	-.003	3	-5.465e-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	1.441e-3	2	NC	1	NC	1
270			min	0	2	0	1	0	1	-1.329e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.002	5	2.882e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	1	-2.658e-3	5	NC	1	NC	1
273		4	max	0	3	0	12	.004	5	4.323e-3	2	NC	3	NC	1
274			min	0	2	-.009	1	0	1	-3.987e-3	5	6093.95	1	NC	1
275		5	max	0	3	0	12	.007	5	5.497e-3	2	NC	3	NC	1
276			min	0	2	-.016	1	-.001	1	-5.111e-3	5	3411.21	1	8000.124	5
277		6	max	0	3	0	12	.01	5	5.032e-3	2	NC	3	NC	1
278			min	0	1	-.025	1	-.002	1	-4.975e-3	5	2163.816	1	5268.397	5
279		7	max	0	3	0	12	.014	5	4.567e-3	2	NC	3	NC	1
280			min	0	1	-.036	1	-.002	1	-4.84e-3	5	1503.159	1	3760.821	5
281		8	max	0	3	0	12	.019	5	4.102e-3	2	NC	3	NC	1
282			min	0	1	-.048	1	-.003	1	-4.705e-3	5	1111.346	1	2839.483	5
283		9	max	0	3	-.001	12	.024	5	3.637e-3	2	NC	3	NC	1
284			min	0	1	-.062	1	-.003	1	-4.57e-3	5	859.544	1	2233.8	5
285		10	max	0	3	-.001	12	.03	5	3.172e-3	2	NC	3	NC	1
286			min	0	1	-.078	1	-.004	1	-4.435e-3	5	688.141	1	1814.068	5
287		11	max	0	3	-.001	12	.035	5	2.707e-3	2	NC	3	NC	1
288			min	0	1	-.095	1	-.004	1	-4.3e-3	5	566.062	1	1510.817	5
289		12	max	0	3	-.001	12	.042	5	2.243e-3	2	NC	3	NC	3
290			min	0	1	-.113	1	-.004	1	-4.165e-3	5	475.945	1	1284.353	5
291		13	max	0	3	0	3	.048	5	1.778e-3	2	NC	3	NC	3
292			min	-.001	1	-.132	1	-.004	1	-4.03e-3	5	407.514	1	1110.731	5
293		14	max	.001	3	0	3	.055	5	1.313e-3	2	NC	3	NC	3
294			min	-.001	1	-.151	1	-.003	1	-3.895e-3	5	354.296	1	974.643	5
295		15	max	.001	3	0	3	.062	5	8.479e-4	2	NC	3	NC	1
296			min	-.001	1	-.172	1	-.003	1	-3.76e-3	5	312.085	1	866.014	5
297		16	max	.001	3	0	3	.069	4	3.831e-4	2	NC	3	NC	1
298			min	-.001	1	-.193	1	-.002	1	-3.669e-3	4	278.05	1	776.493	4
299		17	max	.001	3	0	3	.076	4	4.134e-4	3	NC	3	NC	1
300			min	-.001	1	-.214	1	-.004	3	-3.586e-3	4	250.212	1	702.639	4
301		18	max	.001	3	0	3	.084	4	6.527e-4	3	NC	3	NC	1
302			min	-.001	1	-.236	1	-.007	3	-3.504e-3	4	227.17	1	641.249	4
303		19	max	.001	3	0	3	.091	4	8.921e-4	3	NC	3	NC	1
304			min	-.002	1	-.258	1	-.01	3	-3.422e-3	4	207.901	1	589.726	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	-1.396e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.002	4	0	1	NC	3	NC	1
310			min	0	2	-.008	1	0	1	-2.791e-3	4	7084.566	1	NC	1
311		4	max	0	3	0	15	.004	4	0	1	NC	3	NC	1
312			min	0	2	-.017	1	0	1	-4.187e-3	4	3077.729	1	NC	1
313		5	max	.001	3	0	12	.007	4	0	1	NC	3	NC	1
314			min	-.001	2	-.032	1	0	1	-5.365e-3	4	1699.295	1	7660.59	4
315		6	max	.001	3	0	12	.011	4	0	1	NC	3	NC	1
316			min	-.001	2	-.05	1	0	1	-5.212e-3	4	1064.079	1	5048.226	4
317		7	max	.001	3	0	3	.015	4	0	1	NC	3	NC	1
318			min	-.002	2	-.073	1	0	1	-5.058e-3	4	732.888	1	3606.051	4
319		8	max	.002	3	.002	3	.02	4	0	1	NC	3	NC	1
320			min	-.002	2	-.1	1	0	1	-4.905e-3	4	538.581	1	2724.623	4
321		9	max	.002	3	.004	3	.025	4	0	1	NC	3	NC	1
322			min	-.002	2	-.129	1	0	1	-4.752e-3	4	414.683	1	2145.205	4
323		10	max	.002	3	.006	3	.031	4	0	1	NC	12	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	-.162	1	0	1	-4.599e-3	4	330.848	1	1743.718	4
325		11	max	.002	3	.009	3	.037	4	0	1	NC	12	NC	1
326			min	-.003	2	-.198	1	0	1	-4.445e-3	4	271.415	1	1453.696	4
327		12	max	.003	3	.011	3	.043	4	0	1	9043.645	15	NC	1
328			min	-.003	2	-.235	1	0	1	-4.292e-3	4	227.708	1	1237.165	4
329		13	max	.003	3	.014	3	.05	4	0	1	7740.781	15	NC	1
330			min	-.003	1	-.276	1	0	1	-4.139e-3	4	194.62	1	1071.213	4
331		14	max	.003	3	.017	3	.057	4	0	1	6728.026	15	NC	1
332			min	-.003	1	-.317	1	0	1	-3.986e-3	4	168.954	1	941.198	4
333		15	max	.003	3	.02	3	.064	4	0	1	5925.089	15	NC	1
334			min	-.003	1	-.361	1	0	1	-3.832e-3	4	148.641	1	837.481	4
335		16	max	.003	3	.024	3	.071	4	0	1	5277.882	15	NC	1
336			min	-.004	1	-.405	1	0	1	-3.679e-3	4	132.293	1	753.49	4
337		17	max	.004	3	.027	3	.078	4	0	1	4748.687	15	NC	1
338			min	-.004	1	-.451	1	0	1	-3.526e-3	4	118.943	1	684.605	4
339		18	max	.004	3	.031	3	.085	4	0	1	4310.78	15	NC	1
340			min	-.004	1	-.497	1	0	1	-3.372e-3	4	107.91	1	627.514	4
341		19	max	.004	3	.034	3	.092	4	0	1	3944.657	15	NC	1
342			min	-.004	1	-.543	1	0	1	-3.219e-3	4	98.694	1	579.788	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	6.458e-4	3	NC	1	NC	1
346			min	0	2	0	1	0	3	-1.562e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.002	4	1.292e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-3.124e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.004	4	1.938e-3	3	NC	3	NC	1
350			min	0	2	-.009	1	0	3	-4.686e-3	4	6093.95	1	NC	1
351		5	max	0	3	0	5	.007	4	2.459e-3	3	NC	3	NC	1
352			min	0	2	-.016	1	-.001	3	-5.998e-3	4	3411.21	1	7640.009	4
353		6	max	0	3	0	5	.011	4	2.22e-3	3	NC	3	NC	1
354			min	0	1	-.025	1	-.002	3	-5.78e-3	4	2163.816	1	5043.854	4
355		7	max	0	3	0	5	.015	4	1.98e-3	3	NC	3	NC	1
356			min	0	1	-.036	1	-.002	3	-5.563e-3	4	1503.159	1	3608.364	4
357		8	max	0	3	.001	5	.02	4	1.741e-3	3	NC	3	NC	1
358			min	0	1	-.048	1	-.003	3	-5.345e-3	4	1111.346	1	2730.17	4
359		9	max	0	3	.001	5	.025	4	1.502e-3	3	NC	3	NC	1
360			min	0	1	-.062	1	-.003	3	-5.127e-3	4	859.544	1	2152.52	4
361		10	max	0	3	.002	5	.031	4	1.262e-3	3	NC	3	NC	1
362			min	0	1	-.078	1	-.003	3	-4.909e-3	4	688.141	1	1752.089	4
363		11	max	0	3	.002	5	.037	4	1.023e-3	3	NC	3	NC	1
364			min	0	1	-.095	1	-.003	3	-4.691e-3	4	566.062	1	1462.763	4
365		12	max	0	3	.002	5	.043	4	7.835e-4	3	NC	3	NC	3
366			min	0	1	-.113	1	-.003	3	-4.473e-3	4	475.945	1	1246.739	4
367		13	max	0	3	.003	5	.05	4	5.441e-4	3	NC	3	NC	3
368			min	-.001	1	-.132	1	-.002	3	-4.255e-3	4	407.514	1	1081.192	4
369		14	max	.001	3	.003	5	.056	4	3.047e-4	3	NC	3	NC	3
370			min	-.001	1	-.151	1	-.001	3	-4.038e-3	4	354.296	1	951.536	4
371		15	max	.001	3	.003	5	.063	4	6.537e-5	3	NC	3	NC	1
372			min	-.001	1	-.172	1	0	12	-3.82e-3	4	312.085	1	848.164	4
373		16	max	.001	3	.004	5	.07	4	8.251e-5	9	NC	3	NC	1
374			min	-.001	1	-.193	1	0	10	-3.611e-3	5	278.05	1	764.52	4
375		17	max	.001	3	.004	5	.077	4	3.486e-4	1	NC	3	NC	1
376			min	-.001	1	-.214	1	0	2	-3.447e-3	5	250.212	1	696.005	4
377		18	max	.001	3	.005	5	.084	4	7.869e-4	1	NC	3	NC	1
378			min	-.001	1	-.236	1	-.002	2	-3.284e-3	5	227.17	1	639.317	4
379		19	max	.001	3	.005	5	.091	4	1.225e-3	1	NC	3	NC	1
380			min	-.002	1	-.258	1	-.004	2	-3.12e-3	5	207.901	1	592.034	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	.014	1	0	3	.006	5	1.667e-3	2	NC	1	NC	1
382			min	0	12	-.005	1	-.001	1	-6.817e-4	5	NC	1	NC	1
383		2	max	.013	1	0	3	.025	5	2.313e-3	2	NC	1	NC	5
384			min	0	12	-.027	1	-.02	2	-9.674e-4	3	NC	1	3316.448	2
385		3	max	.012	1	0	3	.043	5	2.958e-3	2	NC	1	NC	5
386			min	.001	12	-.05	1	-.038	2	-1.271e-3	3	NC	1	1682.27	2
387		4	max	.012	1	0	3	.061	5	3.604e-3	2	NC	1	NC	5
388			min	.001	15	-.072	1	-.055	2	-1.575e-3	3	NC	1	1144.575	2
389		5	max	.011	1	0	3	.079	5	4.25e-3	2	NC	1	NC	13
390			min	.001	15	-.094	1	-.071	2	-1.879e-3	3	NC	1	881.641	2
391		6	max	.01	1	.001	3	.098	5	4.896e-3	2	NC	1	NC	13
392			min	.001	15	-.116	1	-.085	2	-2.183e-3	3	NC	1	729.349	2
393		7	max	.01	1	.002	3	.116	5	5.542e-3	2	NC	1	NC	13
394			min	.001	15	-.138	1	-.098	2	-2.486e-3	3	NC	1	633.029	4
395		8	max	.009	1	.002	3	.133	5	6.188e-3	2	NC	1	NC	13
396			min	.001	15	-.16	1	-.108	2	-2.79e-3	3	NC	1	541.872	4
397		9	max	.009	1	.003	3	.151	5	6.834e-3	2	NC	1	NC	13
398			min	0	15	-.182	1	-.116	2	-3.094e-3	3	NC	1	473.625	4
399		10	max	.008	1	.003	3	.168	5	7.479e-3	2	NC	1	NC	13
400			min	0	15	-.204	1	-.122	2	-3.398e-3	3	NC	1	420.636	4
401		11	max	.007	1	.004	3	.185	5	8.125e-3	2	NC	1	NC	13
402			min	0	15	-.225	1	-.124	2	-3.702e-3	3	NC	1	378.314	4
403		12	max	.007	1	.005	3	.202	5	8.771e-3	2	NC	1	NC	13
404			min	0	15	-.247	1	-.122	2	-4.005e-3	3	NC	1	343.736	4
405		13	max	.006	1	.006	3	.218	5	9.417e-3	2	NC	1	NC	13
406			min	0	15	-.268	1	-.117	2	-4.309e-3	3	NC	1	314.956	4
407		14	max	.005	1	.007	3	.234	5	1.006e-2	2	NC	1	NC	13
408			min	0	10	-.29	1	-.108	2	-4.613e-3	3	9532.747	3	290.624	4
409		15	max	.005	3	.008	3	.249	5	1.071e-2	2	NC	1	NC	13
410			min	0	10	-.311	1	-.095	2	-4.917e-3	3	8283.211	3	269.779	4
411		16	max	.005	3	.009	3	.264	5	1.135e-2	2	NC	1	NC	13
412			min	0	10	-.332	1	-.077	2	-5.221e-3	3	7276.75	3	251.712	4
413		17	max	.005	3	.01	3	.278	5	1.2e-2	2	NC	1	NC	5
414			min	0	10	-.353	1	-.054	2	-5.525e-3	3	6458.985	3	235.896	4
415		18	max	.006	3	.011	3	.292	5	1.265e-2	2	NC	1	NC	5
416			min	0	10	-.374	1	-.025	2	-5.828e-3	3	5789.715	3	221.924	4
417		19	max	.006	3	.012	3	.308	4	1.329e-2	2	NC	1	NC	1
418			min	-.001	10	-.395	1	-.002	3	-6.132e-3	3	5238.884	3	209.482	4
419	M6	1	max	.027	1	0	3	.007	4	0	1	NC	1	NC	1
420			min	0	15	-.01	1	0	1	-7.234e-4	4	NC	1	NC	1
421		2	max	.026	1	.005	3	.026	4	0	1	NC	1	NC	1
422			min	0	15	-.058	1	0	1	-8.095e-4	4	NC	1	NC	1
423		3	max	.024	1	.009	3	.045	4	0	1	NC	1	NC	1
424			min	0	15	-.105	1	0	1	-8.956e-4	4	7382.75	3	NC	1
425		4	max	.022	1	.013	3	.064	4	0	1	NC	1	NC	1
426			min	0	15	-.152	1	0	1	-9.817e-4	4	4906.63	3	8870.339	4
427		5	max	.02	1	.018	3	.083	4	0	1	NC	1	NC	1
428			min	0	15	-.199	1	0	1	-1.068e-3	4	3664.855	3	6742.856	4
429		6	max	.019	1	.022	3	.102	4	0	1	NC	1	NC	1
430			min	0	15	-.246	1	0	1	-1.154e-3	4	2917.224	3	5517.753	4
431		7	max	.017	1	.027	3	.121	4	0	1	NC	1	NC	1
432			min	0	15	-.293	1	0	1	-1.24e-3	4	2417.005	3	4748.467	4
433		8	max	.015	1	.031	3	.139	4	0	1	NC	1	NC	1
434			min	0	15	-.339	1	0	1	-1.326e-3	4	2058.451	3	4246.262	4
435		9	max	.013	1	.036	3	.157	4	0	1	NC	1	NC	1
436			min	0	15	-.386	1	0	1	-1.412e-3	4	1788.682	3	3919.952	4
437		10	max	.012	1	.041	3	.175	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	15	-.433	1	0	1	-1.498e-3	4	1578.312	3	3723.073	4
439		11	max	.01	3	.045	3	.192	4	0	1	NC	1	NC	1
440			min	0	15	-.479	1	0	1	-1.584e-3	4	1409.701	3	3633.734	4
441		12	max	.011	3	.05	3	.209	4	0	1	NC	1	NC	1
442			min	0	15	-.525	1	0	1	-1.671e-3	4	1271.616	3	3647.213	4
443		13	max	.012	3	.055	3	.225	4	0	1	NC	1	NC	1
444			min	0	10	-.572	1	0	1	-1.757e-3	4	1156.56	3	3775.754	4
445		14	max	.013	3	.06	3	.241	4	0	1	NC	1	NC	1
446			min	-.002	10	-.618	1	0	1	-1.843e-3	4	1059.335	3	4056.165	4
447		15	max	.014	3	.065	3	.256	4	0	1	NC	1	NC	1
448			min	-.003	2	-.664	1	0	1	-1.929e-3	4	976.221	3	4573.861	4
449		16	max	.015	3	.071	3	.27	4	0	1	NC	1	NC	1
450			min	-.005	2	-.71	1	0	1	-2.015e-3	4	904.485	3	5538.568	4
451		17	max	.016	3	.076	3	.284	4	0	1	NC	1	NC	1
452			min	-.007	2	-.756	1	0	1	-2.101e-3	4	842.073	3	7590.139	4
453		18	max	.017	3	.081	3	.297	4	0	1	NC	1	NC	1
454			min	-.009	2	-.802	1	0	1	-2.187e-3	4	787.409	3	NC	1
455		19	max	.018	3	.086	3	.309	4	0	1	NC	1	NC	1
456			min	-.011	2	-.847	1	0	1	-2.273e-3	4	739.266	3	NC	1
457	M9	1	max	.014	1	0	5	.007	4	6.636e-4	3	NC	1	NC	1
458			min	0	5	-.005	1	-.001	3	-1.667e-3	2	NC	1	NC	1
459		2	max	.013	1	0	3	.028	4	9.674e-4	3	NC	1	NC	4
460			min	0	5	-.027	1	-.01	3	-2.313e-3	2	NC	1	3316.448	2
461		3	max	.012	1	0	3	.049	4	1.271e-3	3	NC	1	NC	5
462			min	0	5	-.05	1	-.018	3	-2.958e-3	2	NC	1	1682.27	2
463		4	max	.012	1	0	3	.07	4	1.575e-3	3	NC	1	NC	15
464			min	0	5	-.072	1	-.026	3	-3.604e-3	2	NC	1	1144.575	2
465		5	max	.011	1	0	3	.091	4	1.879e-3	3	NC	1	8704.878	15
466			min	0	5	-.094	1	-.033	3	-4.25e-3	2	NC	1	881.641	2
467		6	max	.01	1	.001	3	.112	4	2.183e-3	3	NC	1	7127.225	15
468			min	0	5	-.116	1	-.039	3	-4.896e-3	2	NC	1	729.349	2
469		7	max	.01	1	.002	3	.132	4	2.486e-3	3	NC	1	6135.738	15
470			min	0	5	-.138	1	-.045	3	-5.542e-3	2	NC	1	633.247	2
471		8	max	.009	1	.002	3	.151	4	2.79e-3	3	NC	1	5487.858	15
472			min	0	5	-.16	1	-.05	3	-6.188e-3	2	NC	1	570.306	2
473		9	max	.009	1	.003	3	.17	4	3.094e-3	3	NC	1	5066.362	15
474			min	0	5	-.182	1	-.053	3	-6.834e-3	2	NC	1	529.41	2
475		10	max	.008	1	.003	3	.188	4	3.398e-3	3	NC	1	4811.504	15
476			min	0	5	-.204	1	-.056	3	-7.479e-3	2	NC	1	504.928	2
477		11	max	.007	1	.004	3	.206	4	3.702e-3	3	NC	1	4695.118	15
478			min	0	5	-.225	1	-.057	3	-8.125e-3	2	NC	1	494.276	2
479		12	max	.007	1	.005	3	.222	4	4.005e-3	3	NC	1	4711.12	15
480			min	0	5	-.247	1	-.056	3	-8.771e-3	2	NC	1	497.04	2
481		13	max	.006	1	.006	3	.237	4	4.309e-3	3	NC	1	4875.237	15
482			min	0	5	-.268	1	-.054	3	-9.417e-3	2	NC	1	515.016	2
483		14	max	.005	1	.007	3	.252	4	4.613e-3	3	NC	1	5234.793	15
484			min	0	5	-.29	1	-.05	3	-1.006e-2	2	9532.747	3	553.263	2
485		15	max	.005	3	.008	3	.265	4	4.917e-3	3	NC	1	5899.626	15
486			min	0	5	-.311	1	-.044	3	-1.071e-2	2	8283.211	3	623.367	2
487		16	max	.005	3	.009	3	.276	4	5.221e-3	3	NC	1	7139.448	15
488			min	0	5	-.332	1	-.036	3	-1.135e-2	2	7276.75	3	753.668	2
489		17	max	.005	3	.01	3	.287	4	5.525e-3	3	NC	1	9777.154	15
490			min	0	5	-.353	1	-.026	3	-1.2e-2	2	6458.985	3	1030.516	2
491		18	max	.006	3	.011	3	.296	4	5.828e-3	3	NC	1	NC	5
492			min	0	5	-.374	1	-.014	3	-1.265e-2	2	5789.715	3	1887.56	2
493		19	max	.006	3	.012	3	.304	5	6.132e-3	3	NC	1	NC	1
494			min	-.001	10	-.395	1	-.011	1	-1.329e-2	2	5238.884	3	NC	1