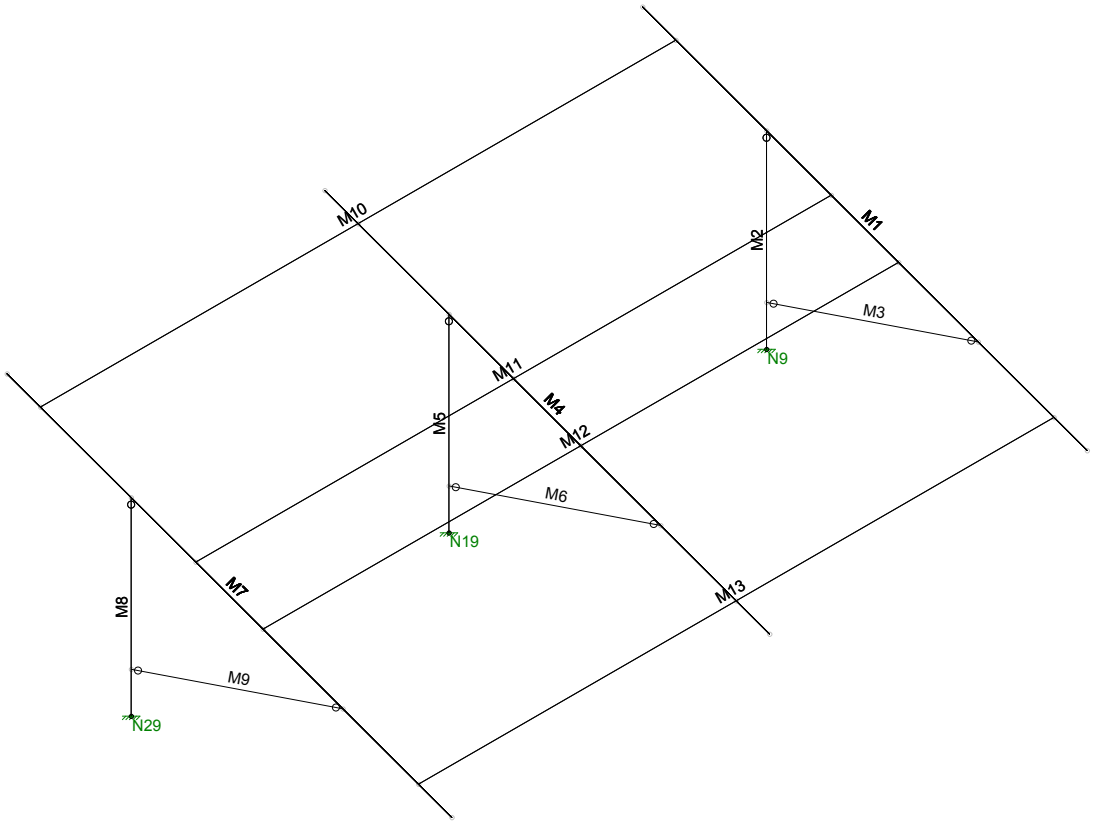


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

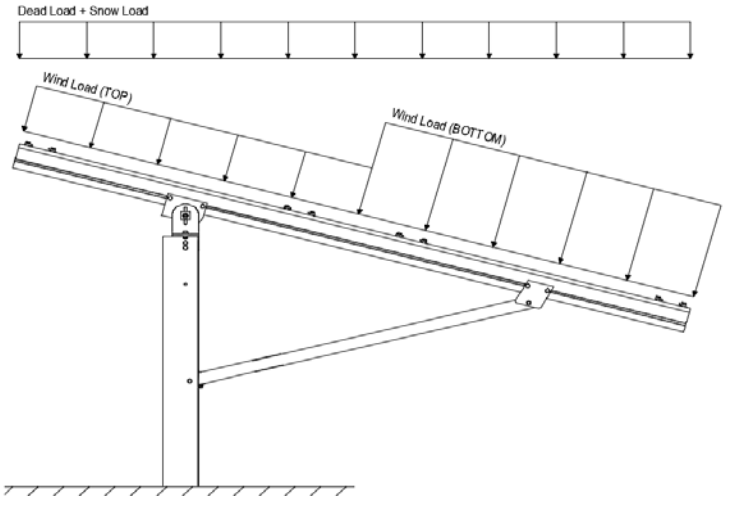
PV modules are required to meet the following specifications:

	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

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



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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	20.62	psf	*(ASCE 7-10, 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 =	110	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	19.00	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.05	*(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

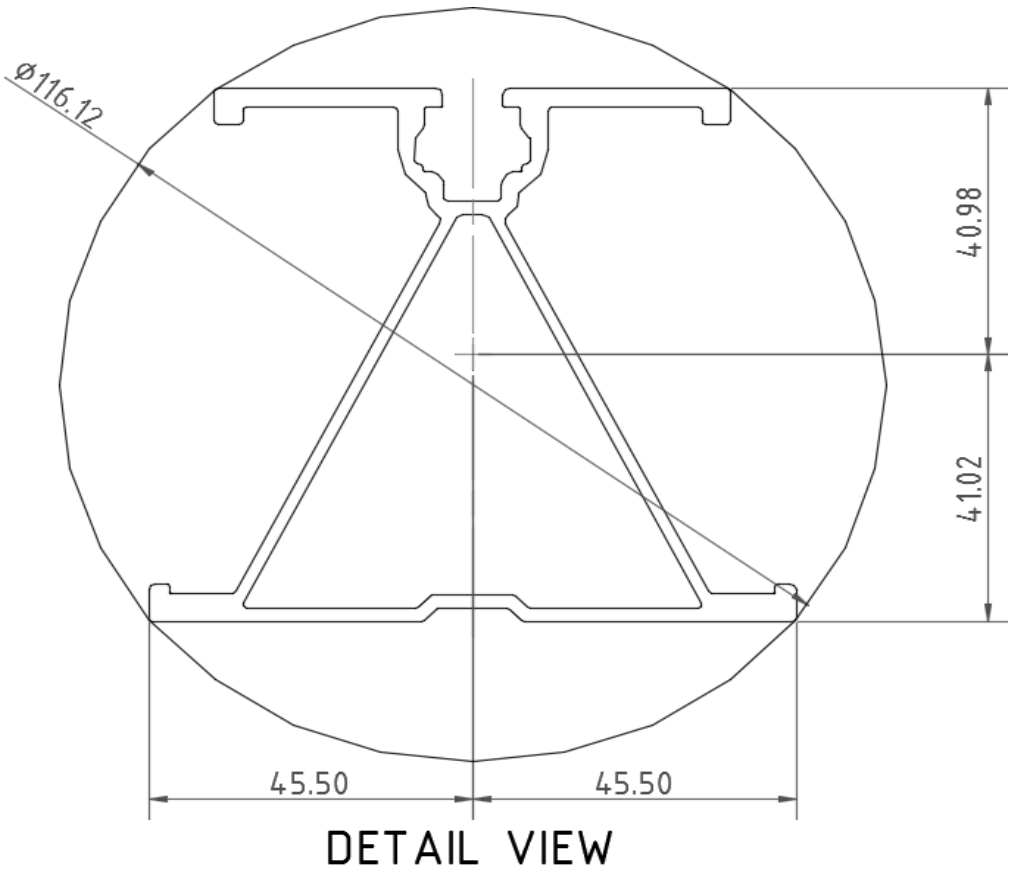
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

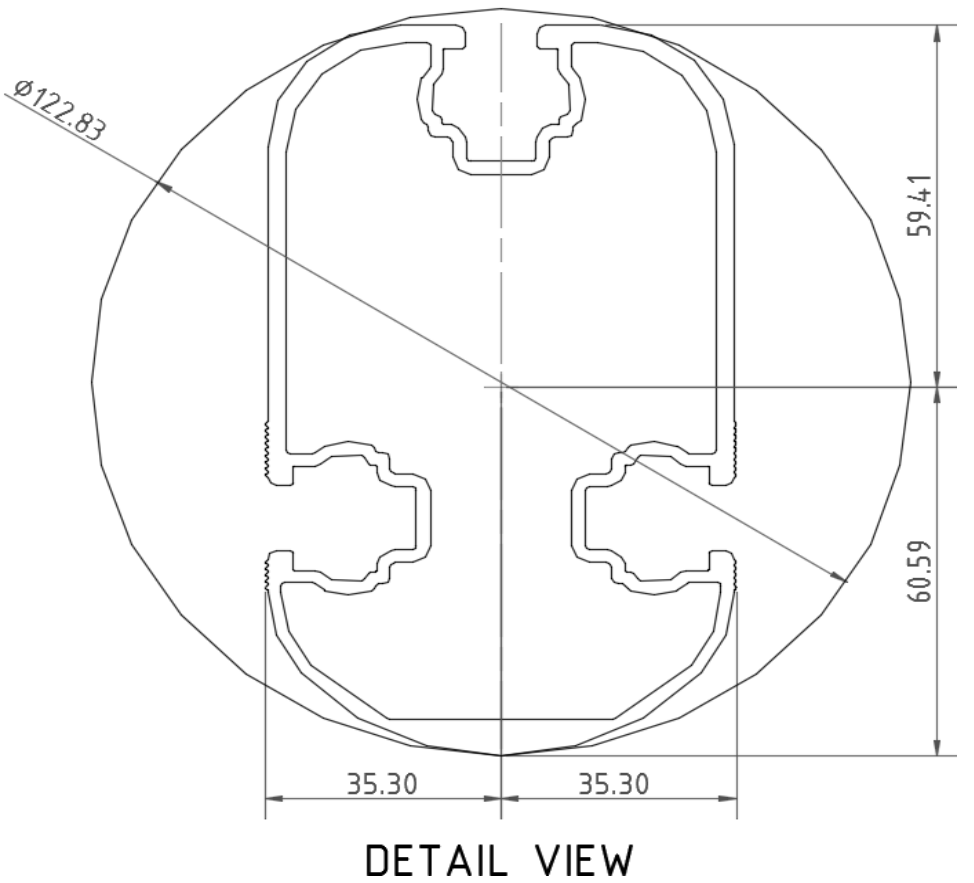
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	2.071	k-ft
M_z =	0.272	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	98%	



4.2 Girder Design

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

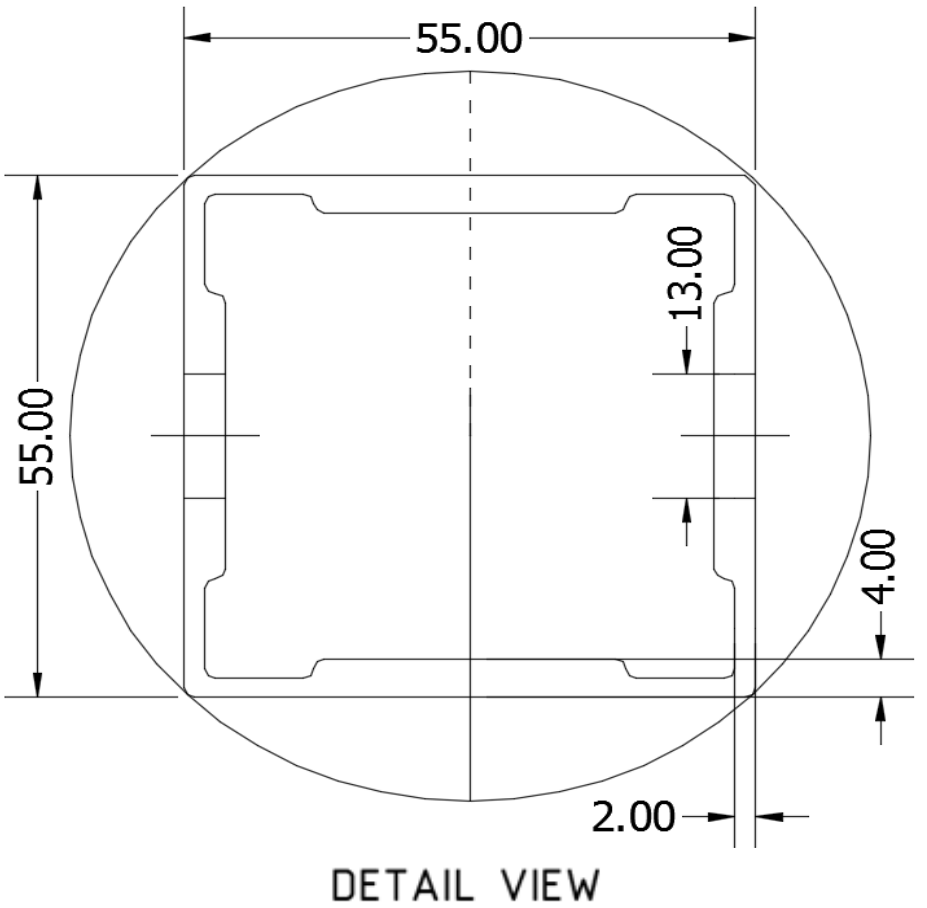
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.735	k-ft
M_z =	0.000	k-ft
P_n =	0.359	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	75%	



4.3 Strut Design

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

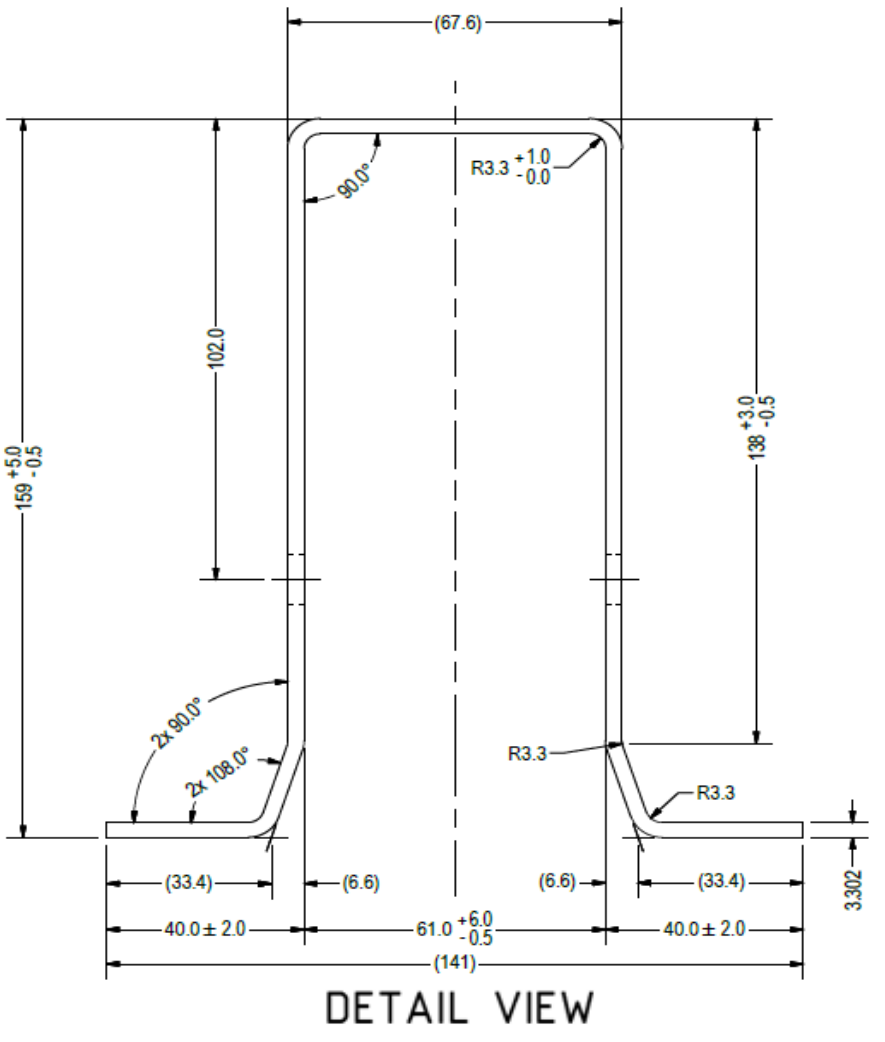
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.400	k-ft
P_n =	5.479	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	69%	



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 =	14.803	k-ft
M_z =	0.000	k-ft
P_r =	7.122	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	46.025	k
Utilization =	94%	



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 =	5.03	k
Maximum Lateral Load =	2.04	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)

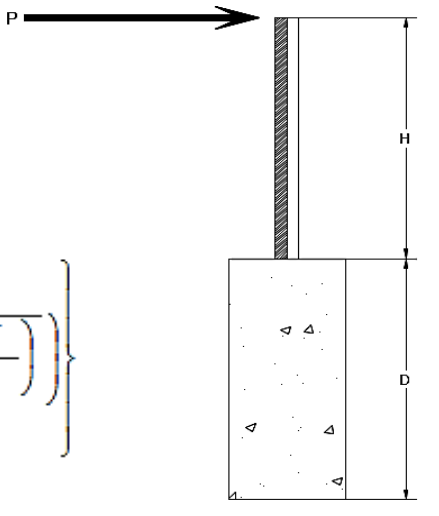
Lateral Force @ Top of Pole, P =	1.88	k
Height of Pole Above Grade, H =	4.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.88	k
Height of Pole Above Grade, H =	4.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	10.14	
Required Footing Depth, D =	13.73	ft
2nd Trial @ D_2 =	8.49	ft
Lateral Soil Bearing @ D/3, S_1 =	0.57	ksf
Lateral Soil Bearing @ D, S_3 =	1.70	ksf
Constant 2.34P/(S_1B), A =	3.88	
Required Footing Depth, D =	6.70	ft
3rd Trial @ D_3 =	7.60	ft
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf
Lateral Soil Bearing @ D, S_3 =	1.52	ksf
Constant 2.34P/(S_1B), A =	4.34	
Required Footing Depth, D =	7.25	ft
4th Trial @ D_4 =	7.42	ft
Lateral Soil Bearing @ D/3, S_1 =	0.49	ksf
Lateral Soil Bearing @ D, S_3 =	1.48	ksf
Constant 2.34P/(S_1B), A =	4.44	
Required Footing Depth, D =	7.37	ft
5th Trial @ D_5 =	7.40	ft
Lateral Soil Bearing @ D/3, S_1 =	0.49	ksf
Lateral Soil Bearing @ D, S_3 =	1.48	ksf
Constant 2.34P/(S_1B), A =	4.45	
Required Footing Depth, D =	7.50	ft

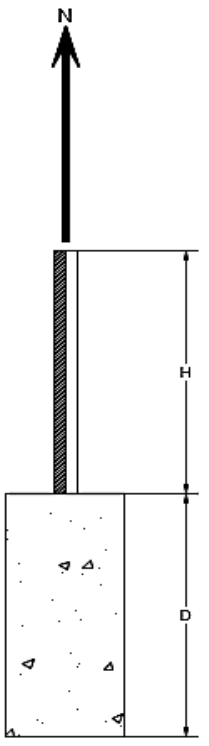
A 2ft diameter x 7.5ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.30	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 =	1.50	k
Required Concrete Volume, V =	10.33	ft^3
Required Footing Depth, D =	3.50	ft

A 2ft diameter x 3.5ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.95
2	0.4	0.2	118.10	4.84
3	0.6	0.2	118.10	4.74
4	0.8	0.2	118.10	4.64
5	1	0.2	118.10	4.53
6	1.2	0.2	118.10	4.43
7	1.4	0.2	118.10	4.32
8	1.6	0.2	118.10	4.22
9	1.8	0.2	118.10	4.12
10	2	0.2	118.10	4.01
11	2.2	0.2	118.10	3.91
12	2.4	0.2	118.10	3.81
13	2.6	0.2	118.10	3.70
14	2.8	0.2	118.10	3.60
15	3	0.2	118.10	3.49
16	3.2	0.2	118.10	3.39
17	3.4	0.2	118.10	3.29
18	0	0.0	0.00	3.29
19	0	0.0	0.00	3.29
20	0	0.0	0.00	3.29
21	0	0.0	0.00	3.29
22	0	0.0	0.00	3.29
23	0	0.0	0.00	3.29
24	0	0.0	0.00	3.29
25	0	0.0	0.00	3.29
26	0	0.0	0.00	3.29
27	0	0.0	0.00	3.29
28	0	0.0	0.00	3.29
29	0	0.0	0.00	3.29
30	0	0.0	0.00	3.29
31	0	0.0	0.00	3.29
32	0	0.0	0.00	3.29
33	0	0.0	0.00	3.29
34	0	0.0	0.00	3.29
Max	3.4	Sum	0.80	

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 =	7.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.40	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	28.27	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

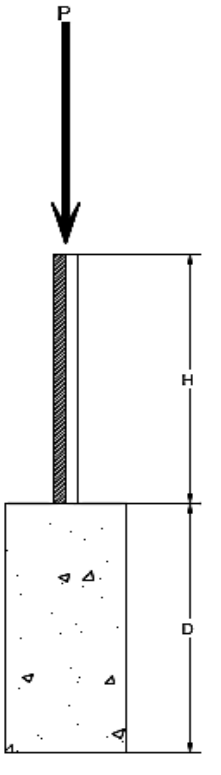
Weight of Concrete

Footing Volume	23.56	ft^3
Weight	3.42	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.24	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.94	k
Applied Force =	7.82	k
Utilization =	65%	

A 2ft diameter footing passes at a depth of 7.5ft.



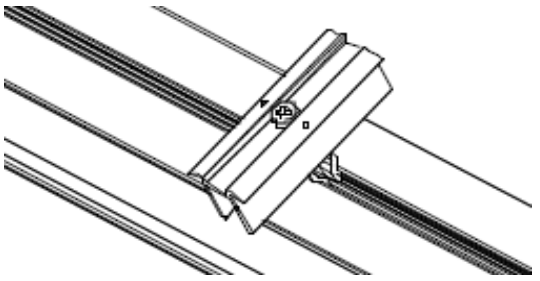
6. DESIGN OF JOINTS AND CONNECTIONS

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.

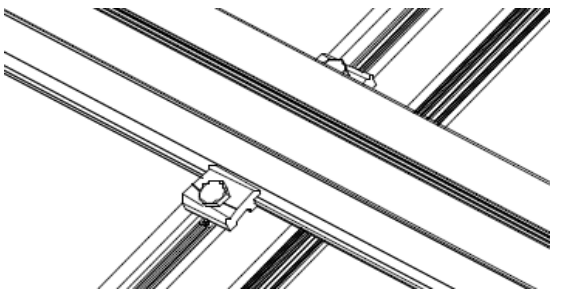
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.372 k
Allowable Uplift	=	1.214 k
Utilization	=	31%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.496 k
Allowable Uplift	=	2.180 k
Utilization	=	69%

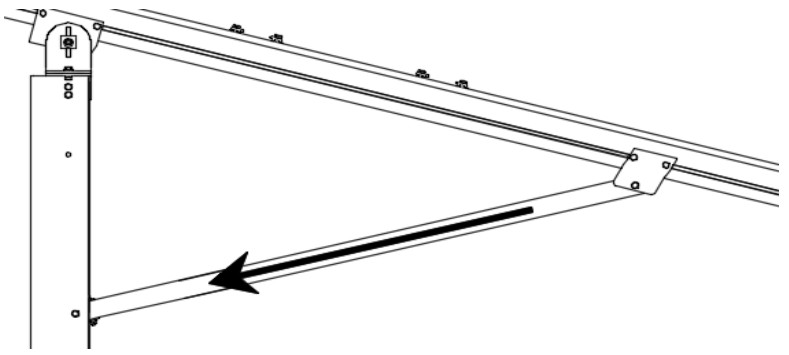


6.2 Strut Connections

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	=	5.479 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	62%

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

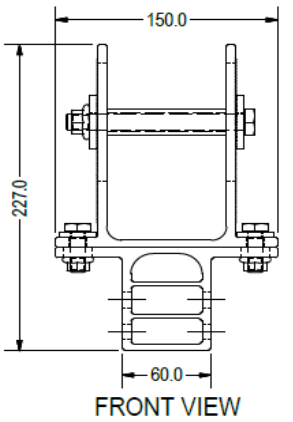


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

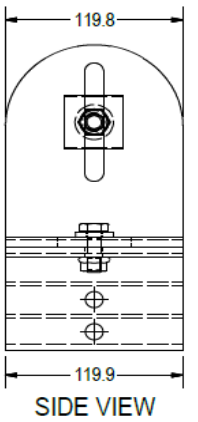
6.3 Girder to Post Connection

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.

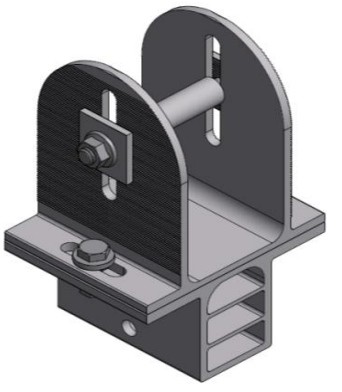
Maximum Tensile Load	=	3.227 k
Allowable Load	=	5.649 k
Utilization	=	57%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

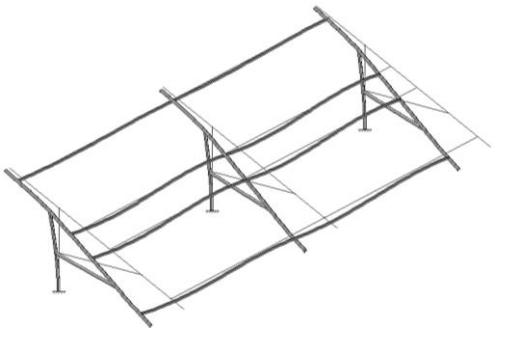
7.1 Seismic Drift

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}	=	0.617 in

0.617 ≤ 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 = 138 in

J = 0.432

381.773

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

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= 27.0 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

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 = 138

J = 0.432

242.785

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

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= 28.3

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

M_{max}Wk = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

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

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

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

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

S1* = 0.33515

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

S2* = 1.23671

φcc = 0.77756

φF_L = (φccFcy)/(λ²)

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	65.62	in	
Pr =	7.12	k	(LRFD Factored Load)
Mr (Strong) =	14.80	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 =	0.1719	<	0.2	
Utilization =	0.94	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.172	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 94%

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	-55.629	-55.629	0	0
2	M11	y	-55.629	-55.629	0	0
3	M12	y	-87.418	-87.418	0	0
4	M13	y	-87.418	-87.418	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	112.319	112.319	0	0
2	M11	y	112.319	112.319	0	0
3	M12	y	52.98	52.98	0	0
4	M13	y	52.98	52.98	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	359.216	2	2611.369	1	377.029	1	.399	1	.008	5	6.298	1
2		min	-534.503	3	-1300.153	3	-361.101	5	-1.356	5	-.008	1	.351	12
3	N19	max	1532.116	2	7150.949	1	0	2	0	1	.008	4	14.192	1
4		min	-1531.631	3	-3872.636	3	-397.776	5	-1.429	4	0	3	.425	15
5	N29	max	359.216	2	2611.369	1	262.157	3	.259	3	.01	4	6.298	1
6		min	-534.503	3	-1300.153	3	-452.907	4	-1.471	4	-.003	3	-.11	5
7	Totals:	max	2250.548	2	12373.687	1	0	9						
8		min	-2600.637	3	-6472.942	3	-1151.528	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	1	.002	4	0	1	0	1	0	1
2			min	0	1	-.001	3	-.001	1	0	1	0	1	0	1
3		2	max	-.179	15	-.49	15	0	3	0	1	0	12	0	6
4			min	-.76	4	-2.085	6	-1.499	5	0	1	0	5	0	15
5		3	max	-6.738	12	216.592	3	10.192	3	.06	3	.315	1	.284	1
6			min	-203.351	1	-645.647	1	-210.08	1	-.26	1	.01	12	-.094	3
7		4	max	-7.034	12	215.373	3	10.192	3	.06	3	.184	1	.685	1
8			min	-203.942	1	-647.273	1	-210.08	1	-.26	1	.014	12	-.228	3
9		5	max	-7.33	12	214.153	3	10.192	3	.06	3	.076	4	1.087	1
10			min	-204.534	1	-648.899	1	-210.08	1	-.26	1	-.01	10	-.361	3
11		6	max	419.687	3	561.149	1	35.083	3	.044	1	.154	1	1.046	1
12			min	-1729.32	1	-135.324	3	-280.41	1	-.049	3	-.045	3	-.366	3
13		7	max	419.243	3	559.522	1	35.083	3	.044	1	.014	2	.698	1
14			min	-1729.912	1	-136.543	3	-280.41	1	-.049	3	-.058	4	-.281	3
15		8	max	418.8	3	557.896	1	35.083	3	.044	1	-.002	12	.351	1
16			min	-1730.504	1	-137.763	3	-280.41	1	-.049	3	-.194	1	-.196	3
17		9	max	409.416	3	62.111	3	36.268	3	.015	5	.096	1	.155	1
18			min	-1941.294	1	-69.867	1	-285.214	1	-.225	2	.001	10	-.157	3
19		10	max	408.972	3	60.891	3	36.268	3	.015	5	.053	3	.199	1
20			min	-1941.886	1	-71.493	1	-285.214	1	-.225	2	-.081	1	-.195	3
21		11	max	408.528	3	59.672	3	36.268	3	.015	5	.075	3	.244	1
22			min	-1942.478	1	-73.119	1	-285.214	1	-.225	2	-.258	1	-.233	3
23		12	max	396.769	3	579.113	3	147.749	2	.372	3	.166	1	.522	1
24			min	-2148.43	1	-638.711	1	-237.422	3	-.536	1	-.011	5	-.476	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	396.326	3	577.893	3	147.749	2	.372	3	.244	1	.919	1
26			min	-2149.022	1	-640.337	1	-237.422	3	-.536	1	-.153	5	-.835	3
27		14	max	205.593	1	573.426	1	83.831	5	.362	1	0	10	1.3	1
28			min	6.904	12	-512.652	3	-179.105	1	-.377	3	-.246	4	-1.178	3
29		15	max	205.001	1	571.8	1	82.331	5	.362	1	-.001	12	.945	1
30			min	6.608	12	-513.871	3	-179.105	1	-.377	3	-.216	4	-.86	3
31		16	max	204.409	1	570.174	1	80.831	5	.362	1	-.002	3	.59	1
32			min	6.312	12	-515.091	3	-179.105	1	-.377	3	-.228	1	-.541	3
33		17	max	203.818	1	568.548	1	79.332	5	.362	1	-.002	3	.237	1
34			min	6.017	12	-516.31	3	-179.105	1	-.377	3	-.34	1	-.221	3
35		18	max	.76	4	2.087	6	1.5	5	0	1	0	12	0	6
36			min	.179	15	.49	15	0	12	0	1	0	5	0	15
37		19	max	0	1	0	1	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.002	4	0	1	0	1	0	1
40			min	0	1	-.003	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	-2.083	4	-1.499	5	0	1	0	5	0	15
43		3	max	-14.116	15	661.93	3	0	1	.021	4	.252	4	.698	1
44			min	-370.074	1	-1830.108	1	-120.63	5	0	1	0	1	-.254	3
45		4	max	-14.295	15	660.71	3	0	1	.021	4	.177	4	1.834	1
46			min	-370.666	1	-1831.734	1	-122.13	5	0	1	0	1	-.665	3
47		5	max	-14.473	15	659.491	3	0	1	.021	4	.101	4	2.971	1
48			min	-371.258	1	-1833.36	1	-123.63	5	0	1	0	1	-1.074	3
49		6	max	1404.763	3	1633.209	1	0	1	0	1	0	1	2.837	1
50			min	-4743.772	1	-487.959	3	-119.866	4	-.018	4	-.007	5	-1.063	3
51		7	max	1404.319	3	1631.583	1	0	1	0	1	0	1	1.824	1
52			min	-4744.364	1	-489.179	3	-121.366	4	-.018	4	-.081	4	-.759	3
53		8	max	1403.875	3	1629.957	1	0	1	0	1	0	1	.812	1
54			min	-4744.956	1	-490.398	3	-122.866	4	-.018	4	-.157	4	-.455	3
55		9	max	1379.157	3	204.275	3	0	1	.015	4	.133	4	.207	1
56			min	-5098.375	1	-267.505	1	-250.377	4	0	1	0	1	-.304	3
57		10	max	1378.713	3	203.055	3	0	1	.015	4	0	1	.374	1
58			min	-5098.967	1	-269.131	1	-251.877	4	0	1	-.023	4	-.43	3
59		11	max	1378.269	3	201.836	3	0	1	.015	4	0	1	.541	1
60			min	-5099.559	1	-270.757	1	-253.376	4	0	1	-.18	4	-.556	3
61		12	max	1358.3	3	1619.055	3	0	1	.13	4	.029	5	1.352	1
62			min	-5462.654	1	-1935.33	1	-274.33	5	0	1	0	1	-1.242	3
63		13	max	1357.856	3	1617.835	3	0	1	.13	4	0	1	2.554	1
64			min	-5463.246	1	-1936.956	1	-275.83	5	0	1	-.142	4	-2.247	3
65		14	max	370.916	1	1643.83	1	71.775	5	0	1	0	1	3.707	1
66			min	14.567	15	-1424.519	3	0	1	-.093	4	-.23	5	-3.209	3
67		15	max	370.324	1	1642.204	1	70.275	5	0	1	0	1	2.688	1
68			min	14.389	15	-1425.738	3	0	1	-.093	4	-.185	5	-2.324	3
69		16	max	369.732	1	1640.578	1	68.776	5	0	1	0	1	1.669	1
70			min	14.21	15	-1426.958	3	0	1	-.093	4	-.142	5	-1.439	3
71		17	max	369.14	1	1638.952	1	67.276	5	0	1	0	1	.651	1
72			min	14.032	15	-1428.177	3	0	1	-.093	4	-.101	4	-.553	3
73		18	max	.76	6	2.088	6	1.5	5	0	1	0	1	0	6
74			min	.179	15	.491	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.003	1	0	1	0	1	0	1	0	1
76			min	0	1	-.006	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.003	4	0	1	0	1	0	1
78			min	0	1	-.001	3	0	3	0	1	0	1	0	1
79		2	max	-.179	15	-.491	15	.001	1	0	1	0	1	0	4
80			min	-.76	4	-2.085	4	-1.499	5	0	1	0	5	0	15
81		3	max	15.515	5	216.592	3	210.08	1	.26	1	.12	5	.284	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
82			min	-203.351	1	-645.647	1	-51.571	5	-.06	3	-.315	1	-.094	3
83		4	max	15.239	5	215.373	3	210.08	1	.26	1	.087	5	.685	1
84			min	-203.942	1	-647.273	1	-53.071	5	-.06	3	-.184	1	-.228	3
85		5	max	14.963	5	214.153	3	210.08	1	.26	1	.054	5	1.087	1
86			min	-204.534	1	-648.899	1	-54.57	5	-.06	3	-.054	1	-.361	3
87		6	max	419.687	3	561.149	1	280.41	1	.049	3	.045	3	1.046	1
88			min	-1729.32	1	-135.324	3	-47.013	5	-.044	1	-.154	1	-.366	3
89		7	max	419.243	3	559.522	1	280.41	1	.049	3	.024	3	.698	1
90			min	-1729.912	1	-136.543	3	-48.513	5	-.044	1	-.047	5	-.281	3
91		8	max	418.8	3	557.896	1	280.41	1	.049	3	.194	1	.351	1
92			min	-1730.504	1	-137.763	3	-50.013	5	-.044	1	-.078	5	-.196	3
93		9	max	409.416	3	62.111	3	285.214	1	.225	2	.054	5	.155	1
94			min	-1941.294	1	-69.867	1	-104.999	5	.019	15	-.096	1	-.157	3
95		10	max	408.972	3	60.891	3	285.214	1	.225	2	.081	1	.199	1
96			min	-1941.886	1	-71.493	1	-106.499	5	.019	15	-.053	3	-.195	3
97		11	max	408.528	3	59.672	3	285.214	1	.225	2	.258	1	.244	1
98			min	-1942.478	1	-73.119	1	-107.999	5	.019	15	-.078	5	-.233	3
99		12	max	396.769	3	579.113	3	237.422	3	.536	1	-.011	12	.522	1
100			min	-2148.43	1	-638.711	1	-250.908	4	-.372	3	-.166	1	-.476	3
101		13	max	396.326	3	577.893	3	237.422	3	.536	1	.129	3	.919	1
102			min	-2149.022	1	-640.337	1	-252.408	4	-.372	3	-.244	1	-.835	3
103		14	max	205.593	1	573.426	1	179.105	1	.377	3	.006	1	1.3	1
104			min	3.797	15	-512.652	3	-.064	3	-.362	1	-.244	5	-1.178	3
105		15	max	205.001	1	571.8	1	179.105	1	.377	3	.117	1	.945	1
106			min	3.619	15	-513.871	3	-.064	3	-.362	1	-.18	5	-.86	3
107		16	max	204.409	1	570.174	1	179.105	1	.377	3	.228	1	.59	1
108			min	3.44	15	-515.091	3	-.064	3	-.362	1	-.118	5	-.541	3
109		17	max	203.818	1	568.548	1	179.105	1	.377	3	.34	1	.237	1
110			min	3.262	15	-516.31	3	-.064	3	-.362	1	-.056	5	-.221	3
111		18	max	.76	4	2.087	4	1.499	5	0	1	0	1	0	4
112			min	.179	15	.491	15	0	1	0	1	0	5	0	15
113		19	max	0	1	0	1	0	12	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	179.06	1	565.07	1	-2.908	15	.006	1	.412	1	.362	1
116			min	-.06	3	-518.687	3	-203.092	1	-.012	3	-.016	5	-.377	3
117		2	max	179.06	1	411.506	1	-1.347	15	.006	1	.18	1	.198	3
118			min	-.06	3	-381.603	3	-160.135	1	-.012	3	-.02	5	-.262	1
119		3	max	179.06	1	257.942	1	.215	15	.006	1	.023	2	.598	3
120			min	-.06	3	-244.518	3	-117.178	1	-.012	3	-.024	4	-.689	1
121		4	max	179.06	1	104.378	1	2.489	5	.006	1	-.003	10	.823	3
122			min	-.06	3	-107.434	3	-74.221	1	-.012	3	-.119	1	-.921	1
123		5	max	179.06	1	29.651	3	4.904	5	.006	1	-.009	12	.873	3
124			min	-.06	3	-49.185	1	-31.264	1	-.012	3	-.187	1	-.956	1
125		6	max	179.06	1	166.735	3	11.897	14	.006	1	-.005	15	.747	3
126			min	-.06	3	-202.749	1	-3.5	10	-.012	3	-.199	1	-.795	1
127		7	max	179.06	1	303.819	3	54.65	1	.006	1	.003	5	.447	3
128			min	-.06	3	-356.313	1	.813	10	-.012	3	-.157	1	-.438	1
129		8	max	179.06	1	440.904	3	97.606	1	.006	1	.017	5	.115	1
130			min	-.06	3	-509.877	1	5.127	10	-.012	3	-.06	1	-.029	3
131		9	max	179.06	1	577.988	3	140.563	1	.006	1	.092	1	.865	1
132			min	-9.526	5	-663.441	1	7.065	12	-.012	3	-.012	10	-.68	3
133		10	max	179.06	1	817.005	1	-2.526	15	.012	3	.3	1	1.811	1
134			min	-.06	3	-715.073	3	-183.52	1	-.006	1	.003	10	-1.506	3
135		11	max	179.06	1	663.441	1	-.964	15	.012	3	.092	1	.865	1
136			min	-.06	3	-577.988	3	-140.563	1	-.006	1	-.022	5	-.68	3
137		12	max	179.06	1	509.877	1	.668	5	.012	3	.005	3	.115	1
138			min	-.06	3	-440.904	3	-97.606	1	-.006	1	-.06	1	-.029	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	179.06	1	356.313	1	3.083	5	.012	3	-.003	12	.447	3
140			min	-.06	3	-303.819	3	-54.65	1	-.006	1	-.157	1	-.438	1
141		14	max	179.06	1	202.749	1	5.499	5	.012	3	-.007	12	.747	3
142			min	-10.787	5	-166.735	3	-11.693	1	-.006	1	-.199	1	-.795	1
143		15	max	179.06	1	49.185	1	31.264	1	.012	3	-.004	15	.873	3
144			min	-23.903	5	-29.651	3	-1.523	3	-.006	1	-.187	1	-.956	1
145		16	max	179.06	1	107.434	3	74.221	1	.012	3	.006	5	.823	3
146			min	-37.02	5	-104.378	1	.741	12	-.006	1	-.119	1	-.921	1
147		17	max	179.06	1	244.518	3	117.178	1	.012	3	.023	2	.598	3
148			min	-50.137	5	-257.942	1	2.302	12	-.006	1	-.012	3	-.689	1
149		18	max	179.06	1	381.603	3	160.135	1	.012	3	.18	1	.198	3
150			min	-63.253	5	-411.506	1	3.863	12	-.006	1	-.007	3	-.262	1
151		19	max	179.06	1	518.687	3	203.092	1	.012	3	.412	1	.362	1
152			min	-76.37	5	-565.07	1	5.425	12	-.006	1	.002	3	-.377	3
153	M11	1	max	411.042	1	561.062	1	21.355	5	0	3	.437	1	.328	1
154			min	-273.553	3	-521.464	3	-206.421	1	-.008	1	-.167	5	-.458	3
155		2	max	411.042	1	407.498	1	23.771	5	0	3	.201	1	.121	3
156			min	-273.553	3	-384.38	3	-163.465	1	-.008	1	-.138	5	-.291	1
157		3	max	411.042	1	253.934	1	26.186	5	0	3	.025	2	.524	3
158			min	-273.553	3	-247.295	3	-120.508	1	-.008	1	-.106	5	-.713	1
159		4	max	411.042	1	100.37	1	28.602	5	0	3	-.001	12	.753	3
160			min	-273.553	3	-110.211	3	-77.551	1	-.008	1	-.107	1	-.94	1
161		5	max	411.042	1	26.873	3	31.017	5	0	3	-.004	12	.806	3
162			min	-273.553	3	-53.193	1	-34.594	1	-.008	1	-.179	1	-.97	1
163		6	max	411.042	1	163.958	3	36.125	4	0	3	.008	5	.684	3
164			min	-273.553	3	-206.757	1	-3.189	10	-.008	1	-.195	1	-.804	1
165		7	max	411.042	1	301.042	3	51.32	1	0	3	.052	5	.387	3
166			min	-273.553	3	-360.321	1	1.124	10	-.008	1	-.157	1	-.441	1
167		8	max	411.042	1	438.127	3	94.277	1	0	3	.1	5	.117	1
168			min	-273.553	3	-513.885	1	3.381	12	-.008	1	-.064	1	-.085	3
169		9	max	411.042	1	575.211	3	137.234	1	0	3	.172	4	.872	1
170			min	-273.553	3	-667.449	1	4.943	12	-.008	1	-.011	10	-.733	3
171		10	max	411.042	1	821.013	1	22.37	5	0	12	.286	1	1.823	1
172			min	-273.553	3	-712.295	3	-180.191	1	-.008	1	.004	10	-1.555	3
173		11	max	411.042	1	667.449	1	24.785	5	.008	1	.084	1	.872	1
174			min	-273.553	3	-575.211	3	-137.234	1	0	3	-.138	5	-.733	3
175		12	max	411.042	1	513.885	1	27.201	5	.008	1	0	3	.117	1
176			min	-273.553	3	-438.127	3	-94.277	1	0	3	-.116	4	-.085	3
177		13	max	411.042	1	360.321	1	29.616	5	.008	1	-.003	12	.387	3
178			min	-273.553	3	-301.042	3	-51.32	1	0	3	-.157	1	-.441	1
179		14	max	411.042	1	206.757	1	32.032	5	.008	1	-.005	12	.684	3
180			min	-273.553	3	-163.958	3	-8.363	1	0	3	-.195	1	-.804	1
181		15	max	411.042	1	53.193	1	40.944	4	.008	1	.013	5	.806	3
182			min	-273.553	3	-26.873	3	1.303	12	0	3	-.179	1	-.97	1
183		16	max	411.042	1	110.211	3	77.551	1	.008	1	.059	5	.753	3
184			min	-273.553	3	-100.37	1	2.864	12	0	3	-.107	1	-.94	1
185		17	max	411.042	1	247.295	3	120.508	1	.008	1	.109	4	.524	3
186			min	-273.553	3	-253.934	1	4.425	12	0	3	.003	12	-.713	1
187		18	max	411.042	1	384.38	3	163.465	1	.008	1	.201	1	.121	3
188			min	-273.553	3	-407.498	1	5.986	12	0	3	.01	12	-.291	1
189		19	max	411.042	1	521.464	3	206.421	1	.008	1	.437	1	.328	1
190			min	-273.553	3	-561.062	1	7.548	12	0	3	.019	12	-.458	3
191	M12	1	max	53.344	5	624.261	1	22.911	5	.002	3	.466	1	.259	2
192			min	-16.708	9	-201.565	3	-210.19	1	-.009	1	-.175	5	.023	12
193		2	max	40.228	5	450.388	1	25.326	5	.002	3	.225	1	.255	3
194			min	-16.708	9	-140.303	3	-167.233	1	-.009	1	-.144	5	-.435	1
195		3	max	34.255	2	276.514	1	27.742	5	.002	3	.04	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	-16.708	9	-79.04	3	-124.276	1	-.009	1	-.11	5	-.899	1
197		4	max	34.255	2	102.641	1	30.157	5	.002	3	0	10	.457	3
198			min	-16.708	9	-17.778	3	-81.319	1	-.009	1	-.095	4	-1.142	1
199		5	max	34.255	2	43.485	3	32.573	5	.002	3	-.008	12	.441	3
200			min	-16.708	9	-71.233	1	-38.363	1	-.009	1	-.169	1	-1.162	1
201		6	max	34.255	2	104.747	3	37.125	4	.002	3	.01	5	.346	3
202			min	-19.068	14	-245.106	1	-5.715	2	-.009	1	-.191	1	-.96	1
203		7	max	34.255	2	166.009	3	48.49	4	.002	3	.056	5	.173	3
204			min	-30.774	4	-418.98	1	-.317	10	-.009	1	-.158	1	-.535	1
205		8	max	34.255	2	227.272	3	90.508	1	.002	3	.105	5	.111	1
206			min	-43.891	4	-592.853	1	3.996	10	-.009	1	-.069	1	-.078	3
207		9	max	34.255	2	288.534	3	133.465	1	.002	3	.178	4	.98	1
208			min	-57.008	4	-766.727	1	6.384	12	-.009	1	-.015	10	-.408	3
209		10	max	34.255	2	940.6	1	113.773	14	.002	3	.277	4	2.071	1
210			min	-70.124	4	-349.796	3	-176.422	1	-.009	1	-.002	10	-.815	3
211		11	max	48.079	5	766.727	1	26.663	5	.009	1	.074	1	.98	1
212			min	-16.708	9	-288.534	3	-133.465	1	-.002	3	-.147	5	-.408	3
213		12	max	34.962	5	592.853	1	29.078	5	.009	1	.004	3	.111	1
214			min	-16.708	9	-227.272	3	-90.508	1	-.002	3	-.123	4	-.078	3
215		13	max	34.255	2	418.98	1	31.494	5	.009	1	-.003	12	.173	3
216			min	-16.708	9	-166.009	3	-47.551	1	-.002	3	-.158	1	-.535	1
217		14	max	34.255	2	245.106	1	33.909	5	.009	1	-.006	12	.346	3
218			min	-16.708	9	-104.747	3	-6.162	9	-.002	3	-.191	1	-.96	1
219		15	max	34.255	2	71.233	1	43.434	4	.009	1	.014	5	.441	3
220			min	-16.708	9	-43.485	3	-.428	3	-.002	3	-.169	1	-1.162	1
221		16	max	34.255	2	17.778	3	81.319	1	.009	1	.062	5	.457	3
222			min	-22.857	4	-102.641	1	1.422	12	-.002	3	-.093	1	-1.142	1
223		17	max	34.255	2	79.04	3	124.276	1	.009	1	.118	4	.395	3
224			min	-35.973	4	-276.514	1	2.983	12	-.002	3	-.007	3	-.899	1
225		18	max	34.255	2	140.303	3	167.233	1	.009	1	.225	1	.255	3
226			min	-49.09	4	-450.388	1	4.545	12	-.002	3	0	3	-.435	1
227		19	max	34.255	2	201.565	3	210.19	1	.009	1	.466	1	.259	2
228			min	-62.207	4	-624.261	1	6.106	12	-.002	3	.008	12	-.025	5
229	M13	1	max	48.488	5	643.758	1	16.07	5	.007	3	.4	1	.26	1
230			min	-209.91	1	-219.076	3	-201.614	1	-.022	1	-.141	5	-.06	3
231		2	max	35.371	5	469.884	1	18.485	5	.007	3	.17	1	.181	3
232			min	-209.91	1	-157.813	3	-158.657	1	-.022	1	-.119	5	-.451	1
233		3	max	22.254	5	296.011	1	20.901	5	.007	3	.016	2	.344	3
234			min	-209.91	1	-96.551	3	-115.7	1	-.022	1	-.098	4	-.941	1
235		4	max	10.192	3	122.137	1	23.316	5	.007	3	-.006	10	.428	3
236			min	-209.91	1	-35.289	3	-72.744	1	-.022	1	-.126	1	-1.208	1
237		5	max	10.192	3	25.974	3	25.732	5	.007	3	-.007	12	.434	3
238			min	-209.91	1	-51.736	1	-29.787	1	-.022	1	-.192	1	-1.253	1
239		6	max	10.192	3	87.236	3	31.838	4	.007	3	0	15	.361	3
240			min	-209.91	1	-225.61	1	-3.002	10	-.022	1	-.202	1	-1.076	1
241		7	max	10.192	3	148.498	3	56.127	1	.007	3	.038	5	.211	3
242			min	-209.91	1	-399.483	1	1.312	10	-.022	1	-.158	1	-.676	1
243		8	max	10.192	3	209.761	3	99.084	1	.007	3	.078	5	-.004	15
244			min	-209.91	1	-573.357	1	4.783	12	-.022	1	-.059	1	-.055	1
245		9	max	10.192	3	271.023	3	142.041	1	.007	3	.146	4	.789	1
246			min	-209.91	1	-747.23	1	6.344	12	-.022	1	-.011	10	-.325	3
247		10	max	10.192	3	921.104	1	114.175	14	.007	3	.304	1	1.855	1
248			min	-209.91	1	-332.285	3	-184.998	1	-.022	1	.005	10	-.711	3
249		11	max	35.069	5	747.23	1	18.94	5	.022	1	.095	1	.789	1
250			min	-209.91	1	-271.023	3	-142.041	1	-.007	3	-.109	5	-.325	3
251		12	max	21.952	5	573.357	1	21.355	5	.022	1	.003	3	0	5
252			min	-209.91	1	-209.761	3	-99.084	1	-.007	3	-.092	4	-.055	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	10.192	3	399.483	1	23.771	5	.022	1	-.003	12	.211	3
254			min	-209.91	1	-148.498	3	-56.127	1	-.007	3	-.158	1	-.676	1
255		14	max	10.192	3	225.61	1	26.186	5	.022	1	-.006	12	.361	3
256			min	-209.91	1	-87.236	3	-13.17	1	-.007	3	-.202	1	-1.076	1
257		15	max	10.192	3	51.736	1	33.992	4	.022	1	.013	5	.434	3
258			min	-209.91	1	-25.974	3	-.314	3	-.007	3	-.192	1	-1.253	1
259		16	max	10.192	3	35.289	3	72.744	1	.022	1	.051	5	.428	3
260			min	-209.91	1	-122.137	1	1.462	12	-.007	3	-.126	1	-1.208	1
261		17	max	10.192	3	96.551	3	115.7	1	.022	1	.092	5	.344	3
262			min	-209.91	1	-296.011	1	3.023	12	-.007	3	-.012	9	-.941	1
263		18	max	10.192	3	157.813	3	158.657	1	.022	1	.17	1	.181	3
264			min	-209.91	1	-469.884	1	4.585	12	-.007	3	.001	3	-.451	1
265		19	max	10.192	3	219.076	3	201.614	1	.022	1	.4	1	.26	1
266			min	-209.91	1	-643.758	1	6.146	12	-.007	3	.008	12	-.06	3
267	M2	1	max	2611.369	1	534.368	3	377.47	1	.008	5	1.356	5	6.298	1
268			min	-1300.153	3	-357.213	2	-361.205	5	-.008	1	-.399	1	.351	12
269		2	max	2609.108	1	534.368	3	377.47	1	.008	5	1.267	5	6.31	1
270			min	-1301.849	3	-357.213	2	-359.246	5	-.008	1	-.306	1	.271	12
271		3	max	2606.848	1	534.368	3	377.47	1	.008	5	1.178	5	6.321	1
272			min	-1303.544	3	-357.213	2	-357.287	5	-.008	1	-.212	1	.192	12
273		4	max	2604.587	1	534.368	3	377.47	1	.008	5	1.089	5	6.332	1
274			min	-1305.24	3	-357.213	2	-355.328	5	-.008	1	-.118	1	.112	12
275		5	max	1988.212	1	1806.435	1	304.86	1	.003	1	1.004	5	6.278	1
276			min	-1132.439	3	10.068	3	-343.604	5	-.001	3	-.105	1	.035	3
277		6	max	1985.951	1	1806.435	1	304.86	1	.003	1	.924	4	5.83	1
278			min	-1134.135	3	10.068	3	-341.645	5	-.001	3	-.03	3	.032	3
279		7	max	1983.691	1	1806.435	1	304.86	1	.003	1	.851	4	5.382	1
280			min	-1135.83	3	10.068	3	-339.686	5	-.001	3	-.089	3	.03	3
281		8	max	1981.43	1	1806.435	1	304.86	1	.003	1	.778	4	4.933	1
282			min	-1137.526	3	10.068	3	-337.727	5	-.001	3	-.148	3	.027	3
283		9	max	1979.169	1	1806.435	1	304.86	1	.003	1	.705	4	4.485	1
284			min	-1139.221	3	10.068	3	-335.767	5	-.001	3	-.207	3	.025	3
285		10	max	1976.909	1	1806.435	1	304.86	1	.003	1	.633	4	4.036	1
286			min	-1140.917	3	10.068	3	-333.808	5	-.001	3	-.266	3	.022	3
287		11	max	1974.648	1	1806.435	1	304.86	1	.003	1	.561	4	3.588	1
288			min	-1142.612	3	10.068	3	-331.849	5	-.001	3	-.325	3	.02	3
289		12	max	1972.388	1	1806.435	1	304.86	1	.003	1	.49	4	3.139	1
290			min	-1144.308	3	10.068	3	-329.89	5	-.001	3	-.384	3	.017	3
291		13	max	1970.127	1	1806.435	1	304.86	1	.003	1	.5	1	2.691	1
292			min	-1146.003	3	10.068	3	-327.931	5	-.001	3	-.443	3	.015	3
293		14	max	1967.866	1	1806.435	1	304.86	1	.003	1	.576	1	2.242	1
294			min	-1147.698	3	10.068	3	-325.972	5	-.001	3	-.502	3	.012	3
295		15	max	1965.606	1	1806.435	1	304.86	1	.003	1	.652	1	1.794	1
296			min	-1149.394	3	10.068	3	-324.012	5	-.001	3	-.561	3	.01	3
297		16	max	1963.345	1	1806.435	1	304.86	1	.003	1	.728	1	1.345	1
298			min	-1151.089	3	10.068	3	-322.053	5	-.001	3	-.62	3	.007	3
299		17	max	1961.085	1	1806.435	1	304.86	1	.003	1	.803	1	.897	1
300			min	-1152.785	3	10.068	3	-320.094	5	-.001	3	-.679	3	.005	3
301		18	max	1958.824	1	1806.435	1	304.86	1	.003	1	.879	1	.448	1
302			min	-1154.48	3	10.068	3	-318.135	5	-.001	3	-.738	3	.002	3
303		19	max	1956.563	1	1806.435	1	304.86	1	.003	1	.955	1	0	1
304			min	-1156.176	3	10.068	3	-316.176	5	-.001	3	-.797	3	0	1
305	M5	1	max	7150.949	1	1531.177	3	0	1	.008	4	1.429	4	14.192	1
306			min	-3872.636	3	-1518.729	2	-398.016	5	0	1	0	1	.425	15
307		2	max	7148.688	1	1531.177	3	0	1	.008	4	1.331	4	14.442	1
308			min	-3874.331	3	-1518.729	2	-396.057	5	0	1	0	1	.262	12
309		3	max	7146.428	1	1531.177	3	0	1	.008	4	1.234	4	14.692	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	-3876.027	3	-1518.729	2	-394.098	5	0	1	0	1	-.015	3
311		4	max	7144.167	1	1531.177	3	0	1	.008	4	1.137	4	14.942	1
312			min	-3877.722	3	-1518.729	2	-392.139	5	0	1	0	1	-.396	3
313		5	max	5447.177	1	4317.406	1	0	1	0	1	1.048	4	15.006	1
314			min	-3292.421	3	-205.743	3	-383.593	4	0	4	0	1	-.715	3
315		6	max	5444.916	1	4317.406	1	0	1	0	1	.953	4	13.934	1
316			min	-3294.117	3	-205.743	3	-381.634	4	0	4	0	1	-.664	3
317		7	max	5442.656	1	4317.406	1	0	1	0	1	.858	4	12.862	1
318			min	-3295.812	3	-205.743	3	-379.675	4	0	4	0	1	-.613	3
319		8	max	5440.395	1	4317.406	1	0	1	0	1	.764	4	11.79	1
320			min	-3297.508	3	-205.743	3	-377.716	4	0	4	0	1	-.562	3
321		9	max	5438.135	1	4317.406	1	0	1	0	1	.671	4	10.718	1
322			min	-3299.203	3	-205.743	3	-375.757	4	0	4	0	1	-.511	3
323		10	max	5435.874	1	4317.406	1	0	1	0	1	.578	4	9.646	1
324			min	-3300.899	3	-205.743	3	-373.797	4	0	4	0	1	-.46	3
325		11	max	5433.613	1	4317.406	1	0	1	0	1	.485	4	8.575	1
326			min	-3302.594	3	-205.743	3	-371.838	4	0	4	0	1	-.409	3
327		12	max	5431.353	1	4317.406	1	0	1	0	1	.393	4	7.503	1
328			min	-3304.289	3	-205.743	3	-369.879	4	0	4	0	1	-.358	3
329		13	max	5429.092	1	4317.406	1	0	1	0	1	.302	4	6.431	1
330			min	-3305.985	3	-205.743	3	-367.92	4	0	4	0	1	-.306	3
331		14	max	5426.832	1	4317.406	1	0	1	0	1	.211	4	5.359	1
332			min	-3307.68	3	-205.743	3	-365.961	4	0	4	0	1	-.255	3
333		15	max	5424.571	1	4317.406	1	0	1	0	1	.12	4	4.287	1
334			min	-3309.376	3	-205.743	3	-364.002	4	0	4	0	1	-.204	3
335		16	max	5422.31	1	4317.406	1	0	1	0	1	.03	4	3.215	1
336			min	-3311.071	3	-205.743	3	-362.042	4	0	4	0	1	-.153	3
337		17	max	5420.05	1	4317.406	1	0	1	0	1	0	1	2.144	1
338			min	-3312.767	3	-205.743	3	-360.083	4	0	4	-.06	4	-.102	3
339		18	max	5417.789	1	4317.406	1	0	1	0	1	0	1	1.072	1
340			min	-3314.462	3	-205.743	3	-358.124	4	0	4	-.149	4	-.051	3
341		19	max	5415.529	1	4317.406	1	0	1	0	1	0	1	0	1
342			min	-3316.158	3	-205.743	3	-356.165	4	0	4	-.238	4	0	1
343	M8	1	max	2611.369	1	534.368	3	262.017	3	.01	4	1.471	4	6.298	1
344			min	-1300.153	3	-357.213	2	-453.351	4	-.003	3	-.259	3	-.11	5
345		2	max	2609.108	1	534.368	3	262.017	3	.01	4	1.359	4	6.31	1
346			min	-1301.849	3	-357.213	2	-451.392	4	-.003	3	-.194	3	-.086	5
347		3	max	2606.848	1	534.368	3	262.017	3	.01	4	1.247	4	6.321	1
348			min	-1303.544	3	-357.213	2	-449.433	4	-.003	3	-.129	3	-.062	5
349		4	max	2604.587	1	534.368	3	262.017	3	.01	4	1.136	4	6.332	1
350			min	-1305.24	3	-357.213	2	-447.474	4	-.003	3	-.064	3	-.039	5
351		5	max	1988.212	1	1806.435	1	237.662	3	.001	3	1.045	4	6.278	1
352			min	-1132.439	3	-5.89	15	-422.392	4	-.003	1	-.029	3	-.02	15
353		6	max	1985.951	1	1806.435	1	237.662	3	.001	3	.941	4	5.83	1
354			min	-1134.135	3	-5.89	15	-420.433	4	-.003	1	0	10	-.019	15
355		7	max	1983.691	1	1806.435	1	237.662	3	.001	3	.837	4	5.382	1
356			min	-1135.83	3	-5.89	15	-418.474	4	-.003	1	-.051	2	-.018	15
357		8	max	1981.43	1	1806.435	1	237.662	3	.001	3	.741	5	4.933	1
358			min	-1137.526	3	-5.89	15	-416.515	4	-.003	1	-.122	1	-.016	15
359		9	max	1979.169	1	1806.435	1	237.662	3	.001	3	.651	5	4.485	1
360			min	-1139.221	3	-5.89	15	-414.556	4	-.003	1	-.198	1	-.015	15
361		10	max	1976.909	1	1806.435	1	237.662	3	.001	3	.561	5	4.036	1
362			min	-1140.917	3	-5.89	15	-412.596	4	-.003	1	-.273	1	-.013	15
363		11	max	1974.648	1	1806.435	1	237.662	3	.001	3	.472	5	3.588	1
364			min	-1142.612	3	-5.89	15	-410.637	4	-.003	1	-.349	1	-.012	15
365		12	max	1972.388	1	1806.435	1	237.662	3	.001	3	.384	3	3.139	1
366			min	-1144.308	3	-5.89	15	-408.678	4	-.003	1	-.425	1	-.01	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
367		13	max	1970.127	1	1806.435	1	237.662	3	.001	3	.443	3	2.691	1
368			min	-1146.003	3	-5.89	15	-406.719	4	-.003	1	-.5	1	-.009	15
369		14	max	1967.866	1	1806.435	1	237.662	3	.001	3	.502	3	2.242	1
370			min	-1147.698	3	-5.89	15	-404.76	4	-.003	1	-.576	1	-.007	15
371		15	max	1965.606	1	1806.435	1	237.662	3	.001	3	.561	3	1.794	1
372			min	-1149.394	3	-5.89	15	-402.8	4	-.003	1	-.652	1	-.006	15
373		16	max	1963.345	1	1806.435	1	237.662	3	.001	3	.62	3	1.345	1
374			min	-1151.089	3	-5.89	15	-400.841	4	-.003	1	-.728	1	-.004	15
375		17	max	1961.085	1	1806.435	1	237.662	3	.001	3	.679	3	.897	1
376			min	-1152.785	3	-5.89	15	-398.882	4	-.003	1	-.803	1	-.003	15
377		18	max	1958.824	1	1806.435	1	237.662	3	.001	3	.738	3	.448	1
378			min	-1154.48	3	-5.89	15	-396.923	4	-.003	1	-.879	1	-.001	15
379		19	max	1956.563	1	1806.435	1	237.662	3	.001	3	.797	3	0	1
380			min	-1156.176	3	-5.89	15	-394.964	4	-.003	1	-.955	1	0	1
381	M3	1	max	1942.303	1	4.757	4	71.135	1	.029	3	.014	1	0	1
382			min	-552.537	3	1.118	15	-24.893	3	-.077	1	-.006	3	0	1
383		2	max	1942.163	1	4.229	4	71.135	1	.029	3	.035	1	0	15
384			min	-552.642	3	.994	15	-24.893	3	-.077	1	-.013	3	-.001	4
385		3	max	1942.024	1	3.7	4	71.135	1	.029	3	.056	1	0	15
386			min	-552.746	3	.87	15	-24.893	3	-.077	1	-.02	3	-.002	4
387		4	max	1941.884	1	3.171	4	71.135	1	.029	3	.077	1	0	15
388			min	-552.851	3	.745	15	-24.893	3	-.077	1	-.027	3	-.003	4
389		5	max	1941.745	1	2.643	4	71.135	1	.029	3	.098	1	-.001	15
390			min	-552.956	3	.621	15	-24.893	3	-.077	1	-.035	3	-.004	4
391		6	max	1941.605	1	2.114	4	71.135	1	.029	3	.119	1	-.001	15
392			min	-553.06	3	.497	15	-24.893	3	-.077	1	-.042	3	-.005	4
393		7	max	1941.466	1	1.586	4	71.135	1	.029	3	.14	1	-.001	15
394			min	-553.165	3	.373	15	-24.893	3	-.077	1	-.049	3	-.006	4
395		8	max	1941.327	1	1.057	4	71.135	1	.029	3	.16	1	-.001	15
396			min	-553.269	3	.248	15	-24.893	3	-.077	1	-.057	3	-.006	4
397		9	max	1941.187	1	.529	4	71.135	1	.029	3	.181	1	-.001	15
398			min	-553.374	3	.124	15	-24.893	3	-.077	1	-.064	3	-.006	4
399		10	max	1941.048	1	0	1	71.135	1	.029	3	.202	1	-.001	15
400			min	-553.478	3	0	1	-24.893	3	-.077	1	-.071	3	-.006	4
401		11	max	1940.908	1	-.124	15	71.135	1	.029	3	.223	1	-.001	15
402			min	-553.583	3	-.529	6	-24.893	3	-.077	1	-.079	3	-.006	4
403		12	max	1940.769	1	-.248	15	71.135	1	.029	3	.244	1	-.001	15
404			min	-553.687	3	-1.057	6	-24.893	3	-.077	1	-.086	3	-.006	4
405		13	max	1940.63	1	-.373	15	71.135	1	.029	3	.265	1	-.001	15
406			min	-553.792	3	-1.586	6	-24.893	3	-.077	1	-.093	3	-.006	4
407		14	max	1940.49	1	-.497	15	71.135	1	.029	3	.286	1	-.001	15
408			min	-553.897	3	-2.114	6	-24.893	3	-.077	1	-.1	3	-.005	4
409		15	max	1940.351	1	-.621	15	71.135	1	.029	3	.306	1	-.001	15
410			min	-554.001	3	-2.643	6	-24.893	3	-.077	1	-.108	3	-.004	4
411		16	max	1940.211	1	-.745	15	71.135	1	.029	3	.327	1	0	15
412			min	-554.106	3	-3.171	6	-24.893	3	-.077	1	-.115	3	-.003	4
413		17	max	1940.072	1	-.87	15	71.135	1	.029	3	.348	1	0	15
414			min	-554.21	3	-3.7	6	-24.893	3	-.077	1	-.122	3	-.002	4
415		18	max	1939.933	1	-.994	15	71.135	1	.029	3	.369	1	0	15
416			min	-554.315	3	-4.229	6	-24.893	3	-.077	1	-.13	3	-.001	4
417		19	max	1939.793	1	-1.118	15	71.135	1	.029	3	.39	1	0	1
418			min	-554.419	3	-4.757	6	-24.893	3	-.077	1	-.137	3	0	1
419	M6	1	max	5531.821	1	4.757	4	0	1	.01	4	.006	4	0	1
420			min	-1835.068	3	1.118	15	-13.956	4	0	1	0	1	0	1
421		2	max	5531.682	1	4.229	4	0	1	.01	4	.002	4	0	15
422			min	-1835.172	3	.994	15	-13.579	4	0	1	0	1	-.001	4
423		3	max	5531.543	1	3.7	4	0	1	.01	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-1835.277	3	.87	15	-13.202	4	0	1	-.002	4	-.002	4
425		4	max	5531.403	1	3.171	4	0	1	.01	4	0	1	0	15
426			min	-1835.381	3	.745	15	-12.825	4	0	1	-.005	4	-.003	4
427		5	max	5531.264	1	2.643	4	0	1	.01	4	0	1	-.001	15
428			min	-1835.486	3	.621	15	-12.448	4	0	1	-.009	4	-.004	4
429		6	max	5531.124	1	2.114	4	0	1	.01	4	0	1	-.001	15
430			min	-1835.591	3	.497	15	-12.071	4	0	1	-.013	4	-.005	4
431		7	max	5530.985	1	1.586	4	0	1	.01	4	0	1	-.001	15
432			min	-1835.695	3	.373	15	-11.695	4	0	1	-.016	4	-.006	4
433		8	max	5530.846	1	1.057	4	0	1	.01	4	0	1	-.001	15
434			min	-1835.8	3	.248	15	-11.318	4	0	1	-.02	4	-.006	4
435		9	max	5530.706	1	.529	4	0	1	.01	4	0	1	-.001	15
436			min	-1835.904	3	.124	15	-10.941	4	0	1	-.023	4	-.006	4
437		10	max	5530.567	1	0	1	0	1	.01	4	0	1	-.001	15
438			min	-1836.009	3	0	1	-10.564	4	0	1	-.026	4	-.006	4
439		11	max	5530.427	1	-.124	15	0	1	.01	4	0	1	-.001	15
440			min	-1836.113	3	-.529	6	-10.187	4	0	1	-.029	4	-.006	4
441		12	max	5530.288	1	-.248	15	0	1	.01	4	0	1	-.001	15
442			min	-1836.218	3	-1.057	6	-9.81	4	0	1	-.032	4	-.006	4
443		13	max	5530.149	1	-.373	15	0	1	.01	4	0	1	-.001	15
444			min	-1836.323	3	-1.586	6	-9.433	4	0	1	-.035	4	-.006	4
445		14	max	5530.009	1	-.497	15	0	1	.01	4	0	1	-.001	15
446			min	-1836.427	3	-2.114	6	-9.057	4	0	1	-.037	4	-.005	4
447		15	max	5529.87	1	-.621	15	0	1	.01	4	0	1	-.001	15
448			min	-1836.532	3	-2.643	6	-8.68	4	0	1	-.04	4	-.004	4
449		16	max	5529.73	1	-.745	15	0	1	.01	4	0	1	0	15
450			min	-1836.636	3	-3.171	6	-8.303	4	0	1	-.043	4	-.003	4
451		17	max	5529.591	1	-.87	15	0	1	.01	4	0	1	0	15
452			min	-1836.741	3	-3.7	6	-7.926	4	0	1	-.045	4	-.002	4
453		18	max	5529.452	1	-.994	15	0	1	.01	4	0	1	0	15
454			min	-1836.845	3	-4.229	6	-7.549	4	0	1	-.047	4	-.001	4
455		19	max	5529.312	1	-1.118	15	0	1	.01	4	0	1	0	1
456			min	-1836.95	3	-4.757	6	-7.172	4	0	1	-.049	4	0	1
457	M9	1	max	1942.303	1	4.757	6	24.893	3	.077	1	.006	5	0	1
458			min	-552.537	3	1.118	15	-71.135	1	-.029	3	-.014	1	0	1
459		2	max	1942.163	1	4.229	6	24.893	3	.077	1	.013	3	0	15
460			min	-552.642	3	.994	15	-71.135	1	-.029	3	-.035	1	-.001	6
461		3	max	1942.024	1	3.7	6	24.893	3	.077	1	.02	3	0	15
462			min	-552.746	3	.87	15	-71.135	1	-.029	3	-.056	1	-.002	6
463		4	max	1941.884	1	3.171	6	24.893	3	.077	1	.027	3	0	15
464			min	-552.851	3	.745	15	-71.135	1	-.029	3	-.077	1	-.003	6
465		5	max	1941.745	1	2.643	6	24.893	3	.077	1	.035	3	-.001	15
466			min	-552.956	3	.621	15	-71.135	1	-.029	3	-.098	1	-.004	6
467		6	max	1941.605	1	2.114	6	24.893	3	.077	1	.042	3	-.001	15
468			min	-553.06	3	.497	15	-71.135	1	-.029	3	-.119	1	-.005	6
469		7	max	1941.466	1	1.586	6	24.893	3	.077	1	.049	3	-.001	15
470			min	-553.165	3	.373	15	-71.135	1	-.029	3	-.14	1	-.006	6
471		8	max	1941.327	1	1.057	6	24.893	3	.077	1	.057	3	-.001	15
472			min	-553.269	3	.248	15	-71.135	1	-.029	3	-.16	1	-.006	6
473		9	max	1941.187	1	.529	6	24.893	3	.077	1	.064	3	-.001	15
474			min	-553.374	3	.124	15	-71.135	1	-.029	3	-.181	1	-.006	6
475		10	max	1941.048	1	0	1	24.893	3	.077	1	.071	3	-.001	15
476			min	-553.478	3	0	1	-71.135	1	-.029	3	-.202	1	-.006	6
477		11	max	1940.908	1	-.124	15	24.893	3	.077	1	.079	3	-.001	15
478			min	-553.583	3	-.529	4	-71.135	1	-.029	3	-.223	1	-.006	6
479		12	max	1940.769	1	-.248	15	24.893	3	.077	1	.086	3	-.001	15
480			min	-553.687	3	-1.057	4	-71.135	1	-.029	3	-.244	1	-.006	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1940.63	1	-.373	15	24.893	3	.077	1	.093	3	-.001	15
482			min	-553.792	3	-1.586	4	-71.135	1	-.029	3	-.265	1	-.006	6
483		14	max	1940.49	1	-.497	15	24.893	3	.077	1	.1	3	-.001	15
484			min	-553.897	3	-2.114	4	-71.135	1	-.029	3	-.286	1	-.005	6
485		15	max	1940.351	1	-.621	15	24.893	3	.077	1	.108	3	-.001	15
486			min	-554.001	3	-2.643	4	-71.135	1	-.029	3	-.306	1	-.004	6
487		16	max	1940.211	1	-.745	15	24.893	3	.077	1	.115	3	0	15
488			min	-554.106	3	-3.171	4	-71.135	1	-.029	3	-.327	1	-.003	6
489		17	max	1940.072	1	-.87	15	24.893	3	.077	1	.122	3	0	15
490			min	-554.21	3	-3.7	4	-71.135	1	-.029	3	-.348	1	-.002	6
491		18	max	1939.933	1	-.994	15	24.893	3	.077	1	.13	3	0	15
492			min	-554.315	3	-4.229	4	-71.135	1	-.029	3	-.369	1	-.001	6
493		19	max	1939.793	1	-1.118	15	24.893	3	.077	1	.137	3	0	1
494			min	-554.419	3	-4.757	4	-71.135	1	-.029	3	-.39	1	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-.004	12	.104	3	.031	1	1.089e-2	3	NC	3	NC	3
2			min	-.267	1	-.785	1	-.628	5	-3.363e-2	1	161.995	1	232.132	5
3		2	max	-.004	12	.079	3	.01	1	1.089e-2	3	9010.711	12	NC	3
4			min	-.267	1	-.675	1	-.597	4	-3.363e-2	1	186.695	1	246.142	5
5		3	max	-.004	12	.053	3	0	12	1.042e-2	3	4501.433	12	NC	2
6			min	-.267	1	-.566	1	-.566	4	-3.159e-2	1	220.319	1	262.65	5
7		4	max	-.004	12	.029	3	0	12	9.702e-3	3	3049.617	12	NC	1
8			min	-.267	1	-.46	1	-.528	4	-2.845e-2	1	266.725	1	284.552	4
9		5	max	-.004	12	.008	3	0	3	8.984e-3	3	3265.747	15	NC	1
10			min	-.267	1	-.364	1	-.485	4	-2.532e-2	1	330.013	1	313.34	4
11		6	max	-.004	12	-.006	12	.002	3	9.035e-3	3	3633.035	15	NC	1
12			min	-.266	1	-.283	1	-.439	4	-2.436e-2	1	412.168	1	350.449	5
13		7	max	-.004	12	-.012	12	.002	3	9.619e-3	3	4049.303	15	NC	2
14			min	-.266	1	-.216	1	-.392	4	-2.488e-2	1	517.326	1	397.383	5
15		8	max	-.004	12	-.012	15	0	3	1.02e-2	3	4536.205	15	NC	2
16			min	-.265	1	-.16	1	-.347	4	-2.541e-2	1	661.413	1	455.964	5
17		9	max	-.004	12	-.009	15	0	9	1.095e-2	3	5130.274	15	NC	2
18			min	-.264	1	-.108	1	-.307	4	-2.485e-2	1	888.302	1	528.499	5
19		10	max	-.005	12	-.006	15	0	1	1.198e-2	3	5885.259	15	NC	2
20			min	-.264	1	-.058	1	-.266	4	-2.235e-2	1	984.954	3	630.496	5
21		11	max	-.005	12	-.002	15	.002	3	1.3e-2	3	NC	10	NC	2
22			min	-.263	1	-.031	3	-.225	4	-1.985e-2	1	989.184	3	778.201	5
23		12	max	-.005	12	.032	1	.006	3	1.051e-2	3	NC	1	NC	2
24			min	-.262	1	-.028	3	-.188	4	-1.482e-2	1	1016.637	3	999.678	5
25		13	max	-.005	12	.069	1	.012	3	6.027e-3	3	NC	9	NC	1
26			min	-.261	1	-.018	3	-.151	4	-8.376e-3	1	1100.896	3	1384.503	5
27		14	max	-.005	12	.093	1	.013	3	1.741e-3	3	NC	4	NC	2
28			min	-.26	1	.003	12	-.118	4	-4.946e-3	4	1339.268	3	2060.264	5
29		15	max	-.005	12	.1	1	.009	3	6.279e-3	3	NC	4	NC	2
30			min	-.26	1	.009	15	-.093	4	-6.526e-3	1	2145.157	3	3183.84	5
31		16	max	-.005	12	.093	1	.008	1	1.082e-2	3	NC	3	NC	2
32			min	-.261	1	.011	15	-.077	5	-1.089e-2	1	2657.591	1	4089.692	1
33		17	max	-.005	12	.148	3	.006	1	1.535e-2	3	NC	4	NC	2
34			min	-.261	1	.013	15	-.066	5	-1.525e-2	1	3046.693	3	4405.157	1
35		18	max	-.005	12	.208	3	0	12	1.831e-2	3	NC	4	NC	2
36			min	-.261	1	.014	10	-.061	4	-1.809e-2	1	1290.522	3	8001.011	1
37		19	max	-.005	12	.268	3	-.003	10	1.831e-2	3	NC	1	NC	1
38			min	-.261	1	.007	10	-.057	4	-1.809e-2	1	819.173	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	.02	3	.352	3	0	1	1.873e-4	4	NC	3	NC	1
40			min	-.63	1	-1.928	1	-.624	4	0	1	69.474	1	234.413	4
41		2	max	.02	3	.277	3	0	1	1.873e-4	4	3030.376	12	NC	1
42			min	-.63	1	-1.654	1	-.597	4	0	1	80.975	1	246.052	4
43		3	max	.02	3	.201	3	0	1	1.992e-5	5	3438.327	15	NC	1
44			min	-.63	1	-1.38	1	-.568	4	0	1	97.082	1	260.029	4
45		4	max	.02	3	.129	3	0	1	0	1	4229.622	15	NC	1
46			min	-.63	1	-1.114	1	-.53	4	-2.397e-4	4	120.193	1	280.535	4
47		5	max	.02	3	.066	3	0	1	0	1	5352.097	15	NC	1
48			min	-.63	1	-.874	1	-.486	4	-4.982e-4	4	153.171	1	308.998	4
49		6	max	.019	3	.019	3	0	1	0	1	6882.431	15	NC	1
50			min	-.629	1	-.676	1	-.439	4	-4.79e-4	4	197.942	1	346.926	4
51		7	max	.019	3	-.01	12	0	1	0	1	8969.879	15	NC	1
52			min	-.627	1	-.518	1	-.391	4	-2.677e-4	4	257.976	1	395.307	4
53		8	max	.018	3	-.011	15	0	1	0	1	NC	15	NC	1
54			min	-.625	1	-.386	1	-.347	4	-5.636e-5	4	346.003	3	454.815	4
55		9	max	.018	3	-.008	15	0	1	1.241e-5	5	NC	5	NC	1
56			min	-.623	1	-.264	1	-.307	4	0	1	332.338	3	525.566	4
57		10	max	.017	3	-.004	15	0	1	0	1	NC	5	NC	1
58			min	-.622	1	-.145	1	-.266	4	-1.732e-4	4	322.806	3	627.719	4
59		11	max	.017	3	0	15	0	1	0	1	NC	4	NC	1
60			min	-.62	1	-.07	3	-.225	4	-3.582e-4	4	318.239	3	775.402	4
61		12	max	.016	3	.076	1	0	1	0	1	NC	5	NC	1
62			min	-.618	1	-.068	3	-.188	4	-1.427e-3	4	319.252	3	986.124	4
63		13	max	.016	3	.165	1	0	1	0	1	NC	5	NC	1
64			min	-.615	1	-.05	3	-.151	4	-2.996e-3	4	333.636	3	1356.011	4
65		14	max	.015	3	.219	1	0	1	0	1	NC	5	NC	1
66			min	-.613	1	0	3	-.119	4	-4.506e-3	4	380.26	3	2003.963	4
67		15	max	.015	3	.222	1	0	1	0	1	NC	5	NC	1
68			min	-.614	1	.006	15	-.096	4	-3.384e-3	4	515.743	3	3071.619	4
69		16	max	.015	3	.217	3	0	1	0	1	NC	5	NC	1
70			min	-.614	1	.005	15	-.079	4	-2.261e-3	4	716.224	1	4959.082	4
71		17	max	.015	3	.361	3	0	1	0	1	NC	3	NC	1
72			min	-.614	1	.004	15	-.068	4	-1.139e-3	4	1028.637	1	8632.898	4
73		18	max	.015	3	.513	3	0	1	0	1	NC	5	NC	1
74			min	-.614	1	.002	15	-.06	4	-4.069e-4	4	830.088	3	NC	1
75		19	max	.015	3	.665	3	0	1	0	1	NC	1	NC	1
76			min	-.614	1	-.006	9	-.052	4	-4.069e-4	4	428.31	3	NC	1
77	M7	1	max	.002	5	.104	3	0	12	3.363e-2	1	NC	3	NC	3
78			min	-.267	1	-.785	1	-.641	4	-1.089e-2	3	161.995	1	224.668	4
79		2	max	.002	5	.079	3	0	12	3.363e-2	1	NC	5	NC	3
80			min	-.267	1	-.675	1	-.602	4	-1.089e-2	3	186.695	1	240.523	4
81		3	max	.002	5	.053	3	.008	1	3.159e-2	1	NC	5	NC	2
82			min	-.267	1	-.566	1	-.562	4	-1.042e-2	3	220.319	1	259.016	4
83		4	max	.002	5	.029	3	.016	1	2.845e-2	1	NC	5	NC	1
84			min	-.267	1	-.46	1	-.52	5	-9.702e-3	3	266.725	1	281.726	4
85		5	max	.002	5	.008	3	.017	1	2.532e-2	1	NC	5	NC	1
86			min	-.267	1	-.364	1	-.477	5	-8.984e-3	3	330.013	1	310.065	4
87		6	max	.002	5	.001	5	.015	1	2.436e-2	1	NC	5	NC	1
88			min	-.266	1	-.283	1	-.432	4	-9.035e-3	3	412.168	1	345.594	4
89		7	max	.002	5	.002	5	.007	1	2.488e-2	1	NC	5	NC	2
90			min	-.266	1	-.216	1	-.389	4	-9.619e-3	3	517.326	1	388.916	4
91		8	max	.002	5	.002	5	.002	2	2.541e-2	1	NC	5	NC	2
92			min	-.265	1	-.16	1	-.347	4	-1.02e-2	3	661.413	1	442.528	4
93		9	max	.002	5	.002	5	0	3	2.485e-2	1	NC	4	NC	2
94			min	-.264	1	-.108	1	-.307	4	-1.095e-2	3	888.302	1	510.846	4
95		10	max	.002	5	.002	5	0	3	2.235e-2	1	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.264	1	-.058	1	-.266	4	-1.198e-2	3	984.954	3	605.552	4
97		11	max	.002	5	.002	5	.002	1	1.985e-2	1	NC	4	NC	2
98			min	-.263	1	-.031	3	-.225	4	-1.3e-2	3	989.184	3	743.451	4
99		12	max	.002	5	.032	1	.01	1	1.482e-2	1	NC	1	NC	2
100			min	-.262	1	-.028	3	-.184	4	-1.051e-2	3	1016.637	3	958.42	4
101		13	max	.002	5	.069	1	.013	1	8.376e-3	1	NC	5	NC	1
102			min	-.261	1	-.018	3	-.147	5	-6.027e-3	3	1100.896	3	1316.654	4
103		14	max	.002	5	.093	1	.008	2	2.165e-3	1	NC	5	NC	2
104			min	-.26	1	0	5	-.116	4	-4.369e-3	5	1339.268	3	1872.042	4
105		15	max	.002	5	.1	1	.002	2	6.526e-3	1	NC	5	NC	2
106			min	-.26	1	-.004	5	-.096	4	-6.279e-3	3	2145.157	3	2611.373	4
107		16	max	.002	5	.093	1	0	10	1.089e-2	1	NC	3	NC	2
108			min	-.261	1	-.007	5	-.081	4	-1.082e-2	3	2657.591	1	3649.104	4
109		17	max	.002	5	.148	3	0	10	1.525e-2	1	NC	5	NC	2
110			min	-.261	1	-.011	5	-.069	4	-1.535e-2	3	3046.693	3	4405.157	1
111		18	max	.002	5	.208	3	.008	1	1.809e-2	1	NC	4	NC	2
112			min	-.261	1	-.016	5	-.057	5	-1.831e-2	3	1290.522	3	8001.011	1
113		19	max	.002	5	.268	3	.025	1	1.809e-2	1	NC	1	NC	1
114			min	-.261	1	-.02	5	-.048	5	-1.831e-2	3	819.173	3	NC	1
115	M10	1	max	.002	1	.187	3	.261	1	8.026e-3	3	NC	1	NC	1
116			min	-.061	4	-.014	5	-.002	5	-2.385e-3	1	NC	1	NC	1
117		2	max	.002	1	.479	3	.338	1	9.395e-3	3	NC	5	NC	3
118			min	-.061	4	-.219	1	.009	12	-3.088e-3	1	946.701	3	3561.365	1
119		3	max	.002	1	.747	3	.464	1	1.076e-2	3	NC	5	NC	3
120			min	-.062	4	-.474	1	.013	12	-3.792e-3	1	493.489	3	1359.306	1
121		4	max	.001	1	.939	3	.591	1	1.213e-2	3	NC	5	NC	3
122			min	-.062	4	-.64	1	.015	12	-4.496e-3	1	367.313	3	835.061	1
123		5	max	.001	1	1.026	3	.689	1	1.35e-2	3	NC	5	NC	3
124			min	-.062	4	-.69	1	.014	12	-5.199e-3	1	329.055	3	644.748	1
125		6	max	0	1	1.002	3	.739	1	1.487e-2	3	NC	5	NC	3
126			min	-.062	4	-.618	1	.011	12	-5.903e-3	1	338.678	3	577.192	1
127		7	max	0	1	.883	3	.738	1	1.624e-2	3	NC	5	NC	3
128			min	-.062	4	-.445	1	.006	12	-6.606e-3	1	396.459	3	577.926	1
129		8	max	0	1	.709	3	.698	1	1.761e-2	3	NC	5	NC	3
130			min	-.062	4	-.218	1	-.003	3	-7.31e-3	1	529.342	3	631.166	1
131		9	max	0	1	.54	3	.643	1	1.897e-2	3	NC	4	NC	3
132			min	-.062	4	-.009	14	-.011	3	-8.014e-3	1	783.423	3	721.288	1
133		10	max	0	1	.46	3	.614	1	2.034e-2	3	NC	1	NC	3
134			min	-.062	4	.003	15	-.015	3	-8.717e-3	1	1010.264	3	781.266	1
135		11	max	0	3	.54	3	.643	1	1.897e-2	3	NC	4	NC	3
136			min	-.062	4	-.009	9	-.011	3	-8.014e-3	1	783.423	3	721.288	1
137		12	max	0	3	.709	3	.698	1	1.761e-2	3	NC	5	NC	3
138			min	-.062	4	-.218	1	-.003	3	-7.31e-3	1	529.342	3	631.166	1
139		13	max	0	3	.883	3	.738	1	1.624e-2	3	NC	5	NC	3
140			min	-.062	4	-.445	1	.006	12	-6.606e-3	1	396.459	3	577.926	1
141		14	max	0	3	1.002	3	.739	1	1.487e-2	3	NC	5	NC	3
142			min	-.062	4	-.618	1	.011	12	-5.903e-3	1	338.678	3	577.192	1
143		15	max	0	3	1.026	3	.689	1	1.35e-2	3	NC	5	NC	3
144			min	-.062	4	-.69	1	.014	12	-5.199e-3	1	329.055	3	644.748	1
145		16	max	0	3	.939	3	.591	1	1.213e-2	3	NC	5	NC	3
146			min	-.062	4	-.64	1	.015	12	-4.496e-3	1	367.313	3	835.061	1
147		17	max	0	3	.747	3	.464	1	1.076e-2	3	NC	5	NC	3
148			min	-.062	4	-.474	1	.013	12	-3.792e-3	1	493.489	3	1359.306	1
149		18	max	0	3	.479	3	.338	1	9.395e-3	3	NC	5	NC	3
150			min	-.062	4	-.219	1	.009	12	-3.088e-3	1	946.701	3	3561.365	1
151		19	max	0	3	.187	3	.261	1	8.026e-3	3	NC	1	NC	1
152			min	-.062	4	.015	15	.005	12	-2.385e-3	1	7681.883	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.004	1	.005	1	.263	1	5.927e-3	1	NC	1	NC	1
154			min	-.21	4	-.03	3	-.002	5	-4.897e-5	5	NC	1	NC	1
155		2	max	.004	1	.191	3	.329	1	6.875e-3	1	NC	5	NC	3
156			min	-.21	4	-.292	1	0	3	9.891e-6	15	929.649	1	3981.421	4
157		3	max	.003	1	.398	3	.449	1	7.822e-3	1	NC	5	NC	3
158			min	-.21	4	-.553	1	0	3	6.06e-5	15	494.432	1	1482.657	1
159		4	max	.003	1	.539	3	.575	1	8.77e-3	1	NC	5	NC	3
160			min	-.211	4	-.724	1	0	3	1.113e-4	15	378.476	1	883.864	1
161		5	max	.002	1	.585	3	.674	1	9.717e-3	1	NC	5	NC	3
162			min	-.211	4	-.776	1	0	3	1.62e-4	15	353.562	1	670.365	1
163		6	max	.002	1	.527	3	.728	1	1.066e-2	1	NC	5	NC	3
164			min	-.211	4	-.704	1	-.003	3	1.799e-4	12	389.57	1	592.461	1
165		7	max	.001	1	.384	3	.733	1	1.161e-2	1	NC	5	NC	3
166			min	-.211	4	-.529	1	-.013	5	1.576e-4	12	516.567	1	586.843	1
167		8	max	0	1	.192	3	.698	1	1.256e-2	1	NC	5	NC	3
168			min	-.211	4	-.3	1	-.03	5	1.354e-4	12	904.805	1	634.449	1
169		9	max	0	1	.012	3	.647	1	1.351e-2	1	NC	4	NC	3
170			min	-.211	4	-.088	1	-.021	5	1.132e-4	12	2965.762	1	718.377	1
171		10	max	0	1	.009	1	.619	1	1.445e-2	1	NC	1	NC	3
172			min	-.212	4	-.07	3	-.016	3	9.093e-5	12	6978.637	3	774.524	1
173		11	max	0	3	.012	3	.647	1	1.351e-2	1	NC	4	NC	3
174			min	-.212	4	-.088	1	-.014	3	1.132e-4	12	2965.762	1	718.377	1
175		12	max	0	3	.192	3	.698	1	1.256e-2	1	NC	5	NC	3
176			min	-.212	4	-.3	1	-.01	3	1.354e-4	12	904.805	1	634.449	1
177		13	max	0	3	.384	3	.733	1	1.161e-2	1	NC	5	NC	3
178			min	-.212	4	-.529	1	-.006	3	1.576e-4	12	516.567	1	586.843	1
179		14	max	.001	3	.527	3	.728	1	1.066e-2	1	NC	15	NC	3
180			min	-.212	4	-.704	1	-.003	3	1.799e-4	12	389.57	1	592.461	1
181		15	max	.002	3	.585	3	.674	1	9.717e-3	1	8221.403	15	NC	3
182			min	-.212	4	-.776	1	0	3	2.021e-4	12	353.562	1	670.365	1
183		16	max	.002	3	.539	3	.575	1	8.77e-3	1	7912.655	15	NC	3
184			min	-.212	4	-.724	1	-.015	5	2.243e-4	12	378.476	1	883.864	1
185		17	max	.002	3	.398	3	.449	1	7.822e-3	1	9222.508	15	NC	3
186			min	-.212	4	-.553	1	-.033	5	2.466e-4	12	494.432	1	1482.657	1
187		18	max	.003	3	.191	3	.329	1	6.875e-3	1	NC	5	NC	3
188			min	-.212	4	-.292	1	-.023	5	2.688e-4	12	929.649	1	4161.642	1
189		19	max	.003	3	.005	1	.263	1	5.927e-3	1	NC	1	NC	1
190			min	-.212	4	-.03	3	.005	12	2.91e-4	12	NC	1	NC	1
191	M12	1	max	0	2	.002	5	.265	1	6.937e-3	1	NC	1	NC	1
192			min	-.321	4	-.127	1	-.002	5	-5.347e-4	3	NC	1	NC	1
193		2	max	0	2	.126	3	.318	1	7.982e-3	1	NC	5	NC	2
194			min	-.321	4	-.521	1	.006	12	-7.065e-4	3	699.44	1	4011.098	4
195		3	max	0	2	.248	3	.432	1	9.028e-3	1	NC	5	NC	3
196			min	-.321	4	-.862	1	.008	12	-8.783e-4	3	375.387	1	1653.172	1
197		4	max	0	2	.32	3	.556	1	1.007e-2	1	NC	5	NC	3
198			min	-.321	4	-1.089	1	.01	12	-1.05e-3	3	286.978	1	946.841	1
199		5	max	0	2	.333	3	.658	1	1.112e-2	1	NC	15	NC	3
200			min	-.321	4	-1.17	1	.009	12	-1.222e-3	3	264.688	1	702.181	1
201		6	max	0	2	.29	3	.716	1	1.216e-2	1	NC	15	NC	3
202			min	-.321	4	-1.102	1	.006	12	-1.394e-3	3	282.901	1	610.97	1
203		7	max	0	2	.204	3	.726	1	1.321e-2	1	NC	5	NC	3
204			min	-.321	4	-.913	1	-.018	5	-1.566e-3	3	350.901	1	597.507	1
205		8	max	0	2	.095	3	.697	1	1.426e-2	1	NC	5	NC	3
206			min	-.321	4	-.657	1	-.034	5	-1.738e-3	3	520.241	1	638.491	1
207		9	max	0	2	-.002	12	.65	1	1.53e-2	1	NC	3	NC	3
208			min	-.321	4	-.418	1	-.024	5	-1.909e-3	3	947.491	1	715.483	1
209		10	max	0	1	-.009	15	.624	1	1.635e-2	1	NC	3	NC	3

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	-.321	4	-.308	1	-.018	3	-2.081e-3	3	1521.456	1	767.466	1
211		11	max	0	9	-.002	12	.65	1	1.53e-2	1	NC	3	NC	3
212			min	-.321	4	-.418	1	-.015	3	-1.909e-3	3	947.491	1	715.483	1
213		12	max	0	9	.095	3	.697	1	1.426e-2	1	NC	5	NC	3
214			min	-.321	4	-.657	1	-.008	3	-1.738e-3	3	520.241	1	638.491	1
215		13	max	0	9	.204	3	.726	1	1.321e-2	1	NC	15	NC	3
216			min	-.321	4	-.913	1	0	3	-1.566e-3	3	350.901	1	597.507	1
217		14	max	0	9	.29	3	.716	1	1.216e-2	1	8837.402	15	NC	3
218			min	-.321	4	-1.102	1	.006	12	-1.394e-3	3	282.901	1	610.97	1
219		15	max	0	9	.333	3	.658	1	1.112e-2	1	7992.166	15	NC	3
220			min	-.321	4	-1.17	1	.009	12	-1.222e-3	3	264.688	1	702.181	1
221		16	max	0	9	.32	3	.556	1	1.007e-2	1	8327.681	15	NC	3
222			min	-.321	4	-1.089	1	-.017	5	-1.05e-3	3	286.978	1	946.841	1
223		17	max	0	9	.248	3	.432	1	9.028e-3	1	NC	15	NC	3
224			min	-.321	4	-.862	1	-.036	5	-8.783e-4	3	375.387	1	1653.172	1
225		18	max	0	9	.126	3	.318	1	7.982e-3	1	NC	5	NC	2
226			min	-.321	4	-.521	1	-.026	5	-7.065e-4	3	699.44	1	5146.879	1
227		19	max	0	9	-.01	15	.265	1	6.937e-3	1	NC	1	NC	1
228			min	-.321	4	-.127	1	.004	12	-5.347e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.07	3	.267	1	1.47e-2	1	NC	1	NC	1
230			min	-.588	4	-.637	1	-.002	5	-3.411e-3	3	NC	1	NC	1
231		2	max	0	3	.235	3	.352	1	1.716e-2	1	NC	5	NC	3
232			min	-.588	4	-1.153	1	.006	12	-4.153e-3	3	535.447	1	3250.929	1
233		3	max	0	3	.377	3	.482	1	1.961e-2	1	NC	15	NC	3
234			min	-.588	4	-1.612	1	.008	12	-4.895e-3	3	283.126	1	1282.924	1
235		4	max	0	3	.476	3	.612	1	2.207e-2	1	NC	15	NC	3
236			min	-.588	4	-1.952	1	.009	12	-5.636e-3	3	209.931	1	799.834	1
237		5	max	0	3	.52	3	.71	1	2.452e-2	1	8544.657	15	NC	3
238			min	-.588	4	-2.138	1	.008	12	-6.378e-3	3	183.937	1	622.506	1
239		6	max	0	3	.509	3	.76	1	2.698e-2	1	8076.649	15	NC	3
240			min	-.588	4	-2.164	1	.005	3	-7.12e-3	3	180.82	1	559.867	1
241		7	max	0	3	.452	3	.758	1	2.943e-2	1	8368.316	15	NC	3
242			min	-.588	4	-2.053	1	-.002	3	-7.862e-3	3	195.014	1	561.978	1
243		8	max	0	3	.368	3	.716	1	3.189e-2	1	9299.179	15	NC	3
244			min	-.588	4	-1.856	1	-.011	5	-8.604e-3	3	226.421	1	614.235	1
245		9	max	0	3	.288	3	.66	1	3.434e-2	1	NC	15	NC	3
246			min	-.588	4	-1.655	1	-.016	3	-9.346e-3	3	271.132	1	701.504	1
247		10	max	0	1	.25	3	.63	1	3.68e-2	1	NC	15	NC	3
248			min	-.588	4	-1.559	1	-.02	3	-1.009e-2	3	299.492	1	759.219	1
249		11	max	0	1	.288	3	.66	1	3.434e-2	1	NC	15	NC	3
250			min	-.587	4	-1.655	1	-.016	3	-9.346e-3	3	271.132	1	701.504	1
251		12	max	0	1	.368	3	.716	1	3.189e-2	1	8362.026	15	NC	3
252			min	-.587	4	-1.856	1	-.01	3	-8.604e-3	3	226.421	1	614.235	1
253		13	max	0	1	.452	3	.758	1	2.943e-2	1	7047.626	15	NC	3
254			min	-.587	4	-2.053	1	-.002	3	-7.862e-3	3	195.014	1	561.978	1
255		14	max	.001	1	.509	3	.76	1	2.698e-2	1	6395.503	15	NC	3
256			min	-.587	4	-2.164	1	.005	3	-7.12e-3	3	180.82	1	559.867	1
257		15	max	.001	1	.52	3	.71	1	2.452e-2	1	6359.586	15	NC	3
258			min	-.587	4	-2.138	1	.008	15	-6.378e-3	3	183.937	1	622.506	1
259		16	max	.002	1	.476	3	.612	1	2.207e-2	1	7073.902	15	NC	3
260			min	-.587	4	-1.952	1	-.014	5	-5.636e-3	3	209.931	1	799.834	1
261		17	max	.002	1	.377	3	.482	1	1.961e-2	1	9248.792	15	NC	3
262			min	-.587	4	-1.612	1	-.028	5	-4.895e-3	3	283.126	1	1282.924	1
263		18	max	.002	1	.235	3	.352	1	1.716e-2	1	NC	5	NC	3
264			min	-.587	4	-1.153	1	-.017	5	-4.153e-3	3	535.447	1	3250.929	1
265		19	max	.002	1	.07	3	.267	1	1.47e-2	1	NC	1	NC	1
266			min	-.587	4	-.637	1	.004	12	-3.411e-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	2.03e-3	1	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.961e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.002	5	4.06e-3	1	NC	1	NC	1
272			min	0	1	-.004	1	0	1	-3.923e-3	5	NC	1	NC	1
273		4	max	0	3	0	12	.005	5	6.09e-3	1	NC	3	NC	1
274			min	0	1	-.01	1	-.001	1	-5.884e-3	5	5635.576	1	NC	1
275		5	max	0	3	0	12	.009	5	7.736e-3	1	NC	3	NC	1
276			min	0	1	-.017	1	-.002	1	-7.544e-3	5	3160.567	1	6231.996	5
277		6	max	0	3	-.001	12	.013	5	7.037e-3	1	NC	3	NC	1
278			min	0	1	-.027	1	-.003	1	-7.363e-3	5	2008.426	1	4101.005	5
279		7	max	0	3	-.001	12	.018	5	6.338e-3	1	NC	3	NC	2
280			min	0	1	-.038	1	-.004	1	-7.182e-3	5	1396.895	1	2925.582	5
281		8	max	0	3	-.002	12	.024	5	5.639e-3	1	NC	3	NC	2
282			min	0	1	-.052	1	-.004	1	-7.001e-3	5	1033.668	1	2207.511	5
283		9	max	0	3	-.002	12	.031	5	4.94e-3	1	NC	3	NC	2
284			min	0	1	-.067	1	-.005	1	-6.82e-3	5	799.979	1	1735.593	5
285		10	max	0	3	-.002	12	.038	5	4.24e-3	1	NC	3	NC	2
286			min	0	1	-.084	1	-.006	1	-6.638e-3	5	640.771	1	1408.641	5
287		11	max	0	3	-.003	12	.046	5	3.541e-3	1	NC	3	NC	2
288			min	-.001	1	-.102	1	-.006	1	-6.457e-3	5	527.301	1	1172.47	5
289		12	max	0	3	-.003	12	.054	5	2.842e-3	1	NC	3	NC	2
290			min	-.001	1	-.121	1	-.006	1	-6.276e-3	5	443.495	1	996.129	5
291		13	max	0	3	-.003	12	.062	5	2.187e-3	2	NC	3	NC	2
292			min	-.001	1	-.141	1	-.006	1	-6.095e-3	5	379.828	1	860.952	5
293		14	max	0	3	-.004	12	.071	5	1.596e-3	2	NC	3	NC	2
294			min	-.001	1	-.162	1	-.005	1	-5.914e-3	5	330.296	1	755.008	5
295		15	max	0	3	-.004	12	.08	4	1.006e-3	2	NC	12	NC	2
296			min	-.001	1	-.184	1	-.003	1	-5.733e-3	5	290.997	1	668.48	4
297		16	max	0	3	-.004	12	.09	4	4.152e-4	2	NC	12	NC	2
298			min	-.001	1	-.207	1	-.003	3	-5.628e-3	4	259.301	1	597.773	4
299		17	max	0	3	-.005	12	.099	4	4.448e-4	3	NC	12	NC	2
300			min	-.002	1	-.23	1	-.006	3	-5.551e-3	4	233.37	1	539.615	4
301		18	max	0	3	-.005	12	.109	4	7.137e-4	3	NC	12	NC	1
302			min	-.002	1	-.253	1	-.009	3	-5.473e-3	4	211.902	1	491.227	4
303		19	max	0	3	-.005	12	.119	4	9.826e-4	3	9969.912	12	NC	1
304			min	-.002	1	-.276	1	-.013	3	-5.395e-3	4	193.945	1	450.567	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-2.092e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.002	4	0	1	NC	3	NC	1
310			min	0	1	-.009	1	0	1	-4.184e-3	4	5704.568	1	NC	1
311		4	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
312			min	0	1	-.021	1	0	1	-6.276e-3	4	2499.397	1	NC	1
313		5	max	0	3	0	12	.009	4	0	1	NC	3	NC	1
314			min	-.001	1	-.039	1	0	1	-8.044e-3	4	1388.467	1	5931.204	4
315		6	max	0	3	0	12	.014	4	0	1	NC	3	NC	1
316			min	-.002	1	-.061	1	0	1	-7.826e-3	4	874.423	1	3907.042	4
317		7	max	.001	3	0	12	.019	4	0	1	NC	3	NC	1
318			min	-.002	1	-.089	1	0	1	-7.609e-3	4	604.536	1	2789.994	4
319		8	max	.001	3	0	3	.025	4	0	1	NC	3	NC	1
320			min	-.002	1	-.12	1	0	1	-7.391e-3	4	445.439	1	2107.499	4
321		9	max	.001	3	0	3	.032	4	0	1	NC	3	NC	1
322			min	-.002	1	-.156	1	0	1	-7.174e-3	4	343.642	1	1658.982	4
323		10	max	.001	3	.002	3	.04	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	1	-.195	1	0	1	-6.956e-3	4	274.581	1	1348.278	4
325		11	max	.002	3	.003	3	.048	4	0	1	NC	3	NC	1
326			min	-.003	1	-.238	1	0	1	-6.739e-3	4	225.523	1	1123.891	4
327		12	max	.002	3	.004	3	.056	4	0	1	NC	3	NC	1
328			min	-.003	1	-.283	1	0	1	-6.521e-3	4	189.385	1	956.403	4
329		13	max	.002	3	.005	3	.065	4	0	1	NC	3	NC	1
330			min	-.003	1	-.331	1	0	1	-6.304e-3	4	161.992	1	828.069	4
331		14	max	.002	3	.007	3	.074	4	0	1	NC	12	NC	1
332			min	-.004	1	-.381	1	0	1	-6.086e-3	4	140.719	1	727.552	4
333		15	max	.002	3	.008	3	.083	4	0	1	NC	12	NC	1
334			min	-.004	1	-.433	1	0	1	-5.869e-3	4	123.867	1	647.389	4
335		16	max	.002	3	.01	3	.092	4	0	1	NC	12	NC	1
336			min	-.004	1	-.486	1	0	1	-5.651e-3	4	110.293	1	582.492	4
337		17	max	.003	3	.012	3	.101	4	0	1	NC	12	NC	1
338			min	-.004	1	-.541	1	0	1	-5.434e-3	4	99.201	1	529.287	4
339		18	max	.003	3	.013	3	.111	4	0	1	8635.028	12	NC	1
340			min	-.005	1	-.596	1	0	1	-5.217e-3	4	90.028	1	485.212	4
341		19	max	.003	3	.015	3	.12	4	0	1	7571.39	12	NC	1
342			min	-.005	1	-.651	1	0	1	-4.999e-3	4	82.362	1	448.386	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	7.305e-4	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-2.422e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.002	4	1.461e-3	3	NC	1	NC	1
348			min	0	1	-.004	1	0	3	-4.845e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.005	4	2.192e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	0	3	-7.267e-3	4	5635.576	1	9982.319	4
351		5	max	0	3	0	5	.009	4	2.782e-3	3	NC	3	NC	1
352			min	0	1	-.017	1	-.001	3	-9.301e-3	4	3160.567	1	5812.92	4
353		6	max	0	3	0	5	.014	4	2.513e-3	3	NC	3	NC	1
354			min	0	1	-.027	1	-.002	3	-8.958e-3	4	2008.426	1	3841.653	4
355		7	max	0	3	0	5	.019	4	2.244e-3	3	NC	3	NC	2
356			min	0	1	-.038	1	-.002	3	-8.614e-3	4	1396.895	1	2750.954	4
357		8	max	0	3	0	5	.026	4	1.975e-3	3	NC	3	NC	2
358			min	0	1	-.052	1	-.003	3	-8.27e-3	4	1033.668	1	2083.482	4
359		9	max	0	3	0	5	.033	4	1.706e-3	3	NC	3	NC	2
360			min	0	1	-.067	1	-.003	3	-7.927e-3	4	799.979	1	1644.391	4
361		10	max	0	3	0	5	.04	4	1.437e-3	3	NC	3	NC	2
362			min	0	1	-.084	1	-.003	3	-7.583e-3	4	640.771	1	1340.014	4
363		11	max	0	3	0	5	.048	4	1.168e-3	3	NC	3	NC	2
364			min	-.001	1	-.102	1	-.003	3	-7.24e-3	4	527.301	1	1120.122	4
365		12	max	0	3	0	5	.056	4	8.996e-4	3	NC	3	NC	2
366			min	-.001	1	-.121	1	-.002	3	-6.896e-3	4	443.495	1	955.993	4
367		13	max	0	3	.001	5	.065	4	6.307e-4	3	NC	3	NC	2
368			min	-.001	1	-.141	1	-.002	3	-6.552e-3	4	379.828	1	830.274	4
369		14	max	0	3	.001	5	.073	4	3.618e-4	3	NC	3	NC	2
370			min	-.001	1	-.162	1	0	3	-6.209e-3	4	330.296	1	731.88	4
371		15	max	0	3	.001	5	.082	4	9.293e-5	3	NC	5	NC	2
372			min	-.001	1	-.184	1	0	10	-5.865e-3	4	290.997	1	653.513	4
373		16	max	0	3	.001	5	.091	4	1.318e-4	9	NC	5	NC	2
374			min	-.001	1	-.207	1	0	10	-5.529e-3	5	259.301	1	590.188	4
375		17	max	0	3	.002	5	.1	4	6.537e-4	1	NC	5	NC	2
376			min	-.002	1	-.23	1	-.003	2	-5.292e-3	5	233.37	1	538.415	4
377		18	max	0	3	.002	5	.108	4	1.353e-3	1	NC	5	NC	1
378			min	-.002	1	-.253	1	-.005	2	-5.054e-3	5	211.902	1	495.686	4
379		19	max	0	3	.002	5	.117	4	2.052e-3	1	NC	5	NC	1
380			min	-.002	1	-.276	1	-.008	2	-4.817e-3	5	193.945	1	460.166	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.015	1	0	12	.008	5	2.283e-3	1	NC	1	NC	1
382			min	0	12	-.005	1	-.002	1	-1.189e-3	5	NC	1	NC	1
383		2	max	.014	1	0	12	.035	5	3.195e-3	1	NC	1	NC	5
384			min	0	12	-.029	1	-.028	1	-1.247e-3	5	NC	1	2324.001	1
385		3	max	.013	1	-.001	12	.062	5	4.106e-3	1	NC	1	NC	5
386			min	0	12	-.053	1	-.054	1	-1.449e-3	3	NC	1	1178.715	1
387		4	max	.013	1	-.002	12	.089	5	5.017e-3	1	NC	1	NC	5
388			min	.001	12	-.077	1	-.078	1	-1.791e-3	3	NC	1	801.884	1
389		5	max	.012	1	-.002	12	.115	5	5.929e-3	1	NC	1	NC	15
390			min	.001	15	-.101	1	-.1	1	-2.134e-3	3	NC	1	617.614	1
391		6	max	.011	1	-.002	12	.142	5	6.84e-3	1	NC	1	NC	15
392			min	.001	15	-.124	1	-.121	1	-2.476e-3	3	NC	1	510.884	1
393		7	max	.011	1	-.003	12	.169	5	7.751e-3	1	NC	1	9147.257	15
394			min	.001	15	-.148	1	-.138	1	-2.818e-3	3	NC	1	443.532	1
395		8	max	.01	1	-.003	12	.195	5	8.663e-3	1	NC	1	8088.97	15
396			min	.001	15	-.171	1	-.153	1	-3.161e-3	3	NC	1	379.447	4
397		9	max	.01	1	-.003	12	.222	5	9.574e-3	1	NC	1	7394.106	15
398			min	.001	15	-.195	1	-.164	1	-3.503e-3	3	NC	1	330.38	4
399		10	max	.009	1	-.003	12	.247	5	1.049e-2	1	NC	1	6961.551	15
400			min	.001	15	-.218	1	-.172	1	-3.845e-3	3	NC	1	292.179	4
401		11	max	.008	1	-.004	12	.273	5	1.14e-2	1	NC	1	6741.661	15
402			min	0	15	-.241	1	-.174	1	-4.187e-3	3	NC	1	261.578	4
403		12	max	.008	1	-.004	12	.298	5	1.231e-2	1	NC	1	6719.499	15
404			min	0	15	-.264	1	-.172	1	-4.53e-3	3	NC	1	236.501	4
405		13	max	.007	1	-.004	12	.323	5	1.322e-2	1	NC	1	6912.689	15
406			min	0	10	-.287	1	-.165	1	-4.872e-3	3	NC	1	215.562	4
407		14	max	.006	1	-.004	12	.347	5	1.413e-2	1	NC	1	7384.027	15
408			min	0	10	-.31	1	-.152	1	-5.214e-3	3	NC	1	197.804	4
409		15	max	.006	1	-.004	12	.371	5	1.504e-2	1	NC	1	8283.8	15
410			min	0	10	-.332	1	-.132	1	-5.557e-3	3	NC	1	182.541	4
411		16	max	.005	1	-.003	12	.394	5	1.595e-2	1	NC	1	9984.369	15
412			min	0	10	-.355	1	-.106	1	-5.899e-3	3	NC	1	169.273	4
413		17	max	.004	1	-.003	3	.417	5	1.687e-2	1	NC	1	NC	15
414			min	0	10	-.378	1	-.073	1	-6.241e-3	3	NC	1	157.622	4
415		18	max	.004	3	-.003	3	.439	5	1.778e-2	1	NC	1	NC	5
416			min	0	10	-.4	1	-.033	2	-6.583e-3	3	NC	1	147.303	4
417		19	max	.005	3	-.003	3	.466	4	1.869e-2	1	NC	1	NC	1
418			min	0	10	-.423	1	-.001	3	-6.926e-3	3	NC	1	138.091	4
419	M6	1	max	.034	1	0	3	.008	4	0	1	NC	1	NC	1
420			min	0	12	-.013	1	0	1	-1.292e-3	4	NC	1	NC	1
421		2	max	.032	1	.002	3	.037	4	0	1	NC	1	NC	1
422			min	0	15	-.069	1	0	1	-1.415e-3	4	NC	1	NC	1
423		3	max	.03	1	.004	3	.066	4	0	1	NC	1	NC	1
424			min	0	15	-.125	1	0	1	-1.538e-3	4	NC	1	NC	1
425		4	max	.028	1	.007	3	.094	4	0	1	NC	1	NC	1
426			min	0	15	-.18	1	0	1	-1.661e-3	4	9831.586	3	6873.074	4
427		5	max	.026	1	.009	3	.122	4	0	1	NC	1	NC	1
428			min	0	15	-.236	1	0	1	-1.784e-3	4	7313.243	3	5207.657	4
429		6	max	.024	1	.011	3	.151	4	0	1	NC	1	NC	1
430			min	0	15	-.292	1	0	1	-1.907e-3	4	5792.508	3	4247.988	4
431		7	max	.022	1	.013	3	.179	4	0	1	NC	1	NC	1
432			min	0	15	-.348	1	0	1	-2.03e-3	4	4772.145	3	3644.372	4
433		8	max	.02	1	.016	3	.206	4	0	1	NC	1	NC	1
434			min	0	15	-.403	1	0	1	-2.154e-3	4	4039.009	3	3248.948	4
435		9	max	.019	1	.018	3	.233	4	0	1	NC	1	NC	1
436			min	0	15	-.459	1	0	1	-2.277e-3	4	3486.467	3	2990.17	4
437		10	max	.017	1	.021	3	.26	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	-.514	1	0	1	-2.4e-3	4	3055.209	3	2831.415	4
439		11	max	.015	1	.024	3	.286	4	0	1	NC	1	NC	1
440			min	0	15	-.569	1	0	1	-2.523e-3	4	2709.582	3	2755.15	4
441		12	max	.013	1	.026	3	.311	4	0	1	NC	1	NC	1
442			min	0	15	-.624	1	0	1	-2.646e-3	4	2426.831	3	2757.044	4
443		13	max	.011	1	.029	3	.336	4	0	1	NC	1	NC	1
444			min	0	15	-.679	1	0	1	-2.769e-3	4	2191.727	3	2845.6	4
445		14	max	.01	3	.032	3	.36	4	0	1	NC	1	NC	1
446			min	0	10	-.734	1	0	1	-2.893e-3	4	1993.676	3	3047.668	4
447		15	max	.01	3	.035	3	.383	4	0	1	NC	1	NC	1
448			min	0	10	-.789	1	0	1	-3.016e-3	4	1825.068	3	3426.171	4
449		16	max	.011	3	.038	3	.406	4	0	1	NC	1	NC	1
450			min	-.002	10	-.844	1	0	1	-3.139e-3	4	1680.286	3	4136.07	4
451		17	max	.011	3	.041	3	.427	4	0	1	NC	1	NC	1
452			min	-.003	2	-.899	1	0	1	-3.262e-3	4	1555.089	3	5650.573	4
453		18	max	.012	3	.044	3	.447	4	0	1	NC	1	NC	1
454			min	-.005	2	-.953	1	0	1	-3.385e-3	4	1446.213	3	NC	1
455		19	max	.013	3	.047	3	.467	4	0	1	NC	1	NC	1
456			min	-.006	2	-1.008	1	0	1	-3.508e-3	4	1351.104	3	NC	1
457	M9	1	max	.015	1	0	5	.009	4	7.645e-4	3	NC	1	NC	1
458			min	0	5	-.005	1	-.001	3	-2.283e-3	1	NC	1	NC	1
459		2	max	.014	1	0	15	.041	4	1.107e-3	3	NC	1	NC	5
460			min	0	5	-.029	1	-.011	3	-3.195e-3	1	NC	1	2324.001	1
461		3	max	.013	1	0	15	.074	4	1.449e-3	3	NC	1	NC	15
462			min	0	5	-.053	1	-.02	3	-4.106e-3	1	NC	1	1178.715	1
463		4	max	.013	1	0	15	.107	4	1.791e-3	3	NC	1	8392.462	15
464			min	0	5	-.077	1	-.029	3	-5.017e-3	1	NC	1	801.884	1
465		5	max	.012	1	0	15	.139	4	2.134e-3	3	NC	1	6372.015	15
466			min	0	5	-.101	1	-.037	3	-5.929e-3	1	NC	1	617.614	1
467		6	max	.011	1	0	15	.17	4	2.476e-3	3	NC	1	5206.571	15
468			min	0	5	-.124	1	-.044	3	-6.84e-3	1	NC	1	510.884	1
469		7	max	.011	1	0	15	.201	4	2.818e-3	3	NC	1	4472.901	15
470			min	0	5	-.148	1	-.051	3	-7.751e-3	1	NC	1	443.532	1
471		8	max	.01	1	0	15	.231	4	3.161e-3	3	NC	1	3992.01	15
472			min	0	5	-.171	1	-.056	3	-8.663e-3	1	NC	1	399.417	1
473		9	max	.01	1	0	15	.259	4	3.503e-3	3	NC	1	3677.289	15
474			min	0	5	-.195	1	-.06	3	-9.574e-3	1	NC	1	370.75	1
475		10	max	.009	1	0	15	.287	4	3.845e-3	3	NC	1	3484.434	15
476			min	0	5	-.218	1	-.063	3	-1.049e-2	1	NC	1	353.582	1
477		11	max	.008	1	0	15	.313	4	4.187e-3	3	NC	1	3392.309	15
478			min	0	5	-.241	1	-.064	3	-1.14e-2	1	NC	1	346.101	1
479		12	max	.008	1	0	15	.338	4	4.53e-3	3	NC	1	3395.852	15
480			min	0	5	-.264	1	-.064	3	-1.231e-2	1	NC	1	348.016	1
481		13	max	.007	1	0	15	.361	4	4.872e-3	3	NC	1	3505.697	15
482			min	0	5	-.287	1	-.062	3	-1.322e-2	1	NC	1	360.583	1
483		14	max	.006	1	0	15	.383	4	5.214e-3	3	NC	1	3755.006	15
484			min	0	5	-.31	1	-.057	3	-1.413e-2	1	NC	1	387.342	1
485		15	max	.006	1	0	15	.402	4	5.557e-3	3	NC	1	4221.303	15
486			min	0	5	-.332	1	-.051	3	-1.504e-2	1	NC	1	436.402	1
487		16	max	.005	1	0	15	.42	4	5.899e-3	3	NC	1	5095.376	15
488			min	0	5	-.355	1	-.042	3	-1.595e-2	1	NC	1	527.598	1
489		17	max	.004	1	.001	15	.435	4	6.241e-3	3	NC	1	6959.725	15
490			min	0	5	-.378	1	-.03	3	-1.687e-2	1	NC	1	721.372	1
491		18	max	.004	3	.001	15	.448	4	6.583e-3	3	NC	1	NC	15
492			min	0	5	-.4	1	-.016	3	-1.778e-2	1	NC	1	1321.259	1
493		19	max	.005	3	.002	15	.459	5	6.926e-3	3	NC	1	NC	1
494			min	0	10	-.423	1	-.017	1	-1.869e-2	1	NC	1	NC	1