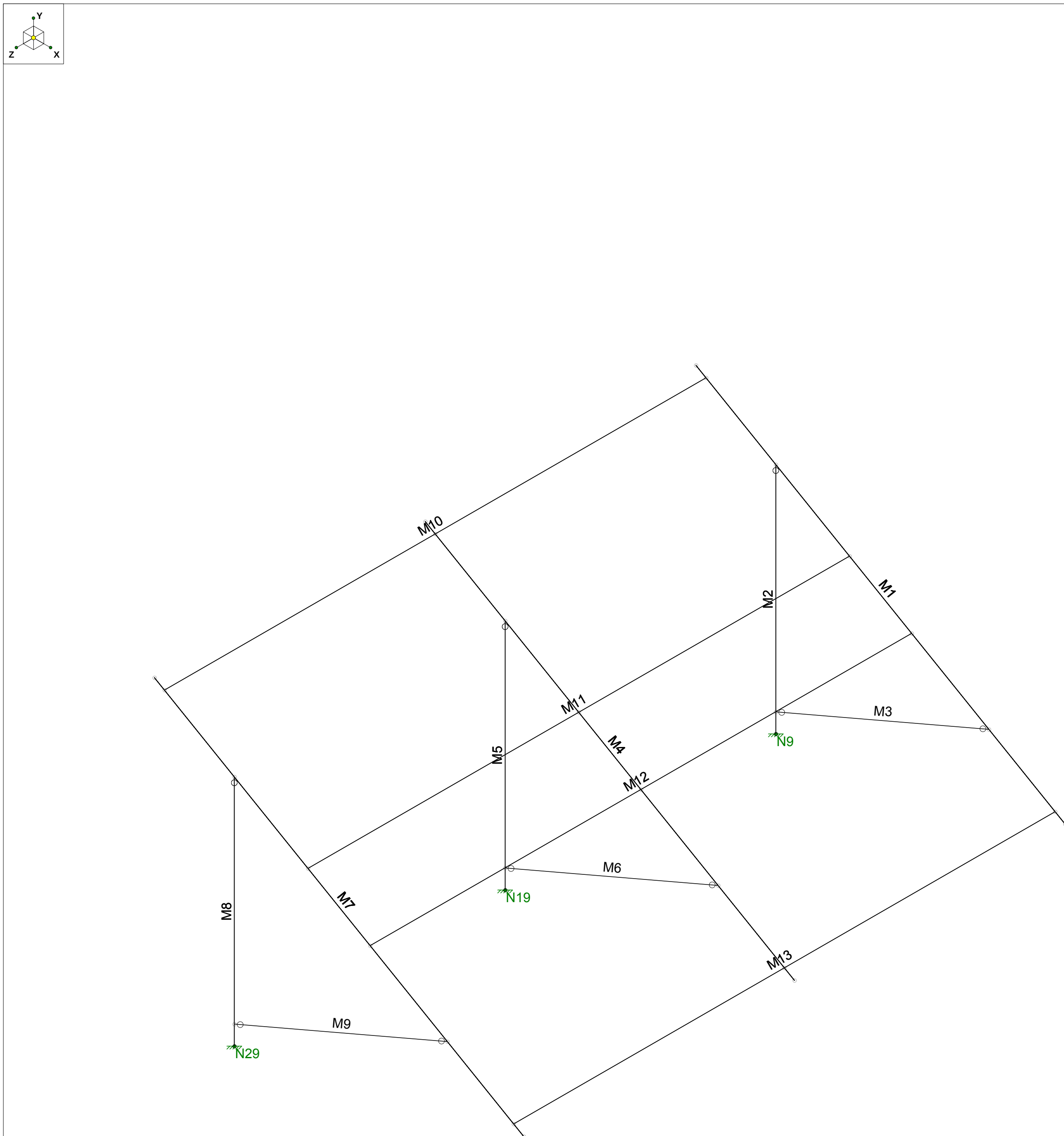


Schletter, Inc.	Standard FS Racking System	30° Tilt w/ Seismic Design
HCV	Representative Calculations - ASCE 7-10	

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.

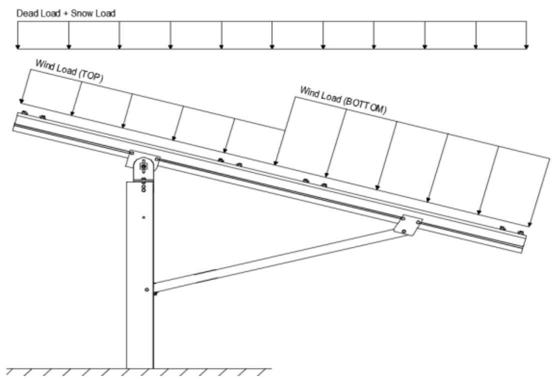
1.2 Construction

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 =	2000	mm	Height =	1900	mm
Width =	1050	mm	Width =	970	mm
Dead Load =	3.00	psf	Dead Load =	1.75	psf

Modules Per Row = 2
Module Tilt = 30°
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
g_{MIN} = 1.75 psf

Self-weight of the PV modules.

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	16.49	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.73		
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

$Cf+_{TOP}$	=	1.15	*(Pressure)*
$Cf+_{BOTTOM}$	=	1.85	
$Cf-_{TOP}$	=	-2.3	*(Suction)*
$Cf-_{BOTTOM}$	=	-1.1	

Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.

2.4 Seismic Loads

S_S =	2.50	R =	1.25
S_{DS} =	1.67	C_S =	0.8
S_1 =	1.00	ρ =	1.3
S_{D1} =	1.00	Ω =	1.25
T_a =	0.08	C_d =	1.25

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W	
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

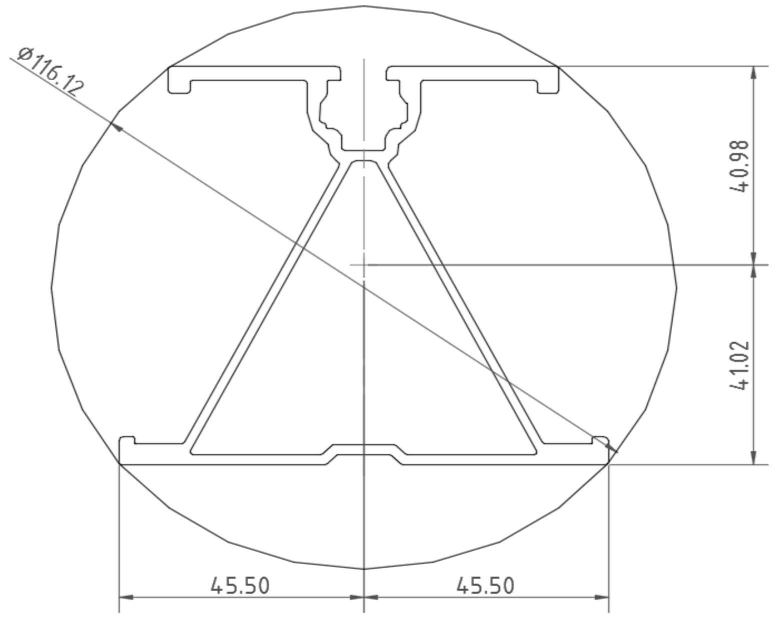
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	78	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 =	1.229	k-ft
M_z =	0.084	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	52%	

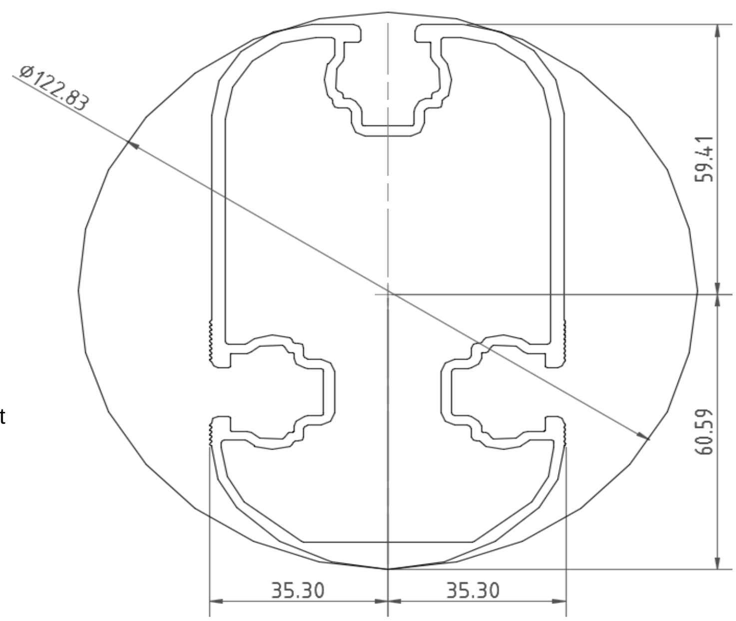


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	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 =	4.043	k-ft
M_z =	0.000	k-ft
P_n =	1.513	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	84%	

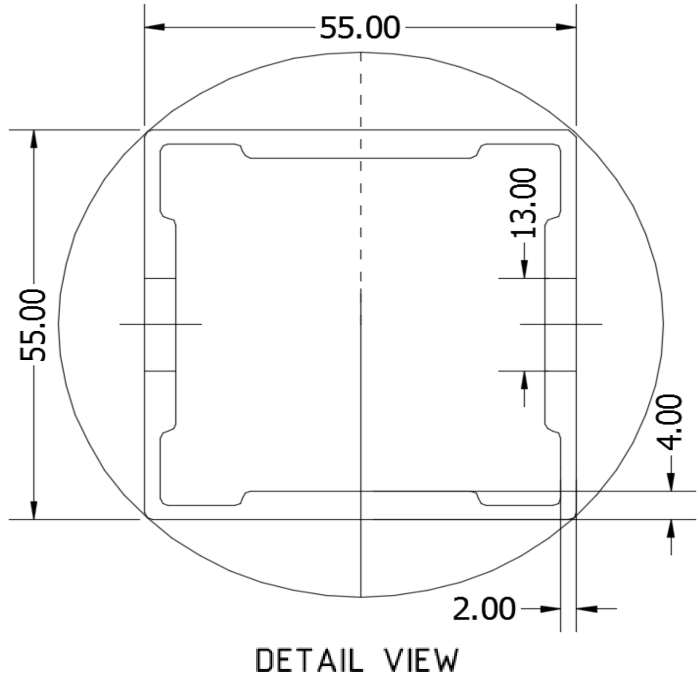


DETAIL VIEW

4.3 Strut Design

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

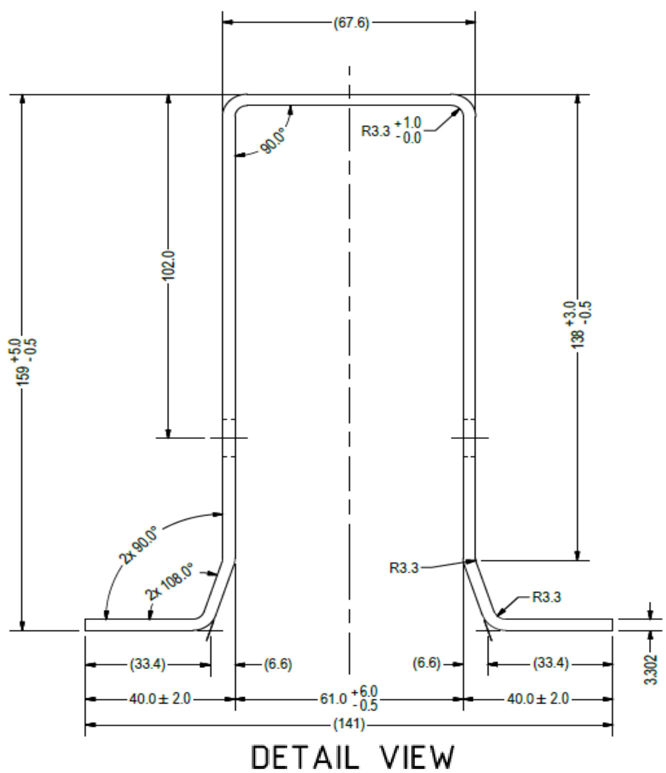
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.553	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	49%	



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 =	89.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	11.601	k-ft
M_z =	0.000	k-ft
P_r =	-5.069	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	75%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

The following LRFD loads include a safety factor of 1.3, and are to be used in conjunction with a Schletter, Inc. Geotechnical Investigation Report. The forces below should fall within the guidelines provided in the Geotechnical Investigation Report. If a Geotechnical Investigation Report is not present, please proceed to Section 5.2 for a concrete footing design.

Maximum Tensile Load =	6.57	k
Maximum Lateral Load =	3.93	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)

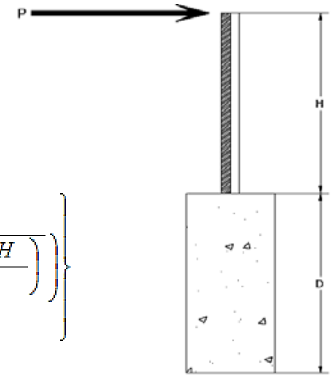
Lateral Force @ Top of Pole, P =	0.67	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



Lateral Bearing @ Bottom = S_3

Lateral Bearing @ D/3 = S_1

Required Depth = D

	Non-Constrained	
Lateral Force @ Top of Pole, P =	0.67	k
Height of Pole Above Grade, H =	6.47	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 =	3.64	
Required Footing Depth, D =	7.20	ft
2nd Trial @ D_2 =	5.23	ft
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf
Lateral Soil Bearing @ D, S_3 =	1.05	ksf
Constant $2.34P/(S_1B)$, A =	2.26	
Required Footing Depth, D =	5.28	ft
3rd Trial @ D_3 =	5.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf
Lateral Soil Bearing @ D, S_3 =	1.05	ksf
Constant $2.34P/(S_1B)$, A =	2.25	
Required Footing Depth, D =	5.27	ft

4th Trial @ D_4 =	5.26	ft
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf
Lateral Soil Bearing @ D, S_3 =	1.05	ksf
Constant $2.34P/(S_1B)$, A =	2.25	
Required Footing Depth, D =	5.26	ft
5th Trial @ D_5 =	5.26	ft
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf
Lateral Soil Bearing @ D, S_3 =	1.05	ksf
Constant $2.34P/(S_1B)$, A =	2.25	
Required Footing Depth, D =	5.50	ft

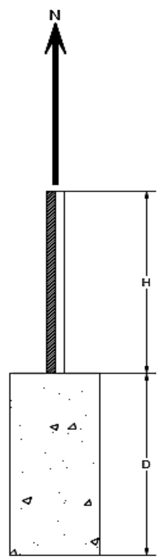
A 2ft diameter x 5.5ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.01	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 =	1.97	k
Required Concrete Volume, V =	13.62	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.51
2	0.4	0.2	118.10	6.41
3	0.6	0.2	118.10	6.30
4	0.8	0.2	118.10	6.20
5	1	0.2	118.10	6.10
6	1.2	0.2	118.10	5.99
7	1.4	0.2	118.10	5.89
8	1.6	0.2	118.10	5.79
9	1.8	0.2	118.10	5.68
10	2	0.2	118.10	5.58
11	2.2	0.2	118.10	5.48
12	2.4	0.2	118.10	5.37
13	2.6	0.2	118.10	5.27
14	2.8	0.2	118.10	5.16
15	3	0.2	118.10	5.06
16	3.2	0.2	118.10	4.96
17	3.4	0.2	118.10	4.85
18	3.6	0.2	118.10	4.75
19	3.8	0.2	118.10	4.65
20	4	0.2	118.10	4.54
21	4.2	0.2	118.10	4.44
22	4.4	0.2	118.10	4.33
23	0	0.0	0.00	4.33
24	0	0.0	0.00	4.33
25	0	0.0	0.00	4.33
26	0	0.0	0.00	4.33
27	0	0.0	0.00	4.33
28	0	0.0	0.00	4.33
29	0	0.0	0.00	4.33
30	0	0.0	0.00	4.33
31	0	0.0	0.00	4.33
32	0	0.0	0.00	4.33
33	0	0.0	0.00	4.33
34	0	0.0	0.00	4.33
Max	4.4	Sum	1.04	

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 =	5.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.46	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	15.71	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

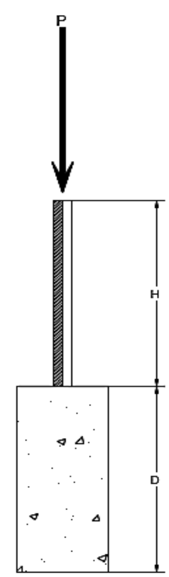
Weight of Concrete

Footing Volume	17.28	ft^3
Weight	2.51	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.36	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.42	k
Applied Force =	5.96	k
Utilization =	63%	

A 2ft diameter footing passes at a depth of 5.5ft.



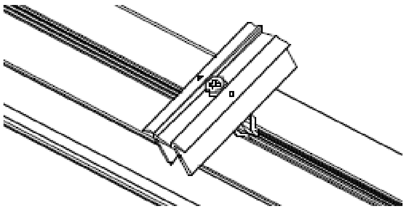
6. DESIGN OF JOINTS AND CONNECTIONS

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.

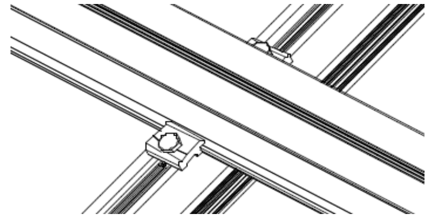
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.901	k
Allowable Uplift =	1.214	k
Utilization =	74%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.093	k
Allowable Uplift =	2.180	k
Utilization =	96%	

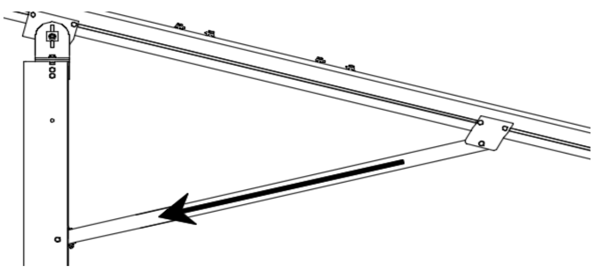


6.2 Strut Connections

The aluminum struts connect the front end of girder to a center section of the steel post. Single M10 bolts are used to attach each end of the strut to the girder and post. ASTM A193/A193M-86 equivalent stainless steel bolts are used.

Maximum Axial Load =	4.553	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	51%	

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

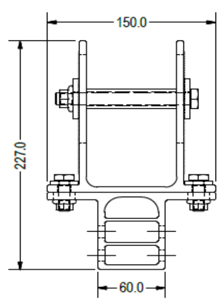


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

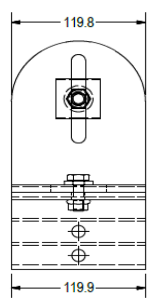
6.3 Girder to Post Connection

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.

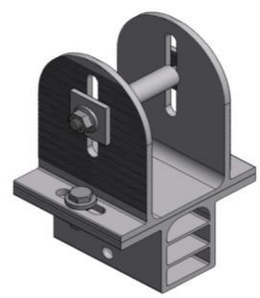
Maximum Tensile Load =	4.292	k
Allowable Load =	5.649	k
Utilization =	76%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

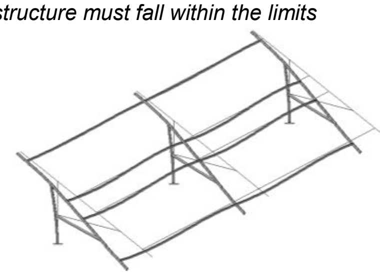
7.1 Seismic Drift

The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).

Mean Height, h_{sx} =	79.13	in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$	
	1.583	in
Max Drift, Δ_{MAX} =	0.773	in

$0.773 \leq 1.583$, 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 = 78 in

J = 0.432

215.785

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

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= 28.6 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

$M_{max}St$ = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 78

J = 0.432

137.226

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

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= 29.6

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

$M_{max}Wk$ = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

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= 30.1 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 = 81.7717
J = 1.98
114.202

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

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= 29.9

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

φF_LSt= 30.1 ksi
Ix = 1970917 mm^4
4.735 in^4
y = 61.046 mm
Sx = 1.970 in^3
M_{max}St = 4.935 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

φF_LWk= 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 = 74.8031 in

J = 0.942

116.737

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

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= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

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= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 0.23671

φcc = 0.82226

φF_L = (φccFcy)/(λ²)

φF_L = 9.61085 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 = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in	
Pr =	-5.07	k	(LRFD Factored Load)
Mr (Strong) =	11.60	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	128.92	
4.71√(E/Fy) =	103.55 =>	kL/r > 4.71√(E/Fy)
Fcr =	15.10 ksi	
Fe =	17.22 ksi	
Pn =	33.677 k	

Torsional/Flexural Torsional Buckling:

Fcr =	11.6026 ksi
Fey =	43.9243 ksi
Fez =	14.9387 ksi
Pn =	25.8738 k

Bending (Strong Axis):

Yielding:			
Mn =	21.95 k-ft		
Flange Local Buckling:			
Mn =	19.207 k-ft		
Pr/Pc =	0.1505 <	0.2	
Utilization =	0.75 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.151 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 75%

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	-9.843	-9.843	0	0
2	M11	Y	-9.843	-9.843	0	0
3	M12	Y	-9.843	-9.843	0	0
4	M13	Y	-9.843	-9.843	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	-5.454	-5.454	0	0
2	M11	Y	-5.454	-5.454	0	0
3	M12	Y	-5.454	-5.454	0	0
4	M13	Y	-5.454	-5.454	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-46.866	-46.866	0	0
2	M11	Y	-46.866	-46.866	0	0
3	M12	Y	-46.866	-46.866	0	0
4	M13	Y	-46.866	-46.866	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	-133.288	-133.288	0	0
2	M11	y	-133.288	-133.288	0	0
3	M12	y	-214.42	-214.42	0	0
4	M13	y	-214.42	-214.42	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	266.576	266.576	0	0
2	M11	y	266.576	266.576	0	0
3	M12	y	127.493	127.493	0	0
4	M13	y	127.493	127.493	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	7.874	7.874	0	0
2	M11	Z	7.874	7.874	0	0
3	M12	Z	7.874	7.874	0	0
4	M13	Z	7.874	7.874	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	750.743	2	2183.156	2	89.343	2	.134	2	.016	5	5.455	1
2		min	-1117.354	3	-1641.353	3	-286.071	5	-1.366	5	-.008	2	.825	15
3	N19	max	3018.718	2	5693.518	2	0	3	0	2	.016	4	7.16	1
4		min	-2888.188	3	-5036.73	3	-299.684	5	-1.415	4	0	1	.286	15
5	N29	max	750.743	2	2183.156	2	114.377	3	.179	3	.017	4	5.455	1
6		min	-1117.354	3	-1641.353	3	-300.942	4	-1.407	4	-.003	3	-.551	5
7	Totals:	max	4520.204	2	10059.83	2	0	2						
8		min	-5122.897	3	-8319.436	3	-877.118	4						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.003	2	0	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-16.351	12	313.137	3	-10.442	12	.035	5	.197	1	.259	2
4			min	-173.928	1	-700.134	2	-90.679	1	-.154	2	.031	12	-.114	3
5		3	max	-16.808	12	311.949	3	-10.442	12	.035	5	.138	1	.719	2
6			min	-174.843	1	-701.718	2	-90.679	1	-.154	2	.024	12	-.319	3
7		4	max	-17.266	12	310.76	3	-10.442	12	.035	5	.083	4	1.18	2
8			min	-175.757	1	-703.303	2	-90.679	1	-.154	2	.017	12	-.523	3
9		5	max	401.722	3	635.238	2	-3.854	12	0	10	.089	2	1.395	2
10			min	-1111.031	2	-267.35	3	-112.764	1	-.028	3	-.017	3	-.621	3
11		6	max	401.036	3	633.653	2	-3.854	12	0	10	.027	2	.979	2
12			min	-1111.946	2	-268.539	3	-112.764	1	-.028	3	-.035	5	-.445	3
13		7	max	400.35	3	632.069	2	-3.854	12	0	10	-.014	10	.564	2
14			min	-1112.861	2	-269.727	3	-112.764	1	-.028	3	-.076	4	-.268	3
15		8	max	399.663	3	630.485	2	-3.854	12	0	10	-.018	12	.15	2
16			min	-1113.776	2	-270.915	3	-112.764	1	-.028	3	-.133	1	-.091	3
17		9	max	371.73	3	18.039	3	-1.256	3	.017	5	.079	1	-.001	15
18			min	-1219.59	2	-7.942	2	-153.946	1	-.096	2	.018	10	-.046	2
19		10	max	371.044	3	16.85	3	-1.256	3	.017	5	.033	3	-.001	15
20			min	-1220.504	2	-9.526	2	-153.946	1	-.096	2	-.026	2	-.041	2
21		11	max	370.358	3	15.662	3	-1.256	3	.017	5	.032	3	0	15
22			min	-1221.419	2	-11.11	2	-153.946	1	-.096	2	-.123	1	-.034	2
23		12	max	336.522	3	705.385	3	12.147	10	.145	3	.1	1	.113	2
24			min	-1329.059	1	-424.447	2	-165.245	4	-.119	2	.023	10	-.261	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	335.836	3	704.197	3	12.147	10	.145	3	.083	1	.392	2
26			min	-1329.974	1	-426.032	2	-166.83	4	-.119	2	-.034	5	-.723	3
27		14	max	335.15	3	703.009	3	12.147	10	.145	3	.073	2	.672	2
28			min	-1330.889	1	-427.616	2	-168.416	4	-.119	2	-.138	5	-1.185	3
29		15	max	334.464	3	701.82	3	12.147	10	.145	3	.08	2	.954	2
30			min	-1331.804	1	-429.2	2	-170.002	4	-.119	2	-.243	5	-1.646	3
31		16	max	175.936	1	436.352	2	54.786	5	.108	2	.013	3	.726	2
32			min	10.233	15	-746.441	3	-78.304	1	-.279	3	-.129	4	-1.256	3
33		17	max	175.021	1	434.768	2	53.2	5	.108	2	-.007	12	.441	2
34			min	9.957	15	-747.629	3	-78.304	1	-.279	3	-.154	1	-.766	3
35		18	max	174.106	1	433.183	2	51.615	5	.108	2	-.022	12	.156	2
36			min	9.681	15	-748.818	3	-78.304	1	-.279	3	-.206	1	-.275	3
37		19	max	0	1	0	2	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	.007	2	0	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	8.635	3	957.032	3	0	1	.041	4	.202	4	.555	2
42			min	-230.803	1	-1804.933	2	-76.238	5	0	1	0	1	-.302	3
43		3	max	7.949	3	955.844	3	0	1	.041	4	.151	4	1.74	2
44			min	-231.717	1	-1806.517	2	-77.823	5	0	1	0	1	-.93	3
45		4	max	7.263	3	954.656	3	0	1	.041	4	.1	4	2.926	2
46			min	-232.632	1	-1808.102	2	-79.409	5	0	1	0	1	-1.557	3
47		5	max	1480.37	3	1831.709	2	0	1	0	1	.003	4	3.444	2
48			min	-2817.64	2	-1012.007	3	-71.523	4	-.023	4	0	1	-1.822	3
49		6	max	1479.684	3	1830.125	2	0	1	0	1	0	1	2.242	2
50			min	-2818.554	2	-1013.195	3	-73.108	4	-.023	4	-.044	5	-1.157	3
51		7	max	1478.998	3	1828.541	2	0	1	0	1	0	1	1.042	2
52			min	-2819.469	2	-1014.383	3	-74.694	4	-.023	4	-.093	4	-.492	3
53		8	max	1478.312	3	1826.956	2	0	1	0	1	0	1	.174	3
54			min	-2820.384	2	-1015.572	3	-76.28	4	-.023	4	-.142	4	-.157	2
55		9	max	1491.412	3	-1.43	15	0	1	.012	4	.113	4	.493	3
56			min	-2852.322	2	-109.061	2	-175.565	4	0	1	0	1	-.706	2
57		10	max	1490.726	3	-1.908	15	0	1	.012	4	0	1	.5	3
58			min	-2853.237	2	-110.645	2	-177.15	4	0	1	-.003	4	-.634	2
59		11	max	1490.04	3	-2.386	15	0	1	.012	4	0	1	.508	3
60			min	-2854.152	2	-112.23	2	-178.736	4	0	1	-.12	4	-.561	2
61		12	max	1514.947	3	1995.248	3	0	1	.123	4	.103	5	.008	9
62			min	-2896.345	2	-1441.539	2	-175.467	4	0	1	0	1	-.119	3
63		13	max	1514.261	3	1994.06	3	0	1	.123	4	0	1	.866	2
64			min	-2897.26	2	-1443.124	2	-177.052	4	0	1	-.013	4	-1.428	3
65		14	max	1513.575	3	1992.871	3	0	1	.123	4	0	1	1.813	2
66			min	-2898.175	2	-1444.708	2	-178.638	4	0	1	-.13	4	-2.736	3
67		15	max	1512.889	3	1991.683	3	0	1	.123	4	0	1	2.762	2
68			min	-2899.089	2	-1446.292	2	-180.223	4	0	1	-.248	4	-4.043	3
69		16	max	232.275	1	1291.692	2	48.005	5	0	1	0	1	2.102	2
70			min	-4.366	3	-1891.924	3	0	1	-.113	4	-.097	5	-3.07	3
71		17	max	231.361	1	1290.107	2	46.42	5	0	1	0	1	1.255	2
72			min	-5.052	3	-1893.113	3	0	1	-.113	4	-.066	5	-1.828	3
73		18	max	230.446	1	1288.523	2	44.834	5	0	1	0	1	.409	2
74			min	-5.738	3	-1894.301	3	0	1	-.113	4	-.036	4	-.585	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.005	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.003	2	0	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	25.642	5	313.137	3	90.679	1	.154	2	.105	5	.259	2
80			min	-173.928	1	-700.134	2	-35.681	5	-.033	3	-.197	1	-.114	3
81		3	max	25.215	5	311.949	3	90.679	1	.154	2	.081	5	.719	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	-174.843	1	-701.718	2	-37.266	5	-.033	3	-.138	1	-.319	3
83		4	max	24.788	5	310.76	3	90.679	1	.154	2	.056	5	1.18	2
84			min	-175.757	1	-703.303	2	-38.852	5	-.033	3	-.078	1	-.523	3
85		5	max	401.722	3	635.238	2	112.764	1	.028	3	.017	3	1.395	2
86			min	-1111.031	2	-267.35	3	-29.702	5	-.02	5	-.089	2	-.621	3
87		6	max	401.036	3	633.653	2	112.764	1	.028	3	.021	3	.979	2
88			min	-1111.946	2	-268.539	3	-31.288	5	-.02	5	-.035	4	-.445	3
89		7	max	400.35	3	632.069	2	112.764	1	.028	3	.059	1	.564	2
90			min	-1112.861	2	-269.727	3	-32.874	5	-.02	5	-.056	5	-.268	3
91		8	max	399.663	3	630.485	2	112.764	1	.028	3	.133	1	.15	2
92			min	-1113.776	2	-270.915	3	-34.459	5	-.02	5	-.078	5	-.091	3
93		9	max	371.73	3	18.039	3	153.946	1	.096	2	.047	5	-.003	15
94			min	-1219.59	2	-7.942	2	-60.573	5	.014	15	-.079	1	-.046	2
95		10	max	371.044	3	16.85	3	153.946	1	.096	2	.026	2	-.003	15
96			min	-1220.504	2	-9.526	2	-62.159	5	.014	15	-.033	3	-.041	2
97		11	max	370.358	3	15.662	3	153.946	1	.096	2	.123	1	-.004	15
98			min	-1221.419	2	-11.11	2	-63.744	5	.014	15	-.035	5	-.034	2
99		12	max	336.522	3	705.385	3	139.991	3	.122	4	.056	5	.113	2
100			min	-1329.059	1	-424.447	2	-150.526	5	-.145	3	-.1	1	-.261	3
101		13	max	335.836	3	704.197	3	139.991	3	.122	4	.016	3	.392	2
102			min	-1329.974	1	-426.032	2	-152.112	5	-.145	3	-.083	1	-.723	3
103		14	max	335.15	3	703.009	3	139.991	3	.122	4	.108	3	.672	2
104			min	-1330.889	1	-427.616	2	-153.697	5	-.145	3	-.153	4	-1.185	3
105		15	max	334.464	3	701.82	3	139.991	3	.122	4	.2	3	.954	2
106			min	-1331.804	1	-429.2	2	-155.283	5	-.145	3	-.249	4	-1.646	3
107		16	max	175.936	1	436.352	2	80.483	4	.279	3	.103	1	.726	2
108			min	6.244	15	-746.441	3	21.171	10	-.108	2	-.099	5	-1.256	3
109		17	max	175.021	1	434.768	2	78.897	4	.279	3	.154	1	.441	2
110			min	5.968	15	-747.629	3	21.171	10	-.108	2	-.057	5	-.766	3
111		18	max	174.106	1	433.183	2	78.304	1	.279	3	.206	1	.156	2
112			min	5.692	15	-748.818	3	21.171	10	-.108	2	-.016	5	-.275	3
113		19	max	0	1	0	2	0	15	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	78.337	1	431.603	2	-5.425	15	.011	2	.232	1	.108	2
116			min	21.171	10	-749.852	3	-173.366	1	-.024	3	.003	15	-.279	3
117		2	max	78.337	1	312.167	2	-3.941	15	.011	2	.118	1	.195	3
118			min	21.171	10	-561.242	3	-141.371	1	-.024	3	0	15	-.161	2
119		3	max	78.337	1	192.73	2	-2.458	15	.011	2	.045	2	.532	3
120			min	21.171	10	-372.632	3	-109.376	1	-.024	3	-.004	5	-.343	2
121		4	max	78.337	1	73.293	2	-.975	15	.011	2	.007	10	.733	3
122			min	21.171	10	-184.022	3	-77.381	1	-.024	3	-.04	1	-.439	2
123		5	max	78.337	1	21.039	5	.657	5	.011	2	-.004	15	.798	3
124			min	17.304	15	-46.144	2	-45.385	1	-.024	3	-.084	1	-.449	2
125		6	max	78.337	1	193.198	3	3.007	4	.011	2	-.003	15	.726	3
126			min	11.567	15	-165.58	2	-26.384	2	-.024	3	-.105	1	-.373	2
127		7	max	78.337	1	381.808	3	21.076	9	.011	2	-.001	15	.519	3
128			min	5.831	15	-285.017	2	-13.005	2	-.024	3	-.104	1	-.21	2
129		8	max	78.337	1	570.418	3	50.6	1	.011	2	.002	5	.175	3
130			min	.094	15	-404.454	2	-7.77	3	-.024	3	-.079	1	-.02	5
131		9	max	78.337	1	759.028	3	82.596	1	.011	2	.01	4	.374	2
132			min	-8.098	5	-523.89	2	-5.508	3	-.024	3	-.07	2	-.305	3
133		10	max	78.337	1	947.638	3	-.917	10	.024	3	.058	9	.796	2
134			min	17.778	15	29.539	15	-114.591	1	-.004	14	-.055	2	-.922	3
135		11	max	78.337	1	523.89	2	5.508	3	.024	3	.004	9	.374	2
136			min	12.042	15	-759.028	3	-82.596	1	-.011	2	-.07	2	-.305	3
137		12	max	78.337	1	404.454	2	7.77	3	.024	3	-.006	15	.175	3
138			min	6.306	15	-570.418	3	-50.6	1	-.011	2	-.079	1	.017	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	78.337	1	285.017	2	13.005	2	.024	3	-.007	15	.519	3
140			min	.569	15	-381.808	3	-21.076	9	-.011	2	-.104	1	-.21	2
141		14	max	78.337	1	165.58	2	26.384	2	.024	3	-.006	15	.726	3
142			min	-7.436	5	-193.198	3	-.055	9	-.011	2	-.105	1	-.373	2
143		15	max	78.337	1	46.144	2	45.385	1	.024	3	-.004	15	.798	3
144			min	-15.959	5	-4.588	3	3.475	15	-.011	2	-.084	1	-.449	2
145		16	max	78.337	1	184.022	3	77.381	1	.024	3	.007	10	.733	3
146			min	-24.481	5	-73.293	2	4.958	15	-.011	2	-.04	1	-.439	2
147		17	max	78.337	1	372.632	3	109.376	1	.024	3	.045	2	.532	3
148			min	-33.004	5	-192.73	2	6.442	15	-.011	2	.003	15	-.343	2
149		18	max	78.337	1	561.242	3	141.371	1	.024	3	.118	1	.195	3
150			min	-41.526	5	-312.167	2	7.925	15	-.011	2	.009	15	-.161	2
151		19	max	78.337	1	749.852	3	173.366	1	.024	3	.232	1	.108	2
152			min	-50.049	5	-431.603	2	9.408	15	-.011	2	.015	15	-.279	3
153	M11	1	max	128.063	1	411.1	2	40.94	5	.002	3	.283	1	.096	4
154			min	-138.614	3	-691.448	3	-185.304	1	-.008	2	-.16	5	-.216	3
155		2	max	128.063	1	291.664	2	43.234	5	.002	3	.161	1	.215	3
156			min	-138.614	3	-502.838	3	-153.309	1	-.008	2	-.13	5	-.231	2
157		3	max	128.063	1	172.227	2	45.529	5	.002	3	.063	2	.51	3
158			min	-138.614	3	-314.228	3	-121.314	1	-.008	2	-.098	5	-.399	2
159		4	max	128.063	1	52.79	2	47.824	5	.002	3	.024	3	.669	3
160			min	-138.614	3	-125.618	3	-89.319	1	-.008	2	-.071	4	-.48	2
161		5	max	128.063	1	62.992	3	50.118	5	.002	3	.006	3	.691	3
162			min	-138.614	3	-66.646	2	-57.324	1	-.008	2	-.067	1	-.475	2
163		6	max	128.063	1	251.602	3	52.413	5	.002	3	.009	5	.578	3
164			min	-138.614	3	-186.083	2	-33.133	2	-.008	2	-.097	1	-.384	2
165		7	max	128.063	1	440.212	3	59.84	4	.002	3	.047	5	.328	3
166			min	-138.614	3	-305.52	2	-19.754	2	-.008	2	-.104	1	-.206	2
167		8	max	128.063	1	628.822	3	69.535	4	.002	3	.088	5	.058	2
168			min	-138.614	3	-424.956	2	-17.191	3	-.008	2	-.088	1	-.058	3
169		9	max	128.063	1	817.432	3	79.23	4	.002	3	.13	5	.408	2
170			min	-138.614	3	-544.393	2	-14.929	3	-.008	2	-.08	2	-.58	3
171		10	max	128.063	1	360.515	10	102.653	1	.008	2	.189	4	.844	2
172			min	-138.614	3	-1006.042	3	-37.269	14	-.003	14	-.07	2	-1.239	3
173		11	max	128.063	1	544.393	2	47.019	5	.008	2	-.006	9	.408	2
174			min	-138.614	3	-817.432	3	-70.657	1	-.002	3	-.133	4	-.58	3
175		12	max	128.063	1	424.956	2	49.313	5	.008	2	-.024	12	.058	2
176			min	-138.614	3	-628.822	3	-38.662	1	-.002	3	-.11	4	-.058	3
177		13	max	128.063	1	305.52	2	51.608	5	.008	2	-.016	12	.328	3
178			min	-138.614	3	-440.212	3	-14.004	9	-.002	3	-.104	1	-.206	2
179		14	max	128.063	1	186.083	2	56.528	4	.008	2	-.007	12	.578	3
180			min	-138.614	3	-251.602	3	7.017	9	-.002	3	-.097	1	-.384	2
181		15	max	128.063	1	66.646	2	66.223	4	.008	2	.018	5	.691	3
182			min	-138.614	3	-62.992	3	14.752	12	-.002	3	-.067	1	-.475	2
183		16	max	128.063	1	125.618	3	89.319	1	.008	2	.06	5	.669	3
184			min	-138.614	3	-52.79	2	16.259	12	-.002	3	-.019	9	-.48	2
185		17	max	128.063	1	314.228	3	121.314	1	.008	2	.112	4	.51	3
186			min	-138.614	3	-172.227	2	17.767	12	-.002	3	.024	9	-.399	2
187		18	max	128.063	1	502.838	3	153.309	1	.008	2	.177	4	.215	3
188			min	-138.614	3	-291.664	2	19.275	12	-.002	3	.04	12	-.231	2
189		19	max	128.063	1	691.448	3	185.304	1	.008	2	.283	1	.029	1
190			min	-138.614	3	-411.1	2	20.782	12	-.002	3	.055	12	-.216	3
191	M12	1	max	24.382	5	635.722	2	40.3	5	0	10	.3	1	.095	2
192			min	-40.704	1	-290.401	3	-189.308	1	-.004	3	-.156	5	.015	9
193		2	max	15.859	5	457.69	2	42.595	5	0	10	.175	1	.221	3
194			min	-40.704	1	-202.24	3	-157.313	1	-.004	3	-.126	5	-.3	2
195		3	max	7.337	5	279.657	2	44.889	5	0	10	.077	2	.336	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	-40.704	1	-114.078	3	-125.318	1	-.004	3	-.095	5	-.566	2
197		4	max	4.245	3	101.625	2	47.184	5	0	10	.025	2	.386	3
198			min	-40.704	1	-25.917	3	-93.323	1	-.004	3	-.067	4	-.704	2
199		5	max	4.245	3	62.244	3	49.478	5	0	10	-.001	12	.373	3
200			min	-40.704	1	-76.407	2	-61.327	1	-.004	3	-.062	1	-.713	2
201		6	max	4.245	3	150.405	3	51.773	5	0	10	.01	5	.296	3
202			min	-40.704	1	-254.439	2	-37.974	2	-.004	3	-.095	1	-.593	2
203		7	max	4.245	3	238.566	3	58.844	4	0	10	.048	5	.156	3
204			min	-40.704	1	-432.471	2	-24.595	2	-.004	3	-.104	1	-.345	2
205		8	max	4.245	3	326.728	3	68.539	4	0	10	.088	5	.031	2
206			min	-45.114	4	-610.503	2	-12.59	10	-.004	3	-.091	1	-.048	3
207		9	max	4.245	3	414.889	3	78.234	4	0	10	.13	5	.537	2
208			min	-53.637	4	-788.535	2	-9.159	3	-.004	3	-.088	2	-.316	3
209		10	max	4.245	3	-7.997	15	98.649	1	.004	3	.188	4	1.17	2
210			min	-62.159	4	-966.567	2	-4.394	10	-.002	4	-.081	2	-.648	3
211		11	max	36.926	5	788.535	2	46.689	5	.004	3	-.008	9	.537	2
212			min	-40.704	1	-414.889	3	-66.653	1	-.001	5	-.135	4	-.316	3
213		12	max	28.403	5	610.503	2	48.984	5	.004	3	-.021	12	.031	2
214			min	-40.704	1	-326.728	3	-34.658	1	-.001	5	-.111	4	-.048	3
215		13	max	19.881	5	432.471	2	51.279	5	.004	3	-.015	12	.156	3
216			min	-40.704	1	-238.566	3	-12.686	9	-.001	5	-.104	1	-.345	2
217		14	max	11.358	5	254.439	2	56.772	4	.004	3	-.009	12	.296	3
218			min	-40.704	1	-150.405	3	8.335	9	-.001	5	-.095	1	-.593	2
219		15	max	4.245	3	76.407	2	66.467	4	.004	3	.017	5	.373	3
220			min	-40.704	1	-62.244	3	11.297	12	-.001	5	-.062	1	-.713	2
221		16	max	4.245	3	25.917	3	93.323	1	.004	3	.058	5	.386	3
222			min	-40.704	1	-101.625	2	12.805	12	-.001	5	-.016	9	-.704	2
223		17	max	4.245	3	114.078	3	125.318	1	.004	3	.111	4	.336	3
224			min	-40.704	1	-279.657	2	14.313	12	-.001	5	.017	12	-.566	2
225		18	max	4.245	3	202.24	3	157.313	1	.004	3	.177	4	.221	3
226			min	-40.704	1	-457.69	2	15.82	12	-.001	5	.028	12	-.3	2
227		19	max	4.245	3	290.401	3	189.308	1	.004	3	.3	1	.095	2
228			min	-41.096	4	-635.722	2	17.328	12	-.001	5	.04	12	-.038	5
229	M13	1	max	34.001	5	699.486	2	26.073	5	.009	3	.228	1	.154	2
230			min	-90.585	1	-314.347	3	-172.804	1	-.024	2	-.117	5	-.033	3
231		2	max	25.478	5	521.454	2	28.367	5	.009	3	.114	1	.162	3
232			min	-90.585	1	-226.186	3	-140.809	1	-.024	2	-.097	5	-.287	2
233		3	max	16.956	5	343.422	2	30.662	5	.009	3	.041	2	.293	3
234			min	-90.585	1	-138.025	3	-108.814	1	-.024	2	-.076	5	-.599	2
235		4	max	8.433	5	165.39	2	32.957	5	.009	3	.008	3	.361	3
236			min	-90.585	1	-49.864	3	-76.819	1	-.024	2	-.066	4	-.783	2
237		5	max	.116	15	38.297	3	35.251	5	.009	3	-.003	12	.365	3
238			min	-90.585	1	-12.642	2	-44.824	1	-.024	2	-.087	1	-.838	2
239		6	max	-5.62	15	126.459	3	37.793	4	.009	3	-.001	15	.306	3
240			min	-90.585	1	-190.674	2	-25.857	2	-.024	2	-.107	1	-.765	2
241		7	max	-10.441	12	214.62	3	47.489	4	.009	3	.026	5	.183	3
242			min	-90.585	1	-368.706	2	-12.478	2	-.024	2	-.105	1	-.563	2
243		8	max	-10.441	12	302.781	3	57.184	4	.009	3	.055	5	-.004	12
244			min	-90.585	1	-546.738	2	-9.169	3	-.024	2	-.08	1	-.232	2
245		9	max	-10.441	12	390.942	3	83.157	1	.009	3	.088	4	.227	2
246			min	-90.585	1	-724.77	2	-6.907	3	-.024	2	-.071	2	-.255	3
247		10	max	-10.441	12	-6.321	15	115.153	1	.024	2	.14	4	.815	2
248			min	-90.585	1	-902.802	2	1.192	10	-.005	14	-.056	2	-.569	3
249		11	max	23.496	5	724.77	2	30.589	5	.024	2	.004	9	.227	2
250			min	-90.585	1	-390.942	3	-83.157	1	-.009	3	-.086	5	-.255	3
251		12	max	14.974	5	546.738	2	32.884	5	.024	2	-.02	12	0	15
252			min	-90.585	1	-302.781	3	-51.162	1	-.009	3	-.08	1	-.232	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	6.451	5	368.706	2	35.178	5	.024	2	-.015	12	.183	3
254			min	-90.585	1	-214.62	3	-21.326	9	-.009	3	-.105	1	-.563	2
255		14	max	-1.209	15	190.674	2	37.473	5	.024	2	-.008	15	.306	3
256			min	-90.585	1	-126.459	3	-.305	9	-.009	3	-.107	1	-.765	2
257		15	max	-6.946	15	12.642	2	47.162	4	.024	2	.016	5	.365	3
258			min	-90.585	1	-38.297	3	9.857	12	-.009	3	-.087	1	-.838	2
259		16	max	-10.441	12	49.864	3	76.819	1	.024	2	.045	5	.361	3
260			min	-90.585	1	-165.39	2	11.365	12	-.009	3	-.043	1	-.783	2
261		17	max	-10.441	12	138.025	3	108.814	1	.024	2	.078	4	.293	3
262			min	-90.585	1	-343.422	2	12.872	12	-.009	3	.003	9	-.599	2
263		18	max	-10.441	12	226.186	3	140.809	1	.024	2	.129	4	.162	3
264			min	-90.585	1	-521.454	2	14.38	12	-.009	3	.023	12	-.287	2
265		19	max	-10.441	12	314.347	3	172.804	1	.024	2	.228	1	.154	2
266			min	-90.585	1	-699.486	2	15.888	12	-.009	3	.034	12	-.035	5
267	M2	1	max	2183.156	2	1116.673	3	89.429	2	.016	5	1.366	5	5.455	1
268			min	-1641.353	3	-749.631	2	-286.128	5	-.008	2	-.134	2	.825	15
269		2	max	2179.884	2	1116.673	3	89.429	2	.016	5	1.264	5	5.542	1
270			min	-1643.807	3	-749.631	2	-283.293	5	-.008	2	-.103	1	.784	15
271		3	max	1519.268	2	940.081	1	61.099	2	0	2	1.159	5	5.404	1
272			min	-1369.115	3	128.795	15	-263.147	5	0	5	-.091	1	.74	15
273		4	max	1515.996	2	940.081	1	61.099	2	0	2	1.065	5	5.066	1
274			min	-1371.569	3	128.795	15	-260.311	5	0	5	-.072	1	.694	15
275		5	max	1512.725	2	940.081	1	61.099	2	0	2	.972	4	4.728	1
276			min	-1374.022	3	128.795	15	-257.476	5	0	5	-.053	1	.648	15
277		6	max	1509.453	2	940.081	1	61.099	2	0	2	.882	4	4.391	1
278			min	-1376.476	3	128.795	15	-254.641	5	0	5	-.034	1	.602	15
279		7	max	1506.182	2	940.081	1	61.099	2	0	2	.792	4	4.053	1
280			min	-1378.93	3	128.795	15	-251.806	5	0	5	-.043	3	.555	15
281		8	max	1502.91	2	940.081	1	61.099	2	0	2	.704	4	3.715	1
282			min	-1381.383	3	128.795	15	-248.97	5	0	5	-.08	3	.509	15
283		9	max	1499.639	2	940.081	1	61.099	2	0	2	.617	4	3.377	1
284			min	-1383.837	3	128.795	15	-246.135	5	0	5	-.117	3	.463	15
285		10	max	1496.367	2	940.081	1	61.099	2	0	2	.53	4	3.04	1
286			min	-1386.29	3	128.795	15	-243.3	5	0	5	-.154	3	.416	15
287		11	max	1493.096	2	940.081	1	61.099	2	0	2	.445	4	2.702	1
288			min	-1388.744	3	128.795	15	-240.465	5	0	5	-.191	3	.37	15
289		12	max	1489.825	2	940.081	1	61.099	2	0	2	.36	4	2.364	1
290			min	-1391.197	3	128.795	15	-237.629	5	0	5	-.229	3	.324	15
291		13	max	1486.553	2	940.081	1	61.099	2	0	2	.277	4	2.026	1
292			min	-1393.651	3	128.795	15	-234.794	5	0	5	-.266	3	.278	15
293		14	max	1483.282	2	940.081	1	61.099	2	0	2	.195	4	1.689	1
294			min	-1396.105	3	128.795	15	-231.959	5	0	5	-.303	3	.231	15
295		15	max	1480.01	2	940.081	1	61.099	2	0	2	.173	2	1.351	1
296			min	-1398.558	3	128.795	15	-229.123	5	0	5	-.34	3	.185	15
297		16	max	1476.739	2	940.081	1	61.099	2	0	2	.195	2	1.013	1
298			min	-1401.012	3	128.795	15	-226.288	5	0	5	-.377	3	.139	15
299		17	max	1473.467	2	940.081	1	61.099	2	0	2	.217	2	.675	1
300			min	-1403.465	3	128.795	15	-223.453	5	0	5	-.415	3	.093	15
301		18	max	1470.196	2	940.081	1	61.099	2	0	2	.239	2	.338	1
302			min	-1405.919	3	128.795	15	-220.618	5	0	5	-.452	3	.046	15
303		19	max	1466.924	2	940.081	1	61.099	2	0	2	.261	2	0	1
304			min	-1408.373	3	128.795	15	-217.782	5	0	5	-.489	3	0	1
305	M5	1	max	5693.518	2	2884.787	3	0	1	.016	4	1.415	4	7.16	1
306			min	-5036.73	3	-3015.226	2	-299.78	5	0	1	0	1	.286	15
307		2	max	5690.247	2	2884.787	3	0	1	.016	4	1.308	4	7.796	1
308			min	-5039.183	3	-3015.226	2	-296.944	5	0	1	0	1	.291	15
309		3	max	3924.209	2	1363.338	1	0	1	0	1	1.199	4	7.837	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	-4088.192	3	49.464	15	-278.69	4	0	4	0	1	.284	15
311		4	max	3920.938	2	1363.338	1	0	1	0	1	1.1	4	7.347	1
312			min	-4090.646	3	49.464	15	-275.855	4	0	4	0	1	.267	15
313		5	max	3917.666	2	1363.338	1	0	1	0	1	1.001	4	6.857	1
314			min	-4093.099	3	49.464	15	-273.019	4	0	4	0	1	.249	15
315		6	max	3914.395	2	1363.338	1	0	1	0	1	.903	4	6.367	1
316			min	-4095.553	3	49.464	15	-270.184	4	0	4	0	1	.231	15
317		7	max	3911.124	2	1363.338	1	0	1	0	1	.807	4	5.878	1
318			min	-4098.006	3	49.464	15	-267.349	4	0	4	0	1	.213	15
319		8	max	3907.852	2	1363.338	1	0	1	0	1	.711	4	5.388	1
320			min	-4100.46	3	49.464	15	-264.514	4	0	4	0	1	.195	15
321		9	max	3904.581	2	1363.338	1	0	1	0	1	.617	4	4.898	1
322			min	-4102.914	3	49.464	15	-261.678	4	0	4	0	1	.178	15
323		10	max	3901.309	2	1363.338	1	0	1	0	1	.523	4	4.408	1
324			min	-4105.367	3	49.464	15	-258.843	4	0	4	0	1	.16	15
325		11	max	3898.038	2	1363.338	1	0	1	0	1	.431	4	3.918	1
326			min	-4107.821	3	49.464	15	-256.008	4	0	4	0	1	.142	15
327		12	max	3894.766	2	1363.338	1	0	1	0	1	.339	4	3.429	1
328			min	-4110.274	3	49.464	15	-253.173	4	0	4	0	1	.124	15
329		13	max	3891.495	2	1363.338	1	0	1	0	1	.249	4	2.939	1
330			min	-4112.728	3	49.464	15	-250.337	4	0	4	0	1	.107	15
331		14	max	3888.223	2	1363.338	1	0	1	0	1	.159	4	2.449	1
332			min	-4115.182	3	49.464	15	-247.502	4	0	4	0	1	.089	15
333		15	max	3884.952	2	1363.338	1	0	1	0	1	.071	4	1.959	1
334			min	-4117.635	3	49.464	15	-244.667	4	0	4	0	1	.071	15
335		16	max	3881.681	2	1363.338	1	0	1	0	1	0	1	1.469	1
336			min	-4120.089	3	49.464	15	-241.832	4	0	4	-.017	5	.053	15
337		17	max	3878.409	2	1363.338	1	0	1	0	1	0	1	.98	1
338			min	-4122.542	3	49.464	15	-238.996	4	0	4	-.103	4	.036	15
339		18	max	3875.138	2	1363.338	1	0	1	0	1	0	1	.49	1
340			min	-4124.996	3	49.464	15	-236.161	4	0	4	-.188	4	.018	15
341		19	max	3871.866	2	1363.338	1	0	1	0	1	0	1	0	1
342			min	-4127.449	3	49.464	15	-233.326	4	0	4	-.272	4	0	1
343	M8	1	max	2183.156	2	1116.673	3	114.29	3	.017	4	1.407	4	5.455	1
344			min	-1641.353	3	-749.631	2	-301.122	4	-.003	3	-.179	3	-.551	5
345		2	max	2179.884	2	1116.673	3	114.29	3	.017	4	1.299	4	5.542	1
346			min	-1643.807	3	-749.631	2	-298.286	4	-.003	3	-.138	3	-.498	5
347		3	max	1519.268	2	940.081	1	103.528	3	0	3	1.191	4	5.404	1
348			min	-1369.115	3	-79.697	5	-275.845	4	0	2	-.106	3	-.458	5
349		4	max	1515.996	2	940.081	1	103.528	3	0	3	1.093	4	5.066	1
350			min	-1371.569	3	-79.697	5	-273.01	4	0	2	-.069	3	-.429	5
351		5	max	1512.725	2	940.081	1	103.528	3	0	3	.995	4	4.728	1
352			min	-1374.022	3	-79.697	5	-270.175	4	0	2	-.032	3	-.401	5
353		6	max	1509.453	2	940.081	1	103.528	3	0	3	.899	4	4.391	1
354			min	-1376.476	3	-79.697	5	-267.339	4	0	2	.003	12	-.372	5
355		7	max	1506.182	2	940.081	1	103.528	3	0	3	.803	4	4.053	1
356			min	-1378.93	3	-79.697	5	-264.504	4	0	2	0	10	-.344	5
357		8	max	1502.91	2	940.081	1	103.528	3	0	3	.709	4	3.715	1
358			min	-1381.383	3	-79.697	5	-261.669	4	0	2	-.02	2	-.315	5
359		9	max	1499.639	2	940.081	1	103.528	3	0	3	.615	4	3.377	1
360			min	-1383.837	3	-79.697	5	-258.834	4	0	2	-.042	2	-.286	5
361		10	max	1496.367	2	940.081	1	103.528	3	0	3	.523	4	3.04	1
362			min	-1386.29	3	-79.697	5	-255.998	4	0	2	-.063	2	-.258	5
363		11	max	1493.096	2	940.081	1	103.528	3	0	3	.432	5	2.702	1
364			min	-1388.744	3	-79.697	5	-253.163	4	0	2	-.085	2	-.229	5
365		12	max	1489.825	2	940.081	1	103.528	3	0	3	.344	5	2.364	1
366			min	-1391.197	3	-79.697	5	-250.328	4	0	2	-.107	2	-.2	5

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
367		13	max	1486.553	2	940.081	1	103.528	3	0	3	.266	3	2.026	1
368			min	-1393.651	3	-79.697	5	-247.493	4	0	2	-.129	2	-.172	5
369		14	max	1483.282	2	940.081	1	103.528	3	0	3	.303	3	1.689	1
370			min	-1396.105	3	-79.697	5	-244.657	4	0	2	-.151	2	-.143	5
371		15	max	1480.01	2	940.081	1	103.528	3	0	3	.34	3	1.351	1
372			min	-1398.558	3	-79.697	5	-241.822	4	0	2	-.173	2	-.115	5
373		16	max	1476.739	2	940.081	1	103.528	3	0	3	.377	3	1.013	1
374			min	-1401.012	3	-79.697	5	-238.987	4	0	2	-.195	2	-.086	5
375		17	max	1473.467	2	940.081	1	103.528	3	0	3	.415	3	.675	1
376			min	-1403.465	3	-79.697	5	-236.151	4	0	2	-.217	2	-.057	5
377		18	max	1470.196	2	940.081	1	103.528	3	0	3	.452	3	.338	1
378			min	-1405.919	3	-79.697	5	-233.316	4	0	2	-.239	2	-.029	5
379		19	max	1466.924	2	940.081	1	103.528	3	0	3	.489	3	0	1
380			min	-1408.373	3	-79.697	5	-230.481	4	0	2	-.264	4	0	1
381	M3	1	max	1679.416	2	5.617	4	28.017	2	.008	3	.018	5	0	1
382			min	-715.858	3	1.32	15	-17.792	5	-.017	2	-.002	2	0	1
383		2	max	1679.207	2	4.993	4	28.017	2	.008	3	.012	4	0	15
384			min	-716.015	3	1.174	15	-17.333	5	-.017	2	-.003	3	-.002	4
385		3	max	1678.999	2	4.369	4	28.017	2	.008	3	.018	2	0	15
386			min	-716.171	3	1.027	15	-16.875	5	-.017	2	-.007	3	-.004	4
387		4	max	1678.79	2	3.745	4	28.017	2	.008	3	.028	2	-.001	15
388			min	-716.327	3	.88	15	-16.416	5	-.017	2	-.011	3	-.005	4
389		5	max	1678.581	2	3.121	4	28.017	2	.008	3	.038	2	-.001	15
390			min	-716.484	3	.734	15	-15.957	5	-.017	2	-.015	3	-.006	4
391		6	max	1678.373	2	2.497	4	28.017	2	.008	3	.048	2	-.002	15
392			min	-716.64	3	.587	15	-15.499	5	-.017	2	-.019	3	-.007	4
393		7	max	1678.164	2	1.872	4	28.017	2	.008	3	.058	2	-.002	15
394			min	-716.797	3	.44	15	-15.04	5	-.017	2	-.023	3	-.008	4
395		8	max	1677.956	2	1.248	4	28.017	2	.008	3	.068	2	-.002	15
396			min	-716.953	3	.293	15	-14.582	5	-.017	2	-.027	3	-.009	4
397		9	max	1677.747	2	.624	4	28.017	2	.008	3	.078	2	-.002	15
398			min	-717.11	3	.147	15	-14.123	5	-.017	2	-.031	3	-.009	4
399		10	max	1677.538	2	0	1	28.017	2	.008	3	.088	2	-.002	15
400			min	-717.266	3	0	1	-13.664	5	-.017	2	-.035	3	-.009	4
401		11	max	1677.33	2	-.147	15	28.017	2	.008	3	.098	2	-.002	15
402			min	-717.423	3	-.624	6	-13.206	5	-.017	2	-.039	3	-.009	4
403		12	max	1677.121	2	-.293	15	28.017	2	.008	3	.108	2	-.002	15
404			min	-717.579	3	-1.248	6	-12.747	5	-.017	2	-.043	3	-.009	4
405		13	max	1676.913	2	-.44	15	28.017	2	.008	3	.118	2	-.002	15
406			min	-717.736	3	-1.872	6	-12.288	5	-.017	2	-.047	3	-.008	4
407		14	max	1676.704	2	-.587	15	28.017	2	.008	3	.128	2	-.002	15
408			min	-717.892	3	-2.497	6	-11.83	5	-.017	2	-.051	5	-.007	4
409		15	max	1676.495	2	-.734	15	28.017	2	.008	3	.138	2	-.001	15
410			min	-718.048	3	-3.121	6	-11.371	5	-.017	2	-.055	5	-.006	4
411		16	max	1676.287	2	-.88	15	28.017	2	.008	3	.148	2	-.001	15
412			min	-718.205	3	-3.745	6	-11.089	3	-.017	2	-.059	5	-.005	4
413		17	max	1676.078	2	-1.027	15	28.017	2	.008	3	.158	2	0	15
414			min	-718.361	3	-4.369	6	-11.089	3	-.017	2	-.063	5	-.004	4
415		18	max	1675.87	2	-1.174	15	28.017	2	.008	3	.168	2	0	15
416			min	-718.518	3	-4.993	6	-11.089	3	-.017	2	-.067	3	-.002	4
417		19	max	1675.661	2	-1.32	15	28.017	2	.008	3	.178	2	0	1
418			min	-718.674	3	-5.617	6	-11.089	3	-.017	2	-.071	3	0	1
419	M6	1	max	4552.949	2	5.617	4	0	1	.002	5	.018	4	0	1
420			min	-2449.523	3	1.32	15	-19.294	4	0	1	0	1	0	1
421		2	max	4552.741	2	4.993	4	0	1	.002	5	.011	4	0	15
422			min	-2449.679	3	1.174	15	-18.836	4	0	1	0	1	-.002	4
423		3	max	4552.532	2	4.369	4	0	1	.002	5	.004	4	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-2449.836	3	1.027	15	-18.377	4	0	1	0	1	-.004	4
425		4	max	4552.324	2	3.745	4	0	1	.002	5	0	1	-.001	15
426			min	-2449.992	3	.88	15	-17.918	4	0	1	-.002	5	-.005	4
427		5	max	4552.115	2	3.121	4	0	1	.002	5	0	1	-.001	15
428			min	-2450.149	3	.734	15	-17.46	4	0	1	-.008	4	-.006	4
429		6	max	4551.906	2	2.497	4	0	1	.002	5	0	1	-.002	15
430			min	-2450.305	3	.587	15	-17.001	4	0	1	-.015	4	-.007	4
431		7	max	4551.698	2	1.872	4	0	1	.002	5	0	1	-.002	15
432			min	-2450.462	3	.44	15	-16.542	4	0	1	-.021	4	-.008	4
433		8	max	4551.489	2	1.248	4	0	1	.002	5	0	1	-.002	15
434			min	-2450.618	3	.293	15	-16.084	4	0	1	-.026	4	-.009	4
435		9	max	4551.281	2	.624	4	0	1	.002	5	0	1	-.002	15
436			min	-2450.775	3	.147	15	-15.625	4	0	1	-.032	4	-.009	4
437		10	max	4551.072	2	0	1	0	1	.002	5	0	1	-.002	15
438			min	-2450.931	3	0	1	-15.167	4	0	1	-.038	4	-.009	4
439		11	max	4550.863	2	-.147	15	0	1	.002	5	0	1	-.002	15
440			min	-2451.087	3	-.624	6	-14.708	4	0	1	-.043	4	-.009	4
441		12	max	4550.655	2	-.293	15	0	1	.002	5	0	1	-.002	15
442			min	-2451.244	3	-1.248	6	-14.249	4	0	1	-.048	4	-.009	4
443		13	max	4550.446	2	-.44	15	0	1	.002	5	0	1	-.002	15
444			min	-2451.4	3	-1.872	6	-13.791	4	0	1	-.053	4	-.008	4
445		14	max	4550.238	2	-.587	15	0	1	.002	5	0	1	-.002	15
446			min	-2451.557	3	-2.497	6	-13.332	4	0	1	-.058	4	-.007	4
447		15	max	4550.029	2	-.734	15	0	1	.002	5	0	1	-.001	15
448			min	-2451.713	3	-3.121	6	-12.873	4	0	1	-.063	4	-.006	4
449		16	max	4549.82	2	-.88	15	0	1	.002	5	0	1	-.001	15
450			min	-2451.87	3	-3.745	6	-12.415	4	0	1	-.067	4	-.005	4
451		17	max	4549.612	2	-1.027	15	0	1	.002	5	0	1	0	15
452			min	-2452.026	3	-4.369	6	-11.956	4	0	1	-.071	4	-.004	4
453		18	max	4549.403	2	-1.174	15	0	1	.002	5	0	1	0	15
454			min	-2452.183	3	-4.993	6	-11.497	4	0	1	-.076	4	-.002	4
455		19	max	4549.195	2	-1.32	15	0	1	.002	5	0	1	0	1
456			min	-2452.339	3	-5.617	6	-11.039	4	0	1	-.08	4	0	1
457	M9	1	max	1679.416	2	5.617	4	11.089	3	.017	2	.018	4	0	1
458			min	-715.858	3	1.32	15	-28.017	2	-.008	3	0	3	0	1
459		2	max	1679.207	2	4.993	4	11.089	3	.017	2	.011	5	0	15
460			min	-716.015	3	1.174	15	-28.017	2	-.008	3	-.008	2	-.002	4
461		3	max	1678.999	2	4.369	4	11.089	3	.017	2	.007	3	0	15
462			min	-716.171	3	1.027	15	-28.017	2	-.008	3	-.018	2	-.004	4
463		4	max	1678.79	2	3.745	4	11.089	3	.017	2	.011	3	-.001	15
464			min	-716.327	3	.88	15	-28.017	2	-.008	3	-.028	2	-.005	4
465		5	max	1678.581	2	3.121	4	11.089	3	.017	2	.015	3	-.001	15
466			min	-716.484	3	.734	15	-28.017	2	-.008	3	-.038	2	-.006	4
467		6	max	1678.373	2	2.497	4	11.089	3	.017	2	.019	3	-.002	15
468			min	-716.64	3	.587	15	-28.017	2	-.008	3	-.048	2	-.007	4
469		7	max	1678.164	2	1.872	4	11.089	3	.017	2	.023	3	-.002	15
470			min	-716.797	3	.44	15	-28.017	2	-.008	3	-.058	2	-.008	4
471		8	max	1677.956	2	1.248	4	11.089	3	.017	2	.027	3	-.002	15
472			min	-716.953	3	.293	15	-28.017	2	-.008	3	-.068	2	-.009	4
473		9	max	1677.747	2	.624	4	11.089	3	.017	2	.031	3	-.002	15
474			min	-717.11	3	.147	15	-28.017	2	-.008	3	-.078	2	-.009	4
475		10	max	1677.538	2	0	1	11.089	3	.017	2	.035	3	-.002	15
476			min	-717.266	3	0	1	-28.017	2	-.008	3	-.088	2	-.009	4
477		11	max	1677.33	2	-.147	15	11.089	3	.017	2	.039	3	-.002	15
478			min	-717.423	3	-.624	6	-28.017	2	-.008	3	-.098	2	-.009	4
479		12	max	1677.121	2	-.293	15	11.089	3	.017	2	.043	3	-.002	15
480			min	-717.579	3	-1.248	6	-28.017	2	-.008	3	-.108	2	-.009	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	1676.913	2	-.44	15	11.089	3	.017	2	.047	3	-.002	15
482			min	-717.736	3	-1.872	6	-28.017	2	-.008	3	-.118	2	-.008	4
483		14	max	1676.704	2	-.587	15	11.089	3	.017	2	.051	3	-.002	15
484			min	-717.892	3	-2.497	6	-28.017	2	-.008	3	-.128	2	-.007	4
485		15	max	1676.495	2	-.734	15	11.089	3	.017	2	.055	3	-.001	15
486			min	-718.048	3	-3.121	6	-28.017	2	-.008	3	-.138	2	-.006	4
487		16	max	1676.287	2	-.88	15	11.089	3	.017	2	.059	3	-.001	15
488			min	-718.205	3	-3.745	6	-28.017	2	-.008	3	-.148	2	-.005	4
489		17	max	1676.078	2	-1.027	15	11.089	3	.017	2	.063	3	0	15
490			min	-718.361	3	-4.369	6	-28.017	2	-.008	3	-.158	2	-.004	4
491		18	max	1675.87	2	-1.174	15	11.089	3	.017	2	.067	3	0	15
492			min	-718.518	3	-4.993	6	-28.017	2	-.008	3	-.168	2	-.002	4
493		19	max	1675.661	2	-1.32	15	11.089	3	.017	2	.071	3	0	1
494			min	-718.674	3	-5.617	6	-28.017	2	-.008	3	-.178	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	-.056	15	-.06	12	.008	1	5.528e-3	3	NC	3	NC	1
2			min	-.403	1	-.692	1	-.639	4	-1.649e-2	2	146.556	1	320.776	5
3		2	max	-.056	15	-.061	15	0	12	5.311e-3	3	NC	5	NC	1
4			min	-.403	1	-.581	1	-.619	4	-1.549e-2	2	165.623	1	336.878	4
5		3	max	-.055	15	-.053	15	-.001	12	4.885e-3	3	NC	5	NC	2
6			min	-.403	1	-.472	1	-.593	4	-1.353e-2	2	189.672	1	359.028	4
7		4	max	-.055	15	-.046	15	-.001	12	4.459e-3	3	NC	5	NC	3
8			min	-.403	1	-.372	1	-.562	4	-1.157e-2	2	219.002	1	389.612	4
9		5	max	-.055	15	-.039	15	0	12	4.253e-3	3	NC	5	NC	2
10			min	-.403	1	-.286	1	-.528	4	-1.016e-2	2	252.549	1	430.114	4
11		6	max	-.055	15	-.032	15	0	3	4.608e-3	3	NC	5	NC	1
12			min	-.402	1	-.217	1	-.493	4	-1.014e-2	2	288.22	1	481.014	4
13		7	max	-.055	15	-.025	15	.001	3	4.964e-3	3	NC	5	NC	1
14			min	-.402	1	-.159	1	-.459	4	-1.013e-2	2	326.722	1	542.528	5
15		8	max	-.055	15	-.018	15	0	3	5.32e-3	3	NC	3	NC	1
16			min	-.402	1	-.107	1	-.429	4	-1.011e-2	2	370.538	1	612.536	5
17		9	max	-.055	15	-.011	15	0	10	5.962e-3	3	NC	5	NC	1
18			min	-.401	1	-.071	3	-.402	4	-9.477e-3	2	425.783	1	693.947	5
19		10	max	-.055	15	.002	10	0	2	6.872e-3	3	NC	5	NC	1
20			min	-.401	1	-.05	3	-.373	4	-8.252e-3	2	501.513	1	806.646	5
21		11	max	-.055	15	.044	2	0	1	7.782e-3	3	NC	5	NC	1
22			min	-.4	1	-.029	3	-.344	4	-7.027e-3	2	611.201	1	964.337	5
23		12	max	-.055	15	.094	1	.003	3	7.357e-3	3	NC	5	NC	1
24			min	-.4	1	-.008	3	-.317	4	-5.662e-3	2	784.562	1	1188.407	5
25		13	max	-.055	15	.144	1	.008	3	5.514e-3	3	NC	5	NC	1
26			min	-.399	1	.011	12	-.287	4	-4.147e-3	2	1083.637	1	1577.528	5
27		14	max	-.055	15	.189	1	.012	3	3.671e-3	3	NC	5	NC	1
28			min	-.399	1	.024	15	-.258	4	-4.707e-3	4	965.76	3	2293.227	5
29		15	max	-.055	15	.225	1	.013	3	1.828e-3	3	NC	2	NC	1
30			min	-.398	1	.031	15	-.235	4	-5.895e-3	4	703.933	3	3606.251	5
31		16	max	-.055	15	.248	1	.009	1	4.812e-3	3	NC	5	NC	1
32			min	-.398	1	.038	15	-.219	4	-5.088e-3	4	504.341	3	5840.463	5
33		17	max	-.055	15	.287	3	.01	1	8.361e-3	3	NC	1	NC	2
34			min	-.398	1	.046	15	-.208	4	-4.047e-3	4	372.69	3	9110.844	1
35		18	max	-.055	15	.398	3	.005	1	1.191e-2	3	NC	1	NC	1
36			min	-.398	1	.053	15	-.202	4	-4.92e-3	2	288.417	3	NC	1
37		19	max	-.055	15	.513	3	-.002	12	1.372e-2	3	NC	1	NC	1
38			min	-.398	1	.061	15	-.198	4	-5.618e-3	2	233.691	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	-.021	15	-.009	3	0	1	8.089e-4	4	NC	3	NC	1
40			min	-.583	1	-1.195	2	-.638	4	0	1	103.019	1	320.741	4
41		2	max	-.021	15	-.029	15	0	1	5.404e-4	4	4243.047	12	NC	1
42			min	-.583	1	-.962	2	-.62	4	0	1	120.19	1	334.467	4
43		3	max	-.021	15	-.024	15	0	1	1.625e-5	5	3846.606	15	NC	1
44			min	-.582	1	-.736	2	-.595	4	0	1	143.369	1	355.557	4
45		4	max	-.021	15	-.019	15	0	1	0	1	4381.216	15	NC	1
46			min	-.582	1	-.564	1	-.564	4	-5.125e-4	4	173.334	1	385.76	4
47		5	max	-.021	15	-.015	15	0	1	0	1	4970.193	15	NC	1
48			min	-.582	1	-.427	1	-.528	4	-8.08e-4	4	208.211	1	426.57	4
49		6	max	-.021	15	-.012	15	0	1	0	1	5568.62	15	NC	1
50			min	-.581	1	-.33	1	-.493	4	-5.098e-4	4	243.029	1	478.03	4
51		7	max	-.021	15	-.01	15	0	1	0	1	6198.521	15	NC	1
52			min	-.58	1	-.257	1	-.459	4	-2.116e-4	4	277.389	1	539.924	4
53		8	max	-.021	15	-.007	15	0	1	8.676e-5	5	6921.405	15	NC	1
54			min	-.579	1	-.197	1	-.428	4	0	1	314.799	1	610.28	4
55		9	max	-.021	15	-.005	15	0	1	1.506e-4	4	8646.49	12	NC	1
56			min	-.578	1	-.133	1	-.402	4	0	1	366.425	1	688.398	4
57		10	max	-.021	15	-.002	15	0	1	0	1	NC	3	NC	1
58			min	-.577	1	-.064	2	-.373	4	-6.03e-6	4	450.865	1	802.56	4
59		11	max	-.021	15	.019	1	0	1	0	1	NC	15	NC	1
60			min	-.576	1	0	15	-.344	4	-1.627e-4	4	605.036	1	961.373	4
61		12	max	-.021	15	.107	1	0	1	0	1	NC	10	NC	1
62			min	-.575	1	.004	15	-.318	4	-1.005e-3	4	964.249	1	1166.987	4
63		13	max	-.021	15	.195	1	0	1	0	1	NC	5	NC	1
64			min	-.574	1	.007	15	-.289	4	-2.575e-3	4	2170.789	9	1521.318	4
65		14	max	-.021	15	.271	1	0	1	0	1	NC	5	NC	1
66			min	-.573	1	.01	15	-.262	4	-4.145e-3	4	1347.335	2	2166.917	4
67		15	max	-.021	15	.322	1	0	1	0	1	NC	4	NC	1
68			min	-.572	1	.012	15	-.239	4	-5.715e-3	4	890.802	3	3306.639	4
69		16	max	-.021	15	.336	1	0	1	0	1	NC	4	NC	1
70			min	-.572	1	.013	15	-.224	4	-4.595e-3	4	473.201	3	5141.4	4
71		17	max	-.021	15	.479	3	0	1	0	1	NC	4	NC	1
72			min	-.572	1	.013	15	-.212	4	-3.158e-3	4	290.529	3	8758.655	4
73		18	max	-.021	15	.696	3	0	1	0	1	NC	4	NC	1
74			min	-.572	1	.013	15	-.204	4	-1.722e-3	4	201.196	3	NC	1
75		19	max	-.021	15	.921	3	0	1	0	1	NC	1	NC	1
76			min	-.572	1	.013	15	-.196	4	-9.897e-4	4	152.47	3	NC	1
77	M7	1	max	.034	5	.031	5	-.001	12	1.649e-2	2	NC	3	NC	1
78			min	-.403	1	-.692	1	-.643	4	-5.528e-3	3	146.556	1	316.103	4
79		2	max	.034	5	.03	5	.006	1	1.549e-2	2	NC	5	NC	1
80			min	-.403	1	-.581	1	-.616	4	-5.311e-3	3	165.623	1	336.311	4
81		3	max	.034	5	.028	5	.013	1	1.353e-2	2	NC	5	NC	2
82			min	-.403	1	-.472	1	-.587	4	-4.885e-3	3	189.672	1	361.435	4
83		4	max	.034	5	.026	5	.014	1	1.157e-2	2	NC	5	NC	3
84			min	-.403	1	-.372	1	-.555	4	-4.459e-3	3	219.002	1	392.986	4
85		5	max	.034	5	.024	5	.012	1	1.016e-2	2	NC	5	NC	2
86			min	-.403	1	-.286	1	-.522	4	-4.253e-3	3	252.549	1	432.594	4
87		6	max	.034	5	.02	5	.008	1	1.014e-2	2	NC	5	NC	1
88			min	-.402	1	-.217	1	-.49	4	-4.608e-3	3	288.22	1	480.237	4
89		7	max	.034	5	.016	5	.003	2	1.013e-2	2	NC	7	NC	1
90			min	-.402	1	-.159	1	-.458	4	-4.964e-3	3	326.722	1	536.764	4
91		8	max	.034	5	.012	5	0	10	1.011e-2	2	NC	3	NC	1
92			min	-.402	1	-.107	1	-.429	4	-5.32e-3	3	370.538	1	603.769	4
93		9	max	.034	5	.008	5	0	3	9.477e-3	2	NC	4	NC	1
94			min	-.401	1	-.071	3	-.402	4	-5.962e-3	3	425.783	1	684.443	4
95		10	max	.034	5	.003	5	.001	3	8.252e-3	2	NC	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
96			min	-.401	1	-.05	3	-.373	4	-6.872e-3	3	501.513	1	793.32	4
97		11	max	.034	5	.044	2	0	3	7.027e-3	2	NC	4	NC	1
98			min	-.4	1	-.029	3	-.344	4	-7.782e-3	3	611.201	1	945.651	4
99		12	max	.034	5	.094	1	.003	1	5.662e-3	2	NC	4	NC	1
100			min	-.4	1	-.008	3	-.316	4	-7.357e-3	3	784.562	1	1169.988	4
101		13	max	.034	5	.144	1	.004	2	4.147e-3	2	NC	4	NC	1
102			min	-.399	1	-.009	5	-.286	4	-5.514e-3	3	1083.637	1	1547.956	4
103		14	max	.034	5	.189	1	.004	2	2.632e-3	2	NC	4	NC	1
104			min	-.399	1	-.014	5	-.259	4	-4.255e-3	5	965.76	3	2202.927	4
105		15	max	.034	5	.225	1	0	10	1.118e-3	2	NC	2	NC	1
106			min	-.398	1	-.019	5	-.238	4	-5.659e-3	5	703.933	3	3275.111	4
107		16	max	.034	5	.248	1	-.002	10	2.183e-3	2	NC	4	NC	1
108			min	-.398	1	-.026	5	-.224	4	-4.812e-3	3	504.341	3	4788.112	4
109		17	max	.034	5	.287	3	-.003	10	3.552e-3	2	NC	1	NC	2
110			min	-.398	1	-.034	5	-.214	4	-8.361e-3	3	372.69	3	7378.187	4
111		18	max	.034	5	.398	3	-.001	12	4.92e-3	2	NC	1	NC	1
112			min	-.398	1	-.042	5	-.204	4	-1.191e-2	3	288.417	3	NC	1
113		19	max	.034	5	.513	3	.007	1	5.618e-3	2	NC	1	NC	1
114			min	-.398	1	-.051	5	-.194	4	-1.372e-2	3	233.691	3	NC	1
115	M10	1	max	0	1	.457	3	.398	1	1.459e-2	3	NC	1	NC	1
116			min	-.199	4	-.046	5	-.034	5	-1.182e-3	2	NC	1	NC	1
117		2	max	0	1	.578	3	.421	1	1.614e-2	3	NC	4	NC	2
118			min	-.199	4	-.034	5	-.026	5	-1.876e-3	2	1289.222	3	6852.439	1
119		3	max	0	1	.691	3	.454	1	1.768e-2	3	NC	4	NC	4
120			min	-.2	4	-.025	5	-.017	5	-2.571e-3	2	665.466	3	2809.88	1
121		4	max	0	1	.783	3	.489	1	1.923e-2	3	NC	4	NC	5
122			min	-.2	4	-.018	5	-.009	5	-3.266e-3	2	478.091	3	1719.435	1
123		5	max	0	1	.845	3	.521	1	2.077e-2	3	NC	4	NC	5
124			min	-.2	4	-.011	5	-.002	15	-3.96e-3	2	401.741	3	1270.524	1
125		6	max	0	1	.875	3	.546	1	2.232e-2	3	NC	4	NC	5
126			min	-.2	4	-.006	5	.003	15	-4.655e-3	2	373.405	3	1054.048	1
127		7	max	0	1	.874	3	.563	1	2.386e-2	3	NC	4	NC	5
128			min	-.2	4	0	15	.007	15	-5.349e-3	2	373.515	3	947.678	1
129		8	max	0	1	.853	3	.571	1	2.541e-2	3	NC	4	NC	5
130			min	-.2	4	.003	15	.011	15	-6.044e-3	2	393.406	3	902.9	1
131		9	max	0	1	.825	3	.573	1	2.696e-2	3	NC	1	NC	5
132			min	-.2	4	.008	15	.016	15	-6.738e-3	2	423.157	3	893.621	1
133		10	max	0	1	.811	3	.572	1	2.85e-2	3	NC	1	NC	5
134			min	-.2	4	.013	15	.021	15	-7.433e-3	2	440.816	3	896.577	1
135		11	max	0	10	.825	3	.573	1	2.696e-2	3	NC	1	NC	5
136			min	-.2	4	.018	15	.026	15	-6.738e-3	2	423.157	3	893.621	1
137		12	max	0	10	.853	3	.571	1	2.541e-2	3	NC	4	NC	5
138			min	-.2	4	.021	15	.031	15	-6.044e-3	2	393.406	3	902.9	1
139		13	max	0	10	.874	3	.563	1	2.386e-2	3	NC	4	NC	5
140			min	-.2	4	.024	15	.035	15	-5.349e-3	2	373.515	3	947.678	1
141		14	max	0	10	.875	3	.546	1	2.232e-2	3	NC	5	NC	5
142			min	-.2	4	.017	10	.039	15	-4.655e-3	2	373.405	3	1054.048	1
143		15	max	0	10	.845	3	.521	1	2.077e-2	3	NC	5	NC	5
144			min	-.2	4	.014	10	.042	15	-3.96e-3	2	401.741	3	1270.524	1
145		16	max	0	10	.783	3	.489	1	1.923e-2	3	NC	5	NC	5
146			min	-.2	4	.02	10	.045	15	-3.266e-3	2	478.091	3	1719.435	1
147		17	max	0	10	.691	3	.454	1	1.768e-2	3	NC	5	NC	4
148			min	-.2	4	.036	10	.048	15	-2.571e-3	2	665.466	3	2809.88	1
149		18	max	0	10	.578	3	.421	1	1.614e-2	3	NC	4	NC	2
150			min	-.2	4	.047	15	.051	15	-1.876e-3	2	1289.222	3	6852.439	1
151		19	max	0	10	.457	3	.398	1	1.459e-2	3	NC	1	NC	1
152			min	-.2	4	.057	15	.055	15	-1.182e-3	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	0	1	.069	1	.4	1	6.495e-3	1	NC	1	NC	1
154			min	-.33	4	-.018	3	-.034	5	-5.191e-4	5	NC	1	NC	1
155		2	max	0	1	.054	3	.415	1	6.999e-3	1	NC	4	NC	1
156			min	-.33	4	.001	15	-.011	5	-3.95e-4	5	2152.103	3	7777.999	4
157		3	max	0	1	.118	3	.444	1	7.504e-3	1	NC	4	NC	3
158			min	-.33	4	-.032	2	0	15	-2.708e-4	5	1142.468	3	3504.249	1
159		4	max	0	1	.162	3	.479	1	8.008e-3	1	NC	4	NC	12
160			min	-.33	4	-.06	2	.004	15	-1.467e-4	5	866.835	3	1979.08	1
161		5	max	0	1	.178	3	.512	1	8.513e-3	1	NC	4	NC	5
162			min	-.33	4	-.069	2	.004	15	-2.797e-5	15	795.235	3	1391.757	1
163		6	max	0	1	.166	3	.54	1	9.018e-3	1	NC	4	NC	5
164			min	-.33	4	-.058	2	.002	15	5.496e-5	15	846.811	3	1115.039	1
165		7	max	0	1	.131	3	.56	1	9.522e-3	1	NC	4	NC	5
166			min	-.33	4	-.032	2	0	15	1.379e-4	15	1048.22	3	976.265	1
167		8	max	0	1	.082	3	.571	1	1.003e-2	1	NC	4	NC	5
168			min	-.33	4	-.002	10	.001	15	2.208e-4	15	1555.046	3	911.268	1
169		9	max	0	1	.051	1	.575	1	1.053e-2	1	NC	4	NC	5
170			min	-.33	4	.001	15	.008	15	3.037e-4	15	2852.753	3	889.098	1
171		10	max	0	1	.063	1	.576	1	1.104e-2	1	NC	1	NC	5
172			min	-.33	4	.002	15	.021	15	3.867e-4	15	4651.541	3	886.958	1
173		11	max	0	3	.051	1	.575	1	1.053e-2	1	NC	4	NC	15
174			min	-.33	4	.003	15	.035	15	4.416e-4	15	2852.753	3	889.098	1
175		12	max	0	3	.082	3	.571	1	1.003e-2	1	NC	4	9540.898	15
176			min	-.33	4	-.002	10	.041	15	4.965e-4	15	1555.046	3	911.268	1
177		13	max	0	3	.131	3	.56	1	9.522e-3	1	NC	4	NC	15
178			min	-.33	4	-.032	2	.042	15	5.514e-4	15	1048.22	3	976.265	1
179		14	max	0	3	.166	3	.54	1	9.018e-3	1	NC	5	NC	5
180			min	-.33	4	-.058	2	.039	15	6.064e-4	15	846.811	3	1115.039	1
181		15	max	0	3	.178	3	.512	1	8.513e-3	1	NC	5	NC	5
182			min	-.33	4	-.069	2	.036	15	6.613e-4	15	795.235	3	1391.757	1
183		16	max	0	3	.162	3	.479	1	8.008e-3	1	NC	5	NC	4
184			min	-.33	4	-.06	2	.033	15	7.162e-4	15	866.835	3	1979.08	1
185		17	max	0	3	.118	3	.444	1	7.504e-3	1	NC	5	NC	3
186			min	-.33	4	-.032	2	.034	15	7.711e-4	15	1142.468	3	3504.249	1
187		18	max	0	3	.054	3	.415	1	6.999e-3	1	NC	4	NC	1
188			min	-.33	4	0	15	.041	15	8.261e-4	15	2152.103	3	NC	1
189		19	max	0	3	.069	1	.4	1	6.495e-3	1	NC	1	NC	1
190			min	-.33	4	-.018	3	.055	15	8.81e-4	15	NC	1	NC	1
191	M12	1	max	0	3	.01	5	.401	1	6.323e-3	1	NC	1	NC	1
192			min	-.416	4	-.084	1	-.034	5	-5.49e-4	5	NC	1	NC	1
193		2	max	0	3	.009	5	.415	1	6.519e-3	1	NC	4	NC	1
194			min	-.416	4	-.151	1	-.011	5	-4.339e-4	5	1807.212	2	8165.966	4
195		3	max	0	3	.007	5	.443	1	6.715e-3	1	NC	4	NC	3
196			min	-.416	4	-.223	2	0	15	-3.187e-4	5	970.877	2	3784.33	1
197		4	max	0	3	.022	3	.477	1	6.912e-3	1	NC	5	NC	12
198			min	-.416	4	-.275	2	.003	15	-2.036e-4	5	735.658	2	2069.305	1
199		5	max	0	3	.029	3	.511	1	7.108e-3	1	NC	5	NC	5
200			min	-.416	4	-.298	2	.003	15	-8.845e-5	5	664.542	2	1428.671	1
201		6	max	0	3	.021	3	.539	1	7.305e-3	1	NC	5	NC	5
202			min	-.416	4	-.291	2	0	15	6.348e-6	15	683.066	2	1130.498	1
203		7	max	0	3	0	3	.56	1	7.501e-3	1	NC	5	NC	5
204			min	-.416	4	-.261	2	0	15	8.349e-5	15	788.27	2	980.734	1
205		8	max	0	3	-.003	15	.573	1	7.697e-3	1	NC	5	NC	5
206			min	-.416	4	-.216	2	.001	15	1.606e-4	15	1015.792	2	909.048	1
207		9	max	0	3	-.005	15	.578	1	7.894e-3	1	NC	5	NC	5
208			min	-.416	4	-.182	1	.007	15	2.378e-4	15	1405.528	2	882.634	1
209		10	max	0	1	-.006	15	.579	1	8.09e-3	1	NC	4	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.416	4	-.167	1	.021	15	3.149e-4	15	1713.159	2	878.802	1
211		11	max	0	1	-.008	15	.578	1	7.894e-3	1	NC	5	NC	15
212			min	-.416	4	-.182	1	.035	15	3.772e-4	15	1405.528	2	882.634	1
213		12	max	0	1	-.01	15	.573	1	7.697e-3	1	NC	5	9283.199	15
214			min	-.416	4	-.216	2	.041	15	4.395e-4	15	1015.792	2	909.048	1
215		13	max	0	1	0	3	.56	1	7.501e-3	1	NC	5	NC	15
216			min	-.416	4	-.261	2	.042	15	5.019e-4	15	788.27	2	980.734	1
217		14	max	0	1	.021	3	.539	1	7.305e-3	1	NC	5	NC	5
218			min	-.416	4	-.291	2	.04	15	5.642e-4	15	683.066	2	1130.498	1
219		15	max	0	1	.029	3	.511	1	7.108e-3	1	NC	5	NC	5
220			min	-.416	4	-.298	2	.037	15	6.265e-4	15	664.542	2	1428.671	1
221		16	max	0	1	.022	3	.477	1	6.912e-3	1	NC	5	NC	4
222			min	-.416	4	-.275	2	.034	15	6.888e-4	15	735.658	2	2069.305	1
223		17	max	0	1	0	3	.443	1	6.715e-3	1	NC	5	NC	3
224			min	-.416	4	-.223	2	.035	15	7.511e-4	15	970.877	2	3784.33	1
225		18	max	0	1	-.017	15	.415	1	6.519e-3	1	NC	4	NC	1
226			min	-.416	4	-.151	1	.041	15	8.134e-4	15	1807.212	2	NC	1
227		19	max	0	1	-.015	15	.401	1	6.323e-3	1	NC	1	NC	1
228			min	-.416	4	-.084	1	.055	15	8.757e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.03	5	.403	1	1.555e-2	2	NC	1	NC	1
230			min	-.63	4	-.638	1	-.034	5	-2.036e-3	3	NC	1	NC	1
231		2	max	0	12	.022	5	.427	1	1.71e-2	2	NC	4	NC	3
232			min	-.63	4	-.767	2	-.013	5	-2.607e-3	3	1093.69	2	6418.739	1
233		3	max	0	12	.013	5	.461	1	1.866e-2	2	NC	5	NC	3
234			min	-.63	4	-.898	2	0	15	-3.179e-3	3	569.68	2	2676.394	1
235		4	max	0	12	.015	3	.497	1	2.021e-2	2	NC	5	NC	12
236			min	-.63	4	-1.005	2	.004	15	-3.75e-3	3	409.796	2	1651.605	1
237		5	max	0	12	.029	3	.53	1	2.177e-2	2	NC	5	NC	15
238			min	-.63	4	-1.08	2	.006	15	-4.322e-3	3	342.444	2	1226.153	1
239		6	max	0	12	.028	3	.556	1	2.332e-2	2	NC	5	NC	5
240			min	-.63	4	-1.12	2	.006	15	-4.893e-3	3	314.408	2	1019.908	1
241		7	max	0	12	.014	3	.573	1	2.488e-2	2	NC	5	NC	5
242			min	-.63	4	-1.13	2	.006	15	-5.465e-3	3	308.557	2	918.158	1
243		8	max	0	12	-.007	3	.581	1	2.643e-2	2	NC	5	NC	5
244			min	-.63	4	-1.116	2	.007	15	-6.036e-3	3	316.984	2	875.083	1
245		9	max	0	12	-.021	12	.583	1	2.799e-2	2	NC	5	NC	5
246			min	-.63	4	-1.094	2	.012	15	-6.608e-3	3	332.247	2	865.91	1
247		10	max	0	1	-.027	12	.583	1	2.954e-2	2	NC	5	NC	5
248			min	-.63	4	-1.081	2	.021	15	-7.179e-3	3	341.536	2	868.572	1
249		11	max	0	1	-.021	12	.583	1	2.799e-2	2	NC	5	NC	15
250			min	-.63	4	-1.094	2	.031	15	-6.608e-3	3	332.247	2	865.91	1
251		12	max	0	1	-.007	3	.581	1	2.643e-2	2	NC	15	NC	15
252			min	-.63	4	-1.116	2	.036	15	-6.036e-3	3	316.984	2	875.083	1
253		13	max	0	1	.014	3	.573	1	2.488e-2	2	NC	15	NC	5
254			min	-.63	4	-1.13	2	.037	15	-5.465e-3	3	308.557	2	918.158	1
255		14	max	0	1	.028	3	.556	1	2.332e-2	2	NC	15	NC	5
256			min	-.63	4	-1.12	2	.036	15	-4.893e-3	3	314.408	2	1019.908	1
257		15	max	0	1	.029	3	.53	1	2.177e-2	2	NC	15	NC	5
258			min	-.63	4	-1.08	2	.035	15	-4.322e-3	3	342.444	2	1226.153	1
259		16	max	0	1	.015	3	.497	1	2.021e-2	2	NC	5	NC	4
260			min	-.63	4	-1.005	2	.035	15	-3.75e-3	3	409.796	2	1651.605	1
261		17	max	0	1	-.012	12	.461	1	1.866e-2	2	NC	5	NC	3
262			min	-.63	4	-.898	2	.037	15	-3.179e-3	3	569.68	2	2676.394	1
263		18	max	0	1	-.036	12	.427	1	1.71e-2	2	NC	5	NC	3
264			min	-.63	4	-.767	2	.043	15	-2.607e-3	3	1093.69	2	6418.739	1
265		19	max	0	1	-.064	12	.403	1	1.555e-2	2	NC	1	NC	1
266			min	-.63	4	-.638	1	.056	15	-2.036e-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	.001	5	2.79e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-5.643e-3	5	NC	1	NC	1
271		3	max	0	3	-.001	15	.005	5	3.939e-3	2	NC	2	NC	1
272			min	0	2	-.008	1	0	2	-8.19e-3	5	9980.657	1	NC	1
273		4	max	0	3	-.003	15	.01	5	3.625e-3	2	NC	4	NC	1
274			min	0	2	-.018	1	0	2	-7.979e-3	5	4420.626	1	7547.547	5
275		5	max	0	3	-.004	15	.018	5	3.31e-3	2	NC	5	NC	1
276			min	0	2	-.031	1	-.001	2	-7.769e-3	5	2512.538	1	4376.652	5
277		6	max	0	3	-.007	15	.027	5	2.996e-3	2	NC	15	NC	1
278			min	0	2	-.048	1	-.002	1	-7.558e-3	5	1632.235	1	2883.262	5
279		7	max	0	3	-.009	15	.038	5	2.682e-3	2	8187.292	15	NC	1
280			min	0	2	-.067	1	-.003	1	-7.347e-3	5	1153.232	1	2060.075	5
281		8	max	0	3	-.013	15	.05	5	2.367e-3	2	6152.425	15	NC	1
282			min	0	2	-.09	1	-.004	1	-7.137e-3	5	863.406	1	1557.423	5
283		9	max	0	3	-.016	15	.063	5	2.053e-3	2	4817.703	15	NC	1
284			min	0	2	-.115	1	-.004	1	-6.926e-3	5	674.265	1	1227.152	5
285		10	max	0	3	-.02	15	.078	5	1.738e-3	2	3894.649	15	NC	1
286			min	0	2	-.143	1	-.005	1	-6.715e-3	5	543.955	1	998.37	5
287		11	max	0	3	-.024	15	.093	5	1.424e-3	2	3228.297	15	NC	1
288			min	-.001	2	-.172	1	-.006	1	-6.504e-3	5	450.158	1	833.01	5
289		12	max	.001	3	-.028	15	.109	4	1.11e-3	2	2731.567	15	NC	1
290			min	-.001	2	-.204	1	-.006	1	-6.294e-3	5	380.401	1	709.411	4
291		13	max	.001	3	-.033	15	.126	4	7.954e-4	2	2350.91	15	NC	1
292			min	-.001	2	-.237	1	-.007	1	-6.105e-3	4	327.045	1	614.493	4
293		14	max	.001	3	-.038	15	.144	4	4.81e-4	2	2052.748	15	NC	1
294			min	-.001	2	-.272	1	-.007	1	-5.923e-3	4	285.317	1	540.12	4
295		15	max	.001	3	-.043	15	.161	4	5.609e-4	3	1814.77	15	NC	1
296			min	-.001	2	-.308	1	-.007	1	-5.74e-3	4	252.056	1	480.768	4
297		16	max	.001	3	-.048	15	.179	4	7.398e-4	3	1621.811	15	NC	1
298			min	-.002	2	-.345	1	-.007	1	-5.558e-3	4	225.118	1	432.68	4
299		17	max	.002	3	-.053	15	.197	4	9.187e-4	3	1463.252	15	NC	1
300			min	-.002	2	-.382	1	-.006	1	-5.376e-3	4	203.004	1	393.22	4
301		18	max	.002	3	-.058	15	.215	4	1.098e-3	3	1331.441	15	NC	1
302			min	-.002	2	-.42	1	-.008	3	-5.193e-3	4	184.636	1	360.495	4
303		19	max	.002	3	-.064	15	.233	4	1.277e-3	3	1220.792	15	NC	1
304			min	-.002	2	-.459	1	-.012	3	-5.011e-3	4	169.229	1	333.113	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	.001	4	0	1	NC	1	NC	1
308			min	0	2	-.002	1	0	1	-5.862e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
310			min	0	2	-.01	1	0	1	-8.503e-3	4	7514.262	1	NC	1
311		4	max	0	3	0	15	.011	4	0	1	NC	4	NC	1
312			min	0	2	-.024	1	0	1	-8.273e-3	4	3217.173	1	7289.508	4
313		5	max	.001	3	-.002	15	.018	4	0	1	NC	5	NC	1
314			min	-.001	2	-.043	1	0	1	-8.043e-3	4	1801.915	1	4228.267	4
315		6	max	.001	3	-.002	15	.028	4	0	1	NC	5	NC	1
316			min	-.001	2	-.067	1	0	1	-7.813e-3	4	1161.093	1	2786.657	4
317		7	max	.002	3	-.004	15	.039	4	0	1	NC	5	NC	1
318			min	-.002	2	-.095	1	0	1	-7.583e-3	4	816.129	1	1992.047	4
319		8	max	.002	3	-.005	15	.051	4	0	1	NC	5	NC	1
320			min	-.002	2	-.127	1	0	1	-7.353e-3	4	608.858	1	1506.852	4
321		9	max	.002	3	-.006	15	.065	4	0	1	NC	15	NC	1
322			min	-.002	2	-.164	1	0	1	-7.123e-3	4	474.251	1	1188.06	4
323		10	max	.003	3	-.007	15	.08	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	2	-.203	1	0	1	-6.892e-3	4	381.849	1	967.237	4
325		11	max	.003	3	-.009	15	.096	4	0	1	8562.596	15	NC	1
326			min	-.003	2	-.246	1	0	1	-6.662e-3	4	315.522	1	807.645	4
327		12	max	.003	3	-.011	15	.113	4	0	1	7235.26	15	NC	1
328			min	-.003	2	-.291	1	0	1	-6.432e-3	4	266.303	1	688.562	4
329		13	max	.003	3	-.012	15	.13	4	0	1	6220.103	15	NC	1
330			min	-.003	2	-.339	1	0	1	-6.202e-3	4	228.723	1	597.273	4
331		14	max	.004	3	-.014	15	.148	4	0	1	5426.255	15	NC	1
332			min	-.004	2	-.389	1	0	1	-5.972e-3	4	199.378	1	525.774	4
333		15	max	.004	3	-.016	15	.166	4	0	1	4793.52	15	NC	1
334			min	-.004	2	-.441	1	0	1	-5.742e-3	4	176.015	1	468.755	4
335		16	max	.004	3	-.018	15	.184	4	0	1	4281.093	15	NC	1
336			min	-.004	2	-.494	1	0	1	-5.512e-3	4	157.114	1	422.601	4
337		17	max	.004	3	-.02	15	.202	4	0	1	3860.45	15	NC	1
338			min	-.004	2	-.548	1	0	1	-5.282e-3	4	141.611	1	384.775	4
339		18	max	.005	3	-.022	15	.22	4	0	1	3511.081	15	NC	1
340			min	-.005	2	-.603	1	0	1	-5.052e-3	4	128.746	1	353.461	4
341		19	max	.005	3	-.024	15	.237	4	0	1	3218.04	15	NC	1
342			min	-.005	2	-.658	1	0	1	-4.822e-3	4	117.961	1	327.318	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	.001	4	1.142e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-6.049e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.005	4	1.586e-3	3	NC	2	NC	1
348			min	0	2	-.008	1	0	3	-8.761e-3	4	9980.657	1	NC	1
349		4	max	0	3	.002	5	.011	4	1.407e-3	3	NC	4	NC	1
350			min	0	2	-.018	1	-.001	3	-8.5e-3	4	4420.626	1	7333.549	4
351		5	max	0	3	.003	5	.018	4	1.228e-3	3	NC	4	NC	1
352			min	0	2	-.031	1	-.002	3	-8.238e-3	4	2512.538	1	4254.282	4
353		6	max	0	3	.004	5	.028	4	1.049e-3	3	NC	4	NC	1
354			min	0	2	-.048	1	-.003	3	-7.977e-3	4	1632.235	1	2803.876	4
355		7	max	0	3	.006	5	.039	4	8.705e-4	3	NC	4	NC	1
356			min	0	2	-.067	1	-.003	3	-7.716e-3	4	1153.232	1	2004.317	4
357		8	max	0	3	.008	5	.051	4	6.916e-4	3	NC	7	NC	1
358			min	0	2	-.09	1	-.004	3	-7.454e-3	4	863.406	1	1516.059	4
359		9	max	0	3	.01	5	.065	4	5.127e-4	3	NC	13	NC	1
360			min	0	2	-.115	1	-.005	3	-7.193e-3	4	674.265	1	1195.234	4
361		10	max	0	3	.013	5	.08	4	3.337e-4	3	NC	13	NC	1
362			min	0	2	-.143	1	-.005	3	-6.932e-3	4	543.955	1	972.992	4
363		11	max	0	3	.015	5	.096	4	1.548e-4	3	NC	13	NC	1
364			min	-.001	2	-.172	1	-.005	3	-6.67e-3	4	450.158	1	812.366	4
365		12	max	.001	3	.018	5	.112	4	-1.607e-5	12	NC	13	NC	1
366			min	-.001	2	-.204	1	-.005	3	-6.409e-3	4	380.401	1	692.506	4
367		13	max	.001	3	.021	5	.129	4	-4.66e-5	9	9296.682	13	NC	1
368			min	-.001	2	-.237	1	-.004	3	-6.148e-3	4	327.045	1	600.615	4
369		14	max	.001	3	.024	5	.147	4	3.895e-5	9	8096.943	13	NC	1
370			min	-.001	2	-.272	1	-.003	3	-5.886e-3	4	285.317	1	528.64	4
371		15	max	.001	3	.027	5	.165	4	1.245e-4	9	7143.067	13	NC	1
372			min	-.001	2	-.308	1	-.001	3	-5.634e-3	5	252.056	1	471.235	4
373		16	max	.001	3	.03	5	.183	4	3.269e-4	1	6372.193	13	NC	1
374			min	-.002	2	-.345	1	0	12	-5.405e-3	5	225.118	1	424.762	4
375		17	max	.002	3	.033	5	.201	4	5.872e-4	1	5740.552	13	NC	1
376			min	-.002	2	-.382	1	.002	10	-5.175e-3	5	203.004	1	386.67	4
377		18	max	.002	3	.036	5	.219	4	8.476e-4	1	5216.777	13	NC	1
378			min	-.002	2	-.42	1	0	10	-4.946e-3	5	184.636	1	355.128	4
379		19	max	.002	3	.04	5	.236	4	1.108e-3	1	4778.073	13	NC	1
380			min	-.002	2	-.459	1	0	10	-4.716e-3	5	169.229	1	328.788	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	.004	1	0	15	.003	5	1.557e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	2	-2.55e-3	5	NC	1	NC	1
383		2	max	.003	1	-.004	15	.037	5	1.805e-3	2	NC	1	NC	3
384			min	0	15	-.031	1	-.017	2	-2.552e-3	5	NC	1	4567.37	2
385		3	max	.003	3	-.009	15	.071	5	2.054e-3	2	NC	1	NC	4
386			min	0	15	-.061	1	-.033	2	-2.553e-3	5	NC	1	2301.262	2
387		4	max	.003	3	-.013	15	.106	5	2.302e-3	2	NC	1	9105.576	13
388			min	0	10	-.09	1	-.048	2	-2.554e-3	5	NC	1	1556.186	2
389		5	max	.004	3	-.017	15	.141	5	2.551e-3	2	NC	1	6704.768	13
390			min	0	10	-.119	1	-.063	2	-2.556e-3	5	NC	1	1192.038	2
391		6	max	.004	3	-.021	15	.176	5	2.799e-3	2	NC	1	5337.555	13
392			min	0	2	-.148	1	-.076	2	-2.557e-3	5	NC	1	981.113	2
393		7	max	.004	3	-.025	15	.21	5	3.048e-3	2	NC	1	4483.963	13
394			min	-.001	2	-.177	1	-.088	2	-2.559e-3	5	8990.605	4	847.855	2
395		8	max	.005	3	-.029	15	.244	5	3.297e-3	2	NC	1	3925.081	13
396			min	-.002	2	-.206	1	-.097	2	-2.56e-3	5	8301.976	4	728.5	14
397		9	max	.005	3	-.033	15	.276	5	3.545e-3	2	NC	1	3555.043	13
398			min	-.003	2	-.234	1	-.105	2	-2.561e-3	5	7931.316	4	635.253	14
399		10	max	.005	3	-.037	15	.308	5	3.794e-3	2	NC	1	3319.016	13
400			min	-.003	2	-.262	1	-.11	2	-2.563e-3	5	7814.056	4	563.068	14
401		11	max	.005	3	-.041	15	.339	5	4.042e-3	2	NC	1	3189.288	13
402			min	-.004	2	-.29	1	-.113	2	-2.564e-3	5	7931.316	4	505.599	14
403		12	max	.006	3	-.044	15	.369	5	4.291e-3	2	NC	1	3155.864	13
404			min	-.005	2	-.318	1	-.112	2	-2.565e-3	5	8301.976	4	458.81	14
405		13	max	.006	3	-.048	15	.398	5	4.539e-3	2	NC	1	3224.596	13
406			min	-.005	2	-.345	1	-.107	2	-2.567e-3	5	8990.605	4	420.009	14
407		14	max	.006	3	-.052	15	.424	5	4.788e-3	2	NC	1	3422.389	13
408			min	-.006	2	-.373	1	-.099	2	-2.568e-3	5	NC	1	387.335	14
409		15	max	.007	3	-.055	15	.45	5	5.037e-3	2	NC	1	3816.005	13
410			min	-.007	2	-.4	1	-.087	2	-2.569e-3	5	NC	1	359.459	14
411		16	max	.007	3	-.059	15	.473	5	5.285e-3	2	NC	1	4572.536	13
412			min	-.007	2	-.427	1	-.07	2	-2.571e-3	5	NC	1	335.405	14
413		17	max	.007	3	-.062	15	.495	4	5.534e-3	2	NC	1	6204.742	13
414			min	-.008	2	-.454	1	-.048	2	-2.572e-3	5	NC	1	314.444	14
415		18	max	.008	3	-.065	15	.517	4	5.782e-3	2	NC	1	NC	12
416			min	-.009	2	-.48	1	-.022	2	-2.574e-3	5	NC	1	296.016	14
417		19	max	.008	3	-.069	15	.537	4	6.031e-3	2	NC	1	NC	1
418			min	-.01	2	-.507	1	0	12	-2.665e-3	3	NC	1	279.687	14
419	M6	1	max	.005	1	0	15	.003	4	0	1	NC	1	NC	1
420			min	0	15	-.003	1	0	1	-2.652e-3	4	NC	1	NC	1
421		2	max	.005	3	-.002	15	.038	4	0	1	NC	1	NC	1
422			min	0	15	-.045	1	0	1	-2.678e-3	4	NC	1	NC	1
423		3	max	.006	3	-.004	15	.074	4	0	1	NC	1	NC	1
424			min	0	10	-.087	1	0	1	-2.703e-3	4	NC	1	6433.43	4
425		4	max	.007	3	-.006	15	.11	4	0	1	NC	1	NC	1
426			min	-.002	2	-.13	1	0	1	-2.729e-3	4	NC	1	4213.644	4
427		5	max	.008	3	-.008	15	.146	4	0	1	NC	1	NC	1
428			min	-.004	2	-.172	1	0	1	-2.754e-3	4	NC	1	3141.335	4
429		6	max	.009	3	-.009	15	.182	4	0	1	NC	1	NC	1
430			min	-.006	2	-.214	1	0	1	-2.78e-3	4	NC	1	2526.401	4
431		7	max	.01	3	-.011	15	.217	4	0	1	NC	1	NC	1
432			min	-.008	2	-.256	1	0	1	-2.805e-3	4	8990.605	4	2140.45	4
433		8	max	.011	3	-.013	15	.252	4	0	1	NC	1	NC	1
434			min	-.01	2	-.297	1	0	1	-2.831e-3	4	8301.976	4	1887.024	4
435		9	max	.012	3	-.014	15	.286	4	0	1	NC	1	NC	1
436			min	-.012	2	-.339	1	0	1	-2.856e-3	4	7931.316	4	1719.386	4
437		10	max	.013	3	-.016	15	.318	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	-.014	2	-.38	1	0	1	-2.881e-3	4	7814.056	4	1613.377	4
439		11	max	.014	3	-.017	15	.35	4	0	1	NC	1	NC	1
440			min	-.015	2	-.421	1	0	1	-2.907e-3	4	7931.316	4	1556.978	4
441		12	max	.015	3	-.019	15	.38	4	0	1	NC	1	NC	1
442			min	-.017	2	-.462	1	0	1	-2.932e-3	4	8301.976	4	1546.268	4
443		13	max	.016	3	-.02	15	.408	4	0	1	NC	1	NC	1
444			min	-.019	2	-.502	1	0	1	-2.958e-3	4	8990.605	4	1584.807	4
445		14	max	.017	3	-.021	15	.435	4	0	1	NC	1	NC	1
446			min	-.021	2	-.543	1	0	1	-2.983e-3	4	NC	1	1686.378	4
447		15	max	.018	3	-.022	15	.46	4	0	1	NC	1	NC	1
448			min	-.023	2	-.583	1	0	1	-3.009e-3	4	NC	1	1884.412	4
449		16	max	.019	3	-.023	15	.483	4	0	1	NC	1	NC	1
450			min	-.025	2	-.623	1	0	1	-3.034e-3	4	NC	1	2262.062	4
451		17	max	.02	3	-.025	15	.504	4	0	1	NC	1	NC	1
452			min	-.027	2	-.663	1	0	1	-3.06e-3	4	NC	1	3074.039	4
453		18	max	.021	3	-.026	15	.522	4	0	1	NC	1	NC	1
454			min	-.029	2	-.703	1	0	1	-3.085e-3	4	NC	1	5601.203	4
455		19	max	.022	3	-.027	15	.538	4	0	1	NC	1	NC	1
456			min	-.03	2	-.742	1	0	1	-3.111e-3	4	NC	1	NC	1
457	M9	1	max	.004	1	0	5	.003	4	5.792e-4	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-2.765e-3	4	NC	1	NC	1
459		2	max	.003	1	.002	5	.039	4	6.951e-4	3	NC	1	NC	3
460			min	0	5	-.031	1	-.007	3	-2.796e-3	4	NC	1	4567.37	2
461		3	max	.003	3	.004	5	.076	4	8.11e-4	3	NC	1	9692.119	12
462			min	0	5	-.061	1	-.014	3	-2.828e-3	4	NC	1	2301.262	2
463		4	max	.003	3	.005	5	.113	4	9.269e-4	3	NC	1	6557.174	12
464			min	0	5	-.09	1	-.02	3	-2.859e-3	4	NC	1	1556.186	2
465		5	max	.004	3	.007	5	.15	4	1.043e-3	3	NC	1	5024.918	12
466			min	0	5	-.119	1	-.026	3	-2.89e-3	4	NC	1	1192.038	2
467		6	max	.004	3	.009	5	.187	4	1.159e-3	3	NC	1	4137.381	12
468			min	0	2	-.148	1	-.032	3	-2.921e-3	4	8621.654	5	981.113	2
469		7	max	.004	3	.011	5	.223	4	1.274e-3	3	NC	1	3576.691	12
470			min	-.001	2	-.177	1	-.037	3	-3.048e-3	2	7053.161	5	847.855	2
471		8	max	.005	3	.013	5	.258	4	1.39e-3	3	NC	1	3208.34	12
472			min	-.002	2	-.206	1	-.041	3	-3.297e-3	2	5924.29	5	760.291	2
473		9	max	.005	3	.015	5	.292	4	1.506e-3	3	NC	1	2967.277	12
474			min	-.003	2	-.234	1	-.044	3	-3.545e-3	2	5073.033	5	702.956	2
475		10	max	.005	3	.018	5	.325	4	1.622e-3	3	NC	1	2820.36	12
476			min	-.003	2	-.262	1	-.047	3	-3.794e-3	2	4409.097	5	667.967	2
477		11	max	.005	3	.02	5	.356	4	1.738e-3	3	NC	1	2752.052	12
478			min	-.004	2	-.29	1	-.048	3	-4.042e-3	2	3878.029	5	651.622	2
479		12	max	.006	3	.023	5	.386	4	1.854e-3	3	NC	1	2759.208	12
480			min	-.005	2	-.318	1	-.048	3	-4.291e-3	2	3444.937	5	653.161	2
481		13	max	.006	3	.025	5	.414	4	1.97e-3	3	NC	1	2851.041	12
482			min	-.005	2	-.345	1	-.046	3	-4.539e-3	2	3086.352	5	674.75	2
483		14	max	.006	3	.028	5	.44	4	2.086e-3	3	NC	1	3054.782	12
484			min	-.006	2	-.373	1	-.043	3	-4.788e-3	2	2785.857	5	722.82	2
485		15	max	.007	3	.031	5	.463	4	2.201e-3	3	NC	1	3433.429	12
486			min	-.007	2	-.4	1	-.038	3	-5.037e-3	2	2531.592	5	812.257	2
487		16	max	.007	3	.033	5	.484	4	2.317e-3	3	NC	1	4141.541	12
488			min	-.007	2	-.427	1	-.032	3	-5.285e-3	2	2314.754	5	979.599	2
489		17	max	.007	3	.036	5	.503	4	2.433e-3	3	NC	1	5650.572	12
490			min	-.008	2	-.454	1	-.024	3	-5.534e-3	2	2128.668	5	1336.302	2
491		18	max	.008	3	.039	5	.519	4	2.549e-3	3	NC	1	NC	12
492			min	-.009	2	-.48	1	-.013	3	-5.782e-3	2	1968.173	5	2442.243	2
493		19	max	.008	3	.042	5	.531	4	2.665e-3	3	NC	1	NC	1
494			min	-.01	2	-.507	1	-.013	1	-6.031e-3	2	1829.224	5	NC	1