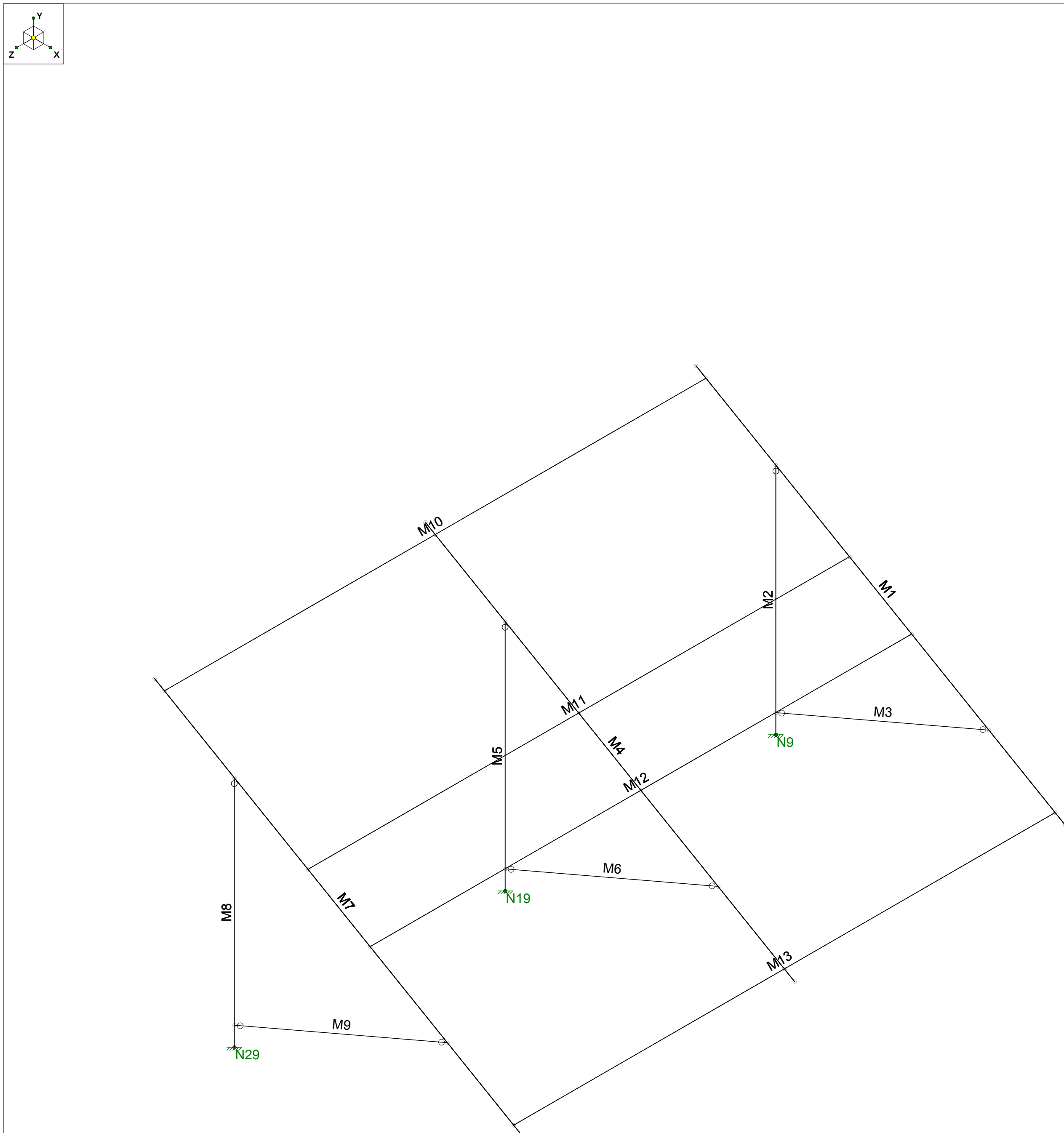


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

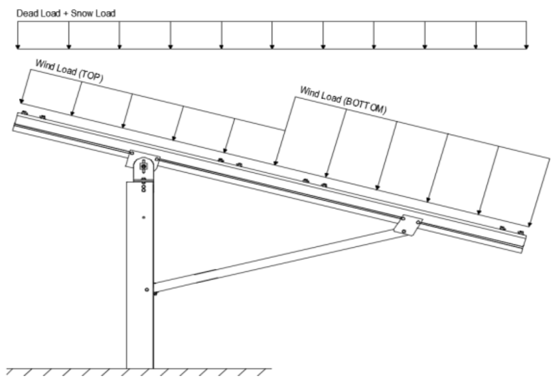
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	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 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005

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 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads
Design Wind Speed, V = 85 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 11.34 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

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 + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 1.0W
1.0D + 0.75L + 0.75W + 0.75S
0.6D + 1.0W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)

[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	Posts	Location
M10	Top	M2	Outer
M11	Mid-Top	M5	Inner
M12	Mid-Bottom	M8	Outer
M13	Bottom		

Girders	Location	Reactions	Location
M1	Outer	N9	Outer
M4	Inner	N19	Inner
M7	Outer	N29	Outer

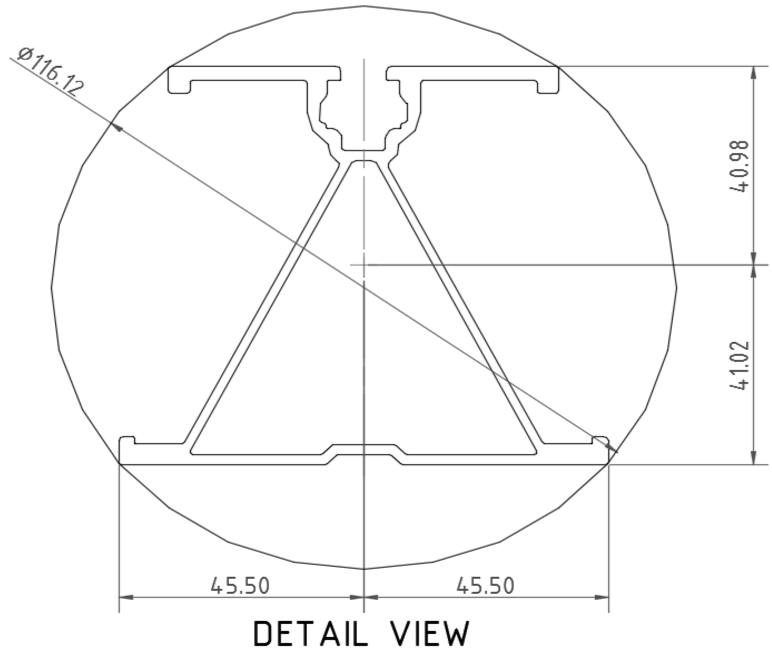
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

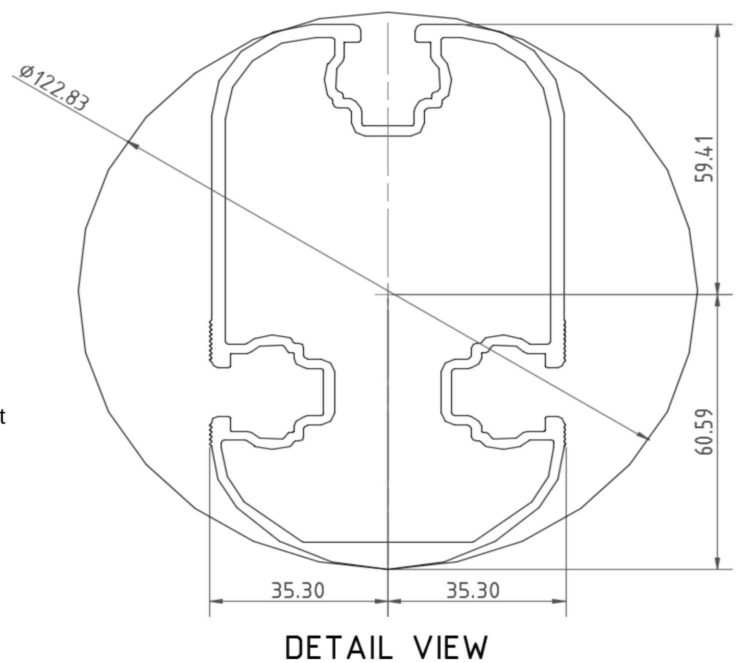
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	132	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.851	k-ft
M_z =	0.305	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	93%	



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).

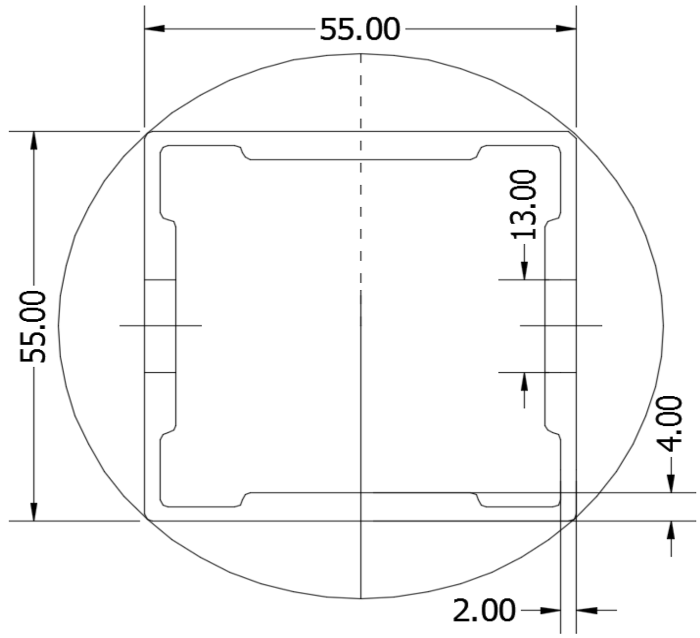
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.535	k-ft
M_z =	0.000	k-ft
P_n =	2.962	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	76%	



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 =	4.569	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	49%	

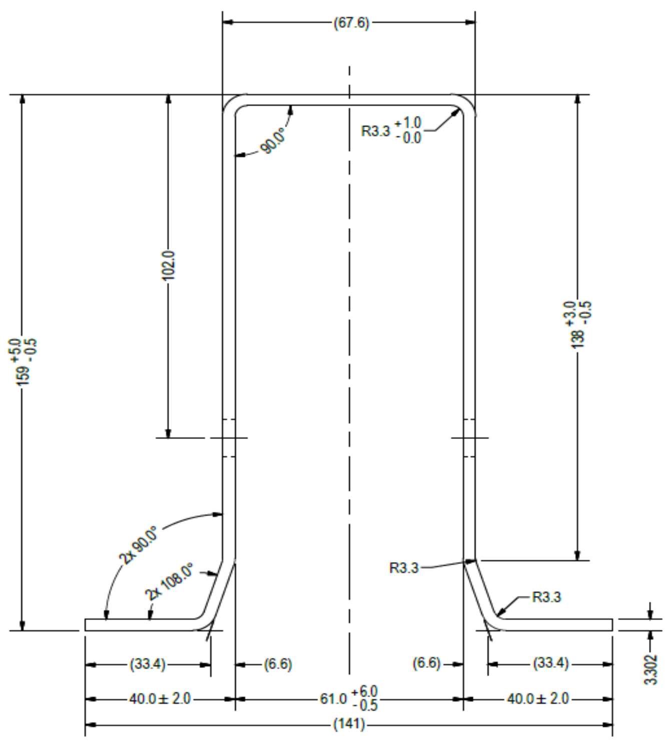


DETAIL VIEW

4.4 Post Design

Galvanized steel posts are a roll formed steel section, that are either ram driven into the ground or placed in a concrete foundation at a defined depth. Embedment depths will be provided on the structural drawings or through a geotechnical testing report. See Appendix A.4 for detailed member calculations. Section units are in (mm).

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	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 =	13.138	k-ft
M_z =	0.000	k-ft
P_r =	6.524	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	96%	



DETAIL VIEW

5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.50	k
Maximum Lateral Load =	3.42	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)

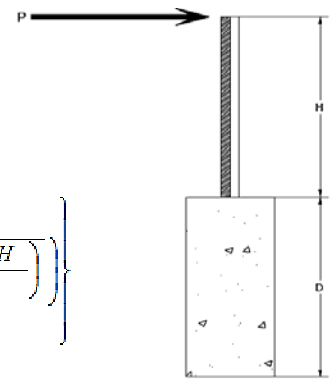
Lateral Force @ Top of Pole, P =	1.17	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

$$A = 2.34\,{}^{P}\!/_{S_1 B}$$

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



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

<u>Non-Constrained</u>

Lateral Force @ Top of Pole, P =	1.17	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 =	6.29	
Required Footing Depth, D =	10.51	ft
2nd Trial @ D_2 =	6.88	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.38	ksf
Constant $2.34P/(S_1B)$, A =	2.97	
Required Footing Depth, D =	6.30	ft
3rd Trial @ D_3 =	6.59	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf
Constant $2.34P/(S_1B)$, A =	3.10	
Required Footing Depth, D =	6.48	ft
4th Trial @ D_4 =	6.53	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant $2.34P/(S_1B)$, A =	3.13	
Required Footing Depth, D =	6.52	ft
5th Trial @ D_5 =	6.53	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant $2.34P/(S_1B)$, A =	3.13	
Required Footing Depth, D =	6.75	ft

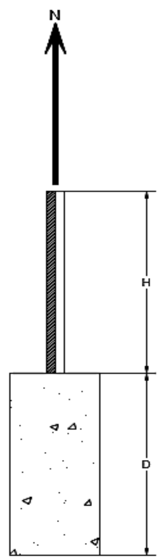
<u>A 2ft diameter x 6.75ft deep footing unrestrained at ground level is required for the racking structure.</u>

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 =	2.63	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 =	1.68	k
Required Concrete Volume, V =	11.61	ft^3
Required Footing Depth, D =	3.75	ft

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.67
2	0.4	0.2	118.10	5.56
3	0.6	0.2	118.10	5.46
4	0.8	0.2	118.10	5.36
5	1	0.2	118.10	5.25
6	1.2	0.2	118.10	5.15
7	1.4	0.2	118.10	5.04
8	1.6	0.2	118.10	4.94
9	1.8	0.2	118.10	4.84
10	2	0.2	118.10	4.73
11	2.2	0.2	118.10	4.63
12	2.4	0.2	118.10	4.53
13	2.6	0.2	118.10	4.42
14	2.8	0.2	118.10	4.32
15	3	0.2	118.10	4.21
16	3.2	0.2	118.10	4.11
17	3.4	0.2	118.10	4.01
18	3.6	0.2	118.10	3.90
19	3.8	0.2	118.10	3.80
20	4	0.2	118.10	3.70
21	0	0.0	0.00	3.70
22	0	0.0	0.00	3.70
23	0	0.0	0.00	3.70
24	0	0.0	0.00	3.70
25	0	0.0	0.00	3.70
26	0	0.0	0.00	3.70
27	0	0.0	0.00	3.70
28	0	0.0	0.00	3.70
29	0	0.0	0.00	3.70
30	0	0.0	0.00	3.70
31	0	0.0	0.00	3.70
32	0	0.0	0.00	3.70
33	0	0.0	0.00	3.70
34	0	0.0	0.00	3.70
Max	4	Sum	0.94	

5.5 Compressive Force Resistance

Skin friction of the soil is checked against the compression force from the racking and the weight of the drilled shaft foundation. Skin friction starts at 3ft below grade. Clay soils are again assumed.

Depth Below Grade, D =	6.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.30	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	23.56	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

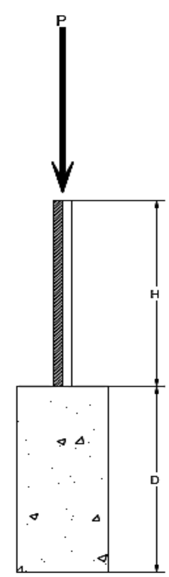
Weight of Concrete

Footing Volume	21.21	ft^3
Weight	3.07	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.53	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.00	k
Applied Force =	7.38	k
Utilization =	67%	

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



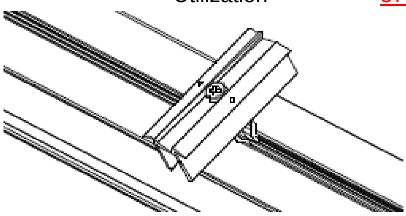
6. DESIGN OF JOINTS AND CONNECTIONS

6.1 Anchorage of Modules to Purlins and Connection of Purlins to Girders

Modules are secured to the purlins with Schletter, Inc. Rapid2+ mounting clamps. Purlins are secured to the girders with the use of 40mm mounting clamps. The reliability of calculations is uncertain due to limited standards, therefore the strength of the clamp fasteners has been evaluated by load testing.

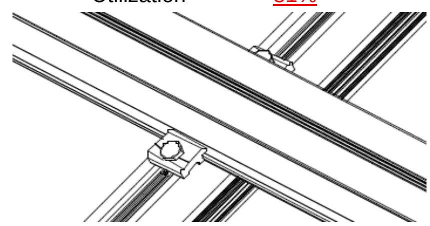
<u>Fastening of Modules to Purlins</u>

Maximum Uplifting Force =	0.454	k
Allowable Uplift =	1.214	k
Utilization =	37%	



<u>Fastening of Purlins to Girders</u>

Maximum Uplifting Force =	1.760	k
Allowable Uplift =	2.180	k
Utilization =	81%	

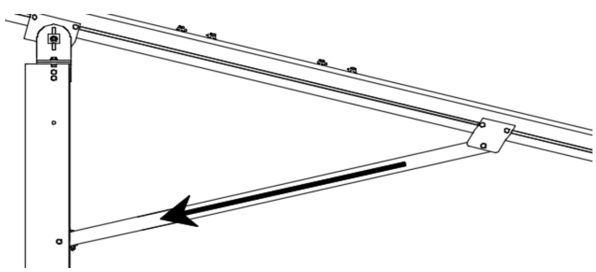


6.2 Strut Connections

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 =	4.569	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)

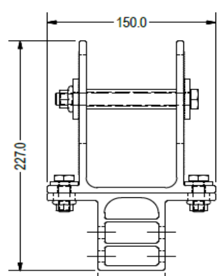


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

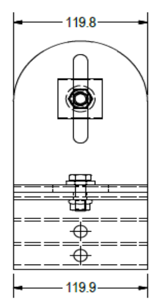
6.3 Girder to Post Connection

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.

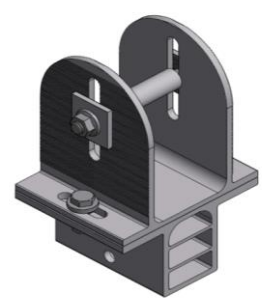
Maximum Tensile Load =	3.662	k
Allowable Load =	5.649	k
Utilization =	65%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

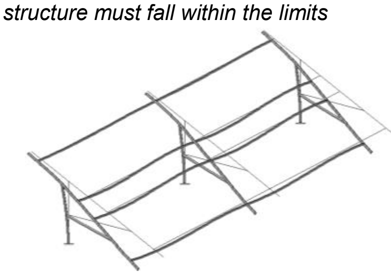
7.1 Seismic Drift

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} =	1.328	in

1.328 ≤ 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 = 132 in

J = 0.432

365.174

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 27.1 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

φF_LSt= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

M_{max}St = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 132

J = 0.432

232.229

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 28.4

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

M_{max}Wk = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:
3.4.14

L_b = 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

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

$S2^*$ = 1.23671

φcc = 0.82226

φF_L= $(\varphi ccFcy)/(\lambda^2)$

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 =	6.52 k	(LRFD Factored Load)
Mr (Strong) =	13.14 k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00 k-ft	(LRFD Factored Load)

Flexural Buckling:		Torsional/Flexural Torsional Buckling:	
kL/r =	128.92	Fcr =	11.6026 ksi
4.71√(E/Fy) =	103.55 => kL/r > 4.71√(E/Fy)	Fey =	43.9243 ksi
Fcr =	15.10 ksi	Fez =	14.9387 ksi
Fe =	17.22 ksi	Pn =	25.8738 k
Pn =	33.677 k		

Bending (Strong Axis):				Bending (Weak Axis):			
Yielding:				Yielding:			
Mn =	21.95 k-ft			Mn =	14.65 k-ft		
Flange Local Buckling:				Flange Local Buckling:			
Mn =	19.207 k-ft			Mn =	14.39 k-ft		
Pr/Pc =	0.2802 ≥	0.2		Pr/Pc =	0.280 ≥	0.2	
Utilization =	0.96 <	1.0	OK	Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 96%

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	-42.8	-42.8	0	0
2	M11	y	-42.8	-42.8	0	0
3	M12	y	-68.853	-68.853	0	0
4	M13	y	-68.853	-68.853	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	85.601	85.601	0	0
2	M11	y	85.601	85.601	0	0
3	M12	y	40.939	40.939	0	0
4	M13	y	40.939	40.939	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	661.727	2	2479.611	1	209.752	1	.352	1	.027	5	7.08	1
2		min	-936.726	3	-1355.588	3	-416.894	5	-2.077	5	-.016	2	.886	15
3	N19	max	2606.732	2	6545.44	1	0	3	0	1	.029	4	12.961	1
4		min	-2580.756	3	-4224.6	3	-448.365	5	-2.181	4	0	1	.53	15
5	N29	max	661.727	2	2479.611	1	198.573	3	.305	3	.03	4	7.08	1
6		min	-936.726	3	-1355.588	3	-471.307	4	-2.208	4	-.006	3	-.361	5
7	Totals:	max	3930.186	2	11504.661	1	0	2						
8		min	-4454.208	3	-6935.776	3	-1301.937	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	.004	1	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-15.683	12	253.437	3	-9.902	12	.049	3	.418	1	.235	2
4			min	-256.948	1	-641.813	2	-192.195	1	-.243	2	.036	12	-.089	3
5		3	max	-16.141	12	252.249	3	-9.902	12	.049	3	.292	1	.657	2
6			min	-257.862	1	-643.398	2	-192.195	1	-.243	2	.03	12	-.255	3
7		4	max	-16.598	12	251.06	3	-9.902	12	.049	3	.166	1	1.08	2
8			min	-258.777	1	-644.982	2	-192.195	1	-.243	2	.019	10	-.42	3
9		5	max	330.86	3	611.31	2	7.194	3	.059	2	.21	1	1.272	2
10			min	-1153.224	1	-230.688	3	-245.449	1	-.073	3	-.041	3	-.497	3
11		6	max	330.174	3	609.726	2	7.194	3	.059	2	.063	2	.872	2
12			min	-1154.139	1	-231.876	3	-245.449	1	-.073	3	-.049	5	-.345	3
13		7	max	329.488	3	608.141	2	7.194	3	.059	2	-.012	10	.472	2
14			min	-1155.054	1	-233.064	3	-245.449	1	-.073	3	-.123	4	-.192	3
15		8	max	328.802	3	606.557	2	7.194	3	.059	2	-.017	12	.074	2
16			min	-1155.969	1	-234.253	3	-245.449	1	-.073	3	-.273	1	-.039	3
17		9	max	304.568	3	4.314	3	21.771	3	.024	5	.13	1	.037	3
18			min	-1425.907	1	-18.315	2	-297.871	1	-.182	2	.008	10	-.109	2
19		10	max	303.882	3	3.126	3	21.771	3	.024	5	.062	3	.034	3
20			min	-1426.822	1	-19.899	2	-297.871	1	-.182	2	-.065	1	-.096	2
21		11	max	303.196	3	1.938	3	21.771	3	.024	5	.076	3	.033	3
22			min	-1427.736	1	-21.484	2	-297.871	1	-.182	2	-.261	1	-.082	1
23		12	max	275.086	3	601.225	3	70.166	2	.299	3	.191	1	.088	1
24			min	-1692.545	1	-493.426	1	-258.287	4	-.312	1	.018	10	-.159	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	274.399	3	600.037	3	70.166	2	.299	3	.189	1	.413	1
26			min	-1693.46	1	-495.01	1	-259.872	4	-.312	1	-.089	5	-.553	3
27		14	max	273.713	3	598.848	3	70.166	2	.299	3	.186	1	.738	1
28			min	-1694.375	1	-496.595	1	-261.458	4	-.312	1	-.252	5	-.946	3
29		15	max	273.027	3	597.66	3	70.166	2	.299	3	.21	2	1.064	1
30			min	-1695.289	1	-498.179	1	-263.043	4	-.312	1	-.416	5	-1.339	3
31		16	max	259.204	1	490.916	1	88.485	5	.253	1	.032	3	.81	1
32			min	15.529	12	-609.562	3	-159.12	1	-.426	3	-.267	4	-1.022	3
33		17	max	258.29	1	489.332	1	86.9	5	.253	1	0	3	.488	1
34			min	15.072	12	-610.751	3	-159.12	1	-.426	3	-.338	1	-.622	3
35		18	max	257.375	1	487.748	1	85.314	5	.253	1	-.022	12	.168	1
36			min	14.614	12	-611.939	3	-159.12	1	-.426	3	-.443	1	-.221	3
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.008	1	.001	4	0	1	0	1	0	1
40			min	0	1	0	3	0	1	0	1	0	1	0	1
41		2	max	-15.932	12	811.165	3	0	1	.061	4	.342	4	.576	2
42			min	-463.473	1	-1842.182	2	-129.137	5	0	1	0	1	-.262	3
43		3	max	-16.389	12	809.977	3	0	1	.061	4	.258	4	1.785	2
44			min	-464.388	1	-1843.767	2	-130.723	5	0	1	0	1	-.794	3
45		4	max	-16.847	12	808.788	3	0	1	.061	4	.172	4	2.995	2
46			min	-465.303	1	-1845.351	2	-132.308	5	0	1	0	1	-1.325	3
47		5	max	1199.45	3	1807.717	2	0	1	0	1	.013	4	3.535	2
48			min	-3035.841	1	-824.747	3	-117.354	4	-.046	4	0	1	-1.556	3
49		6	max	1198.764	3	1806.132	2	0	1	0	1	0	1	2.349	2
50			min	-3036.756	1	-825.936	3	-118.94	4	-.046	4	-.065	5	-1.014	3
51		7	max	1198.078	3	1804.548	2	0	1	0	1	0	1	1.165	2
52			min	-3037.671	1	-827.124	3	-120.525	4	-.046	4	-.143	4	-.472	3
53		8	max	1197.392	3	1802.963	2	0	1	0	1	0	1	.071	3
54			min	-3038.586	1	-828.312	3	-122.111	4	-.046	4	-.222	4	-.049	1
55		9	max	1174.912	3	12.392	3	0	1	.019	4	.163	5	.326	3
56			min	-3476.078	1	-88.089	1	-267.932	4	0	1	0	1	-.574	2
57		10	max	1174.226	3	11.204	3	0	1	.019	4	0	1	.318	3
58			min	-3476.992	1	-89.673	1	-269.518	4	0	1	-.013	4	-.517	2
59		11	max	1173.54	3	10.015	3	0	1	.019	4	0	1	.311	3
60			min	-3477.907	1	-91.257	1	-271.103	4	0	1	-.191	4	-.46	2
61		12	max	1158.813	3	1698.319	3	0	1	.196	4	.13	5	.069	1
62			min	-3925.658	1	-1572.465	1	-289.128	5	0	1	0	1	-.234	3
63		13	max	1158.127	3	1697.131	3	0	1	.196	4	0	1	1.101	1
64			min	-3926.572	1	-1574.05	1	-290.714	5	0	1	-.062	4	-1.348	3
65		14	max	1157.441	3	1695.942	3	0	1	.196	4	0	1	2.135	1
66			min	-3927.487	1	-1575.634	1	-292.299	5	0	1	-.253	4	-2.461	3
67		15	max	1156.755	3	1694.754	3	0	1	.196	4	0	1	3.169	1
68			min	-3928.402	1	-1577.219	1	-293.885	5	0	1	-.445	4	-3.574	3
69		16	max	464.448	1	1472.454	1	73.836	5	0	1	0	1	2.413	1
70			min	18.984	12	-1665.122	3	0	1	-.197	4	-.199	5	-2.713	3
71		17	max	463.533	1	1470.87	1	72.251	5	0	1	0	1	1.447	1
72			min	18.527	12	-1666.311	3	0	1	-.197	4	-.151	5	-1.62	3
73		18	max	462.619	1	1469.285	1	70.665	5	0	1	0	1	.482	1
74			min	18.07	12	-1667.499	3	0	1	-.197	4	-.104	4	-.526	3
75		19	max	0	1	.001	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	.004	1	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	18.206	5	253.437	3	192.195	1	.243	2	.16	5	.235	2
80			min	-256.948	1	-641.813	2	-54.815	5	-.049	3	-.418	1	-.089	3
81		3	max	17.779	5	252.249	3	192.195	1	.243	2	.123	5	.657	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	-257.862	1	-643.398	2	-56.4	5	-.049	3	-.292	1	-.255	3
83		4	max	17.352	5	251.06	3	192.195	1	.243	2	.086	5	1.08	2
84			min	-258.777	1	-644.982	2	-57.986	5	-.049	3	-.166	1	-.42	3
85		5	max	330.86	3	611.31	2	245.449	1	.073	3	.041	3	1.272	2
86			min	-1153.224	1	-230.688	3	-39.092	5	-.059	2	-.21	1	-.497	3
87		6	max	330.174	3	609.726	2	245.449	1	.073	3	.036	3	.872	2
88			min	-1154.139	1	-231.876	3	-40.677	5	-.059	2	-.063	2	-.345	3
89		7	max	329.488	3	608.141	2	245.449	1	.073	3	.112	1	.472	2
90			min	-1155.054	1	-233.064	3	-42.263	5	-.059	2	-.079	5	-.192	3
91		8	max	328.802	3	606.557	2	245.449	1	.073	3	.273	1	.074	2
92			min	-1155.969	1	-234.253	3	-43.848	5	-.059	2	-.108	5	-.039	3
93		9	max	304.568	3	4.314	3	297.871	1	.182	2	.067	5	.037	3
94			min	-1425.907	1	-18.315	2	-97.682	5	.022	15	-.13	1	-.109	2
95		10	max	303.882	3	3.126	3	297.871	1	.182	2	.065	1	.034	3
96			min	-1426.822	1	-19.899	2	-99.268	5	.022	15	-.062	3	-.096	2
97		11	max	303.196	3	1.938	3	297.871	1	.182	2	.261	1	.033	3
98			min	-1427.736	1	-21.484	2	-100.853	5	.022	15	-.076	3	-.082	1
99		12	max	275.086	3	601.225	3	225.421	3	.312	1	.045	5	.088	1
100			min	-1692.545	1	-493.426	1	-239.679	5	-.299	3	-.191	1	-.159	3
101		13	max	274.399	3	600.037	3	225.421	3	.312	1	.046	3	.413	1
102			min	-1693.46	1	-495.01	1	-241.265	5	-.299	3	-.189	1	-.553	3
103		14	max	273.713	3	598.848	3	225.421	3	.312	1	.193	3	.738	1
104			min	-1694.375	1	-496.595	1	-242.85	5	-.299	3	-.305	4	-.946	3
105		15	max	273.027	3	597.66	3	225.421	3	.312	1	.341	3	1.064	1
106			min	-1695.289	1	-498.179	1	-244.436	5	-.299	3	-.458	4	-1.339	3
107		16	max	259.204	1	490.916	1	159.12	1	.426	3	.234	1	.81	1
108			min	7.455	15	-609.562	3	23.208	10	-.253	1	-.189	5	-1.022	3
109		17	max	258.29	1	489.332	1	159.12	1	.426	3	.338	1	.488	1
110			min	7.18	15	-610.751	3	23.208	10	-.253	1	-.116	5	-.622	3
111		18	max	257.375	1	487.748	1	159.12	1	.426	3	.443	1	.168	1
112			min	6.904	15	-611.939	3	23.208	10	-.253	1	-.044	5	-.221	3
113		19	max	0	1	0	2	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	159.182	1	486.545	1	-6.639	15	.005	2	.496	1	.253	1
116			min	23.202	10	-613.055	3	-257.027	1	-.016	3	-.008	5	-.426	3
117		2	max	159.182	1	350.913	1	-4.129	15	.005	2	.215	1	.225	3
118			min	23.202	10	-452.287	3	-202.881	1	-.016	3	-.019	5	-.258	1
119		3	max	159.182	1	215.281	1	-1.618	15	.005	2	.025	2	.68	3
120			min	23.202	10	-291.518	3	-148.736	1	-.016	3	-.029	4	-.604	1
121		4	max	159.182	1	79.649	1	1.073	5	.005	2	-.006	12	.938	3
122			min	23.202	10	-130.749	3	-94.59	1	-.016	3	-.149	1	-.785	1
123		5	max	159.182	1	30.019	3	4.956	5	.005	2	-.012	12	.999	3
124			min	23.202	10	-55.983	1	-40.444	1	-.016	3	-.231	1	-.799	1
125		6	max	159.182	1	190.788	3	14.562	14	.005	2	-.009	15	.864	3
126			min	22.827	15	-191.615	1	-4.153	10	-.016	3	-.247	1	-.648	1
127		7	max	159.182	1	351.556	3	67.847	1	.005	2	0	15	.533	3
128			min	13.12	15	-327.247	1	1.131	12	-.016	3	-.198	1	-.331	1
129		8	max	159.182	1	512.325	3	121.993	1	.005	2	.018	5	.152	1
130			min	3.412	15	-462.88	1	3.683	12	-.016	3	-.082	1	-.034	5
131		9	max	159.182	1	673.094	3	176.139	1	.005	2	.101	1	.801	1
132			min	-8.731	5	-598.512	1	6.234	12	-.016	3	-.013	10	-.719	3
133		10	max	159.182	1	833.862	3	23.584	10	.016	3	.349	1	1.615	1
134			min	23.202	10	-345.738	10	-230.285	1	-.002	14	.002	12	-1.64	3
135		11	max	159.182	1	598.512	1	-3.446	15	.016	3	.101	1	.801	1
136			min	20.938	15	-673.094	3	-176.139	1	-.005	2	-.022	5	-.719	3
137		12	max	159.182	1	462.88	1	-.935	15	.016	3	-.013	12	.152	1
138			min	11.23	15	-512.325	3	-121.993	1	-.005	2	-.082	1	.004	12

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	159.182	1	327.247	1	2.142	5	.016	3	-.016	12	.533	3
140			min	1.523	15	-351.556	3	-67.847	1	-.005	2	-.198	1	-.331	1
141		14	max	159.182	1	191.615	1	6.026	5	.016	3	-.014	15	.864	3
142			min	-11.678	5	-190.788	3	-13.702	1	-.005	2	-.247	1	-.648	1
143		15	max	159.182	1	55.983	1	40.444	1	.016	3	-.007	15	.999	3
144			min	-26.101	5	-30.019	3	3.972	12	-.005	2	-.231	1	-.799	1
145		16	max	159.182	1	130.749	3	94.59	1	.016	3	.003	5	.938	3
146			min	-40.524	5	-79.649	1	6.523	12	-.005	2	-.149	1	-.785	1
147		17	max	159.182	1	291.518	3	148.736	1	.016	3	.025	2	.68	3
148			min	-54.947	5	-215.281	1	9.074	12	-.005	2	-.011	9	-.604	1
149		18	max	159.182	1	452.287	3	202.881	1	.016	3	.215	1	.225	3
150			min	-69.37	5	-350.913	1	11.626	12	-.005	2	.016	12	-.258	1
151		19	max	159.182	1	613.055	3	257.027	1	.016	3	.496	1	.253	1
152			min	-83.792	5	-486.545	1	14.177	12	-.005	2	.032	12	-.426	3
153	M11	1	max	293.481	1	479.494	1	27.48	5	0	12	.554	1	.176	4
154			min	-247.047	3	-600.769	3	-264.946	1	-.009	1	-.219	5	-.424	3
155		2	max	293.481	1	343.862	1	31.363	5	0	12	.263	1	.212	3
156			min	-247.047	3	-440.001	3	-210.8	1	-.009	1	-.183	5	-.333	1
157		3	max	293.481	1	208.23	1	35.246	5	0	12	.039	1	.651	3
158			min	-247.047	3	-279.232	3	-156.655	1	-.009	1	-.143	5	-.671	1
159		4	max	293.481	1	72.598	1	39.129	5	0	12	.012	3	.894	3
160			min	-247.047	3	-118.463	3	-102.509	1	-.009	1	-.127	4	-.842	1
161		5	max	293.481	1	42.305	3	43.013	5	0	12	-.004	12	.941	3
162			min	-247.047	3	-63.034	1	-48.363	1	-.009	1	-.212	1	-.848	1
163		6	max	293.481	1	203.074	3	49.762	4	0	12	.008	5	.791	3
164			min	-247.047	3	-198.666	1	-8.039	3	-.009	1	-.238	1	-.688	1
165		7	max	293.481	1	363.842	3	66.169	4	0	12	.068	5	.444	3
166			min	-247.047	3	-334.298	1	-4.211	3	-.009	1	-.198	1	-.363	1
167		8	max	293.481	1	524.611	3	114.074	1	0	12	.132	5	.129	1
168			min	-247.047	3	-469.931	1	-.384	3	-.009	1	-.092	1	-.099	3
169		9	max	293.481	1	685.38	3	168.22	1	0	12	.227	4	.786	1
170			min	-247.047	3	-605.563	1	2.598	12	-.009	1	-.025	3	-.838	3
171		10	max	293.481	1	846.148	3	222.366	1	.009	1	.358	4	1.609	1
172			min	-247.047	3	-741.195	1	-5.15	12	-.004	14	-.019	3	-1.774	3
173		11	max	293.481	1	605.563	1	33.586	5	.009	1	.081	1	.786	1
174			min	-247.047	3	-685.38	3	-168.22	1	0	5	-.186	5	-.838	3
175		12	max	293.481	1	469.931	1	37.469	5	.009	1	-.017	12	.129	1
176			min	-247.047	3	-524.611	3	-114.074	1	0	5	-.16	4	-.099	3
177		13	max	293.481	1	334.298	1	41.353	5	.009	1	-.016	12	.444	3
178			min	-247.047	3	-363.842	3	-59.928	1	0	5	-.198	1	-.363	1
179		14	max	293.481	1	198.666	1	45.236	5	.009	1	-.011	12	.791	3
180			min	-247.047	3	-203.074	3	-7.341	9	0	5	-.238	1	-.688	1
181		15	max	293.481	1	63.034	1	59.271	4	.009	1	.016	5	.941	3
182			min	-247.047	3	-42.305	3	7.608	12	0	5	-.212	1	-.848	1
183		16	max	293.481	1	118.463	3	102.509	1	.009	1	.079	5	.894	3
184			min	-247.047	3	-72.598	1	10.159	12	0	5	-.12	1	-.842	1
185		17	max	293.481	1	279.232	3	156.655	1	.009	1	.152	4	.651	3
186			min	-247.047	3	-208.23	1	12.711	12	0	5	.016	9	-.671	1
187		18	max	293.481	1	440.001	3	210.8	1	.009	1	.275	4	.212	3
188			min	-247.047	3	-343.862	1	15.262	12	0	5	.038	12	-.333	1
189		19	max	293.481	1	600.769	3	264.946	1	.009	1	.554	1	.17	1
190			min	-247.047	3	-479.494	1	17.814	12	0	5	.059	12	-.424	3
191	M12	1	max	52.035	5	622.882	2	28.065	5	0	15	.582	1	.241	2
192			min	-51.036	1	-239.838	3	-268.839	1	-.007	1	-.221	5	.033	12
193		2	max	37.612	5	449.02	2	31.949	5	0	15	.287	1	.301	3
194			min	-51.036	1	-166.409	3	-214.694	1	-.007	1	-.184	5	-.414	2
195		3	max	23.189	5	275.158	2	35.832	5	0	15	.057	1	.46	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	-51.036	1	-92.979	3	-160.548	1	-.007	1	-.143	5	-.856	2
197		4	max	14.617	3	101.296	2	39.715	5	0	15	0	10	.528	3
198			min	-51.036	1	-19.55	3	-106.402	1	-.007	1	-.125	4	-1.086	2
199		5	max	14.617	3	53.88	3	43.598	5	0	15	-.009	12	.507	3
200			min	-51.036	1	-72.566	2	-52.256	1	-.007	1	-.203	1	-1.104	2
201		6	max	14.617	3	127.31	3	49.879	4	0	15	.01	5	.397	3
202			min	-51.036	1	-246.428	2	-8.972	2	-.007	1	-.234	1	-.909	2
203		7	max	14.617	3	200.739	3	66.286	4	0	15	.07	5	.196	3
204			min	-51.036	1	-420.29	2	-.6	3	-.007	1	-.198	1	-.502	2
205		8	max	14.617	3	274.169	3	110.181	1	0	15	.135	5	.118	2
206			min	-64.075	4	-594.152	2	2.297	12	-.007	1	-.097	1	-.094	3
207		9	max	14.617	3	347.598	3	164.327	1	0	15	.23	4	.951	2
208			min	-78.497	4	-768.014	2	4.849	12	-.007	1	-.019	10	-.474	3
209		10	max	14.617	3	-17.754	15	218.473	1	.002	3	.361	4	1.996	2
210			min	-92.92	4	-941.876	2	-10.882	3	-.007	1	-.005	3	-.944	3
211		11	max	52.6	5	768.014	2	34.559	5	.007	1	.071	1	.951	2
212			min	-51.036	1	-347.598	3	-164.327	1	0	5	-.191	5	-.474	3
213		12	max	38.177	5	594.152	2	38.442	5	.007	1	-.015	12	.118	2
214			min	-51.036	1	-274.169	3	-110.181	1	0	5	-.165	4	-.094	3
215		13	max	23.754	5	420.29	2	42.325	5	.007	1	-.016	12	.196	3
216			min	-51.036	1	-200.739	3	-56.035	1	0	5	-.198	1	-.502	2
217		14	max	14.617	3	246.428	2	46.208	5	.007	1	-.014	12	.397	3
218			min	-51.036	1	-127.31	3	-5.643	9	0	5	-.234	1	-.909	2
219		15	max	14.617	3	72.566	2	60.973	4	.007	1	.016	5	.507	3
220			min	-51.036	1	-53.88	3	5.357	12	0	5	-.203	1	-1.104	2
221		16	max	14.617	3	19.55	3	106.402	1	.007	1	.08	5	.528	3
222			min	-51.036	1	-101.296	2	7.909	12	0	5	-.106	1	-1.086	2
223		17	max	14.617	3	92.979	3	160.548	1	.007	1	.157	4	.46	3
224			min	-51.036	1	-275.158	2	10.46	12	0	5	.01	12	-.856	2
225		18	max	14.617	3	166.409	3	214.694	1	.007	1	.287	1	.301	3
226			min	-63.633	4	-449.02	2	13.012	12	0	5	.025	12	-.414	2
227		19	max	14.617	3	239.838	3	268.839	1	.007	1	.582	1	.241	2
228			min	-78.056	4	-622.882	2	15.563	12	0	5	.042	12	-.059	5
229	M13	1	max	53.097	5	641.133	2	18.64	5	.005	3	.483	1	.243	2
230			min	-191.875	1	-254.641	3	-255.337	1	-.021	1	-.178	5	-.049	3
231		2	max	38.674	5	467.271	2	22.524	5	.005	3	.204	1	.218	3
232			min	-191.875	1	-181.211	3	-201.191	1	-.021	1	-.153	5	-.434	2
233		3	max	24.252	5	293.409	2	26.407	5	.005	3	.017	2	.394	3
234			min	-191.875	1	-107.782	3	-147.045	1	-.021	1	-.129	4	-.899	2
235		4	max	9.829	5	119.547	2	30.29	5	.005	3	-.002	12	.481	3
236			min	-191.875	1	-34.352	3	-92.899	1	-.021	1	-.156	1	-1.151	2
237		5	max	-2.695	15	39.077	3	34.173	5	.005	3	-.01	12	.478	3
238			min	-191.875	1	-54.315	2	-38.754	1	-.021	1	-.236	1	-1.191	2
239		6	max	-9.902	12	112.507	3	43.074	4	.005	3	-.003	15	.385	3
240			min	-191.875	1	-228.177	2	-3.947	3	-.021	1	-.25	1	-1.019	2
241		7	max	-9.902	12	185.937	3	69.538	1	.005	3	.044	5	.203	3
242			min	-191.875	1	-402.039	2	-.12	3	-.021	1	-.199	1	-.634	2
243		8	max	-9.902	12	259.366	3	123.684	1	.005	3	.098	5	-.01	15
244			min	-191.875	1	-575.901	2	2.641	12	-.021	1	-.08	1	-.072	1
245		9	max	-9.902	12	332.796	3	177.83	1	.005	3	.187	4	.774	2
246			min	-191.875	1	-749.763	2	5.192	12	-.021	1	-.015	3	-.431	3
247		10	max	-9.902	12	-17.468	15	231.975	1	.021	1	.354	1	1.797	2
248			min	-191.875	1	-923.625	2	-11.362	3	-.008	14	-.003	3	-.883	3
249		11	max	36.667	5	749.763	2	23.396	5	.021	1	.104	1	.774	2
250			min	-191.875	1	-332.796	3	-177.83	1	-.005	3	-.138	5	-.431	3
251		12	max	22.244	5	575.901	2	27.279	5	.021	1	-.014	12	.006	5
252			min	-191.875	1	-259.366	3	-123.684	1	-.005	3	-.121	4	-.072	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	7.822	5	402.039	2	31.162	5	.021	1	-.016	12	.203	3
254			min	-191.875	1	-185.937	3	-69.538	1	-.005	3	-.199	1	-.634	2
255		14	max	-4.021	15	228.177	2	35.045	5	.021	1	-.014	12	.385	3
256			min	-191.875	1	-112.507	3	-15.392	1	-.005	3	-.25	1	-1.019	2
257		15	max	-9.902	12	54.315	2	46.796	4	.021	1	.015	5	.478	3
258			min	-191.875	1	-39.077	3	5.014	12	-.005	3	-.236	1	-1.191	2
259		16	max	-9.902	12	34.352	3	92.899	1	.021	1	.065	5	.481	3
260			min	-191.875	1	-119.547	2	7.565	12	-.005	3	-.156	1	-1.151	2
261		17	max	-9.902	12	107.782	3	147.045	1	.021	1	.119	5	.394	3
262			min	-191.875	1	-293.409	2	10.117	12	-.005	3	-.015	9	-.899	2
263		18	max	-9.902	12	181.211	3	201.191	1	.021	1	.222	4	.218	3
264			min	-191.875	1	-467.271	2	12.668	12	-.005	3	.023	12	-.434	2
265		19	max	-9.902	12	254.641	3	255.337	1	.021	1	.483	1	.243	2
266			min	-191.875	1	-641.133	2	15.22	12	-.005	3	.04	12	-.049	3
267	M2	1	max	2479.611	1	936.249	3	210.01	1	.027	5	2.077	5	7.08	1
268			min	-1355.588	3	-660.603	2	-417.01	5	-.016	2	-.352	1	.886	15
269		2	max	2476.339	1	936.249	3	210.01	1	.027	5	1.928	5	7.138	1
270			min	-1358.042	3	-660.603	2	-414.174	5	-.016	2	-.277	1	.847	15
271		3	max	1899.59	1	1206.764	1	155.116	1	.002	1	1.772	5	6.937	1
272			min	-1130.328	3	139.514	15	-387.966	5	0	3	-.24	1	.802	15
273		4	max	1896.319	1	1206.764	1	155.116	1	.002	1	1.633	5	6.503	1
274			min	-1132.782	3	139.514	15	-385.131	5	0	3	-.184	1	.752	15
275		5	max	1893.047	1	1206.764	1	155.116	1	.002	1	1.497	4	6.07	1
276			min	-1135.235	3	139.514	15	-382.296	5	0	3	-.128	1	.702	15
277		6	max	1889.776	1	1206.764	1	155.116	1	.002	1	1.367	4	5.636	1
278			min	-1137.689	3	139.514	15	-379.46	5	0	3	-.073	1	.652	15
279		7	max	1886.504	1	1206.764	1	155.116	1	.002	1	1.238	4	5.203	1
280			min	-1140.142	3	139.514	15	-376.625	5	0	3	-.074	3	.601	15
281		8	max	1883.233	1	1206.764	1	155.116	1	.002	1	1.11	4	4.769	1
282			min	-1142.596	3	139.514	15	-373.79	5	0	3	-.137	3	.551	15
283		9	max	1879.961	1	1206.764	1	155.116	1	.002	1	.983	4	4.336	1
284			min	-1145.05	3	139.514	15	-370.955	5	0	3	-.201	3	.501	15
285		10	max	1876.69	1	1206.764	1	155.116	1	.002	1	.857	4	3.902	1
286			min	-1147.503	3	139.514	15	-368.119	5	0	3	-.264	3	.451	15
287		11	max	1873.418	1	1206.764	1	155.116	1	.002	1	.731	4	3.468	1
288			min	-1149.957	3	139.514	15	-365.284	5	0	3	-.328	3	.401	15
289		12	max	1870.147	1	1206.764	1	155.116	1	.002	1	.607	4	3.035	1
290			min	-1152.41	3	139.514	15	-362.449	5	0	3	-.391	3	.351	15
291		13	max	1866.875	1	1206.764	1	155.116	1	.002	1	.484	4	2.601	1
292			min	-1154.864	3	139.514	15	-359.614	5	0	3	-.455	3	.301	15
293		14	max	1863.604	1	1206.764	1	155.116	1	.002	1	.373	1	2.168	1
294			min	-1157.317	3	139.514	15	-356.778	5	0	3	-.518	3	.251	15
295		15	max	1860.333	1	1206.764	1	155.116	1	.002	1	.429	1	1.734	1
296			min	-1159.771	3	139.514	15	-353.943	5	0	3	-.582	3	.2	15
297		16	max	1857.061	1	1206.764	1	155.116	1	.002	1	.485	1	1.301	1
298			min	-1162.225	3	139.514	15	-351.108	5	0	3	-.646	3	.15	15
299		17	max	1853.79	1	1206.764	1	155.116	1	.002	1	.54	1	.867	1
300			min	-1164.678	3	139.514	15	-348.273	5	0	3	-.709	3	.1	15
301		18	max	1850.518	1	1206.764	1	155.116	1	.002	1	.596	1	.434	1
302			min	-1167.132	3	139.514	15	-345.437	5	0	3	-.773	3	.05	15
303		19	max	1847.247	1	1206.764	1	155.116	1	.002	1	.652	1	0	1
304			min	-1169.585	3	139.514	15	-342.602	5	0	3	-.836	3	0	1
305	M5	1	max	6545.44	1	2577.783	3	0	1	.029	4	2.181	4	12.961	1
306			min	-4224.6	3	-2600.939	2	-448.601	5	0	1	0	1	.53	15
307		2	max	6542.168	1	2577.783	3	0	1	.029	4	2.022	4	13.544	1
308			min	-4227.054	3	-2600.939	2	-445.766	5	0	1	0	1	.537	15
309		3	max	4943.105	1	2327.115	1	0	1	0	1	1.858	4	13.377	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	-3439.111	3	91.02	15	-424.582	4	-.001	4	0	1	.523	15
311		4	max	4939.833	1	2327.115	1	0	1	0	1	1.706	4	12.541	1
312			min	-3441.565	3	91.02	15	-421.747	4	-.001	4	0	1	.491	15
313		5	max	4936.562	1	2327.115	1	0	1	0	1	1.555	4	11.705	1
314			min	-3444.018	3	91.02	15	-418.912	4	-.001	4	0	1	.458	15
315		6	max	4933.29	1	2327.115	1	0	1	0	1	1.405	4	10.869	1
316			min	-3446.472	3	91.02	15	-416.076	4	-.001	4	0	1	.425	15
317		7	max	4930.019	1	2327.115	1	0	1	0	1	1.256	4	10.033	1
318			min	-3448.926	3	91.02	15	-413.241	4	-.001	4	0	1	.392	15
319		8	max	4926.748	1	2327.115	1	0	1	0	1	1.108	4	9.197	1
320			min	-3451.379	3	91.02	15	-410.406	4	-.001	4	0	1	.36	15
321		9	max	4923.476	1	2327.115	1	0	1	0	1	.961	4	8.361	1
322			min	-3453.833	3	91.02	15	-407.571	4	-.001	4	0	1	.327	15
323		10	max	4920.205	1	2327.115	1	0	1	0	1	.815	4	7.525	1
324			min	-3456.286	3	91.02	15	-404.735	4	-.001	4	0	1	.294	15
325		11	max	4916.933	1	2327.115	1	0	1	0	1	.67	4	6.688	1
326			min	-3458.74	3	91.02	15	-401.9	4	-.001	4	0	1	.262	15
327		12	max	4913.662	1	2327.115	1	0	1	0	1	.526	4	5.852	1
328			min	-3461.194	3	91.02	15	-399.065	4	-.001	4	0	1	.229	15
329		13	max	4910.39	1	2327.115	1	0	1	0	1	.383	4	5.016	1
330			min	-3463.647	3	91.02	15	-396.23	4	-.001	4	0	1	.196	15
331		14	max	4907.119	1	2327.115	1	0	1	0	1	.241	4	4.18	1
332			min	-3466.101	3	91.02	15	-393.394	4	-.001	4	0	1	.164	15
333		15	max	4903.847	1	2327.115	1	0	1	0	1	.1	4	3.344	1
334			min	-3468.554	3	91.02	15	-390.559	4	-.001	4	0	1	.131	15
335		16	max	4900.576	1	2327.115	1	0	1	0	1	0	1	2.508	1
336			min	-3471.008	3	91.02	15	-387.724	4	-.001	4	-.04	5	.098	15
337		17	max	4897.304	1	2327.115	1	0	1	0	1	0	1	1.672	1
338			min	-3473.462	3	91.02	15	-384.889	4	-.001	4	-.178	4	.065	15
339		18	max	4894.033	1	2327.115	1	0	1	0	1	0	1	.836	1
340			min	-3475.915	3	91.02	15	-382.053	4	-.001	4	-.316	4	.033	15
341		19	max	4890.762	1	2327.115	1	0	1	0	1	0	1	0	1
342			min	-3478.369	3	91.02	15	-379.218	4	-.001	4	-.453	4	0	1
343	M8	1	max	2479.611	1	936.249	3	198.451	3	.03	4	2.208	4	7.08	1
344			min	-1355.588	3	-660.603	2	-471.72	4	-.006	3	-.305	3	-.361	5
345		2	max	2476.339	1	936.249	3	198.451	3	.03	4	2.039	4	7.138	1
346			min	-1358.042	3	-660.603	2	-468.885	4	-.006	3	-.234	3	-.313	5
347		3	max	1899.59	1	1206.764	1	176.892	3	0	3	1.871	4	6.937	1
348			min	-1130.328	3	-48.976	5	-434.283	4	-.002	1	-.181	3	-.282	5
349		4	max	1896.319	1	1206.764	1	176.892	3	0	3	1.716	4	6.503	1
350			min	-1132.782	3	-48.976	5	-431.447	4	-.002	1	-.117	3	-.264	5
351		5	max	1893.047	1	1206.764	1	176.892	3	0	3	1.561	4	6.07	1
352			min	-1135.235	3	-48.976	5	-428.612	4	-.002	1	-.053	3	-.246	5
353		6	max	1889.776	1	1206.764	1	176.892	3	0	3	1.408	4	5.636	1
354			min	-1137.689	3	-48.976	5	-425.777	4	-.002	1	.007	12	-.229	5
355		7	max	1886.504	1	1206.764	1	176.892	3	0	3	1.255	4	5.203	1
356			min	-1140.142	3	-48.976	5	-422.942	4	-.002	1	-.014	2	-.211	5
357		8	max	1883.233	1	1206.764	1	176.892	3	0	3	1.104	4	4.769	1
358			min	-1142.596	3	-48.976	5	-420.106	4	-.002	1	-.065	2	-.194	5
359		9	max	1879.961	1	1206.764	1	176.892	3	0	3	.953	4	4.336	1
360			min	-1145.05	3	-48.976	5	-417.271	4	-.002	1	-.115	2	-.176	5
361		10	max	1876.69	1	1206.764	1	176.892	3	0	3	.809	5	3.902	1
362			min	-1147.503	3	-48.976	5	-414.436	4	-.002	1	-.166	2	-.158	5
363		11	max	1873.418	1	1206.764	1	176.892	3	0	3	.672	5	3.468	1
364			min	-1149.957	3	-48.976	5	-411.601	4	-.002	1	-.217	2	-.141	5
365		12	max	1870.147	1	1206.764	1	176.892	3	0	3	.535	5	3.035	1
366			min	-1152.41	3	-48.976	5	-408.765	4	-.002	1	-.267	2	-.123	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	1866.875	1	1206.764	1	176.892	3	0	3	.455	3	2.601	1
368			min	-1154.864	3	-48.976	5	-405.93	4	-.002	1	-.318	2	-.106	5
369		14	max	1863.604	1	1206.764	1	176.892	3	0	3	.518	3	2.168	1
370			min	-1157.317	3	-48.976	5	-403.095	4	-.002	1	-.373	1	-.088	5
371		15	max	1860.333	1	1206.764	1	176.892	3	0	3	.582	3	1.734	1
372			min	-1159.771	3	-48.976	5	-400.26	4	-.002	1	-.429	1	-.07	5
373		16	max	1857.061	1	1206.764	1	176.892	3	0	3	.646	3	1.301	1
374			min	-1162.225	3	-48.976	5	-397.424	4	-.002	1	-.485	1	-.053	5
375		17	max	1853.79	1	1206.764	1	176.892	3	0	3	.709	3	.867	1
376			min	-1164.678	3	-48.976	5	-394.589	4	-.002	1	-.54	1	-.035	5
377		18	max	1850.518	1	1206.764	1	176.892	3	0	3	.773	3	.434	1
378			min	-1167.132	3	-48.976	5	-391.754	4	-.002	1	-.596	1	-.018	5
379		19	max	1847.247	1	1206.764	1	176.892	3	0	3	.836	3	0	1
380			min	-1169.585	3	-48.976	5	-388.919	4	-.002	1	-.652	1	0	1
381	M3	1	max	1577.402	2	5.617	6	55.284	2	.015	3	.03	5	0	1
382			min	-595.181	3	1.32	15	-24.622	5	-.035	2	-.004	1	0	1
383		2	max	1577.193	2	4.993	6	55.284	2	.015	3	.024	4	0	15
384			min	-595.337	3	1.174	15	-24.163	5	-.035	2	-.007	3	-.002	6
385		3	max	1576.984	2	4.369	6	55.284	2	.015	3	.036	2	0	15
386			min	-595.494	3	1.027	15	-23.704	5	-.035	2	-.014	3	-.004	6
387		4	max	1576.776	2	3.745	6	55.284	2	.015	3	.055	2	-.001	15
388			min	-595.65	3	.88	15	-23.246	5	-.035	2	-.022	3	-.005	6
389		5	max	1576.567	2	3.121	6	55.284	2	.015	3	.075	2	-.001	15
390			min	-595.807	3	.734	15	-22.787	5	-.035	2	-.03	3	-.006	6
391		6	max	1576.359	2	2.497	6	55.284	2	.015	3	.095	2	-.002	15
392			min	-595.963	3	.587	15	-22.328	5	-.035	2	-.038	3	-.007	6
393		7	max	1576.15	2	1.872	6	55.284	2	.015	3	.114	2	-.002	15
394			min	-596.12	3	.44	15	-22.037	3	-.035	2	-.046	3	-.008	6
395		8	max	1575.941	2	1.248	6	55.284	2	.015	3	.134	2	-.002	15
396			min	-596.276	3	.293	15	-22.037	3	-.035	2	-.054	3	-.009	6
397		9	max	1575.733	2	.624	6	55.284	2	.015	3	.154	2	-.002	15
398			min	-596.432	3	.147	15	-22.037	3	-.035	2	-.062	3	-.009	6
399		10	max	1575.524	2	0	1	55.284	2	.015	3	.174	2	-.002	15
400			min	-596.589	3	0	1	-22.037	3	-.035	2	-.069	3	-.009	6
401		11	max	1575.316	2	-.147	15	55.284	2	.015	3	.193	2	-.002	15
402			min	-596.745	3	-.624	4	-22.037	3	-.035	2	-.077	3	-.009	6
403		12	max	1575.107	2	-.293	15	55.284	2	.015	3	.213	2	-.002	15
404			min	-596.902	3	-1.248	4	-22.037	3	-.035	2	-.085	3	-.009	6
405		13	max	1574.898	2	-.44	15	55.284	2	.015	3	.233	2	-.002	15
406			min	-597.058	3	-1.872	4	-22.037	3	-.035	2	-.093	3	-.008	6
407		14	max	1574.69	2	-.587	15	55.284	2	.015	3	.253	2	-.002	15
408			min	-597.215	3	-2.497	4	-22.037	3	-.035	2	-.101	3	-.007	6
409		15	max	1574.481	2	-.734	15	55.284	2	.015	3	.272	2	-.001	15
410			min	-597.371	3	-3.121	4	-22.037	3	-.035	2	-.109	3	-.006	6
411		16	max	1574.273	2	-.88	15	55.284	2	.015	3	.292	2	-.001	15
412			min	-597.528	3	-3.745	4	-22.037	3	-.035	2	-.117	3	-.005	6
413		17	max	1574.064	2	-1.027	15	55.284	2	.015	3	.312	2	0	15
414			min	-597.684	3	-4.369	4	-22.037	3	-.035	2	-.125	3	-.004	6
415		18	max	1573.855	2	-1.174	15	55.284	2	.015	3	.331	2	0	15
416			min	-597.841	3	-4.993	4	-22.037	3	-.035	2	-.132	3	-.002	6
417		19	max	1573.647	2	-1.32	15	55.284	2	.015	3	.351	2	0	1
418			min	-597.997	3	-5.617	4	-22.037	3	-.035	2	-.14	3	0	1
419	M6	1	max	4569.282	2	5.617	4	0	1	.004	5	.031	4	0	1
420			min	-2034.599	3	1.32	15	-29.18	4	0	1	0	1	0	1
421		2	max	4569.073	2	4.993	4	0	1	.004	5	.02	4	0	15
422			min	-2034.755	3	1.174	15	-28.722	4	0	1	0	1	-.002	4
423		3	max	4568.865	2	4.369	4	0	1	.004	5	.01	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	-2034.912	3	1.027	15	-28.263	4	0	1	0	1	-.004	4
425		4	max	4568.656	2	3.745	4	0	1	.004	5	0	4	-.001	15
426			min	-2035.068	3	.88	15	-27.804	4	0	1	0	1	-.005	4
427		5	max	4568.447	2	3.121	4	0	1	.004	5	0	1	-.001	15
428			min	-2035.225	3	.734	15	-27.346	4	0	1	-.01	4	-.006	4
429		6	max	4568.239	2	2.497	4	0	1	.004	5	0	1	-.002	15
430			min	-2035.381	3	.587	15	-26.887	4	0	1	-.019	4	-.007	4
431		7	max	4568.03	2	1.872	4	0	1	.004	5	0	1	-.002	15
432			min	-2035.537	3	.44	15	-26.429	4	0	1	-.029	4	-.008	4
433		8	max	4567.822	2	1.248	4	0	1	.004	5	0	1	-.002	15
434			min	-2035.694	3	.293	15	-25.97	4	0	1	-.038	4	-.009	4
435		9	max	4567.613	2	.624	4	0	1	.004	5	0	1	-.002	15
436			min	-2035.85	3	.147	15	-25.511	4	0	1	-.047	4	-.009	4
437		10	max	4567.404	2	0	1	0	1	.004	5	0	1	-.002	15
438			min	-2036.007	3	0	1	-25.053	4	0	1	-.056	4	-.009	4
439		11	max	4567.196	2	-.147	15	0	1	.004	5	0	1	-.002	15
440			min	-2036.163	3	-.624	6	-24.594	4	0	1	-.065	4	-.009	4
441		12	max	4566.987	2	-.293	15	0	1	.004	5	0	1	-.002	15
442			min	-2036.32	3	-1.248	6	-24.135	4	0	1	-.074	4	-.009	4
443		13	max	4566.779	2	-.44	15	0	1	.004	5	0	1	-.002	15
444			min	-2036.476	3	-1.872	6	-23.677	4	0	1	-.083	4	-.008	4
445		14	max	4566.57	2	-.587	15	0	1	.004	5	0	1	-.002	15
446			min	-2036.633	3	-2.497	6	-23.218	4	0	1	-.091	4	-.007	4
447		15	max	4566.361	2	-.734	15	0	1	.004	5	0	1	-.001	15
448			min	-2036.789	3	-3.121	6	-22.759	4	0	1	-.099	4	-.006	4
449		16	max	4566.153	2	-.88	15	0	1	.004	5	0	1	-.001	15
450			min	-2036.946	3	-3.745	6	-22.301	4	0	1	-.107	4	-.005	4
451		17	max	4565.944	2	-1.027	15	0	1	.004	5	0	1	0	15
452			min	-2037.102	3	-4.369	6	-21.842	4	0	1	-.115	4	-.004	4
453		18	max	4565.736	2	-1.174	15	0	1	.004	5	0	1	0	15
454			min	-2037.258	3	-4.993	6	-21.383	4	0	1	-.123	4	-.002	4
455		19	max	4565.527	2	-1.32	15	0	1	.004	5	0	1	0	1
456			min	-2037.415	3	-5.617	6	-20.925	4	0	1	-.13	4	0	1
457	M9	1	max	1577.402	2	5.617	4	22.037	3	.035	2	.032	4	0	1
458			min	-595.181	3	1.32	15	-55.284	2	-.015	3	-.001	3	0	1
459		2	max	1577.193	2	4.993	4	22.037	3	.035	2	.02	5	0	15
460			min	-595.337	3	1.174	15	-55.284	2	-.015	3	-.016	2	-.002	4
461		3	max	1576.984	2	4.369	4	22.037	3	.035	2	.014	3	0	15
462			min	-595.494	3	1.027	15	-55.284	2	-.015	3	-.036	2	-.004	4
463		4	max	1576.776	2	3.745	4	22.037	3	.035	2	.022	3	-.001	15
464			min	-595.65	3	.88	15	-55.284	2	-.015	3	-.055	2	-.005	4
465		5	max	1576.567	2	3.121	4	22.037	3	.035	2	.03	3	-.001	15
466			min	-595.807	3	.734	15	-55.284	2	-.015	3	-.075	2	-.006	4
467		6	max	1576.359	2	2.497	4	22.037	3	.035	2	.038	3	-.002	15
468			min	-595.963	3	.587	15	-55.284	2	-.015	3	-.095	2	-.007	4
469		7	max	1576.15	2	1.872	4	22.037	3	.035	2	.046	3	-.002	15
470			min	-596.12	3	.44	15	-55.284	2	-.015	3	-.114	2	-.008	4
471		8	max	1575.941	2	1.248	4	22.037	3	.035	2	.054	3	-.002	15
472			min	-596.276	3	.293	15	-55.284	2	-.015	3	-.134	2	-.009	4
473		9	max	1575.733	2	.624	4	22.037	3	.035	2	.062	3	-.002	15
474			min	-596.432	3	.147	15	-55.284	2	-.015	3	-.154	2	-.009	4
475		10	max	1575.524	2	0	1	22.037	3	.035	2	.069	3	-.002	15
476			min	-596.589	3	0	1	-55.284	2	-.015	3	-.174	2	-.009	4
477		11	max	1575.316	2	-.147	15	22.037	3	.035	2	.077	3	-.002	15
478			min	-596.745	3	-.624	6	-55.284	2	-.015	3	-.193	2	-.009	4
479		12	max	1575.107	2	-.293	15	22.037	3	.035	2	.085	3	-.002	15
480			min	-596.902	3	-1.248	6	-55.284	2	-.015	3	-.213	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	1574.898	2	-.44	15	22.037	3	.035	2	.093	3	-.002	15
482			min	-597.058	3	-1.872	6	-55.284	2	-.015	3	-.233	2	-.008	4
483		14	max	1574.69	2	-.587	15	22.037	3	.035	2	.101	3	-.002	15
484			min	-597.215	3	-2.497	6	-55.284	2	-.015	3	-.253	2	-.007	4
485		15	max	1574.481	2	-.734	15	22.037	3	.035	2	.109	3	-.001	15
486			min	-597.371	3	-3.121	6	-55.284	2	-.015	3	-.272	2	-.006	4
487		16	max	1574.273	2	-.88	15	22.037	3	.035	2	.117	3	-.001	15
488			min	-597.528	3	-3.745	6	-55.284	2	-.015	3	-.292	2	-.005	4
489		17	max	1574.064	2	-1.027	15	22.037	3	.035	2	.125	3	0	15
490			min	-597.684	3	-4.369	6	-55.284	2	-.015	3	-.312	2	-.004	4
491		18	max	1573.855	2	-1.174	15	22.037	3	.035	2	.132	3	0	15
492			min	-597.841	3	-4.993	6	-55.284	2	-.015	3	-.331	2	-.002	4
493		19	max	1573.647	2	-1.32	15	22.037	3	.035	2	.14	3	0	1
494			min	-597.997	3	-5.617	6	-55.284	2	-.015	3	-.351	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	-.06	15	-.062	12	.018	1	1.019e-2	3	NC	3	NC	1
2			min	-.518	1	-.847	1	-1.16	4	-3.014e-2	2	117.134	1	164.137	5
3		2	max	-.06	15	-.067	12	0	12	9.875e-3	3	NC	3	NC	3
4			min	-.518	1	-.716	1	-1.119	4	-2.856e-2	2	131.335	1	172.569	4
5		3	max	-.06	15	-.059	15	-.001	12	9.254e-3	3	NC	12	NC	3
6			min	-.518	1	-.588	1	-1.068	4	-2.547e-2	2	148.954	1	184.02	4
7		4	max	-.06	15	-.05	15	0	12	8.632e-3	3	NC	12	NC	3
8			min	-.518	1	-.47	1	-1.008	4	-2.238e-2	2	170.069	1	199.659	4
9		5	max	-.06	15	-.042	15	0	3	8.444e-3	3	NC	12	NC	3
10			min	-.517	1	-.368	1	-.942	4	-2.036e-2	2	193.843	1	220.218	4
11		6	max	-.06	15	-.034	15	.002	3	9.37e-3	3	NC	3	NC	3
12			min	-.517	1	-.284	1	-.873	4	-2.111e-2	2	218.883	1	246.238	4
13		7	max	-.06	15	-.027	15	.002	3	1.03e-2	3	NC	3	NC	1
14			min	-.516	1	-.213	1	-.807	4	-2.186e-2	2	245.848	1	278.261	4
15		8	max	-.06	15	-.019	15	0	3	1.122e-2	3	8091.761	12	NC	1
16			min	-.516	1	-.149	1	-.746	4	-2.261e-2	2	276.636	1	315.454	5
17		9	max	-.06	15	-.012	15	0	2	1.25e-2	3	4786.776	12	NC	1
18			min	-.515	1	-.086	1	-.69	4	-2.178e-2	2	315.574	1	359.814	5
19		10	max	-.06	15	-.004	10	.002	1	1.41e-2	3	3431.277	12	NC	1
20			min	-.515	1	-.032	3	-.632	4	-1.946e-2	2	368.904	1	421.23	5
21		11	max	-.06	15	.045	1	0	1	1.57e-2	3	2690.724	12	NC	1
22			min	-.514	1	-.015	3	-.575	4	-1.763e-2	1	445.879	1	507.586	5
23		12	max	-.06	15	.113	1	.006	3	1.468e-2	3	3647.205	10	NC	1
24			min	-.514	1	.002	12	-.521	4	-1.478e-2	1	566.639	1	631.454	5
25		13	max	-.06	15	.18	1	.015	3	1.087e-2	3	7662.296	10	NC	1
26			min	-.513	1	.014	12	-.465	4	-1.08e-2	1	772.054	1	841.916	5
27		14	max	-.06	15	.24	1	.022	3	7.07e-3	3	NC	10	NC	1
28			min	-.512	1	.026	15	-.411	4	-8.737e-3	4	986.435	3	1223.757	5
29		15	max	-.06	15	.288	1	.022	3	3.268e-3	3	NC	2	NC	1
30			min	-.512	1	.033	15	-.366	4	-1.002e-2	4	761.154	3	1931.009	5
31		16	max	-.06	15	.321	1	.016	1	7.72e-3	3	NC	2	NC	2
32			min	-.512	1	.041	15	-.335	4	-8.996e-3	4	568.886	3	3200.376	5
33		17	max	-.06	15	.341	1	.02	1	1.314e-2	3	NC	2	NC	2
34			min	-.512	1	.049	15	-.314	4	-8.56e-3	1	432.086	3	4503.278	1
35		18	max	-.06	15	.353	1	.01	1	1.856e-2	3	NC	1	NC	2
36			min	-.512	1	.056	15	-.302	4	-1.179e-2	1	340.279	3	6051.036	1
37		19	max	-.06	15	.414	3	-.002	10	2.133e-2	3	NC	1	NC	1
38			min	-.512	1	.063	15	-.298	4	-1.343e-2	1	278.89	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	-.039	15	-.052	12	0	1	4.246e-4	4	NC	3	NC	1
40			min	-.997	1	-1.761	1	-1.159	4	0	1	61.267	1	163.822	4
41		2	max	-.039	15	-.053	15	0	1	3.351e-5	5	5190.482	12	NC	1
42			min	-.997	1	-1.471	1	-1.121	4	0	1	70.034	1	171.487	4
43		3	max	-.039	15	-.044	15	0	1	0	1	2712.832	12	NC	1
44			min	-.996	1	-1.189	1	-1.07	4	-7.404e-4	4	81.373	1	182.656	4
45		4	max	-.039	15	-.035	15	0	1	0	1	2349.956	15	NC	1
46			min	-.996	1	-.933	1	-1.009	4	-1.512e-3	4	95.446	1	198.204	4
47		5	max	-.039	15	-.028	15	0	1	0	1	2673.378	15	NC	1
48			min	-.996	1	-.719	1	-.942	4	-1.903e-3	4	111.488	1	218.912	4
49		6	max	-.039	15	-.022	15	0	1	0	1	3008.961	15	NC	1
50			min	-.995	1	-.556	1	-.873	4	-1.318e-3	4	127.923	1	245.015	4
51		7	max	-.039	15	-.017	15	0	1	0	1	3367.731	15	NC	1
52			min	-.993	1	-.425	1	-.806	4	-7.319e-4	4	144.981	1	276.785	4
53		8	max	-.039	15	-.012	15	0	1	0	1	8143.878	12	NC	1
54			min	-.992	1	-.311	1	-.745	4	-1.462e-4	4	164.166	1	313.984	4
55		9	max	-.039	15	-.008	15	0	1	1.706e-5	5	NC	3	NC	1
56			min	-.991	1	-.195	1	-.691	4	0	1	189.545	1	357.084	4
57		10	max	-.039	15	-.003	15	0	1	0	1	5112.556	12	NC	1
58			min	-.989	1	-.071	1	-.632	4	-2.201e-4	4	227.525	1	418.929	4
59		11	max	-.039	15	.062	1	0	1	0	1	6241.409	15	NC	1
60			min	-.988	1	-.011	3	-.574	4	-4.564e-4	4	289.054	1	505.714	4
61		12	max	-.039	15	.202	1	0	1	0	1	8196.59	15	NC	1
62			min	-.987	1	.008	15	-.522	4	-1.788e-3	4	404.539	1	623.054	4
63		13	max	-.039	15	.341	1	0	1	0	1	NC	10	NC	1
64			min	-.985	1	.013	15	-.466	4	-4.283e-3	4	671.698	1	822.911	4
65		14	max	-.039	15	.464	1	0	1	0	1	NC	5	NC	1
66			min	-.983	1	.018	15	-.414	4	-6.778e-3	4	908.574	3	1186.317	4
67		15	max	-.039	15	.553	1	0	1	0	1	NC	1	NC	1
68			min	-.982	1	.022	15	-.371	4	-9.273e-3	4	589.921	3	1843.914	4
69		16	max	-.039	15	.594	1	0	1	0	1	NC	4	NC	1
70			min	-.982	1	.024	15	-.342	4	-7.296e-3	4	374.009	3	2972.287	4
71		17	max	-.039	15	.597	1	0	1	0	1	NC	4	NC	1
72			min	-.982	1	.025	15	-.321	4	-4.794e-3	4	253.1	3	5347.445	4
73		18	max	-.039	15	.693	3	0	1	0	1	NC	4	NC	1
74			min	-.982	1	.025	15	-.305	4	-2.292e-3	4	185.009	3	NC	1
75		19	max	-.039	15	.907	3	0	1	0	1	NC	1	NC	1
76			min	-.982	1	.025	15	-.294	4	-1.016e-3	4	144.65	3	NC	1
77	M7	1	max	.021	5	.012	5	-.001	12	3.014e-2	2	NC	3	NC	1
78			min	-.518	1	-.847	1	-1.17	4	-1.019e-2	3	117.134	1	160.931	4
79		2	max	.021	5	.014	5	.012	1	2.856e-2	2	NC	3	NC	3
80			min	-.518	1	-.716	1	-1.112	4	-9.875e-3	3	131.335	1	172.111	4
81		3	max	.021	5	.015	5	.028	1	2.547e-2	2	NC	5	NC	3
82			min	-.518	1	-.588	1	-1.053	4	-9.254e-3	3	148.954	1	185.546	4
83		4	max	.021	5	.015	5	.031	1	2.238e-2	2	NC	5	NC	3
84			min	-.518	1	-.47	1	-.991	4	-8.632e-3	3	170.069	1	201.937	4
85		5	max	.021	5	.014	5	.028	1	2.036e-2	2	NC	5	NC	3
86			min	-.517	1	-.368	1	-.927	4	-8.444e-3	3	193.843	1	222.119	4
87		6	max	.021	5	.013	5	.018	1	2.111e-2	2	NC	3	NC	3
88			min	-.517	1	-.284	1	-.865	4	-9.37e-3	3	218.883	1	246.186	4
89		7	max	.021	5	.01	5	.007	1	2.186e-2	2	NC	3	NC	1
90			min	-.516	1	-.213	1	-.805	4	-1.03e-2	3	245.848	1	274.865	4
91		8	max	.021	5	.008	5	0	2	2.261e-2	2	NC	5	NC	1
92			min	-.516	1	-.149	1	-.747	4	-1.122e-2	3	276.636	1	309.636	4
93		9	max	.021	5	.005	5	.001	3	2.178e-2	2	NC	5	NC	1
94			min	-.515	1	-.086	1	-.69	4	-1.25e-2	3	315.574	1	353.113	4
95		10	max	.021	5	.003	5	.002	3	1.946e-2	2	NC	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
96			min	-.515	1	-.032	3	-.633	4	-1.41e-2	3	368.904	1	411.924	4
97		11	max	.021	5	.045	1	0	10	1.763e-2	1	NC	5	NC	1
98			min	-.514	1	-.015	3	-.575	4	-1.57e-2	3	445.879	1	495.027	4
99		12	max	.021	5	.113	1	.008	1	1.478e-2	1	NC	7	NC	1
100			min	-.514	1	-.002	5	-.518	4	-1.468e-2	3	566.639	1	619.98	4
101		13	max	.021	5	.18	1	.012	1	1.08e-2	1	NC	4	NC	1
102			min	-.513	1	-.005	5	-.46	4	-1.087e-2	3	772.054	1	826.664	4
103		14	max	.021	5	.24	1	.012	2	6.835e-3	1	NC	4	NC	1
104			min	-.512	1	-.008	5	-.409	4	-7.07e-3	3	986.435	3	1177.237	4
105		15	max	.021	5	.288	1	.005	2	2.864e-3	1	NC	2	NC	1
106			min	-.512	1	-.012	5	-.371	4	-9.148e-3	5	761.154	3	1737.651	4
107		16	max	.021	5	.321	1	0	10	5.335e-3	1	NC	2	NC	2
108			min	-.512	1	-.018	5	-.345	4	-7.72e-3	3	568.886	3	2516.088	4
109		17	max	.021	5	.341	1	-.002	10	8.56e-3	1	NC	2	NC	2
110			min	-.512	1	-.025	5	-.326	4	-1.314e-2	3	432.086	3	3844.545	4
111		18	max	.021	5	.353	1	-.001	10	1.179e-2	1	NC	1	NC	2
112			min	-.512	1	-.032	5	-.308	4	-1.856e-2	3	340.279	3	6051.036	1
113		19	max	.021	5	.414	3	.015	1	1.343e-2	1	NC	1	NC	1
114			min	-.512	1	-.04	5	-.289	4	-2.133e-2	3	278.89	3	NC	1
115	M10	1	max	.002	1	.369	3	.512	1	1.162e-2	3	NC	1	NC	1
116			min	-.299	4	-.036	5	-.021	5	-1.002e-3	5	NC	1	NC	1
117		2	max	.001	1	.693	3	.611	1	1.334e-2	3	NC	4	NC	3
118			min	-.299	4	-.022	10	0	15	-1.477e-3	2	815.124	3	2661.664	1
119		3	max	.001	1	.992	3	.763	1	1.506e-2	3	NC	5	NC	15
120			min	-.299	4	-.159	2	.013	15	-2.015e-3	2	423.749	3	1052.24	1
121		4	max	.001	1	1.213	3	.916	1	1.677e-2	3	NC	5	NC	15
122			min	-.299	4	-.26	2	.022	15	-2.553e-3	2	312.976	3	653.562	1
123		5	max	0	1	1.324	3	1.035	1	1.849e-2	3	NC	5	NC	15
124			min	-.299	4	-.278	2	.027	15	-3.091e-3	2	276.498	3	504.868	1
125		6	max	0	1	1.319	3	1.1	1	2.02e-2	3	NC	5	NC	15
126			min	-.299	4	-.211	2	.028	15	-3.629e-3	2	278.02	3	448.871	1
127		7	max	0	1	1.213	3	1.108	1	2.192e-2	3	NC	5	NC	15
128			min	-.299	4	-.075	2	.028	15	-4.167e-3	2	312.862	3	443.14	1
129		8	max	0	1	1.046	3	1.07	1	2.364e-2	3	NC	4	NC	5
130			min	-.299	4	.01	15	.027	15	-4.705e-3	2	390.047	3	473.459	1
131		9	max	0	1	.88	3	1.013	1	2.535e-2	3	NC	5	NC	5
132			min	-.299	4	.016	15	.03	15	-5.243e-3	2	516.418	3	526.605	1
133		10	max	0	1	.802	3	.982	1	2.707e-2	3	NC	5	NC	5
134			min	-.299	4	.025	15	.039	15	-5.781e-3	2	609.966	3	561.316	1
135		11	max	0	10	.88	3	1.013	1	2.535e-2	3	NC	5	NC	15
136			min	-.299	4	.029	15	.051	15	-5.243e-3	2	516.418	3	526.605	1
137		12	max	0	10	1.046	3	1.07	1	2.364e-2	3	NC	4	9194.854	15
138			min	-.299	4	.014	10	.059	15	-4.705e-3	2	390.047	3	473.459	1
139		13	max	0	10	1.213	3	1.108	1	2.192e-2	3	NC	5	9108.012	15
140			min	-.299	4	-.075	2	.064	15	-4.167e-3	2	312.862	3	443.14	1
141		14	max	0	10	1.319	3	1.1	1	2.02e-2	3	8797.502	15	NC	15
142			min	-.3	4	-.211	2	.064	15	-3.629e-3	2	278.02	3	448.871	1
143		15	max	0	10	1.324	3	1.035	1	1.849e-2	3	6581.732	15	NC	15
144			min	-.3	4	-.278	2	.061	15	-3.091e-3	2	276.498	3	504.868	1
145		16	max	0	10	1.213	3	.916	1	1.677e-2	3	6001.177	15	NC	5
146			min	-.3	4	-.26	2	.057	15	-2.553e-3	2	312.976	3	653.562	1
147		17	max	0	10	.992	3	.763	1	1.506e-2	3	6682.757	15	NC	5
148			min	-.3	4	-.159	2	.053	15	-2.015e-3	2	423.749	3	1052.24	1
149		18	max	0	10	.693	3	.611	1	1.334e-2	3	NC	15	NC	3
150			min	-.3	4	-.022	10	.053	15	-1.477e-3	2	815.124	3	2661.664	1
151		19	max	0	10	.369	3	.512	1	1.162e-2	3	NC	1	NC	1
152			min	-.3	4	.06	15	.06	15	-9.394e-4	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	.003	1	.08	1	.514	1	8.587e-3	1	NC	1	NC	1
154			min	-.546	4	-.006	3	-.021	5	-2.955e-4	5	NC	1	NC	1
155		2	max	.003	1	.248	3	.589	1	9.601e-3	1	NC	4	NC	3
156			min	-.546	4	-.174	2	.036	15	-1.447e-4	5	1041.298	3	3034.323	4
157		3	max	.002	1	.478	3	.728	1	1.062e-2	1	NC	5	NC	3
158			min	-.546	4	-.37	1	.059	15	-1.38e-5	15	545.545	3	1231.54	1
159		4	max	.002	1	.633	3	.878	1	1.163e-2	1	NC	5	NC	12
160			min	-.546	4	-.498	1	.058	15	8.616e-5	15	413.102	3	725.209	1
161		5	max	.002	1	.684	3	1	1	1.264e-2	1	NC	5	6497.889	15
162			min	-.546	4	-.528	1	.042	15	1.861e-4	15	382.519	3	542.685	1
163		6	max	.001	1	.626	3	1.074	1	1.366e-2	1	NC	5	NC	5
164			min	-.546	4	-.459	1	.019	15	2.861e-4	15	417.929	3	471.668	1
165		7	max	.001	1	.476	3	1.092	1	1.467e-2	1	NC	5	NC	5
166			min	-.547	4	-.313	2	-.003	15	3.86e-4	15	548.382	3	457.085	1
167		8	max	0	1	.275	3	1.064	1	1.569e-2	1	NC	5	NC	13
168			min	-.547	4	-.139	2	-.018	5	4.86e-4	15	941.441	3	480.344	1
169		9	max	0	1	.087	3	1.015	1	1.67e-2	1	NC	1	NC	13
170			min	-.547	4	0	15	-.004	15	5.86e-4	15	2836.796	3	526.796	1
171		10	max	0	1	.133	1	.987	1	1.772e-2	1	NC	3	NC	5
172			min	-.547	4	.001	3	.039	15	6.859e-4	15	4969.982	1	557.817	1
173		11	max	0	3	.087	3	1.015	1	1.67e-2	1	NC	1	4566.068	15
174			min	-.547	4	.005	10	.084	15	7.167e-4	15	2836.796	3	526.796	1
175		12	max	0	3	.275	3	1.064	1	1.569e-2	1	NC	5	3804.279	15
176			min	-.547	4	-.139	2	.1	15	7.474e-4	15	941.441	3	480.344	1
177		13	max	0	3	.476	3	1.092	1	1.467e-2	1	NC	15	4533.278	15
178			min	-.547	4	-.313	2	.093	15	7.781e-4	15	548.382	3	457.085	1
179		14	max	.001	3	.626	3	1.074	1	1.366e-2	1	8460.826	15	8222.27	15
180			min	-.547	4	-.459	1	.071	15	8.089e-4	15	417.929	3	471.668	1
181		15	max	.001	3	.684	3	1	1	1.264e-2	1	6624.115	15	NC	5
182			min	-.547	4	-.528	1	.043	15	8.396e-4	15	382.519	3	542.685	1
183		16	max	.002	3	.633	3	.878	1	1.163e-2	1	6190.925	15	NC	12
184			min	-.547	4	-.498	1	.017	15	8.704e-4	15	413.102	3	725.209	1
185		17	max	.002	3	.478	3	.728	1	1.062e-2	1	7008.112	15	NC	3
186			min	-.547	4	-.37	1	.004	15	9.011e-4	15	545.545	3	1231.54	1
187		18	max	.002	3	.248	3	.589	1	9.601e-3	1	NC	15	NC	3
188			min	-.547	4	-.174	2	.015	15	9.319e-4	15	1041.298	3	3510.988	1
189		19	max	.003	3	.08	1	.514	1	8.587e-3	1	NC	1	NC	1
190			min	-.547	4	-.006	3	.06	15	9.626e-4	15	NC	1	NC	1
191	M12	1	max	0	3	.006	5	.516	1	8.05e-3	1	NC	1	NC	1
192			min	-.719	4	-.119	1	-.021	5	-3.395e-4	5	NC	1	NC	1
193		2	max	0	3	.102	3	.579	1	8.792e-3	1	NC	5	NC	3
194			min	-.719	4	-.443	1	.036	15	-1.998e-4	5	783.914	2	3115.735	4
195		3	max	0	3	.23	3	.713	1	9.534e-3	1	NC	5	NC	12
196			min	-.719	4	-.72	1	.058	15	-6.017e-5	5	421.325	2	1341.294	1
197		4	max	0	3	.304	3	.861	1	1.028e-2	1	NC	5	7372.648	12
198			min	-.719	4	-.903	1	.057	15	3.597e-5	15	323.13	2	765.218	1
199		5	max	0	3	.316	3	.985	1	1.102e-2	1	NC	5	6833.265	15
200			min	-.719	4	-.967	1	.04	15	1.288e-4	15	299.747	2	562.558	1
201		6	max	0	3	.269	3	1.062	1	1.176e-2	1	NC	5	NC	5
202			min	-.719	4	-.91	1	.016	15	2.215e-4	15	323.643	2	482.997	1
203		7	max	0	3	.176	3	1.085	1	1.25e-2	1	NC	5	NC	5
204			min	-.719	4	-.753	1	-.006	5	3.143e-4	15	409.283	2	463.504	1
205		8	max	0	3	.06	3	1.062	1	1.324e-2	1	NC	5	NC	13
206			min	-.719	4	-.543	1	-.022	5	4.071e-4	15	623.146	1	482.916	1
207		9	max	0	3	-.01	15	1.018	1	1.398e-2	1	NC	3	NC	13
208			min	-.719	4	-.346	1	-.005	5	4.999e-4	15	1160.487	1	525.798	1
209		10	max	0	1	-.01	15	.992	1	1.473e-2	1	NC	5	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	-.719	4	-.256	1	.039	15	5.927e-4	15	1919.963	1	554.881	1
211		11	max	0	1	-.015	15	1.018	1	1.398e-2	1	NC	3	4457.709	15
212			min	-.719	4	-.346	1	.086	15	6.316e-4	15	1160.487	1	525.798	1
213		12	max	0	1	.06	3	1.062	1	1.324e-2	1	NC	5	3699.468	15
214			min	-.719	4	-.543	1	.102	15	6.705e-4	15	623.146	1	482.916	1
215		13	max	0	1	.176	3	1.085	1	1.25e-2	1	NC	15	4386.778	15
216			min	-.719	4	-.753	1	.095	15	7.094e-4	15	409.283	2	463.504	1
217		14	max	0	1	.269	3	1.062	1	1.176e-2	1	7696.235	15	7848.871	15
218			min	-.719	4	-.91	1	.073	15	7.484e-4	15	323.643	2	482.997	1
219		15	max	0	1	.316	3	.985	1	1.102e-2	1	6827.725	15	NC	5
220			min	-.719	4	-.967	1	.044	15	7.873e-4	15	299.747	2	562.558	1
221		16	max	0	1	.304	3	.861	1	1.028e-2	1	6959.04	15	NC	13
222			min	-.719	4	-.903	1	.017	15	8.262e-4	15	323.13	2	765.218	1
223		17	max	0	1	.23	3	.713	1	9.534e-3	1	8439.97	15	NC	6
224			min	-.719	4	-.72	1	.004	15	8.651e-4	15	421.325	2	1341.294	1
225		18	max	0	1	.102	3	.579	1	8.792e-3	1	NC	15	NC	3
226			min	-.719	4	-.443	1	.014	15	9.041e-4	15	783.914	2	4149.756	1
227		19	max	0	1	-.016	15	.516	1	8.05e-3	1	NC	1	NC	1
228			min	-.719	4	-.119	1	.06	15	9.43e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.013	5	.518	1	1.66e-2	1	NC	1	NC	1
230			min	-1.142	4	-.783	1	-.021	5	-1.198e-3	3	NC	1	NC	1
231		2	max	0	12	.048	3	.624	1	1.883e-2	1	NC	5	NC	3
232			min	-1.142	4	-1.214	1	.033	15	-1.697e-3	3	597.776	2	2484.911	1
233		3	max	0	12	.169	3	.78	1	2.106e-2	1	NC	5	NC	12
234			min	-1.142	4	-1.6	1	.057	15	-2.196e-3	3	316.585	2	1006.367	1
235		4	max	0	12	.245	3	.935	1	2.33e-2	1	NC	15	7105.186	12
236			min	-1.142	4	-1.889	1	.061	15	-2.694e-3	3	235.361	2	632.219	1
237		5	max	0	12	.265	3	1.055	1	2.553e-2	1	NC	15	5349.653	15
238			min	-1.142	4	-2.052	1	.051	15	-3.193e-3	3	207.049	2	491.57	1
239		6	max	0	12	.228	3	1.119	1	2.776e-2	1	9176.411	15	9561.924	15
240			min	-1.142	4	-2.085	1	.033	15	-3.692e-3	3	202.733	1	438.829	1
241		7	max	0	12	.147	3	1.126	1	3.e-2	1	8707.418	15	NC	5
242			min	-1.141	4	-2.005	1	.015	15	-4.19e-3	3	216.009	1	434.342	1
243		8	max	0	12	.043	3	1.086	1	3.223e-2	1	8871.554	15	NC	5
244			min	-1.141	4	-1.854	1	.004	15	-4.689e-3	3	246.538	1	464.74	1
245		9	max	0	12	-.038	12	1.028	1	3.446e-2	1	NC	12	NC	5
246			min	-1.141	4	-1.696	1	.009	15	-5.188e-3	3	289.181	1	517.181	1
247		10	max	0	1	-.058	15	.997	1	3.67e-2	1	NC	3	NC	5
248			min	-1.141	4	-1.619	1	.039	15	-5.686e-3	3	315.576	1	551.259	1
249		11	max	0	1	-.038	12	1.028	1	3.446e-2	1	NC	12	5784.759	15
250			min	-1.141	4	-1.696	1	.072	15	-5.188e-3	3	289.181	1	517.181	1
251		12	max	0	1	.043	3	1.086	1	3.223e-2	1	7383.243	15	5020	15
252			min	-1.141	4	-1.854	1	.083	15	-4.689e-3	3	246.538	1	464.74	1
253		13	max	0	1	.147	3	1.126	1	3.e-2	1	6192.493	15	6205.506	15
254			min	-1.141	4	-2.005	1	.078	15	-4.19e-3	3	216.009	1	434.342	1
255		14	max	0	1	.228	3	1.119	1	2.776e-2	1	5550.552	15	NC	15
256			min	-1.141	4	-2.085	1	.06	15	-3.692e-3	3	202.733	1	438.829	1
257		15	max	.001	1	.265	3	1.055	1	2.553e-2	1	5422.202	15	NC	5
258			min	-1.141	4	-2.052	1	.039	15	-3.193e-3	3	207.049	2	491.57	1
259		16	max	.001	1	.245	3	.935	1	2.33e-2	1	5895.469	15	NC	13
260			min	-1.141	4	-1.889	1	.019	15	-2.694e-3	3	235.361	2	632.219	1
261		17	max	.002	1	.169	3	.78	1	2.106e-2	1	7492.036	15	NC	4
262			min	-1.141	4	-1.6	1	.011	15	-2.196e-3	3	316.585	2	1006.367	1
263		18	max	.002	1	.048	3	.624	1	1.883e-2	1	NC	15	NC	3
264			min	-1.141	4	-1.214	1	.021	15	-1.697e-3	3	597.776	2	2484.911	1
265		19	max	.002	1	-.064	12	.518	1	1.66e-2	1	NC	1	NC	1
266			min	-1.141	4	-.783	1	.06	15	-1.198e-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	.002	5	5.534e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-9.579e-3	5	NC	1	NC	1
271		3	max	0	3	-.001	15	.007	5	7.806e-3	2	NC	2	NC	1
272			min	0	1	-.01	1	-.001	1	-1.391e-2	5	7699.885	1	NC	1
273		4	max	0	3	-.003	15	.016	5	7.172e-3	2	NC	5	NC	1
274			min	0	1	-.023	1	-.002	1	-1.357e-2	5	3422.859	1	4949.432	5
275		5	max	0	3	-.005	15	.027	5	6.537e-3	2	NC	5	NC	1
276			min	0	1	-.04	1	-.004	1	-1.323e-2	5	1948.585	1	2867.289	5
277		6	max	0	3	-.007	15	.041	5	5.903e-3	2	NC	15	NC	1
278			min	0	1	-.061	1	-.006	1	-1.289e-2	5	1267.021	1	1887.204	5
279		7	max	0	3	-.01	15	.058	5	5.269e-3	2	7576.977	15	NC	1
280			min	0	1	-.087	1	-.008	1	-1.255e-2	5	895.715	1	1347.203	5
281		8	max	0	3	-.014	15	.076	5	4.635e-3	2	5691.938	15	NC	3
282			min	0	1	-.116	1	-.01	1	-1.221e-2	5	670.876	1	1017.601	5
283		9	max	0	3	-.017	15	.097	5	4.001e-3	2	4456.046	15	NC	9
284			min	-.001	1	-.148	1	-.012	1	-1.187e-2	5	524.065	1	801.112	5
285		10	max	0	3	-.022	15	.119	5	3.367e-3	2	3601.625	15	NC	9
286			min	-.001	1	-.184	1	-.013	1	-1.153e-2	5	422.877	1	651.201	5
287		11	max	0	3	-.026	15	.143	5	2.733e-3	2	2984.978	15	NC	9
288			min	-.001	1	-.222	1	-.015	1	-1.118e-2	5	350.019	1	542.88	5
289		12	max	0	3	-.031	15	.168	5	2.098e-3	2	2525.396	15	NC	9
290			min	-.001	1	-.262	1	-.016	1	-1.084e-2	5	295.821	1	462.068	5
291		13	max	0	3	-.036	15	.194	4	1.464e-3	2	2173.266	15	NC	3
292			min	-.002	1	-.305	1	-.016	1	-1.055e-2	4	254.357	1	399.717	4
293		14	max	.001	3	-.041	15	.221	4	8.301e-4	2	1897.487	15	NC	3
294			min	-.002	1	-.35	1	-.016	1	-1.03e-2	4	221.924	1	350.698	4
295		15	max	.001	3	-.046	15	.249	4	9.548e-4	3	1677.399	15	NC	3
296			min	-.002	1	-.396	1	-.016	1	-1.005e-2	4	196.069	1	311.577	4
297		16	max	.001	3	-.052	15	.277	4	1.296e-3	3	1498.965	15	NC	3
298			min	-.002	1	-.443	1	-.014	1	-9.8e-3	4	175.126	1	279.872	4
299		17	max	.001	3	-.057	15	.306	4	1.637e-3	3	1352.353	15	NC	3
300			min	-.002	1	-.491	1	-.012	1	-9.551e-3	4	157.931	1	253.844	4
301		18	max	.001	3	-.063	15	.334	4	1.978e-3	3	1230.484	15	NC	1
302			min	-.002	1	-.54	1	-.013	3	-9.302e-3	4	143.648	1	232.243	4
303		19	max	.001	3	-.069	15	.362	4	2.319e-3	3	1128.188	15	NC	1
304			min	-.002	1	-.589	1	-.021	3	-9.052e-3	4	131.667	1	214.15	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	.002	4	0	1	NC	1	NC	1
308			min	0	1	-.004	1	0	1	-1.019e-2	4	NC	1	NC	1
309		3	max	0	3	0	15	.008	4	0	1	NC	3	NC	1
310			min	0	1	-.019	1	0	1	-1.478e-2	4	4180.63	1	NC	1
311		4	max	0	3	-.002	15	.016	4	0	1	NC	5	NC	1
312			min	-.001	1	-.042	1	0	1	-1.438e-2	4	1826.363	1	4717.102	4
313		5	max	0	3	-.003	15	.028	4	0	1	NC	5	NC	1
314			min	-.001	1	-.075	1	0	1	-1.398e-2	4	1031.797	1	2734.377	4
315		6	max	.001	3	-.005	15	.043	4	0	1	NC	5	NC	1
316			min	-.002	1	-.116	1	0	1	-1.358e-2	4	668.034	1	1801.167	4
317		7	max	.001	3	-.007	15	.06	4	0	1	NC	15	NC	1
318			min	-.002	1	-.165	1	0	1	-1.318e-2	4	470.977	1	1286.996	4
319		8	max	.002	3	-.009	15	.08	4	0	1	8908.731	15	NC	1
320			min	-.002	1	-.22	1	0	1	-1.278e-2	4	352.091	1	973.151	4
321		9	max	.002	3	-.011	15	.101	4	0	1	6957.929	15	NC	1
322			min	-.003	1	-.283	1	0	1	-1.238e-2	4	274.664	1	767.009	4
323		10	max	.002	3	-.014	15	.124	4	0	1	5613.704	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	1	-.351	1	0	1	-1.198e-2	4	221.4	1	624.265	4
325		11	max	.002	3	-.017	15	.149	4	0	1	4646.02	15	NC	1
326			min	-.003	1	-.424	1	0	1	-1.158e-2	4	183.106	1	521.135	4
327		12	max	.003	3	-.02	15	.175	4	0	1	3926.27	15	NC	1
328			min	-.004	1	-.502	1	0	1	-1.117e-2	4	154.652	1	444.209	4
329		13	max	.003	3	-.023	15	.201	4	0	1	3375.707	15	NC	1
330			min	-.004	1	-.584	1	0	1	-1.077e-2	4	132.905	1	385.261	4
331		14	max	.003	3	-.026	15	.229	4	0	1	2945.108	15	NC	1
332			min	-.004	1	-.67	1	0	1	-1.037e-2	4	115.908	1	339.112	4
333		15	max	.003	3	-.03	15	.257	4	0	1	2601.86	15	NC	1
334			min	-.005	1	-.758	1	0	1	-9.972e-3	4	102.367	1	302.328	4
335		16	max	.004	3	-.033	15	.285	4	0	1	2323.848	15	NC	1
336			min	-.005	1	-.849	1	0	1	-9.571e-3	4	91.404	1	272.572	4
337		17	max	.004	3	-.037	15	.313	4	0	1	2095.613	15	NC	1
338			min	-.005	1	-.942	1	0	1	-9.17e-3	4	82.409	1	248.203	4
339		18	max	.004	3	-.041	15	.34	4	0	1	1906.035	15	NC	1
340			min	-.006	1	-1.036	1	0	1	-8.769e-3	4	74.939	1	228.047	4
341		19	max	.004	3	-.044	15	.367	4	0	1	1747.012	15	NC	1
342			min	-.006	1	-1.13	1	0	1	-8.368e-3	4	68.676	1	211.241	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	.002	4	2.255e-3	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-1.087e-2	4	NC	1	NC	1
347		3	max	0	3	0	5	.008	4	3.137e-3	3	NC	2	NC	1
348			min	0	1	-.01	1	0	3	-1.573e-2	4	7699.885	1	NC	1
349		4	max	0	3	.001	5	.017	4	2.796e-3	3	NC	4	NC	1
350			min	0	1	-.023	1	-.002	3	-1.523e-2	4	3422.859	1	4671.275	4
351		5	max	0	3	.002	5	.029	4	2.455e-3	3	NC	4	NC	1
352			min	0	1	-.04	1	-.003	3	-1.472e-2	4	1948.585	1	2709.702	4
353		6	max	0	3	.003	5	.043	4	2.114e-3	3	NC	5	NC	1
354			min	0	1	-.061	1	-.005	3	-1.422e-2	4	1267.021	1	1785.941	4
355		7	max	0	3	.004	5	.061	4	1.773e-3	3	NC	5	NC	1
356			min	0	1	-.087	1	-.006	3	-1.372e-2	4	895.715	1	1276.793	4
357		8	max	0	3	.005	5	.08	4	1.432e-3	3	NC	5	NC	3
358			min	0	1	-.116	1	-.007	3	-1.322e-2	4	670.876	1	965.934	4
359		9	max	0	3	.006	5	.102	4	1.091e-3	3	NC	5	NC	9
360			min	-.001	1	-.148	1	-.008	3	-1.272e-2	4	524.065	1	761.718	4
361		10	max	0	3	.008	5	.125	4	7.501e-4	3	NC	7	NC	9
362			min	-.001	1	-.184	1	-.009	3	-1.221e-2	4	422.877	1	620.288	4
363		11	max	0	3	.009	5	.15	4	4.091e-4	3	NC	15	NC	9
364			min	-.001	1	-.222	1	-.009	3	-1.171e-2	4	350.019	1	518.102	4
365		12	max	0	3	.011	5	.176	4	6.816e-5	3	9808.441	15	NC	9
366			min	-.001	1	-.262	1	-.008	3	-1.121e-2	4	295.821	1	441.879	4
367		13	max	0	3	.013	5	.202	4	-1.721e-4	12	8454.239	15	NC	3
368			min	-.002	1	-.305	1	-.007	3	-1.071e-2	4	254.357	1	383.474	4
369		14	max	.001	3	.015	5	.23	4	1.003e-4	9	7391.157	15	NC	3
370			min	-.002	1	-.35	1	-.005	3	-1.02e-2	4	221.924	1	337.757	4
371		15	max	.001	3	.017	5	.258	4	3.747e-4	9	6541.064	15	NC	3
372			min	-.002	1	-.396	1	-.002	3	-9.738e-3	5	196.069	1	301.326	4
373		16	max	.001	3	.019	5	.285	4	9.983e-4	1	5850.681	15	NC	3
374			min	-.002	1	-.443	1	.001	12	-9.337e-3	5	175.126	1	271.866	4
375		17	max	.001	3	.021	5	.313	4	1.646e-3	1	5282.581	15	NC	3
376			min	-.002	1	-.491	1	0	10	-8.936e-3	5	157.931	1	247.753	4
377		18	max	.001	3	.023	5	.341	4	2.295e-3	1	4809.737	15	NC	1
378			min	-.002	1	-.54	1	-.001	10	-8.535e-3	5	143.648	1	227.824	4
379		19	max	.001	3	.025	5	.367	4	2.943e-3	1	4412.378	15	NC	1
380			min	-.002	1	-.589	1	-.004	2	-8.134e-3	5	131.667	1	211.223	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.005	1	0	15	.004	5	3.076e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-4.454e-3	5	NC	1	NC	1
383		2	max	.004	1	-.005	15	.062	5	3.577e-3	2	NC	1	NC	4
384			min	0	15	-.04	1	-.033	2	-4.453e-3	5	NC	1	2311.259	2
385		3	max	.004	1	-.009	15	.121	5	4.078e-3	2	NC	1	NC	4
386			min	0	10	-.077	1	-.065	2	-4.452e-3	5	NC	1	1164.612	2
387		4	max	.003	1	-.014	15	.18	5	4.578e-3	2	NC	1	NC	4
388			min	0	10	-.114	1	-.095	2	-4.451e-3	5	NC	1	787.601	2
389		5	max	.003	3	-.018	15	.239	5	5.079e-3	2	NC	1	NC	6
390			min	0	10	-.151	1	-.124	2	-4.45e-3	5	NC	1	603.34	2
391		6	max	.003	3	-.023	15	.298	5	5.58e-3	2	NC	1	7633.903	6
392			min	0	10	-.188	1	-.15	2	-4.449e-3	5	NC	1	496.61	2
393		7	max	.004	3	-.027	15	.357	5	6.08e-3	2	NC	1	5937.677	6
394			min	0	2	-.225	1	-.174	2	-4.448e-3	5	8990.605	6	429.181	2
395		8	max	.004	3	-.031	15	.415	5	6.581e-3	2	NC	1	4887.096	6
396			min	-.002	2	-.262	1	-.193	2	-4.447e-3	5	8301.976	6	384.875	2
397		9	max	.004	3	-.036	15	.472	5	7.082e-3	2	NC	1	4208.48	6
398			min	-.002	2	-.298	1	-.209	2	-4.446e-3	5	7931.316	6	355.866	2
399		10	max	.004	3	-.04	15	.528	5	7.582e-3	2	NC	1	3766.837	6
400			min	-.003	2	-.334	1	-.219	2	-4.445e-3	5	7814.056	6	338.167	2
401		11	max	.005	3	-.044	15	.583	5	8.083e-3	2	NC	1	3492.377	6
402			min	-.004	2	-.37	1	-.224	2	-4.444e-3	5	7931.316	6	329.243	14
403		12	max	.005	3	-.048	15	.636	5	8.584e-3	2	NC	1	3351.08	6
404			min	-.004	2	-.406	1	-.222	2	-4.443e-3	5	8301.976	6	293.736	14
405		13	max	.005	3	-.052	15	.687	5	9.084e-3	2	NC	1	3333.703	6
406			min	-.005	2	-.441	1	-.213	2	-4.442e-3	5	8990.605	6	264.072	14
407		14	max	.005	3	-.056	15	.736	5	9.585e-3	2	NC	1	3489.58	13
408			min	-.006	2	-.477	1	-.197	2	-4.441e-3	5	NC	1	238.912	14
409		15	max	.006	3	-.06	15	.783	5	1.009e-2	2	NC	1	3843.375	13
410			min	-.006	2	-.512	1	-.173	2	-4.44e-3	5	NC	1	217.304	14
411		16	max	.006	3	-.063	15	.828	5	1.059e-2	2	NC	1	4553.885	13
412			min	-.007	2	-.547	1	-.14	2	-4.501e-3	3	NC	1	198.545	14
413		17	max	.006	3	-.067	15	.87	5	1.109e-2	2	NC	1	6115.933	13
414			min	-.007	2	-.581	1	-.098	2	-4.723e-3	3	NC	1	182.112	14
415		18	max	.006	3	-.071	15	.915	4	1.159e-2	2	NC	1	NC	6
416			min	-.008	2	-.616	1	-.045	2	-4.945e-3	3	NC	1	167.601	14
417		19	max	.007	3	-.075	15	.96	4	1.209e-2	2	NC	1	NC	1
418			min	-.009	2	-.651	1	0	3	-5.168e-3	3	NC	1	154.701	14
419	M6	1	max	.009	1	0	15	.004	4	0	1	NC	1	NC	1
420			min	0	15	-.004	1	0	1	-4.756e-3	4	NC	1	NC	1
421		2	max	.007	1	-.003	15	.066	4	0	1	NC	1	NC	1
422			min	0	15	-.076	1	0	1	-4.812e-3	4	NC	1	9138.848	4
423		3	max	.006	3	-.006	15	.128	4	0	1	NC	1	NC	1
424			min	0	15	-.147	1	0	1	-4.868e-3	4	NC	1	4397.713	4
425		4	max	.007	3	-.01	15	.191	4	0	1	NC	1	NC	1
426			min	0	10	-.218	1	0	1	-4.924e-3	4	NC	1	2860.167	4
427		5	max	.008	3	-.013	15	.253	4	0	1	NC	1	NC	1
428			min	-.002	2	-.289	1	0	1	-4.98e-3	4	NC	1	2118.937	4
429		6	max	.008	3	-.016	15	.315	4	0	1	NC	1	NC	1
430			min	-.004	2	-.359	1	0	1	-5.036e-3	4	NC	1	1694.429	4
431		7	max	.009	3	-.019	15	.377	4	0	1	NC	1	NC	1
432			min	-.006	2	-.43	1	0	1	-5.091e-3	4	8990.605	4	1428.029	4
433		8	max	.01	3	-.021	15	.438	4	0	1	NC	1	NC	1
434			min	-.008	2	-.5	1	0	1	-5.147e-3	4	8301.976	4	1252.778	4
435		9	max	.011	3	-.024	15	.497	4	0	1	NC	1	NC	1
436			min	-.01	2	-.57	1	0	1	-5.203e-3	4	7931.316	4	1136.21	4
437		10	max	.012	3	-.027	15	.555	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	-.012	2	-.64	1	0	1	-5.259e-3	4	7814.056	4	1061.475	4
439		11	max	.013	3	-.03	15	.611	4	0	1	NC	1	NC	1
440			min	-.013	2	-.71	1	0	1	-5.315e-3	4	7931.316	4	1020.064	4
441		12	max	.013	3	-.032	15	.665	4	0	1	NC	1	NC	1
442			min	-.015	2	-.779	1	0	1	-5.371e-3	4	8301.976	4	1008.947	4
443		13	max	.014	3	-.035	15	.717	4	0	1	NC	1	NC	1
444			min	-.017	2	-.849	1	0	1	-5.427e-3	4	8990.605	4	1030.039	4
445		14	max	.015	3	-.037	15	.766	4	0	1	NC	1	NC	1
446			min	-.019	2	-.918	1	0	1	-5.483e-3	4	NC	1	1091.874	4
447		15	max	.016	3	-.04	15	.812	4	0	1	NC	1	NC	1
448			min	-.021	2	-.986	1	0	1	-5.539e-3	4	NC	1	1215.547	4
449		16	max	.017	3	-.042	15	.854	4	0	1	NC	1	NC	1
450			min	-.023	2	-1.055	1	0	1	-5.595e-3	4	NC	1	1453.819	4
451		17	max	.018	3	-.045	15	.894	4	0	1	NC	1	NC	1
452			min	-.025	2	-1.124	1	0	1	-5.65e-3	4	NC	1	1968.57	4
453		18	max	.019	3	-.047	15	.929	4	0	1	NC	1	NC	1
454			min	-.027	2	-1.192	1	0	1	-5.706e-3	4	NC	1	3574.206	4
455		19	max	.019	3	-.049	15	.961	4	0	1	NC	1	NC	1
456			min	-.028	2	-1.261	1	0	1	-5.762e-3	4	NC	1	NC	1
457	M9	1	max	.005	1	0	5	.004	4	1.166e-3	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-5.139e-3	4	NC	1	NC	1
459		2	max	.004	1	0	5	.07	4	1.388e-3	3	NC	1	NC	15
460			min	0	5	-.04	1	-.014	3	-5.239e-3	4	NC	1	2311.259	2
461		3	max	.004	1	.002	5	.136	4	1.611e-3	3	NC	1	6486.731	15
462			min	0	5	-.077	1	-.027	3	-5.34e-3	4	NC	1	1164.612	2
463		4	max	.003	1	.003	5	.202	4	1.833e-3	3	NC	1	4220.053	15
464			min	0	5	-.114	1	-.04	3	-5.441e-3	4	NC	1	787.601	2
465		5	max	.003	3	.003	5	.268	4	2.055e-3	3	NC	1	3127.16	15
466			min	0	5	-.151	1	-.052	3	-5.541e-3	4	NC	1	603.34	2
467		6	max	.003	3	.004	5	.334	4	2.278e-3	3	NC	1	2501.174	15
468			min	0	10	-.188	1	-.062	3	-5.642e-3	4	NC	1	496.61	2
469		7	max	.004	3	.006	5	.398	4	2.5e-3	3	NC	1	2108.301	15
470			min	0	2	-.225	1	-.072	3	-6.08e-3	2	8990.605	4	429.181	2
471		8	max	.004	3	.007	5	.461	4	2.722e-3	3	NC	1	1849.839	15
472			min	-.002	2	-.262	1	-.08	3	-6.581e-3	2	8301.976	4	384.875	2
473		9	max	.004	3	.008	5	.522	4	2.945e-3	3	NC	1	1677.929	15
474			min	-.002	2	-.298	1	-.087	3	-7.082e-3	2	7931.316	4	355.866	2
475		10	max	.004	3	.009	5	.581	4	3.167e-3	3	NC	1	1567.737	15
476			min	-.003	2	-.334	1	-.091	3	-7.582e-3	2	7814.056	4	338.167	2
477		11	max	.005	3	.011	5	.637	4	3.389e-3	3	NC	1	1506.72	15
478			min	-.004	2	-.37	1	-.094	3	-8.083e-3	2	7184.233	5	329.904	2
479		12	max	.005	3	.012	5	.69	4	3.611e-3	3	NC	1	1490.425	15
480			min	-.004	2	-.406	1	-.093	3	-8.584e-3	2	6259.981	5	330.695	2
481		13	max	.005	3	.014	5	.739	4	3.834e-3	3	NC	1	1521.697	15
482			min	-.005	2	-.441	1	-.09	3	-9.084e-3	2	5506.487	5	341.636	2
483		14	max	.005	3	.016	5	.785	4	4.056e-3	3	NC	1	1613.153	15
484			min	-.006	2	-.477	1	-.084	3	-9.585e-3	2	4885.534	5	365.986	2
485		15	max	.006	3	.018	5	.827	4	4.278e-3	3	NC	1	1795.975	15
486			min	-.006	2	-.512	1	-.075	3	-1.009e-2	2	4369.264	5	411.282	2
487		16	max	.006	3	.02	5	.864	4	4.501e-3	3	NC	1	2148.133	15
488			min	-.007	2	-.547	1	-.062	3	-1.059e-2	2	3936.892	5	496.028	2
489		17	max	.006	3	.022	5	.896	4	4.723e-3	3	NC	1	2908.852	15
490			min	-.007	2	-.581	1	-.045	3	-1.109e-2	2	3572.619	5	676.665	2
491		18	max	.006	3	.024	5	.923	4	4.945e-3	3	NC	1	5281.63	15
492			min	-.008	2	-.616	1	-.025	3	-1.159e-2	2	3264.264	5	1236.71	2
493		19	max	.007	3	.026	5	.945	4	5.168e-3	3	NC	1	NC	1
494			min	-.009	2	-.651	1	-.03	1	-1.209e-2	2	3002.323	5	NC	1