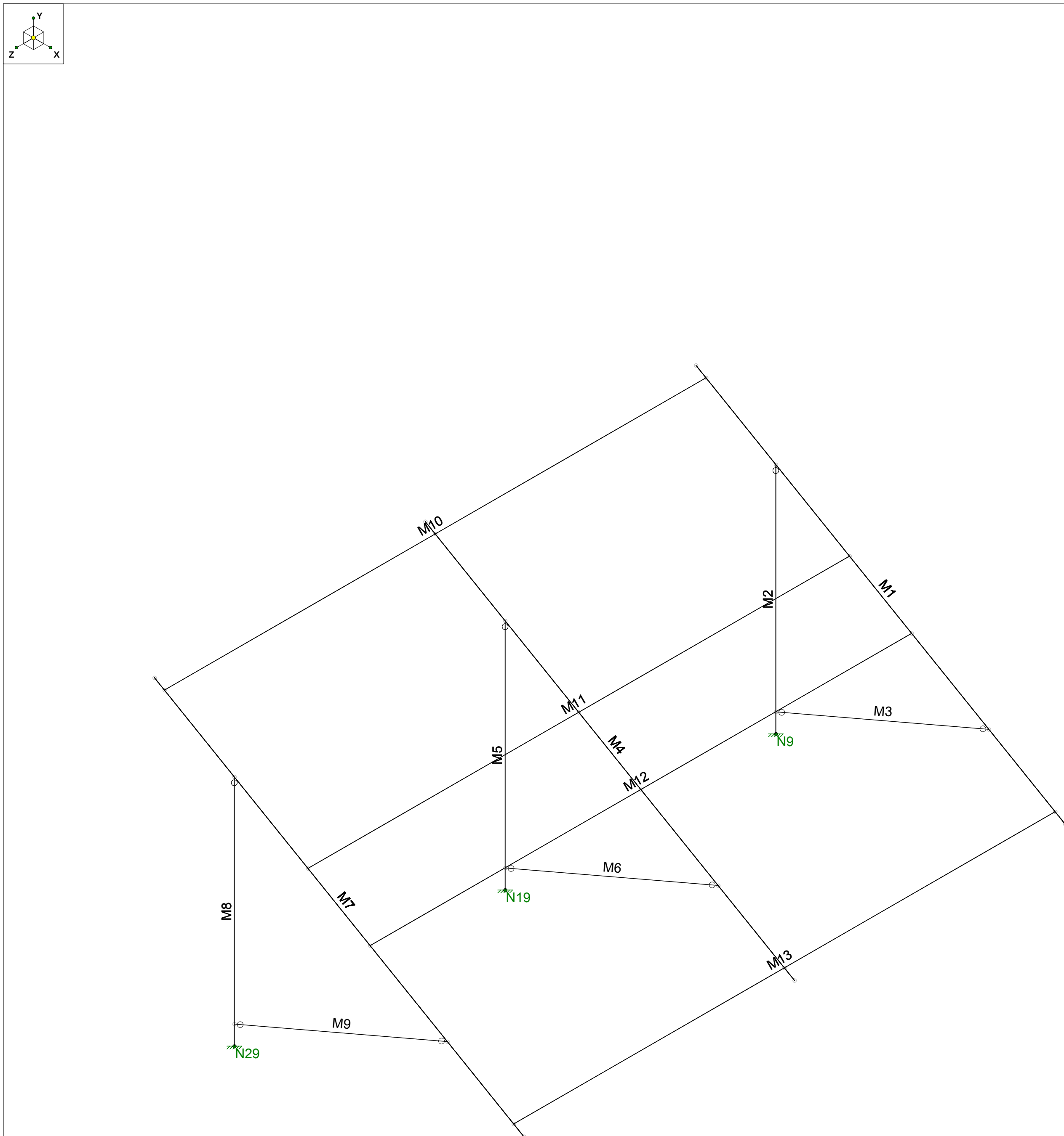


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

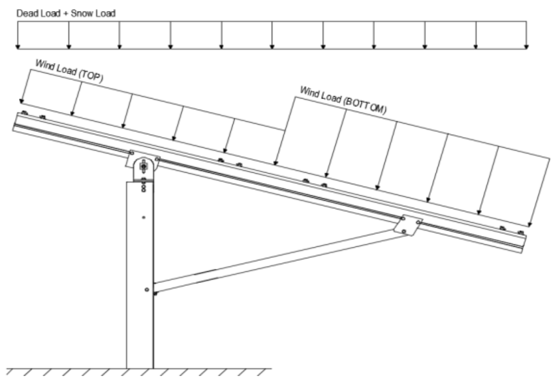
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	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	*Self-weight of the PV modules.*
g_{MIN} =	1.75	psf	

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	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 =	160	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 40.19 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]
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 + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [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

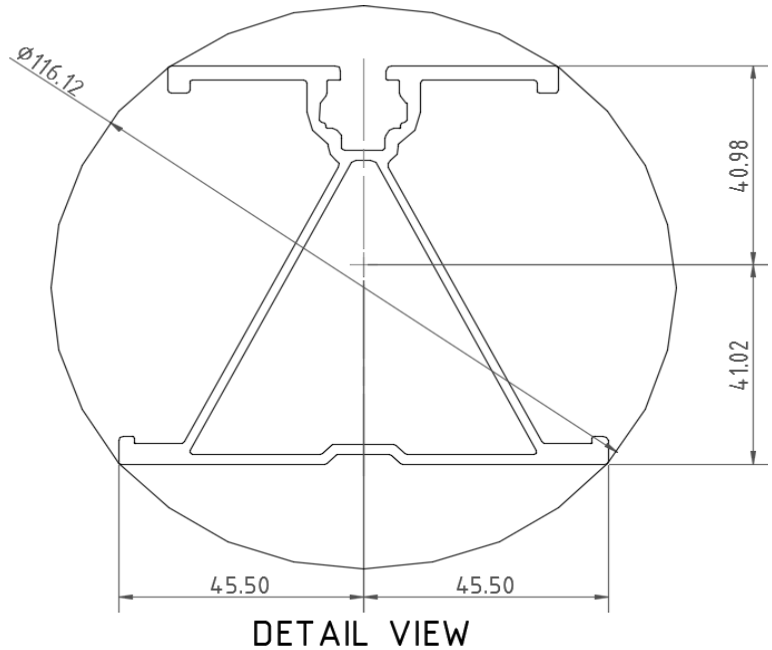
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

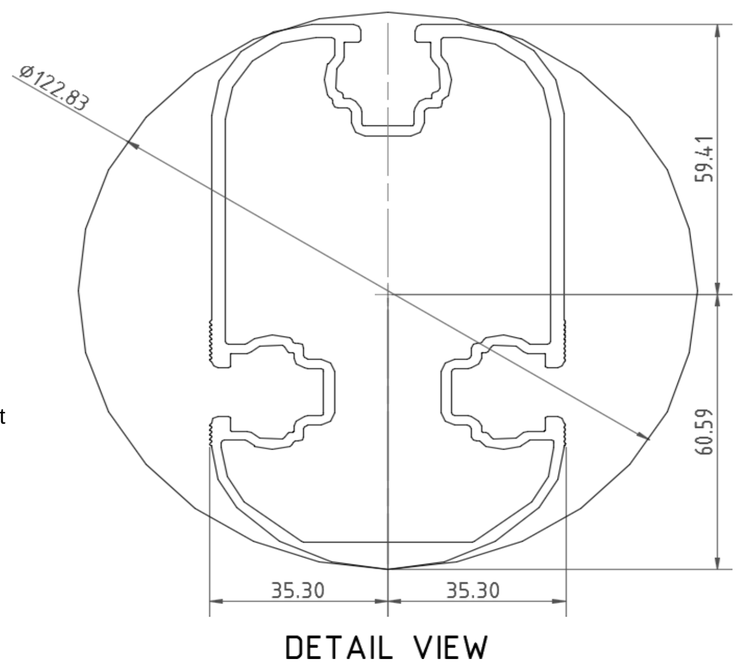
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	66	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	0.978	k-ft
M_z =	0.078	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	42%	



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).

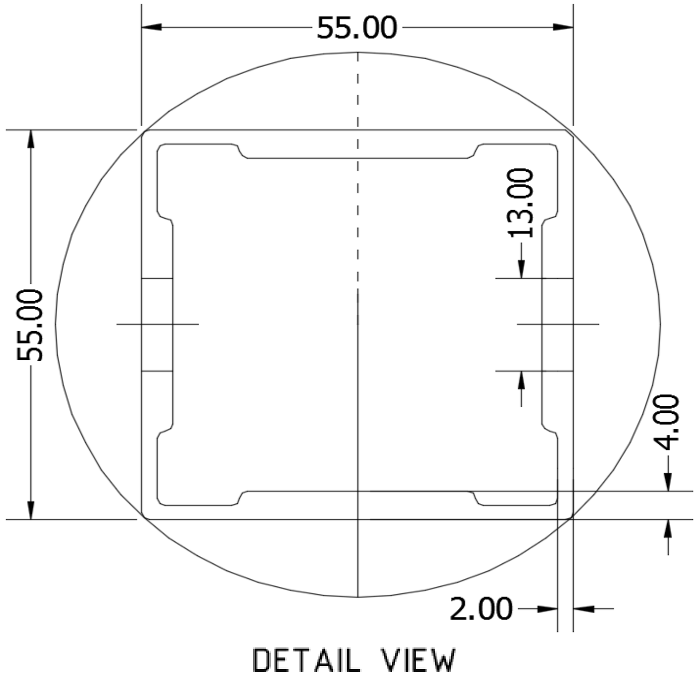
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.815	k-ft
M_z =	0.000	k-ft
P_n =	1.470	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	79%	



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).

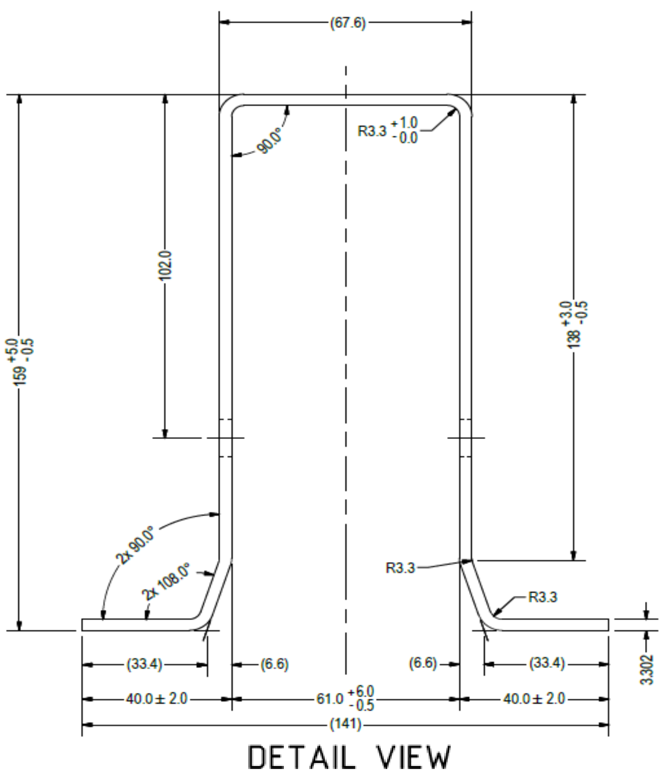
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.245	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	45%	



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 =	10.809	k-ft
M_z =	0.000	k-ft
P_r =	-4.835	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	71%	



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 =	6.27	k
Maximum Lateral Load =	3.75	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)

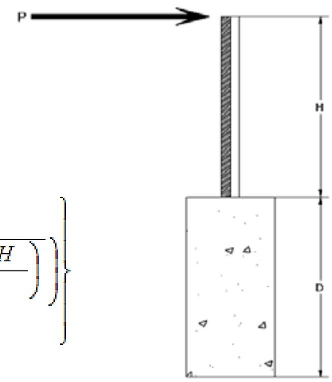
Lateral Force @ Top of Pole, P =	0.57	k
Height of Pole Above Grade, H =	7.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	0.57	k
Height of Pole Above Grade, H =	7.47	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 =	3.06	
Required Footing Depth, D =	6.76	ft
2nd Trial @ D_2 =	5.00	ft
Lateral Soil Bearing @ D/3, S_1 =	0.33	ksf
Lateral Soil Bearing @ D, S_3 =	1.00	ksf
Constant $2.34P/(S_1B)$, A =	1.99	
Required Footing Depth, D =	5.14	ft
3rd Trial @ D_3 =	5.07	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.01	ksf
Constant $2.34P/(S_1B)$, A =	1.96	
Required Footing Depth, D =	5.10	ft
4th Trial @ D_4 =	5.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.02	ksf
Constant $2.34P/(S_1B)$, A =	1.96	
Required Footing Depth, D =	5.09	ft
5th Trial @ D_5 =	5.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.02	ksf
Constant $2.34P/(S_1B)$, A =	1.96	
Required Footing Depth, D =	5.25	ft

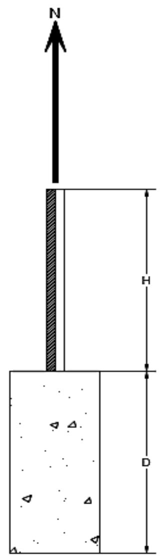
A 2ft diameter x 5.25ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.88	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 =	1.89	k
Required Concrete Volume, V =	13.03	ft^3
Required Footing Depth, D =	4.25	ft

A 2ft diameter x 4.25ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.22
2	0.4	0.2	118.10	6.12
3	0.6	0.2	118.10	6.01
4	0.8	0.2	118.10	5.91
5	1	0.2	118.10	5.81
6	1.2	0.2	118.10	5.70
7	1.4	0.2	118.10	5.60
8	1.6	0.2	118.10	5.50
9	1.8	0.2	118.10	5.39
10	2	0.2	118.10	5.29
11	2.2	0.2	118.10	5.18
12	2.4	0.2	118.10	5.08
13	2.6	0.2	118.10	4.98
14	2.8	0.2	118.10	4.87
15	3	0.2	118.10	4.77
16	3.2	0.2	118.10	4.67
17	3.4	0.2	118.10	4.56
18	3.6	0.2	118.10	4.46
19	3.8	0.2	118.10	4.36
20	4	0.2	118.10	4.25
21	4.2	0.2	118.10	4.15
22	0	0.0	0.00	4.15
23	0	0.0	0.00	4.15
24	0	0.0	0.00	4.15
25	0	0.0	0.00	4.15
26	0	0.0	0.00	4.15
27	0	0.0	0.00	4.15
28	0	0.0	0.00	4.15
29	0	0.0	0.00	4.15
30	0	0.0	0.00	4.15
31	0	0.0	0.00	4.15
32	0	0.0	0.00	4.15
33	0	0.0	0.00	4.15
34	0	0.0	0.00	4.15
Max	4.2	Sum	0.99	

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 =	5.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.13	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	14.14	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

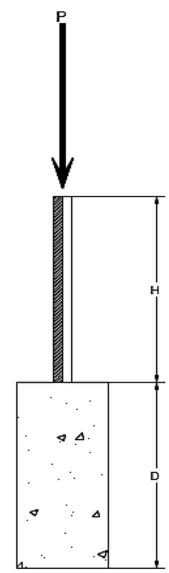
Weight of Concrete

Footing Volume	16.49	ft^3
Weight	2.39	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.12	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.11	k
Applied Force =	5.52	k
Utilization =	61%	

A 2ft diameter footing passes at a depth of 5.25ft.



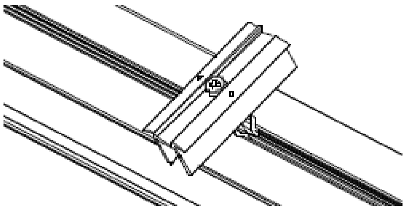
6. DESIGN OF JOINTS AND CONNECTIONS

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.

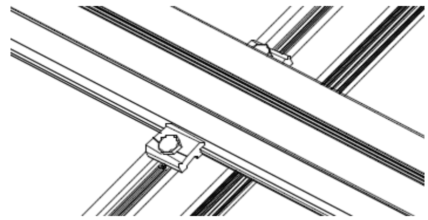
Fastening of Modules to Purlins

Maximum Uplifting Force =	1.027	k
Allowable Uplift =	1.214	k
Utilization =	85%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.024	k
Allowable Uplift =	2.180	k
Utilization =	93%	

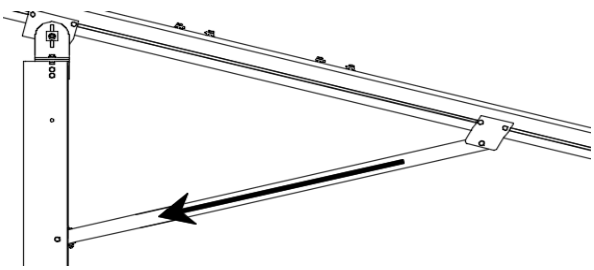


6.2 Strut Connections

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 =	4.245	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	48%	

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

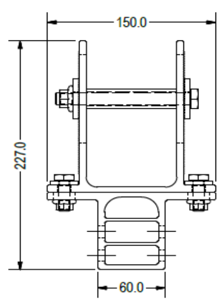


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

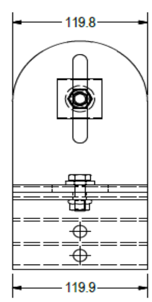
6.3 Girder to Post Connection

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.

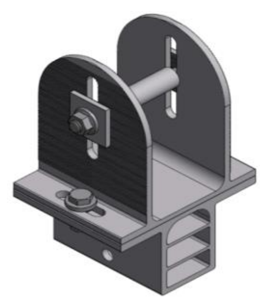
Maximum Tensile Load =	4.142	k
Allowable Load =	5.649	k
Utilization =	73%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

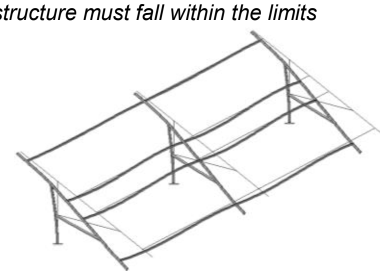
7.1 Seismic Drift

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} =	0.684	in

0.684 ≤ 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 = 66 in

J = 0.432

182.587

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.0 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 = 66

J = 0.432

116.114

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

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 = 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
$\varphi F_L = \varphi b[Bt\text{-}Dt^*\sqrt{(Rb/t)}]$
$\varphi F_L =$ 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
$\varphi F_L = 1.3\varphi yFcy$
$\varphi F_L =$ 43.2 ksi

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
$\varphi F_L = 1.3\varphi yFcy$
$\varphi F_L =$ 43.2 ksi

$\varphi F_L St =$ 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

$\varphi F_L Wk =$ 31.6 ksi
Iy = 763048 mm^4
1.833 in^4
x = 35 mm
Sy = 1.330 in^3
$M_{max}Wk =$ 3.499 k-ft

Compression

3.4.9
b/t = 4.5
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
$\varphi F_L = \varphi yFcy$
$\varphi F_L =$ 33.3 ksi

b/t = 16.3333
S1 = 12.21
S2 = 32.70
$\varphi F_L = \varphi c[Bp\text{-}1.6Dp^*b/t]$
$\varphi F_L =$ 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
$\varphi F_L = \varphi c[Bt\text{-}Dt^*\sqrt{(Rb/t)}]$
$\varphi F_L =$ 30.80 ksi

$\varphi F_L =$ 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

$\lambda =$ 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

$\varphi cc =$ 0.82226

$\varphi F_L = (\varphi ccFcy)/(\lambda^2)$

$\varphi F_L =$ 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)

$\varphi F_L = \varphi c[Bp\text{-}1.6Dp^*b/t]$

$\varphi F_L =$ 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

$\varphi F_L = \varphi c[Bp\text{-}1.6Dp^*b/t]$

$\varphi F_L =$ 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

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.25 ksi

$\varphi F_L =$ 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 =	-4.83 k	(LRFD Factored Load)
Mr (Strong) =	10.81 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 =	0.1436 <	0.2	
Utilization =	0.71 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.144 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 71%

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	-151.652	-151.652	0	0
2	M11	y	-151.652	-151.652	0	0
3	M12	y	-243.962	-243.962	0	0
4	M13	y	-243.962	-243.962	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	303.305	303.305	0	0
2	M11	y	303.305	303.305	0	0
3	M12	y	145.059	145.059	0	0
4	M13	y	145.059	145.059	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	731.743	2	2100.418	2	70.343	2	.106	2	.014	5	4.969	1
2		min	-1099.901	3	-1611.838	3	-256.108	5	-1.204	5	-.006	2	.811	15
3	N19	max	2888.269	2	5270.833	2	0	3	0	2	.014	4	5.852	1
4		min	-2732.202	3	-4815.226	3	-266.82	5	-1.244	4	0	1	.236	15
5	N29	max	731.743	2	2100.418	2	92.235	3	.145	3	.015	4	4.969	1
6		min	-1099.901	3	-1611.838	3	-266.554	4	-1.234	4	-.003	3	-.6	5
7	Totals:	max	4351.754	2	9471.669	2	0	2						
8		min	-4932.004	3	-8038.901	3	-782.714	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	-15.843	12	310.602	3	-8.998	12	.034	5	.153	1	.252	2
4			min	-153.655	1	-683.8	2	-70.435	1	-.126	2	.026	12	-.113	3
5		3	max	-16.3	12	309.414	3	-8.998	12	.034	5	.107	1	.701	2
6			min	-154.57	1	-685.384	2	-70.435	1	-.126	2	.02	12	-.317	3
7		4	max	-16.757	12	308.225	3	-8.998	12	.034	5	.069	4	1.152	2
8			min	-155.484	1	-686.969	2	-70.435	1	-.126	2	.014	12	-.519	3
9		5	max	394.635	3	610.653	2	-3.69	12	-.002	9	.071	2	1.364	2
10			min	-1073.263	2	-259.545	3	-87.172	1	-.021	3	-.014	3	-.617	3
11		6	max	393.949	3	609.069	2	-3.69	12	-.002	9	.02	2	.964	2
12			min	-1074.178	2	-260.733	3	-87.172	1	-.021	3	-.032	4	-.447	3
13		7	max	393.263	3	607.484	2	-3.69	12	-.002	9	-.013	12	.565	2
14			min	-1075.093	2	-261.921	3	-87.172	1	-.021	3	-.066	4	-.275	3
15		8	max	392.576	3	605.9	2	-3.69	12	-.002	9	-.015	12	.167	2
16			min	-1076.008	2	-263.109	3	-87.172	1	-.021	3	-.104	1	-.103	3
17		9	max	364.703	3	23.1	3	-3.489	12	.016	5	.066	1	0	15
18			min	-1176.429	2	-4.754	2	-124.971	1	-.074	2	.018	10	-.024	2
19		10	max	364.017	3	21.911	3	-3.489	12	.016	5	.026	3	0	15
20			min	-1177.344	2	-6.338	2	-124.971	1	-.074	2	-.02	2	-.038	3
21		11	max	363.331	3	20.723	3	-3.489	12	.016	5	.023	3	0	5
22			min	-1178.259	2	-7.923	2	-124.971	1	-.074	2	-.098	1	-.052	3
23		12	max	328.914	3	688.171	3	8.333	10	.111	3	.08	4	.123	2
24			min	-1273.135	2	-401.564	2	-141.981	4	-.09	2	.02	10	-.281	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	328.228	3	686.983	3	8.333	10	.111	3	.065	1	.387	2
26			min	-1274.05	2	-403.149	2	-143.567	4	-.09	2	-.024	5	-.732	3
27		14	max	327.542	3	685.794	3	8.333	10	.111	3	.058	2	.652	2
28			min	-1274.964	2	-404.733	2	-145.153	4	-.09	2	-.114	5	-1.182	3
29		15	max	326.856	3	684.606	3	8.333	10	.111	3	.062	2	.918	2
30			min	-1275.879	2	-406.318	2	-146.738	4	-.09	2	-.205	5	-1.632	3
31		16	max	155.362	1	419.287	2	47.277	5	.088	2	.01	3	.699	2
32			min	8.302	15	-739.657	3	-60.704	1	-.231	3	-.102	4	-1.245	3
33		17	max	154.447	1	417.703	2	45.692	5	.088	2	-.007	12	.425	2
34			min	8.026	15	-740.845	3	-60.704	1	-.231	3	-.119	1	-.759	3
35		18	max	153.533	1	416.119	2	44.106	5	.088	2	-.019	15	.151	2
36			min	7.75	15	-742.033	3	-60.704	1	-.231	3	-.158	1	-.273	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	.006	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	13.541	3	911.207	3	0	1	.039	4	.171	4	.512	2
42			min	-182.746	1	-1670.493	2	-64.503	5	0	1	0	1	-.286	3
43		3	max	12.855	3	910.018	3	0	1	.039	4	.129	4	1.609	2
44			min	-183.661	1	-1672.078	2	-66.088	5	0	1	0	1	-.884	3
45		4	max	12.169	3	908.83	3	0	1	.039	4	.085	4	2.707	2
46			min	-184.576	1	-1673.662	2	-67.674	5	0	1	0	1	-1.48	3
47		5	max	1423.876	3	1719.014	2	0	1	0	1	0	14	3.182	2
48			min	-2603.455	2	-977.626	3	-61.071	4	-.019	4	0	5	-1.73	3
49		6	max	1423.19	3	1717.429	2	0	1	0	1	0	1	2.054	2
50			min	-2604.369	2	-978.815	3	-62.656	4	-.019	4	-.04	5	-1.088	3
51		7	max	1422.504	3	1715.845	2	0	1	0	1	0	1	.928	2
52			min	-2605.284	2	-980.003	3	-64.242	4	-.019	4	-.082	4	-.445	3
53		8	max	1421.818	3	1714.26	2	0	1	0	1	0	1	.198	3
54			min	-2606.199	2	-981.191	3	-65.828	4	-.019	4	-.124	4	-.197	2
55		9	max	1441.061	3	-1.133	15	0	1	.012	4	.1	4	.51	3
56			min	-2611.872	2	-108.625	2	-153.4	4	0	1	0	1	-.707	2
57		10	max	1440.375	3	-1.611	15	0	1	.012	4	0	1	.524	3
58			min	-2612.787	2	-110.209	2	-154.985	4	0	1	-.002	4	-.635	2
59		11	max	1439.689	3	-2.088	15	0	1	.012	4	0	1	.539	3
60			min	-2613.702	2	-111.793	2	-156.571	4	0	1	-.104	4	-.562	2
61		12	max	1472.02	3	1911.337	3	0	1	.109	4	.094	5	-.001	15
62			min	-2630.467	2	-1351.455	2	-150.348	4	0	1	0	1	-.111	2
63		13	max	1471.334	3	1910.149	3	0	1	.109	4	0	1	.777	2
64			min	-2631.382	2	-1353.04	2	-151.934	4	0	1	-.005	4	-1.31	3
65		14	max	1470.648	3	1908.96	3	0	1	.109	4	0	1	1.665	2
66			min	-2632.296	2	-1354.624	2	-153.519	4	0	1	-.106	4	-2.563	3
67		15	max	1469.962	3	1907.772	3	0	1	.109	4	0	1	2.554	2
68			min	-2633.211	2	-1356.208	2	-155.105	4	0	1	-.207	4	-3.815	3
69		16	max	184.82	1	1196.988	2	41.856	5	0	1	0	1	1.944	2
70			min	-10.228	3	-1787.081	3	0	1	-.094	4	-.077	5	-2.897	3
71		17	max	183.906	1	1195.404	2	40.271	5	0	1	0	1	1.159	2
72			min	-10.914	3	-1788.27	3	0	1	-.094	4	-.05	5	-1.724	3
73		18	max	182.991	1	1193.819	2	38.685	5	0	1	0	1	.376	2
74			min	-11.6	3	-1789.458	3	0	1	-.094	4	-.024	4	-.55	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.004	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	27.651	5	310.602	3	70.435	1	.126	2	.092	5	.252	2
80			min	-153.655	1	-683.8	2	-31.058	5	-.029	3	-.153	1	-.113	3
81		3	max	27.224	5	309.414	3	70.435	1	.126	2	.071	5	.701	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	-154.57	1	-685.384	2	-32.643	5	-.029	3	-.107	1	-.317	3
83		4	max	26.797	5	308.225	3	70.435	1	.126	2	.049	5	1.152	2
84			min	-155.484	1	-686.969	2	-34.229	5	-.029	3	-.06	1	-.519	3
85		5	max	394.635	3	610.653	2	87.172	1	.021	3	.014	3	1.364	2
86			min	-1073.263	2	-259.545	3	-26.75	5	-.017	5	-.071	2	-.617	3
87		6	max	393.949	3	609.069	2	87.172	1	.021	3	.017	3	.964	2
88			min	-1074.178	2	-260.733	3	-28.336	5	-.017	5	-.032	4	-.447	3
89		7	max	393.263	3	607.484	2	87.172	1	.021	3	.047	1	.565	2
90			min	-1075.093	2	-261.921	3	-29.922	5	-.017	5	-.051	5	-.275	3
91		8	max	392.576	3	605.9	2	87.172	1	.021	3	.104	1	.167	2
92			min	-1076.008	2	-263.109	3	-31.507	5	-.017	5	-.071	5	-.103	3
93		9	max	364.703	3	23.1	3	124.971	1	.074	2	.041	5	-.003	15
94			min	-1176.429	2	-4.754	2	-52.137	5	.012	9	-.066	1	-.024	2
95		10	max	364.017	3	21.911	3	124.971	1	.074	2	.02	2	-.003	15
96			min	-1177.344	2	-6.338	2	-53.723	5	.012	9	-.026	3	-.038	3
97		11	max	363.331	3	20.723	3	124.971	1	.074	2	.098	1	-.004	15
98			min	-1178.259	2	-7.923	2	-55.308	5	.012	9	-.029	5	-.052	3
99		12	max	328.914	3	688.171	3	114.354	3	.106	4	.055	5	.123	2
100			min	-1273.135	2	-401.564	2	-130.531	5	-.111	3	-.079	1	-.281	3
101		13	max	328.228	3	686.983	3	114.354	3	.106	4	.011	3	.387	2
102			min	-1274.05	2	-403.149	2	-132.116	5	-.111	3	-.065	1	-.732	3
103		14	max	327.542	3	685.794	3	114.354	3	.106	4	.086	3	.652	2
104			min	-1274.964	2	-404.733	2	-133.702	5	-.111	3	-.126	4	-1.182	3
105		15	max	326.856	3	684.606	3	114.354	3	.106	4	.161	3	.918	2
106			min	-1275.879	2	-406.318	2	-135.288	5	-.111	3	-.209	4	-1.632	3
107		16	max	155.362	1	419.287	2	66.643	4	.231	3	.079	1	.699	2
108			min	6.189	15	-739.657	3	18.193	10	-.089	4	-.08	5	-1.245	3
109		17	max	154.447	1	417.703	2	65.057	4	.231	3	.119	1	.425	2
110			min	5.913	15	-740.845	3	18.193	10	-.089	4	-.045	5	-.759	3
111		18	max	153.533	1	416.119	2	63.472	4	.231	3	.158	1	.151	2
112			min	5.637	15	-742.033	3	18.193	10	-.089	4	-.01	5	-.273	3
113		19	max	0	1	0	2	0	12	0	1	0	1	0	1
114			min	0	1	-.002	3	0	4	0	1	0	1	0	1
115	M10	1	max	61.942	4	414.544	2	-5.368	15	.012	2	.179	1	.089	4
116			min	18.193	10	-743.04	3	-152.721	1	-.024	3	.004	15	-.231	3
117		2	max	60.726	1	302.26	2	-4.113	15	.012	2	.094	1	.168	3
118			min	18.193	10	-561.001	3	-125.648	1	-.024	3	.002	15	-.131	2
119		3	max	60.726	1	189.976	2	-2.858	15	.012	2	.04	2	.455	3
120			min	18.193	10	-378.962	3	-98.575	1	-.024	3	0	5	-.281	2
121		4	max	60.726	1	77.691	2	-1.603	15	.012	2	.007	10	.631	3
122			min	18.193	10	-196.924	3	-71.502	1	-.024	3	-.027	1	-.363	2
123		5	max	60.726	1	21.538	5	-.348	15	.012	2	-.003	15	.696	3
124			min	14.188	15	-34.593	2	-44.429	1	-.024	3	-.062	1	-.376	2
125		6	max	60.726	1	167.153	3	1.329	5	.012	2	-.002	15	.649	3
126			min	9.334	15	-146.877	2	-29.542	2	-.024	3	-.081	1	-.321	2
127		7	max	60.726	1	349.192	3	15.808	9	.012	2	-.001	15	.491	3
128			min	4.48	15	-259.161	2	-18.222	2	-.024	3	-.083	1	-.197	2
129		8	max	60.726	1	531.231	3	36.789	1	.012	2	0	5	.222	3
130			min	-.373	15	-371.446	2	-10.085	10	-.024	3	-.069	1	-.018	5
131		9	max	60.726	1	713.269	3	63.862	1	.012	2	.004	5	.257	2
132			min	-7.543	5	-483.73	2	-8.08	3	-.024	3	-.069	2	-.158	3
133		10	max	60.726	1	895.308	3	3.151	10	.024	3	.034	9	.587	2
134			min	14.924	15	27.213	15	-90.935	1	-.004	4	-.063	2	-.649	3
135		11	max	60.726	1	483.73	2	8.08	3	.024	3	-.003	9	.257	2
136			min	10.07	15	-713.269	3	-63.862	1	-.012	2	-.069	2	-.158	3
137		12	max	60.726	1	371.446	2	10.085	10	.024	3	-.004	15	.222	3
138			min	5.217	15	-531.231	3	-36.789	1	-.012	2	-.069	1	-.005	10

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	60.726	1	259.161	2	18.222	2	.024	3	-.005	15	.491	3
140			min	.363	15	-349.192	3	-15.808	9	-.012	2	-.083	1	-.197	2
141		14	max	60.726	1	146.877	2	29.542	2	.024	3	-.004	15	.649	3
142			min	-6.479	5	-167.153	3	1.203	15	-.012	2	-.081	1	-.321	2
143		15	max	60.726	1	34.593	2	44.429	1	.024	3	-.003	15	.696	3
144			min	-13.69	5	9.116	12	2.458	15	-.012	2	-.062	1	-.376	2
145		16	max	60.726	1	196.924	3	71.502	1	.024	3	.007	10	.631	3
146			min	-20.901	5	-77.691	2	3.713	15	-.012	2	-.027	1	-.363	2
147		17	max	60.726	1	378.962	3	98.575	1	.024	3	.04	2	.455	3
148			min	-28.113	5	-189.976	2	4.968	15	-.012	2	.001	15	-.281	2
149		18	max	60.726	1	561.001	3	125.648	1	.024	3	.094	1	.168	3
150			min	-35.324	5	-302.26	2	6.223	15	-.012	2	.005	15	-.131	2
151		19	max	60.726	1	743.04	3	152.721	1	.024	3	.179	1	.088	2
152			min	-42.536	5	-414.544	2	7.478	15	-.012	2	.009	15	-.231	3
153	M11	1	max	103.805	1	391.352	2	44.973	5	.003	3	.225	1	.083	4
154			min	-109.559	3	-669.18	3	-165.558	1	-.008	2	-.144	5	-.163	3
155		2	max	103.805	1	279.067	2	46.915	5	.003	3	.132	1	.19	3
156			min	-109.559	3	-487.142	3	-138.485	1	-.008	2	-.116	5	-.189	2
157		3	max	103.805	1	166.783	2	48.856	5	.003	3	.058	2	.432	3
158			min	-109.559	3	-305.103	3	-111.412	1	-.008	2	-.087	5	-.325	2
159		4	max	103.805	1	54.499	2	50.798	5	.003	3	.023	3	.563	3
160			min	-109.559	3	-123.065	3	-84.339	1	-.008	2	-.061	4	-.393	2
161		5	max	103.805	1	58.974	3	52.74	5	.003	3	.007	3	.582	3
162			min	-109.559	3	-57.785	2	-57.267	1	-.008	2	-.047	1	-.392	2
163		6	max	103.805	1	241.013	3	54.681	5	.003	3	.008	5	.491	3
164			min	-109.559	3	-170.07	2	-37.526	2	-.008	2	-.074	1	-.322	2
165		7	max	103.805	1	423.051	3	59.791	4	.003	3	.042	5	.288	3
166			min	-109.559	3	-282.354	2	-26.205	2	-.008	2	-.084	1	-.184	2
167		8	max	103.805	1	605.09	3	67.995	4	.003	3	.077	5	.026	1
168			min	-109.559	3	-394.638	2	-20.255	3	-.008	2	-.078	1	-.026	3
169		9	max	103.805	1	787.128	3	76.198	4	.003	3	.113	5	.299	2
170			min	-109.559	3	-506.922	2	-18.341	3	-.008	2	-.079	2	-.452	3
171		10	max	103.805	1	969.167	3	78.098	1	.008	2	.159	4	.643	2
172			min	-109.559	3	-619.207	2	-23.334	14	-.003	14	-.078	2	-.988	3
173		11	max	103.805	1	506.922	2	50.848	5	.008	2	-.012	9	.299	2
174			min	-109.559	3	-787.128	3	-51.025	1	-.003	3	-.121	4	-.452	3
175		12	max	103.805	1	394.638	2	52.789	5	.008	2	-.022	12	.026	1
176			min	-109.559	3	-605.09	3	-26.283	9	-.003	3	-.096	4	-.026	3
177		13	max	103.805	1	282.354	2	54.731	5	.008	2	-.014	12	.288	3
178			min	-109.559	3	-423.051	3	-8.495	9	-.003	3	-.084	1	-.184	2
179		14	max	103.805	1	170.07	2	60.085	4	.008	2	-.006	12	.491	3
180			min	-109.559	3	-241.013	3	9.292	9	-.003	3	-.074	1	-.322	2
181		15	max	103.805	1	57.785	2	68.288	4	.008	2	.018	5	.582	3
182			min	-109.559	3	-58.974	3	15.958	12	-.003	3	-.047	1	-.392	2
183		16	max	103.805	1	123.065	3	84.339	1	.008	2	.054	5	.563	3
184			min	-109.559	3	-54.499	2	17.234	12	-.003	3	-.011	9	-.393	2
185		17	max	103.805	1	305.103	3	111.412	1	.008	2	.1	4	.432	3
186			min	-109.559	3	-166.783	2	18.509	12	-.003	3	.022	9	-.325	2
187		18	max	103.805	1	487.142	3	138.485	1	.008	2	.154	4	.19	3
188			min	-109.559	3	-279.067	2	19.785	12	-.003	3	.037	12	-.189	2
189		19	max	103.805	1	669.18	3	165.558	1	.008	2	.225	1	.018	1
190			min	-109.559	3	-391.352	2	21.061	12	-.003	3	.049	12	-.163	3
191	M12	1	max	18.909	5	607.86	2	43.875	5	0	10	.24	1	.068	2
192			min	-37.465	1	-287.683	3	-169.795	1	-.004	3	-.14	5	.011	9
193		2	max	11.698	5	439.164	2	45.816	5	0	10	.145	1	.182	3
194			min	-37.465	1	-202.351	3	-142.723	1	-.004	3	-.112	5	-.252	2
195		3	max	4.486	5	270.468	2	47.758	5	0	10	.071	2	.279	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	-37.465	1	-117.018	3	-115.65	1	-.004	3	-.084	5	-.469	2
197		4	max	.745	3	101.772	2	49.7	5	0	10	.027	2	.325	3
198			min	-37.465	1	-31.685	3	-88.577	1	-.004	3	-.057	4	-.582	2
199		5	max	.745	3	53.648	3	51.641	5	0	10	0	10	.318	3
200			min	-37.465	1	-66.924	2	-61.504	1	-.004	3	-.042	1	-.593	2
201		6	max	.745	3	138.98	3	53.583	5	0	10	.009	5	.259	3
202			min	-37.465	1	-235.62	2	-42.875	2	-.004	3	-.072	1	-.501	2
203		7	max	.745	3	224.313	3	58.339	4	0	10	.043	5	.148	3
204			min	-37.465	1	-404.316	2	-31.555	2	-.004	3	-.085	1	-.305	2
205		8	max	.745	3	309.646	3	66.543	4	0	10	.077	5	-.002	10
206			min	-40.078	4	-573.011	2	-20.234	2	-.004	3	-.081	1	-.015	1
207		9	max	.745	3	394.978	3	74.746	4	0	10	.113	5	.395	2
208			min	-47.29	4	-741.707	2	-12.932	10	-.004	3	-.086	2	-.23	3
209		10	max	.745	3	-5.504	15	82.95	4	.004	3	.157	4	.9	2
210			min	-54.501	4	-910.403	2	-9.465	10	-.002	4	-.088	2	-.498	3
211		11	max	32.812	5	741.707	2	50.059	5	.004	3	-.014	9	.395	2
212			min	-37.465	1	-394.978	3	-46.788	1	-.002	5	-.121	4	-.23	3
213		12	max	25.601	5	573.011	2	52.001	5	.004	3	-.019	12	.003	5
214			min	-37.465	1	-309.646	3	-24.982	9	-.002	5	-.097	4	-.015	1
215		13	max	18.389	5	404.316	2	53.943	5	.004	3	-.014	12	.148	3
216			min	-37.465	1	-224.313	3	-7.195	9	-.002	5	-.085	1	-.305	2
217		14	max	11.178	5	235.62	2	59.859	4	.004	3	-.008	12	.259	3
218			min	-37.465	1	-138.98	3	10.592	9	-.002	5	-.072	1	-.501	2
219		15	max	3.966	5	66.924	2	68.063	4	.004	3	.016	5	.318	3
220			min	-37.465	1	-53.648	3	12.088	12	-.002	5	-.042	1	-.593	2
221		16	max	.745	3	31.685	3	88.577	1	.004	3	.052	5	.325	3
222			min	-37.465	1	-101.772	2	13.364	12	-.002	5	-.009	9	-.582	2
223		17	max	.745	3	117.018	3	115.65	1	.004	3	.098	4	.279	3
224			min	-37.465	1	-270.468	2	14.64	12	-.002	5	.016	12	-.469	2
225		18	max	.745	3	202.351	3	142.723	1	.004	3	.152	4	.182	3
226			min	-37.465	1	-439.164	2	15.916	12	-.002	5	.025	12	-.252	2
227		19	max	.745	3	287.683	3	169.795	1	.004	3	.24	1	.068	2
228			min	-37.465	1	-607.86	2	17.191	12	-.002	5	.035	12	-.033	5
229	M13	1	max	29.384	5	683.135	2	28.081	5	.009	3	.176	1	.126	2
230			min	-70.373	1	-311.813	3	-152.616	1	-.023	2	-.103	5	-.029	3
231		2	max	22.173	5	514.439	2	30.022	5	.009	3	.091	1	.136	3
232			min	-70.373	1	-226.48	3	-125.543	1	-.023	2	-.085	5	-.24	2
233		3	max	14.961	5	345.743	2	31.964	5	.009	3	.037	2	.248	3
234			min	-70.373	1	-141.148	3	-98.47	1	-.023	2	-.066	5	-.503	2
235		4	max	7.75	5	177.047	2	33.905	5	.009	3	.007	3	.308	3
236			min	-70.373	1	-55.815	3	-71.397	1	-.023	2	-.055	4	-.663	2
237		5	max	.539	5	29.518	3	35.847	5	.009	3	-.002	12	.316	3
238			min	-70.373	1	3.21	10	-44.324	1	-.023	2	-.064	1	-.72	2
239		6	max	-4.352	15	114.851	3	37.789	5	.009	3	-.001	15	.272	3
240			min	-70.373	1	-160.345	2	-29.585	2	-.023	2	-.083	1	-.673	2
241		7	max	-8.998	12	200.183	3	45.454	4	.009	3	.022	5	.176	3
242			min	-70.373	1	-329.041	2	-18.264	2	-.023	2	-.085	1	-.524	2
243		8	max	-8.998	12	285.516	3	53.657	4	.009	3	.046	5	.027	3
244			min	-70.373	1	-497.736	2	-10.931	3	-.023	2	-.071	1	-.271	2
245		9	max	-8.998	12	370.849	3	63.967	1	.009	3	.073	5	.085	2
246			min	-70.373	1	-666.432	2	-9.017	3	-.023	2	-.071	2	-.173	3
247		10	max	-8.998	12	-3.347	15	91.04	1	.023	2	.112	4	.544	2
248			min	-70.373	1	-835.128	2	-3.192	10	-.005	14	-.065	2	-.426	3
249		11	max	20.237	5	666.432	2	32.377	5	.023	2	-.003	9	.085	2
250			min	-70.373	1	-370.849	3	-63.967	1	-.009	3	-.075	4	-.173	3
251		12	max	13.025	5	497.736	2	34.318	5	.023	2	-.018	12	.027	3
252			min	-70.373	1	-285.516	3	-36.894	1	-.009	3	-.071	1	-.271	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	5.814	5	329.041	2	36.26	5	.023	2	-.013	12	.176	3
254			min	-70.373	1	-200.183	3	-15.914	9	-.009	3	-.085	1	-.524	2
255		14	max	-.796	15	160.345	2	38.952	4	.023	2	-.006	15	.272	3
256			min	-70.373	1	-114.851	3	1.873	9	-.009	3	-.083	1	-.673	2
257		15	max	-5.65	15	9.41	5	47.156	4	.023	2	.015	5	.316	3
258			min	-70.373	1	-29.518	3	10.278	12	-.009	3	-.064	1	-.72	2
259		16	max	-8.998	12	55.815	3	71.397	1	.023	2	.04	5	.308	3
260			min	-70.373	1	-177.047	2	11.554	12	-.009	3	-.029	1	-.663	2
261		17	max	-8.998	12	141.148	3	98.47	1	.023	2	.068	4	.248	3
262			min	-70.373	1	-345.743	2	12.83	12	-.009	3	.003	9	-.503	2
263		18	max	-8.998	12	226.48	3	125.543	1	.023	2	.11	4	.136	3
264			min	-70.373	1	-514.439	2	14.106	12	-.009	3	.02	12	-.24	2
265		19	max	-8.998	12	311.813	3	152.616	1	.023	2	.176	1	.126	2
266			min	-70.373	1	-683.135	2	15.381	12	-.009	3	.029	12	-.034	5
267	M2	1	max	2100.418	2	1099.241	3	70.409	2	.014	5	1.204	5	4.969	1
268			min	-1611.838	3	-730.713	2	-256.155	5	-.006	2	-.106	2	.811	15
269		2	max	2097.147	2	1099.241	3	70.409	2	.014	5	1.113	5	5.058	1
270			min	-1614.291	3	-730.713	2	-253.319	5	-.006	2	-.081	2	.769	15
271		3	max	1456.144	2	858.756	1	48.153	2	0	2	1.019	5	4.936	1
272			min	-1344.617	3	126.235	15	-234.33	5	0	5	-.072	2	.726	15
273		4	max	1452.872	2	858.756	1	48.153	2	0	2	.936	5	4.628	1
274			min	-1347.07	3	126.235	15	-231.495	5	0	5	-.055	1	.68	15
275		5	max	1449.601	2	858.756	1	48.153	2	0	2	.854	4	4.319	1
276			min	-1349.524	3	126.235	15	-228.66	5	0	5	-.041	1	.635	15
277		6	max	1446.329	2	858.756	1	48.153	2	0	2	.773	4	4.011	1
278			min	-1351.977	3	126.235	15	-225.824	5	0	5	-.026	1	.59	15
279		7	max	1443.058	2	858.756	1	48.153	2	0	2	.694	4	3.702	1
280			min	-1354.431	3	126.235	15	-222.989	5	0	5	-.034	3	.544	15
281		8	max	1439.786	2	858.756	1	48.153	2	0	2	.615	4	3.394	1
282			min	-1356.885	3	126.235	15	-220.154	5	0	5	-.064	3	.499	15
283		9	max	1436.515	2	858.756	1	48.153	2	0	2	.538	4	3.085	1
284			min	-1359.338	3	126.235	15	-217.318	5	0	5	-.094	3	.454	15
285		10	max	1433.244	2	858.756	1	48.153	2	0	2	.461	4	2.777	1
286			min	-1361.792	3	126.235	15	-214.483	5	0	5	-.124	3	.408	15
287		11	max	1429.972	2	858.756	1	48.153	2	0	2	.385	4	2.468	1
288			min	-1364.245	3	126.235	15	-211.648	5	0	5	-.154	3	.363	15
289		12	max	1426.701	2	858.756	1	48.153	2	0	2	.311	4	2.16	1
290			min	-1366.699	3	126.235	15	-208.813	5	0	5	-.184	3	.317	15
291		13	max	1423.429	2	858.756	1	48.153	2	0	2	.237	4	1.851	1
292			min	-1369.153	3	126.235	15	-205.977	5	0	5	-.214	3	.272	15
293		14	max	1420.158	2	858.756	1	48.153	2	0	2	.165	4	1.543	1
294			min	-1371.606	3	126.235	15	-203.142	5	0	5	-.244	3	.227	15
295		15	max	1416.886	2	858.756	1	48.153	2	0	2	.136	2	1.234	1
296			min	-1374.06	3	126.235	15	-200.307	5	0	5	-.274	3	.181	15
297		16	max	1413.615	2	858.756	1	48.153	2	0	2	.153	2	.926	1
298			min	-1376.513	3	126.235	15	-197.472	5	0	5	-.304	3	.136	15
299		17	max	1410.343	2	858.756	1	48.153	2	0	2	.17	2	.617	1
300			min	-1378.967	3	126.235	15	-194.636	5	0	5	-.334	3	.091	15
301		18	max	1407.072	2	858.756	1	48.153	2	0	2	.188	2	.309	1
302			min	-1381.42	3	126.235	15	-191.801	5	0	5	-.364	3	.045	15
303		19	max	1403.8	2	858.756	1	48.153	2	0	2	.205	2	0	1
304			min	-1383.874	3	126.235	15	-188.966	5	0	5	-.394	3	0	1
305	M5	1	max	5270.833	2	2729.219	3	0	1	.014	4	1.244	4	5.852	1
306			min	-4815.226	3	-2885.587	2	-266.893	5	0	1	0	1	.236	15
307		2	max	5267.561	2	2729.219	3	0	1	.014	4	1.148	4	6.455	1
308			min	-4817.68	3	-2885.587	2	-264.058	5	0	1	0	1	.241	15
309		3	max	3616.051	2	1134.881	1	0	1	0	1	1.052	4	6.524	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	-3905.132	3	41.043	15	-246.511	4	0	4	0	1	.236	15
311		4	max	3612.78	2	1134.881	1	0	1	0	1	.964	4	6.116	1
312			min	-3907.586	3	41.043	15	-243.675	4	0	4	0	1	.221	15
313		5	max	3609.509	2	1134.881	1	0	1	0	1	.877	4	5.708	1
314			min	-3910.039	3	41.043	15	-240.84	4	0	4	0	1	.206	15
315		6	max	3606.237	2	1134.881	1	0	1	0	1	.791	4	5.3	1
316			min	-3912.493	3	41.043	15	-238.005	4	0	4	0	1	.192	15
317		7	max	3602.966	2	1134.881	1	0	1	0	1	.706	4	4.893	1
318			min	-3914.947	3	41.043	15	-235.17	4	0	4	0	1	.177	15
319		8	max	3599.694	2	1134.881	1	0	1	0	1	.622	4	4.485	1
320			min	-3917.4	3	41.043	15	-232.334	4	0	4	0	1	.162	15
321		9	max	3596.423	2	1134.881	1	0	1	0	1	.539	4	4.077	1
322			min	-3919.854	3	41.043	15	-229.499	4	0	4	0	1	.147	15
323		10	max	3593.151	2	1134.881	1	0	1	0	1	.457	4	3.67	1
324			min	-3922.307	3	41.043	15	-226.664	4	0	4	0	1	.133	15
325		11	max	3589.88	2	1134.881	1	0	1	0	1	.377	4	3.262	1
326			min	-3924.761	3	41.043	15	-223.828	4	0	4	0	1	.118	15
327		12	max	3586.608	2	1134.881	1	0	1	0	1	.297	4	2.854	1
328			min	-3927.215	3	41.043	15	-220.993	4	0	4	0	1	.103	15
329		13	max	3583.337	2	1134.881	1	0	1	0	1	.218	4	2.446	1
330			min	-3929.668	3	41.043	15	-218.158	4	0	4	0	1	.088	15
331		14	max	3580.066	2	1134.881	1	0	1	0	1	.14	4	2.039	1
332			min	-3932.122	3	41.043	15	-215.323	4	0	4	0	1	.074	15
333		15	max	3576.794	2	1134.881	1	0	1	0	1	.063	4	1.631	1
334			min	-3934.575	3	41.043	15	-212.487	4	0	4	0	1	.059	15
335		16	max	3573.523	2	1134.881	1	0	1	0	1	0	1	1.223	1
336			min	-3937.029	3	41.043	15	-209.652	4	0	4	-.013	5	.044	15
337		17	max	3570.251	2	1134.881	1	0	1	0	1	0	1	.815	1
338			min	-3939.482	3	41.043	15	-206.817	4	0	4	-.088	4	.029	15
339		18	max	3566.98	2	1134.881	1	0	1	0	1	0	1	.408	1
340			min	-3941.936	3	41.043	15	-203.982	4	0	4	-.161	4	.015	15
341		19	max	3563.708	2	1134.881	1	0	1	0	1	0	1	0	1
342			min	-3944.39	3	41.043	15	-201.146	4	0	4	-.234	4	0	1
343	M8	1	max	2100.418	2	1099.241	3	92.166	3	.015	4	1.234	4	4.969	1
344			min	-1611.838	3	-730.713	2	-266.696	4	-.003	3	-.145	3	-.6	5
345		2	max	2097.147	2	1099.241	3	92.166	3	.015	4	1.139	4	5.058	1
346			min	-1614.291	3	-730.713	2	-263.86	4	-.003	3	-.112	3	-.545	5
347		3	max	1456.144	2	858.756	1	83.497	3	0	3	1.043	4	4.936	1
348			min	-1344.617	3	-87.485	5	-243.389	4	0	2	-.086	3	-.503	5
349		4	max	1452.872	2	858.756	1	83.497	3	0	3	.956	4	4.628	1
350			min	-1347.07	3	-87.485	5	-240.554	4	0	2	-.056	3	-.471	5
351		5	max	1449.601	2	858.756	1	83.497	3	0	3	.87	4	4.319	1
352			min	-1349.524	3	-87.485	5	-237.719	4	0	2	-.026	3	-.44	5
353		6	max	1446.329	2	858.756	1	83.497	3	0	3	.786	4	4.011	1
354			min	-1351.977	3	-87.485	5	-234.883	4	0	2	.003	12	-.409	5
355		7	max	1443.058	2	858.756	1	83.497	3	0	3	.702	4	3.702	1
356			min	-1354.431	3	-87.485	5	-232.048	4	0	2	0	10	-.377	5
357		8	max	1439.786	2	858.756	1	83.497	3	0	3	.619	4	3.394	1
358			min	-1356.885	3	-87.485	5	-229.213	4	0	2	-.015	2	-.346	5
359		9	max	1436.515	2	858.756	1	83.497	3	0	3	.537	4	3.085	1
360			min	-1359.338	3	-87.485	5	-226.378	4	0	2	-.032	2	-.314	5
361		10	max	1433.244	2	858.756	1	83.497	3	0	3	.456	4	2.777	1
362			min	-1361.792	3	-87.485	5	-223.542	4	0	2	-.049	2	-.283	5
363		11	max	1429.972	2	858.756	1	83.497	3	0	3	.376	4	2.468	1
364			min	-1364.245	3	-87.485	5	-220.707	4	0	2	-.067	2	-.251	5
365		12	max	1426.701	2	858.756	1	83.497	3	0	3	.3	5	2.16	1
366			min	-1366.699	3	-87.485	5	-217.872	4	0	2	-.084	2	-.22	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	1423.429	2	858.756	1	83.497	3	0	3	.224	5	1.851	1
368			min	-1369.153	3	-87.485	5	-215.037	4	0	2	-.101	2	-.189	5
369		14	max	1420.158	2	858.756	1	83.497	3	0	3	.244	3	1.543	1
370			min	-1371.606	3	-87.485	5	-212.201	4	0	2	-.118	2	-.157	5
371		15	max	1416.886	2	858.756	1	83.497	3	0	3	.274	3	1.234	1
372			min	-1374.06	3	-87.485	5	-209.366	4	0	2	-.136	2	-.126	5
373		16	max	1413.615	2	858.756	1	83.497	3	0	3	.304	3	.926	1
374			min	-1376.513	3	-87.485	5	-206.531	4	0	2	-.153	2	-.094	5
375		17	max	1410.343	2	858.756	1	83.497	3	0	3	.334	3	.617	1
376			min	-1378.967	3	-87.485	5	-203.696	4	0	2	-.17	2	-.063	5
377		18	max	1407.072	2	858.756	1	83.497	3	0	3	.364	3	.309	1
378			min	-1381.42	3	-87.485	5	-200.86	4	0	2	-.188	2	-.031	5
379		19	max	1403.8	2	858.756	1	83.497	3	0	3	.394	3	0	1
380			min	-1383.874	3	-87.485	5	-198.025	4	0	2	-.225	4	0	1
381	M3	1	max	1628.218	2	5.617	6	22.017	2	.007	3	.016	5	0	1
382			min	-702.978	3	1.32	15	-16.512	5	-.014	2	-.002	2	0	1
383		2	max	1628.009	2	4.993	6	22.017	2	.007	3	.01	4	0	15
384			min	-703.134	3	1.174	15	-16.054	5	-.014	2	-.003	3	-.002	6
385		3	max	1627.801	2	4.369	6	22.017	2	.007	3	.014	2	0	15
386			min	-703.291	3	1.027	15	-15.595	5	-.014	2	-.006	3	-.004	6
387		4	max	1627.592	2	3.745	6	22.017	2	.007	3	.022	2	-.001	15
388			min	-703.447	3	.88	15	-15.136	5	-.014	2	-.009	3	-.005	6
389		5	max	1627.383	2	3.121	6	22.017	2	.007	3	.03	2	-.001	15
390			min	-703.604	3	.734	15	-14.678	5	-.014	2	-.012	3	-.006	6
391		6	max	1627.175	2	2.497	6	22.017	2	.007	3	.038	2	-.002	15
392			min	-703.76	3	.587	15	-14.219	5	-.014	2	-.015	3	-.007	6
393		7	max	1626.966	2	1.872	6	22.017	2	.007	3	.045	2	-.002	15
394			min	-703.917	3	.44	15	-13.761	5	-.014	2	-.019	3	-.008	6
395		8	max	1626.758	2	1.248	6	22.017	2	.007	3	.053	2	-.002	15
396			min	-704.073	3	.293	15	-13.302	5	-.014	2	-.022	3	-.009	6
397		9	max	1626.549	2	.624	6	22.017	2	.007	3	.061	2	-.002	15
398			min	-704.23	3	.147	15	-12.843	5	-.014	2	-.026	5	-.009	6
399		10	max	1626.34	2	0	1	22.017	2	.007	3	.069	2	-.002	15
400			min	-704.386	3	0	1	-12.385	5	-.014	2	-.031	5	-.009	6
401		11	max	1626.132	2	-.147	15	22.017	2	.007	3	.077	2	-.002	15
402			min	-704.543	3	-.624	4	-11.926	5	-.014	2	-.035	5	-.009	6
403		12	max	1625.923	2	-.293	15	22.017	2	.007	3	.085	2	-.002	15
404			min	-704.699	3	-1.248	4	-11.467	5	-.014	2	-.039	5	-.009	6
405		13	max	1625.715	2	-.44	15	22.017	2	.007	3	.093	2	-.002	15
406			min	-704.856	3	-1.872	4	-11.009	5	-.014	2	-.043	5	-.008	6
407		14	max	1625.506	2	-.587	15	22.017	2	.007	3	.1	2	-.002	15
408			min	-705.012	3	-2.497	4	-10.55	5	-.014	2	-.047	5	-.007	6
409		15	max	1625.297	2	-.734	15	22.017	2	.007	3	.108	2	-.001	15
410			min	-705.168	3	-3.121	4	-10.091	5	-.014	2	-.051	5	-.006	6
411		16	max	1625.089	2	-.88	15	22.017	2	.007	3	.116	2	-.001	15
412			min	-705.325	3	-3.745	4	-9.633	5	-.014	2	-.054	5	-.005	6
413		17	max	1624.88	2	-1.027	15	22.017	2	.007	3	.124	2	0	15
414			min	-705.481	3	-4.369	4	-9.174	5	-.014	2	-.058	5	-.004	6
415		18	max	1624.672	2	-1.174	15	22.017	2	.007	3	.132	2	0	15
416			min	-705.638	3	-4.993	4	-8.926	3	-.014	2	-.061	5	-.002	6
417		19	max	1624.463	2	-1.32	15	22.017	2	.007	3	.14	2	0	1
418			min	-705.794	3	-5.617	4	-8.926	3	-.014	2	-.064	5	0	1
419	M6	1	max	4245.019	2	5.617	4	0	1	.002	5	.016	4	0	1
420			min	-2348.812	3	1.32	15	-17.6	4	0	1	0	1	0	1
421		2	max	4244.81	2	4.993	4	0	1	.002	5	.009	4	0	15
422			min	-2348.969	3	1.174	15	-17.141	4	0	1	0	1	-.002	4
423		3	max	4244.602	2	4.369	4	0	1	.002	5	.003	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	-2349.125	3	1.027	15	-16.682	4	0	1	0	1	-.004	4
425		4	max	4244.393	2	3.745	4	0	1	.002	5	0	1	-.001	15
426			min	-2349.281	3	.88	15	-16.224	4	0	1	-.003	4	-.005	4
427		5	max	4244.185	2	3.121	4	0	1	.002	5	0	1	-.001	15
428			min	-2349.438	3	.734	15	-15.765	4	0	1	-.008	4	-.006	4
429		6	max	4243.976	2	2.497	4	0	1	.002	5	0	1	-.002	15
430			min	-2349.594	3	.587	15	-15.306	4	0	1	-.014	4	-.007	4
431		7	max	4243.767	2	1.872	4	0	1	.002	5	0	1	-.002	15
432			min	-2349.751	3	.44	15	-14.848	4	0	1	-.019	4	-.008	4
433		8	max	4243.559	2	1.248	4	0	1	.002	5	0	1	-.002	15
434			min	-2349.907	3	.293	15	-14.389	4	0	1	-.024	4	-.009	4
435		9	max	4243.35	2	.624	4	0	1	.002	5	0	1	-.002	15
436			min	-2350.064	3	.147	15	-13.93	4	0	1	-.029	4	-.009	4
437		10	max	4243.142	2	0	1	0	1	.002	5	0	1	-.002	15
438			min	-2350.22	3	0	1	-13.472	4	0	1	-.034	4	-.009	4
439		11	max	4242.933	2	-.147	15	0	1	.002	5	0	1	-.002	15
440			min	-2350.377	3	-.624	6	-13.013	4	0	1	-.039	4	-.009	4
441		12	max	4242.724	2	-.293	15	0	1	.002	5	0	1	-.002	15
442			min	-2350.533	3	-1.248	6	-12.554	4	0	1	-.044	4	-.009	4
443		13	max	4242.516	2	-.44	15	0	1	.002	5	0	1	-.002	15
444			min	-2350.69	3	-1.872	6	-12.096	4	0	1	-.048	4	-.008	4
445		14	max	4242.307	2	-.587	15	0	1	.002	5	0	1	-.002	15
446			min	-2350.846	3	-2.497	6	-11.637	4	0	1	-.052	4	-.007	4
447		15	max	4242.099	2	-.734	15	0	1	.002	5	0	1	-.001	15
448			min	-2351.002	3	-3.121	6	-11.178	4	0	1	-.056	4	-.006	4
449		16	max	4241.89	2	-.88	15	0	1	.002	5	0	1	-.001	15
450			min	-2351.159	3	-3.745	6	-10.72	4	0	1	-.06	4	-.005	4
451		17	max	4241.681	2	-1.027	15	0	1	.002	5	0	1	0	15
452			min	-2351.315	3	-4.369	6	-10.261	4	0	1	-.064	4	-.004	4
453		18	max	4241.473	2	-1.174	15	0	1	.002	5	0	1	0	15
454			min	-2351.472	3	-4.993	6	-9.803	4	0	1	-.068	4	-.002	4
455		19	max	4241.264	2	-1.32	15	0	1	.002	5	0	1	0	1
456			min	-2351.628	3	-5.617	6	-9.344	4	0	1	-.071	4	0	1
457	M9	1	max	1628.218	2	5.617	4	8.926	3	.014	2	.016	4	0	1
458			min	-702.978	3	1.32	15	-22.017	2	-.007	3	0	3	0	1
459		2	max	1628.009	2	4.993	4	8.926	3	.014	2	.009	5	0	15
460			min	-703.134	3	1.174	15	-22.017	2	-.007	3	-.006	2	-.002	4
461		3	max	1627.801	2	4.369	4	8.926	3	.014	2	.006	3	0	15
462			min	-703.291	3	1.027	15	-22.017	2	-.007	3	-.014	2	-.004	4
463		4	max	1627.592	2	3.745	4	8.926	3	.014	2	.009	3	-.001	15
464			min	-703.447	3	.88	15	-22.017	2	-.007	3	-.022	2	-.005	4
465		5	max	1627.383	2	3.121	4	8.926	3	.014	2	.012	3	-.001	15
466			min	-703.604	3	.734	15	-22.017	2	-.007	3	-.03	2	-.006	4
467		6	max	1627.175	2	2.497	4	8.926	3	.014	2	.015	3	-.002	15
468			min	-703.76	3	.587	15	-22.017	2	-.007	3	-.038	2	-.007	4
469		7	max	1626.966	2	1.872	4	8.926	3	.014	2	.019	3	-.002	15
470			min	-703.917	3	.44	15	-22.017	2	-.007	3	-.045	2	-.008	4
471		8	max	1626.758	2	1.248	4	8.926	3	.014	2	.022	3	-.002	15
472			min	-704.073	3	.293	15	-22.017	2	-.007	3	-.053	2	-.009	4
473		9	max	1626.549	2	.624	4	8.926	3	.014	2	.025	3	-.002	15
474			min	-704.23	3	.147	15	-22.017	2	-.007	3	-.061	2	-.009	4
475		10	max	1626.34	2	0	1	8.926	3	.014	2	.028	3	-.002	15
476			min	-704.386	3	0	1	-22.017	2	-.007	3	-.069	2	-.009	4
477		11	max	1626.132	2	-.147	15	8.926	3	.014	2	.031	3	-.002	15
478			min	-704.543	3	-.624	6	-22.017	2	-.007	3	-.077	2	-.009	4
479		12	max	1625.923	2	-.293	15	8.926	3	.014	2	.035	3	-.002	15
480			min	-704.699	3	-1.248	6	-22.017	2	-.007	3	-.085	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	1625.715	2	-.44	15	8.926	3	.014	2	.038	3	-.002	15
482			min	-704.856	3	-1.872	6	-22.017	2	-.007	3	-.093	2	-.008	4
483		14	max	1625.506	2	-.587	15	8.926	3	.014	2	.041	3	-.002	15
484			min	-705.012	3	-2.497	6	-22.017	2	-.007	3	-.1	2	-.007	4
485		15	max	1625.297	2	-.734	15	8.926	3	.014	2	.044	3	-.001	15
486			min	-705.168	3	-3.121	6	-22.017	2	-.007	3	-.108	2	-.006	4
487		16	max	1625.089	2	-.88	15	8.926	3	.014	2	.047	3	-.001	15
488			min	-705.325	3	-3.745	6	-22.017	2	-.007	3	-.116	2	-.005	4
489		17	max	1624.88	2	-1.027	15	8.926	3	.014	2	.051	3	0	15
490			min	-705.481	3	-4.369	6	-22.017	2	-.007	3	-.124	2	-.004	4
491		18	max	1624.672	2	-1.174	15	8.926	3	.014	2	.054	3	0	15
492			min	-705.638	3	-4.993	6	-22.017	2	-.007	3	-.132	2	-.002	4
493		19	max	1624.463	2	-1.32	15	8.926	3	.014	2	.057	3	0	1
494			min	-705.794	3	-5.617	6	-22.017	2	-.007	3	-.14	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	-.054	15	-.056	12	.006	1	4.533e-3	3	NC	3	NC	1
2			min	-.368	1	-.666	2	-.554	4	-1.314e-2	2	159.718	1	367.967	5
3		2	max	-.054	15	-.059	15	0	12	4.346e-3	3	NC	5	NC	1
4			min	-.368	1	-.546	2	-.536	4	-1.232e-2	2	180.954	1	386.431	4
5		3	max	-.054	15	-.052	15	-.001	12	3.979e-3	3	NC	5	NC	2
6			min	-.368	1	-.435	1	-.514	4	-1.072e-2	2	207.891	1	411.787	4
7		4	max	-.054	15	-.045	15	0	12	3.612e-3	3	NC	5	NC	2
8			min	-.368	1	-.341	1	-.487	4	-9.124e-3	2	240.955	1	446.524	4
9		5	max	-.054	15	-.038	15	0	12	3.421e-3	3	NC	5	NC	1
10			min	-.368	1	-.261	1	-.458	4	-7.953e-3	2	279.032	1	492.282	4
11		6	max	-.054	15	-.031	15	0	3	3.683e-3	3	NC	5	NC	1
12			min	-.367	1	-.196	1	-.428	4	-7.881e-3	2	319.757	1	549.369	4
13		7	max	-.054	15	-.024	15	.001	3	3.946e-3	3	NC	5	NC	1
14			min	-.367	1	-.143	1	-.399	4	-7.81e-3	2	363.9	1	617.865	5
15		8	max	-.054	15	-.018	15	0	3	4.208e-3	3	NC	3	NC	1
16			min	-.367	1	-.095	1	-.373	4	-7.738e-3	2	414.255	1	695.38	5
17		9	max	-.054	15	-.011	15	0	10	4.681e-3	3	NC	5	NC	1
18			min	-.366	1	-.073	3	-.35	4	-7.221e-3	2	477.872	1	784.526	5
19		10	max	-.054	15	.005	2	0	2	5.351e-3	3	NC	5	NC	1
20			min	-.366	1	-.053	3	-.325	4	-6.283e-3	2	565.387	1	906.785	5
21		11	max	-.054	15	.046	2	0	1	6.021e-3	3	NC	5	NC	1
22			min	-.365	1	-.032	3	-.301	4	-5.345e-3	2	692.828	1	1075.917	5
23		12	max	-.054	15	.089	1	.002	3	5.683e-3	3	NC	5	NC	1
24			min	-.365	1	-.011	3	-.277	4	-4.307e-3	2	895.989	1	1312.919	5
25		13	max	-.054	15	.134	1	.006	3	4.274e-3	3	NC	5	NC	1
26			min	-.365	1	.01	12	-.252	4	-3.163e-3	2	1251.505	1	1717.949	5
27		14	max	-.054	15	.174	1	.01	3	2.865e-3	3	NC	2	NC	1
28			min	-.364	1	.023	15	-.227	4	-4.05e-3	4	1014.833	3	2442.367	5
29		15	max	-.054	15	.205	1	.01	3	1.456e-3	3	NC	2	NC	1
30			min	-.364	1	.03	15	-.206	4	-5.158e-3	4	727.587	3	3715.733	5
31		16	max	-.054	15	.226	1	.007	3	3.936e-3	3	NC	5	NC	1
32			min	-.364	1	.038	15	-.192	4	-4.466e-3	4	515.73	3	5787.444	5
33		17	max	-.054	15	.286	3	.008	1	6.872e-3	3	NC	1	NC	1
34			min	-.364	1	.045	15	-.182	4	-3.563e-3	4	378.707	3	9827.627	5
35		18	max	-.054	15	.397	3	.004	1	9.809e-3	3	NC	1	NC	1
36			min	-.364	1	.052	15	-.175	4	-3.998e-3	2	291.972	3	NC	1
37		19	max	-.054	15	.512	3	-.001	12	1.131e-2	3	NC	1	NC	1
38			min	-.364	1	.06	15	-.17	4	-4.57e-3	2	236.009	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	-.018	15	-.001	3	0	1	9.691e-4	4	NC	3	NC	1
40			min	-.485	1	-1.059	2	-.553	4	0	1	122.043	2	367.962	4
41		2	max	-.018	15	-.024	15	0	1	7.158e-4	4	4512.026	12	NC	1
42			min	-.485	1	-.849	2	-.537	4	0	1	144.353	1	383.768	4
43		3	max	-.018	15	-.02	15	0	1	2.198e-4	5	4632.18	15	NC	1
44			min	-.485	1	-.648	2	-.516	4	0	1	173.236	1	407.848	4
45		4	max	-.018	15	-.016	15	0	1	0	1	5263.586	15	NC	1
46			min	-.484	1	-.473	1	-.489	4	-2.778e-4	4	210.89	1	442.15	4
47		5	max	-.018	15	-.013	15	0	1	0	1	5953.902	15	NC	1
48			min	-.484	1	-.357	1	-.458	4	-5.685e-4	4	254.78	1	488.302	4
49		6	max	-.018	15	-.01	15	0	1	0	1	6648.396	15	NC	1
50			min	-.483	1	-.277	1	-.428	4	-3.293e-4	4	297.953	1	546.159	4
51		7	max	-.018	15	-.008	15	0	1	0	1	7374.037	15	NC	1
52			min	-.483	1	-.218	1	-.398	4	-8.999e-5	4	339.533	1	615.225	4
53		8	max	-.018	15	-.006	15	0	1	1.493e-4	4	8204.433	15	NC	1
54			min	-.482	1	-.17	1	-.373	4	0	1	384.036	1	692.973	4
55		9	max	-.018	15	-.004	15	0	1	1.846e-4	4	NC	12	NC	1
56			min	-.481	1	-.119	2	-.35	4	0	1	446.139	1	778.325	4
57		10	max	-.018	15	-.002	15	0	1	2.792e-5	5	NC	3	NC	1
58			min	-.48	1	-.066	2	-.325	4	0	1	550.087	1	902.318	4
59		11	max	-.017	15	.015	3	0	1	0	1	NC	15	NC	1
60			min	-.479	1	-.003	10	-.3	4	-1.29e-4	4	745.123	1	1072.758	4
61		12	max	-.017	15	.083	1	0	1	0	1	NC	5	NC	1
62			min	-.478	1	.003	15	-.278	4	-8.822e-4	4	1223.483	1	1289.42	4
63		13	max	-.017	15	.159	1	0	1	0	1	NC	5	NC	1
64			min	-.477	1	.006	15	-.254	4	-2.268e-3	4	2680.39	9	1656.789	4
65		14	max	-.017	15	.224	1	0	1	0	1	NC	5	NC	1
66			min	-.476	1	.008	15	-.229	4	-3.655e-3	4	1360.26	2	2308.559	4
67		15	max	-.017	15	.267	1	0	1	0	1	NC	4	NC	1
68			min	-.475	1	.01	15	-.21	4	-5.041e-3	4	1005.687	2	3416.575	4
69		16	max	-.017	15	.278	1	0	1	0	1	NC	4	NC	1
70			min	-.475	1	.011	15	-.196	4	-4.114e-3	4	533.616	3	5142.064	4
71		17	max	-.017	15	.438	3	0	1	0	1	NC	4	NC	1
72			min	-.475	1	.011	15	-.185	4	-2.915e-3	4	322.812	3	8461.846	4
73		18	max	-.017	15	.638	3	0	1	0	1	NC	4	NC	1
74			min	-.476	1	.011	15	-.176	4	-1.717e-3	4	221.742	3	NC	1
75		19	max	-.017	15	.846	3	0	1	0	1	NC	1	NC	1
76			min	-.476	1	.011	15	-.168	4	-1.105e-3	4	167.273	3	NC	1
77	M7	1	max	.038	5	.035	5	0	12	1.314e-2	2	NC	3	NC	1
78			min	-.368	1	-.666	2	-.557	4	-4.533e-3	3	159.718	1	363.366	4
79		2	max	.038	5	.033	5	.005	1	1.232e-2	2	NC	5	NC	1
80			min	-.368	1	-.546	2	-.534	4	-4.346e-3	3	180.954	1	385.924	4
81		3	max	.038	5	.032	5	.01	1	1.072e-2	2	NC	5	NC	2
82			min	-.368	1	-.435	1	-.509	4	-3.979e-3	3	207.891	1	414.16	4
83		4	max	.038	5	.029	5	.011	1	9.124e-3	2	NC	5	NC	2
84			min	-.368	1	-.341	1	-.482	4	-3.612e-3	3	240.955	1	449.786	4
85		5	max	.038	5	.026	5	.009	1	7.953e-3	2	NC	5	NC	1
86			min	-.368	1	-.261	1	-.454	4	-3.421e-3	3	279.032	1	494.592	4
87		6	max	.038	5	.022	5	.006	1	7.881e-3	2	NC	4	NC	1
88			min	-.367	1	-.196	1	-.425	4	-3.683e-3	3	319.757	1	548.452	4
89		7	max	.038	5	.018	5	.002	2	7.81e-3	2	NC	4	NC	1
90			min	-.367	1	-.143	1	-.399	4	-3.946e-3	3	363.9	1	612.09	4
91		8	max	.038	5	.013	5	0	10	7.738e-3	2	NC	3	NC	1
92			min	-.367	1	-.095	1	-.373	4	-4.208e-3	3	414.255	1	686.809	4
93		9	max	.038	5	.008	5	0	3	7.221e-3	2	NC	4	NC	1
94			min	-.366	1	-.073	3	-.35	4	-4.681e-3	3	477.872	1	775.446	4
95		10	max	.038	5	.005	2	0	3	6.283e-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	-.366	1	-.053	3	-.326	4	-5.351e-3	3	565.387	1	894.131	4
97		11	max	.038	5	.046	2	0	3	5.345e-3	2	NC	4	NC	1
98			min	-.365	1	-.032	3	-.301	4	-6.021e-3	3	692.828	1	1058.265	4
99		12	max	.038	5	.089	1	.002	1	4.307e-3	2	NC	4	NC	1
100			min	-.365	1	-.011	3	-.276	4	-5.683e-3	3	895.989	1	1295.839	4
101		13	max	.038	5	.134	1	.003	2	3.163e-3	2	NC	4	NC	1
102			min	-.365	1	-.01	5	-.251	4	-4.274e-3	3	1251.505	1	1691.292	4
103		14	max	.038	5	.174	1	.003	2	2.02e-3	2	NC	2	NC	1
104			min	-.364	1	-.015	5	-.227	4	-3.739e-3	5	1014.833	3	2364.46	4
105		15	max	.038	5	.205	1	0	10	8.757e-4	2	NC	2	NC	1
106			min	-.364	1	-.021	5	-.208	4	-4.989e-3	5	727.587	3	3446.458	4
107		16	max	.038	5	.226	1	-.002	10	1.758e-3	2	NC	4	NC	1
108			min	-.364	1	-.028	5	-.195	4	-4.189e-3	5	515.73	3	4978.013	4
109		17	max	.038	5	.286	3	-.002	10	2.878e-3	2	NC	1	NC	1
110			min	-.364	1	-.036	5	-.186	4	-6.872e-3	3	378.707	3	7644.606	4
111		18	max	.038	5	.397	3	-.001	12	3.998e-3	2	NC	1	NC	1
112			min	-.364	1	-.045	5	-.177	4	-9.809e-3	3	291.972	3	NC	1
113		19	max	.038	5	.512	3	.005	1	4.57e-3	2	NC	1	NC	1
114			min	-.364	1	-.053	5	-.167	4	-1.131e-2	3	236.009	3	NC	1
115	M10	1	max	0	1	.456	3	.364	1	1.459e-2	3	NC	1	NC	1
116			min	-.172	4	-.049	5	-.038	5	-1.26e-3	2	NC	1	NC	1
117		2	max	0	1	.54	3	.378	1	1.59e-2	3	NC	4	NC	2
118			min	-.172	4	-.039	5	-.03	5	-1.902e-3	2	1569.442	3	9379.188	1
119		3	max	0	1	.619	3	.397	1	1.721e-2	3	NC	13	NC	3
120			min	-.172	4	-.03	5	-.023	5	-2.545e-3	2	807.264	3	3904.406	1
121		4	max	0	1	.686	3	.419	1	1.851e-2	3	NC	14	NC	4
122			min	-.172	4	-.023	5	-.015	5	-3.187e-3	2	574.624	3	2394.645	1
123		5	max	0	1	.733	3	.439	1	1.982e-2	3	NC	14	NC	5
124			min	-.172	4	-.016	5	-.008	5	-3.83e-3	2	475.69	3	1761.779	1
125		6	max	0	1	.761	3	.455	1	2.112e-2	3	NC	14	NC	5
126			min	-.172	4	-.01	5	-.001	15	-4.473e-3	2	432.891	3	1448.92	1
127		7	max	0	1	.769	3	.466	1	2.243e-2	3	NC	14	NC	5
128			min	-.172	4	-.004	5	.004	15	-5.115e-3	2	421.19	3	1287.389	1
129		8	max	0	1	.764	3	.473	1	2.374e-2	3	NC	9	NC	5
130			min	-.172	4	.001	15	.008	15	-5.758e-3	2	429.153	3	1210.148	1
131		9	max	0	1	.751	3	.475	1	2.504e-2	3	NC	9	NC	5
132			min	-.172	4	.006	15	.013	15	-6.4e-3	2	446.773	3	1182.989	1
133		10	max	0	1	.744	3	.476	1	2.635e-2	3	NC	9	NC	5
134			min	-.172	4	.011	15	.017	15	-7.043e-3	2	457.894	3	1179.865	1
135		11	max	0	10	.751	3	.475	1	2.504e-2	3	NC	9	NC	5
136			min	-.172	4	.016	15	.022	15	-6.4e-3	2	446.773	3	1182.989	1
137		12	max	0	10	.764	3	.473	1	2.374e-2	3	NC	9	NC	5
138			min	-.172	4	.02	15	.027	15	-5.758e-3	2	429.153	3	1210.148	1
139		13	max	0	10	.769	3	.466	1	2.243e-2	3	8478.3	9	NC	5
140			min	-.172	4	.024	15	.031	15	-5.115e-3	2	421.19	3	1287.389	1
141		14	max	0	10	.761	3	.455	1	2.112e-2	3	6860.839	9	NC	5
142			min	-.172	4	.027	15	.035	15	-4.473e-3	2	432.891	3	1448.92	1
143		15	max	0	10	.733	3	.439	1	1.982e-2	3	6430.027	9	NC	5
144			min	-.172	4	.03	10	.039	15	-3.83e-3	2	475.69	3	1761.779	1
145		16	max	0	10	.686	3	.419	1	1.851e-2	3	6975.155	9	NC	5
146			min	-.172	4	.036	15	.043	15	-3.187e-3	2	574.624	3	2394.645	1
147		17	max	0	10	.619	3	.397	1	1.721e-2	3	9120.767	9	NC	3
148			min	-.172	4	.041	15	.046	15	-2.545e-3	2	807.264	3	3904.406	1
149		18	max	0	10	.54	3	.378	1	1.59e-2	3	NC	9	NC	2
150			min	-.172	4	.048	15	.05	15	-1.902e-3	2	1088.773	5	9379.188	1
151		19	max	0	10	.456	3	.364	1	1.459e-2	3	NC	1	NC	1
152			min	-.172	4	.056	15	.054	15	-1.26e-3	2	984.709	4	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	0	1	.067	2	.365	1	5.879e-3	1	NC	1	NC	1
154			min	-.288	4	-.021	3	-.038	5	-5.747e-4	5	NC	1	NC	1
155		2	max	0	1	.039	1	.375	1	6.271e-3	1	NC	4	NC	1
156			min	-.288	4	0	15	-.02	5	-4.551e-4	5	2808.751	3	NC	1
157		3	max	0	1	.067	3	.392	1	6.662e-3	1	NC	4	NC	3
158			min	-.288	4	0	10	-.009	5	-3.354e-4	5	1489.21	3	4931.619	1
159		4	max	0	1	.096	3	.413	1	7.054e-3	1	NC	4	NC	3
160			min	-.289	4	-.017	2	-.004	5	-2.157e-4	5	1121.011	3	2776.305	1
161		5	max	0	1	.109	3	.433	1	7.445e-3	1	NC	4	NC	5
162			min	-.289	4	-.025	2	-.002	15	-9.608e-5	5	1011.817	3	1936.116	1
163		6	max	0	1	.105	3	.451	1	7.837e-3	1	NC	4	NC	5
164			min	-.289	4	-.022	2	-.001	15	4.346e-6	15	1046.124	3	1533.33	1
165		7	max	0	1	.086	3	.465	1	8.229e-3	1	NC	4	NC	5
166			min	-.289	4	-.009	2	0	15	8.442e-5	15	1226.398	3	1324.21	1
167		8	max	0	1	.059	3	.474	1	8.62e-3	1	NC	4	NC	4
168			min	-.289	4	0	15	.002	15	1.645e-4	15	1633.091	3	1218.202	1
169		9	max	0	1	.039	1	.478	1	9.012e-3	1	NC	4	NC	5
170			min	-.289	4	.001	15	.007	15	2.446e-4	15	2396.586	3	1173.447	1
171		10	max	0	1	.046	1	.479	1	9.403e-3	1	NC	4	NC	5
172			min	-.289	4	.002	15	.017	15	3.246e-4	15	3070.527	3	1163.566	1
173		11	max	0	3	.039	1	.478	1	9.012e-3	1	NC	4	NC	15
174			min	-.289	4	.002	15	.028	15	3.844e-4	15	2396.586	3	1173.447	1
175		12	max	0	3	.059	3	.474	1	8.62e-3	1	NC	4	NC	15
176			min	-.289	4	.002	15	.033	15	4.441e-4	15	1633.091	3	1218.202	1
177		13	max	0	3	.086	3	.465	1	8.229e-3	1	NC	4	NC	5
178			min	-.289	4	-.009	2	.035	15	5.038e-4	15	1226.398	3	1324.21	1
179		14	max	0	3	.105	3	.451	1	7.837e-3	1	NC	4	NC	5
180			min	-.289	4	-.022	2	.035	15	5.636e-4	15	1046.124	3	1533.33	1
181		15	max	0	3	.109	3	.433	1	7.445e-3	1	NC	4	NC	4
182			min	-.289	4	-.025	2	.035	15	6.233e-4	15	1011.817	3	1936.116	1
183		16	max	0	3	.096	3	.413	1	7.054e-3	1	NC	4	NC	3
184			min	-.289	4	-.017	2	.035	15	6.831e-4	15	1121.011	3	2776.305	1
185		17	max	0	3	.067	3	.392	1	6.662e-3	1	NC	4	NC	3
186			min	-.289	4	0	10	.037	15	7.428e-4	15	1489.21	3	4931.619	1
187		18	max	0	3	.039	1	.375	1	6.271e-3	1	NC	4	NC	1
188			min	-.289	4	.003	15	.043	15	8.026e-4	15	2808.751	3	NC	1
189		19	max	0	3	.067	2	.365	1	5.879e-3	1	NC	1	NC	1
190			min	-.289	4	-.021	3	.054	15	8.623e-4	15	NC	1	NC	1
191	M12	1	max	0	3	.011	5	.367	1	5.803e-3	1	NC	1	NC	1
192			min	-.362	4	-.084	3	-.038	5	-6.041e-4	5	NC	1	NC	1
193		2	max	0	3	.01	5	.375	1	5.886e-3	1	NC	4	NC	1
194			min	-.362	4	-.115	1	-.021	5	-4.925e-4	5	2375.774	2	NC	1
195		3	max	0	3	.008	5	.391	1	5.97e-3	1	NC	4	NC	3
196			min	-.362	4	-.161	2	-.01	5	-3.809e-4	5	1270.302	2	5327.394	1
197		4	max	0	3	.005	5	.412	1	6.054e-3	1	NC	4	NC	5
198			min	-.362	4	-.196	2	-.005	5	-2.693e-4	5	952.186	2	2900.059	1
199		5	max	0	3	.003	5	.433	1	6.137e-3	1	NC	4	NC	5
200			min	-.362	4	-.213	2	-.003	5	-1.577e-4	5	844.322	2	1983.807	1
201		6	max	0	3	0	15	.452	1	6.221e-3	1	NC	5	NC	5
202			min	-.362	4	-.214	2	-.002	15	-4.614e-5	5	842.23	2	1550.86	1
203		7	max	0	3	-.001	15	.466	1	6.304e-3	1	NC	5	NC	5
204			min	-.362	4	-.2	2	-.001	15	3.399e-5	15	926.101	2	1326.675	1
205		8	max	0	3	-.003	15	.475	1	6.388e-3	1	NC	4	NC	4
206			min	-.362	4	-.177	2	.002	15	1.089e-4	15	1104.121	2	1211.824	1
207		9	max	0	3	-.004	15	.48	1	6.471e-3	1	NC	4	NC	5
208			min	-.362	4	-.154	1	.007	15	1.838e-4	15	1365.98	2	1161.681	1
209		10	max	0	1	-.005	15	.481	1	6.555e-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	-.362	4	-.146	1	.018	15	2.587e-4	15	1540.548	2	1149.706	1
211		11	max	0	1	-.007	15	.48	1	6.471e-3	1	NC	4	NC	15
212			min	-.362	4	-.154	1	.028	15	3.256e-4	15	1365.98	2	1161.681	1
213		12	max	0	1	-.009	15	.475	1	6.388e-3	1	NC	5	NC	15
214			min	-.362	4	-.177	2	.033	15	3.925e-4	15	1104.121	2	1211.824	1
215		13	max	0	1	-.01	12	.466	1	6.304e-3	1	NC	5	NC	5
216			min	-.362	4	-.2	2	.036	15	4.594e-4	15	926.101	2	1326.675	1
217		14	max	0	1	-.004	12	.452	1	6.221e-3	1	NC	5	NC	5
218			min	-.362	4	-.214	2	.036	15	5.264e-4	15	842.23	2	1550.86	1
219		15	max	0	1	-.003	12	.433	1	6.137e-3	1	NC	5	NC	4
220			min	-.362	4	-.213	2	.035	15	5.933e-4	15	844.322	2	1983.807	1
221		16	max	0	1	-.008	12	.412	1	6.054e-3	1	NC	5	NC	4
222			min	-.362	4	-.196	2	.035	15	6.602e-4	15	952.186	2	2900.059	1
223		17	max	0	1	-.015	15	.391	1	5.97e-3	1	NC	4	NC	3
224			min	-.362	4	-.161	2	.038	15	7.271e-4	15	1270.302	2	5327.394	1
225		18	max	0	1	-.015	15	.375	1	5.886e-3	1	NC	4	NC	1
226			min	-.362	4	-.115	1	.043	15	7.94e-4	15	2375.774	2	NC	1
227		19	max	0	1	-.014	15	.367	1	5.803e-3	1	NC	1	NC	1
228			min	-.362	4	-.084	3	.054	15	8.609e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.034	5	.368	1	1.524e-2	2	NC	1	NC	1
230			min	-.546	4	-.608	2	-.038	5	-2.152e-3	3	NC	1	NC	1
231		2	max	0	12	.027	5	.383	1	1.649e-2	2	NC	4	NC	2
232			min	-.546	4	-.704	2	-.022	5	-2.661e-3	3	1372.745	2	8740.418	1
233		3	max	0	12	.018	5	.404	1	1.774e-2	2	NC	5	NC	3
234			min	-.546	4	-.793	2	-.011	5	-3.17e-3	3	711.785	2	3694.405	1
235		4	max	0	12	.01	5	.426	1	1.899e-2	2	NC	5	NC	12
236			min	-.546	4	-.868	2	-.004	5	-3.678e-3	3	507.526	2	2283.483	1
237		5	max	0	12	.002	15	.446	1	2.024e-2	2	NC	5	NC	5
238			min	-.546	4	-.923	2	0	15	-4.187e-3	3	418.607	2	1687.08	1
239		6	max	0	12	.002	3	.463	1	2.149e-2	2	NC	5	NC	5
240			min	-.546	4	-.957	2	.001	15	-4.696e-3	3	377.671	2	1390.499	1
241		7	max	0	12	-.002	3	.475	1	2.274e-2	2	NC	5	NC	5
242			min	-.546	4	-.972	2	.003	15	-5.205e-3	3	362.641	2	1236.525	1
243		8	max	0	12	-.011	12	.482	1	2.399e-2	2	NC	5	NC	5
244			min	-.546	4	-.971	2	.006	15	-5.714e-3	3	363.414	2	1162.288	1
245		9	max	0	12	-.018	12	.484	1	2.524e-2	2	NC	5	NC	5
246			min	-.546	4	-.962	2	.01	15	-6.222e-3	3	372.172	2	1135.633	1
247		10	max	0	1	-.021	12	.485	1	2.649e-2	2	NC	5	NC	5
248			min	-.546	4	-.957	2	.018	15	-6.731e-3	3	378.337	2	1132.24	1
249		11	max	0	1	-.018	12	.484	1	2.524e-2	2	NC	5	NC	5
250			min	-.546	4	-.962	2	.025	15	-6.222e-3	3	372.172	2	1135.633	1
251		12	max	0	1	-.011	12	.482	1	2.399e-2	2	NC	5	NC	5
252			min	-.546	4	-.971	2	.03	15	-5.714e-3	3	363.414	2	1162.288	1
253		13	max	0	1	-.002	3	.475	1	2.274e-2	2	NC	5	NC	5
254			min	-.546	4	-.972	2	.032	15	-5.205e-3	3	362.641	2	1236.525	1
255		14	max	0	1	.002	3	.463	1	2.149e-2	2	NC	5	NC	5
256			min	-.546	4	-.957	2	.033	15	-4.696e-3	3	377.671	2	1390.499	1
257		15	max	0	1	0	3	.446	1	2.024e-2	2	NC	5	NC	4
258			min	-.546	4	-.923	2	.034	15	-4.187e-3	3	418.607	2	1687.08	1
259		16	max	0	1	-.012	12	.426	1	1.899e-2	2	NC	5	NC	4
260			min	-.546	4	-.868	2	.036	15	-3.678e-3	3	507.526	2	2283.483	1
261		17	max	0	1	-.025	12	.404	1	1.774e-2	2	NC	5	NC	3
262			min	-.546	4	-.793	2	.039	15	-3.17e-3	3	711.785	2	3694.405	1
263		18	max	0	1	-.042	12	.383	1	1.649e-2	2	NC	4	NC	2
264			min	-.546	4	-.704	2	.045	15	-2.661e-3	3	1372.745	2	8740.418	1
265		19	max	0	1	-.061	12	.368	1	1.524e-2	2	NC	1	NC	1
266			min	-.546	4	-.608	2	.054	15	-2.152e-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	2.19e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-4.977e-3	5	NC	1	NC	1
271		3	max	0	3	-.001	15	.004	5	3.091e-3	2	NC	1	NC	1
272			min	0	2	-.007	1	0	2	-7.224e-3	5	NC	1	NC	1
273		4	max	0	3	-.002	15	.009	5	2.843e-3	2	NC	4	NC	1
274			min	0	2	-.016	1	0	2	-7.04e-3	5	4846.608	1	8568.718	5
275		5	max	0	3	-.004	15	.016	5	2.596e-3	2	NC	5	NC	1
276			min	0	2	-.028	1	-.001	2	-6.855e-3	5	2753.538	1	4970.479	5
277		6	max	0	3	-.007	15	.024	5	2.348e-3	2	NC	15	NC	1
278			min	0	2	-.043	1	-.002	2	-6.671e-3	5	1788.391	1	3275.475	5
279		7	max	0	3	-.009	15	.033	5	2.101e-3	2	8346.445	15	NC	1
280			min	0	2	-.061	1	-.002	2	-6.486e-3	5	1263.379	1	2341.001	5
281		8	max	0	3	-.012	15	.044	5	1.853e-3	2	6272.707	15	NC	1
282			min	0	2	-.082	1	-.003	2	-6.302e-3	5	945.777	1	1770.311	5
283		9	max	0	3	-.016	15	.056	5	1.606e-3	2	4912.285	15	NC	1
284			min	0	2	-.105	1	-.003	2	-6.117e-3	5	738.537	1	1395.285	5
285		10	max	0	3	-.02	15	.068	5	1.358e-3	2	3971.352	15	NC	1
286			min	0	2	-.13	1	-.004	1	-5.932e-3	5	595.773	1	1135.466	5
287		11	max	0	3	-.024	15	.082	4	1.111e-3	2	3292.035	15	NC	1
288			min	-.001	2	-.157	1	-.004	1	-5.748e-3	5	493.02	1	947.548	4
289		12	max	.001	3	-.028	15	.096	4	8.635e-4	2	2785.605	15	NC	1
290			min	-.001	2	-.186	1	-.005	1	-5.564e-3	4	416.606	1	807.071	4
291		13	max	.001	3	-.032	15	.111	4	6.16e-4	2	2397.493	15	NC	1
292			min	-.001	2	-.217	1	-.005	1	-5.399e-3	4	358.161	1	699.338	4
293		14	max	.001	3	-.037	15	.126	4	3.685e-4	2	2093.478	15	NC	1
294			min	-.001	2	-.248	1	-.005	1	-5.235e-3	4	312.456	1	614.913	4
295		15	max	.001	3	-.042	15	.142	4	4.401e-4	3	1850.817	15	NC	1
296			min	-.001	2	-.281	1	-.005	1	-5.071e-3	4	276.026	1	547.536	4
297		16	max	.001	3	-.047	15	.157	4	5.834e-4	3	1654.056	15	NC	1
298			min	-.001	2	-.315	1	-.005	1	-4.906e-3	4	246.522	1	492.942	4
299		17	max	.001	3	-.052	15	.173	4	7.266e-4	3	1492.368	15	NC	1
300			min	-.002	2	-.349	1	-.005	1	-4.742e-3	4	222.303	1	448.141	4
301		18	max	.002	3	-.057	15	.189	4	8.699e-4	3	1357.951	15	NC	1
302			min	-.002	2	-.384	1	-.006	3	-4.577e-3	4	202.186	1	410.985	4
303		19	max	.002	3	-.062	15	.204	4	1.013e-3	3	1245.114	15	NC	1
304			min	-.002	2	-.419	1	-.01	3	-4.413e-3	4	185.313	1	379.897	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	3	0	1	-5.14e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.004	4	0	1	NC	2	NC	1
310			min	0	2	-.008	1	0	1	-7.458e-3	4	9172.364	1	NC	1
311		4	max	0	3	0	15	.009	4	0	1	NC	4	NC	1
312			min	0	2	-.02	1	0	1	-7.259e-3	4	3902.144	1	8298.534	4
313		5	max	.001	3	-.001	15	.016	4	0	1	NC	5	NC	1
314			min	-.001	2	-.036	1	0	1	-7.061e-3	4	2179.724	1	4814.84	4
315		6	max	.001	3	-.002	15	.024	4	0	1	NC	5	NC	1
316			min	-.001	2	-.055	1	0	1	-6.863e-3	4	1402.484	1	3173.959	4
317		7	max	.002	3	-.003	15	.034	4	0	1	NC	5	NC	1
318			min	-.002	2	-.079	1	0	1	-6.664e-3	4	984.894	1	2269.371	4
319		8	max	.002	3	-.004	15	.045	4	0	1	NC	5	NC	1
320			min	-.002	2	-.106	1	0	1	-6.466e-3	4	734.299	1	1716.948	4
321		9	max	.002	3	-.005	15	.057	4	0	1	NC	15	NC	1
322			min	-.002	2	-.136	1	0	1	-6.268e-3	4	571.698	1	1353.939	4
323		10	max	.002	3	-.006	15	.07	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.169	1	0	1	-6.07e-3	4	460.151	1	1102.457	4
325		11	max	.003	3	-.008	15	.084	4	0	1	NC	15	NC	1
326			min	-.003	2	-.204	1	0	1	-5.871e-3	4	380.121	1	920.683	4
327		12	max	.003	3	-.009	15	.099	4	0	1	8722.891	15	NC	1
328			min	-.003	2	-.242	1	0	1	-5.673e-3	4	320.756	1	785.032	4
329		13	max	.003	3	-.01	15	.114	4	0	1	7498.839	15	NC	1
330			min	-.003	2	-.282	1	0	1	-5.475e-3	4	275.444	1	681.027	4
331		14	max	.003	3	-.012	15	.129	4	0	1	6541.668	15	NC	1
332			min	-.003	2	-.323	1	0	1	-5.277e-3	4	240.069	1	599.557	4
333		15	max	.004	3	-.013	15	.145	4	0	1	5778.78	15	NC	1
334			min	-.004	2	-.366	1	0	1	-5.078e-3	4	211.913	1	534.574	4
335		16	max	.004	3	-.015	15	.161	4	0	1	5160.96	15	NC	1
336			min	-.004	2	-.41	1	0	1	-4.88e-3	4	189.138	1	481.963	4
337		17	max	.004	3	-.017	15	.177	4	0	1	4653.814	15	NC	1
338			min	-.004	2	-.455	1	0	1	-4.682e-3	4	170.461	1	438.835	4
339		18	max	.005	3	-.018	15	.193	4	0	1	4232.606	15	NC	1
340			min	-.004	2	-.501	1	0	1	-4.483e-3	4	154.963	1	403.12	4
341		19	max	.005	3	-.02	15	.208	4	0	1	3879.315	15	NC	1
342			min	-.004	2	-.547	1	0	1	-4.285e-3	4	141.975	1	373.293	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	9.207e-4	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-5.266e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.279e-3	3	NC	1	NC	1
348			min	0	2	-.007	1	0	3	-7.63e-3	4	NC	1	NC	1
349		4	max	0	3	.002	5	.009	4	1.136e-3	3	NC	4	NC	1
350			min	0	2	-.016	1	0	3	-7.409e-3	4	4846.608	1	8367.014	4
351		5	max	0	3	.003	5	.016	4	9.923e-4	3	NC	4	NC	1
352			min	0	2	-.028	1	-.002	3	-7.188e-3	4	2753.538	1	4854.953	4
353		6	max	0	3	.005	5	.024	4	8.491e-4	3	NC	4	NC	1
354			min	0	2	-.043	1	-.002	3	-6.968e-3	4	1788.391	1	3200.415	4
355		7	max	0	3	.007	5	.034	4	7.058e-4	3	NC	4	NC	1
356			min	0	2	-.061	1	-.003	3	-6.747e-3	4	1263.379	1	2288.2	4
357		8	max	0	3	.009	5	.045	4	5.626e-4	3	NC	4	NC	1
358			min	0	2	-.082	1	-.003	3	-6.526e-3	4	945.777	1	1731.077	4
359		9	max	0	3	.011	5	.057	4	4.193e-4	3	NC	4	NC	1
360			min	0	2	-.105	1	-.004	3	-6.306e-3	4	738.537	1	1364.96	4
361		10	max	0	3	.014	5	.07	4	2.761e-4	3	NC	13	NC	1
362			min	0	2	-.13	1	-.004	3	-6.085e-3	4	595.773	1	1111.312	4
363		11	max	0	3	.017	5	.084	4	1.328e-4	3	NC	13	NC	1
364			min	-.001	2	-.157	1	-.004	3	-5.864e-3	4	493.02	1	927.965	4
365		12	max	.001	3	.02	5	.098	4	-7.242e-6	12	NC	13	NC	1
366			min	-.001	2	-.186	1	-.004	3	-5.643e-3	4	416.606	1	791.132	4
367		13	max	.001	3	.023	5	.113	4	-2.553e-5	9	NC	13	NC	1
368			min	-.001	2	-.217	1	-.003	3	-5.423e-3	4	358.161	1	686.214	4
369		14	max	.001	3	.026	5	.128	4	3.551e-5	9	NC	13	NC	1
370			min	-.001	2	-.248	1	-.002	3	-5.202e-3	4	312.456	1	604.021	4
371		15	max	.001	3	.029	5	.144	4	9.655e-5	9	NC	13	NC	1
372			min	-.001	2	-.281	1	-.001	3	-4.988e-3	5	276.026	1	538.455	4
373		16	max	.001	3	.033	5	.16	4	2.533e-4	1	NC	13	NC	1
374			min	-.001	2	-.315	1	0	12	-4.791e-3	5	246.522	1	485.364	4
375		17	max	.001	3	.036	5	.176	4	4.506e-4	1	NC	13	NC	1
376			min	-.002	2	-.349	1	.001	10	-4.593e-3	5	222.303	1	441.835	4
377		18	max	.002	3	.04	5	.191	4	6.479e-4	1	9219.041	13	NC	1
378			min	-.002	2	-.384	1	0	10	-4.395e-3	5	202.186	1	405.778	4
379		19	max	.002	3	.044	5	.207	4	8.689e-4	2	8437.795	13	NC	1
380			min	-.002	2	-.419	1	0	10	-4.197e-3	5	185.313	1	375.657	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	.003	1	0	15	.002	5	1.221e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	2	-2.25e-3	5	NC	1	NC	1
383		2	max	.003	1	-.004	15	.033	5	1.415e-3	2	NC	1	NC	3
384			min	0	15	-.029	1	-.013	2	-2.255e-3	5	NC	1	5814.701	2
385		3	max	.003	3	-.009	15	.063	5	1.609e-3	2	NC	1	NC	6
386			min	0	15	-.056	1	-.026	2	-2.26e-3	5	NC	1	2929.655	2
387		4	max	.003	3	-.013	15	.094	5	1.804e-3	2	NC	1	NC	14
388			min	0	10	-.082	1	-.038	2	-2.266e-3	5	NC	1	1981.081	2
389		5	max	.004	3	-.017	15	.124	5	1.998e-3	2	NC	1	NC	14
390			min	0	10	-.109	1	-.049	2	-2.271e-3	5	NC	1	1517.477	2
391		6	max	.004	3	-.021	15	.155	5	2.192e-3	2	NC	1	NC	14
392			min	0	2	-.136	1	-.06	2	-2.276e-3	5	NC	1	1248.945	2
393		7	max	.004	3	-.025	15	.185	5	2.387e-3	2	NC	1	NC	14
394			min	-.001	2	-.162	1	-.069	2	-2.281e-3	5	8990.605	6	1079.291	2
395		8	max	.004	3	-.029	15	.214	5	2.581e-3	2	NC	1	NC	14
396			min	-.002	2	-.188	1	-.076	2	-2.286e-3	5	8301.976	6	967.81	2
397		9	max	.005	3	-.032	15	.243	5	2.775e-3	2	NC	1	NC	14
398			min	-.003	2	-.214	1	-.082	2	-2.292e-3	5	7931.316	6	894.813	2
399		10	max	.005	3	-.036	15	.271	5	2.97e-3	2	NC	1	NC	14
400			min	-.003	2	-.24	1	-.087	2	-2.297e-3	5	7814.056	6	850.263	2
401		11	max	.005	3	-.04	15	.298	5	3.164e-3	2	NC	1	NC	14
402			min	-.004	2	-.266	1	-.088	2	-2.302e-3	5	7931.316	6	829.447	2
403		12	max	.006	3	-.044	15	.324	5	3.358e-3	2	NC	1	NC	14
404			min	-.005	2	-.291	1	-.088	2	-2.307e-3	5	8301.976	6	831.397	2
405		13	max	.006	3	-.047	15	.348	5	3.553e-3	2	NC	1	NC	14
406			min	-.005	2	-.316	1	-.084	2	-2.312e-3	5	8990.605	6	858.868	2
407		14	max	.006	3	-.051	15	.371	5	3.747e-3	2	NC	1	NC	14
408			min	-.006	2	-.341	1	-.078	2	-2.318e-3	5	NC	1	920.045	2
409		15	max	.007	3	-.054	15	.393	5	3.941e-3	2	NC	1	NC	14
410			min	-.007	2	-.366	1	-.068	2	-2.323e-3	5	NC	1	1033.877	2
411		16	max	.007	3	-.057	15	.413	5	4.136e-3	2	NC	1	NC	14
412			min	-.007	2	-.39	1	-.055	2	-2.328e-3	5	NC	1	1246.866	2
413		17	max	.007	3	-.061	15	.431	4	4.33e-3	2	NC	1	NC	14
414			min	-.008	2	-.415	1	-.038	2	-2.333e-3	5	NC	1	1700.875	2
415		18	max	.007	3	-.064	15	.45	4	4.524e-3	2	NC	1	NC	9
416			min	-.009	2	-.439	1	-.017	2	-2.338e-3	5	NC	1	3108.518	2
417		19	max	.008	3	-.068	15	.466	4	4.718e-3	2	NC	1	NC	1
418			min	-.009	2	-.463	1	0	12	-2.344e-3	5	NC	1	NC	1
419	M6	1	max	.004	3	0	15	.002	4	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	-2.324e-3	4	NC	1	NC	1
421		2	max	.005	3	-.002	15	.034	4	0	1	NC	1	NC	1
422			min	0	15	-.038	1	0	1	-2.349e-3	4	NC	1	NC	1
423		3	max	.006	3	-.003	15	.065	4	0	1	NC	1	NC	1
424			min	0	2	-.073	1	0	1	-2.373e-3	4	NC	1	6967.066	4
425		4	max	.007	3	-.005	15	.097	4	0	1	NC	1	NC	1
426			min	-.002	2	-.109	1	0	1	-2.397e-3	4	NC	1	4572.99	4
427		5	max	.008	3	-.007	15	.128	4	0	1	NC	1	NC	1
428			min	-.004	2	-.144	1	0	1	-2.421e-3	4	NC	1	3415.817	4
429		6	max	.009	3	-.008	15	.159	4	0	1	NC	1	NC	1
430			min	-.006	2	-.179	1	0	1	-2.445e-3	4	NC	1	2751.981	4
431		7	max	.01	3	-.009	15	.19	4	0	1	NC	1	NC	1
432			min	-.008	2	-.214	1	0	1	-2.469e-3	4	8990.605	4	2335.35	4
433		8	max	.011	3	-.011	15	.22	4	0	1	NC	1	NC	1
434			min	-.009	2	-.249	1	0	1	-2.494e-3	4	8301.976	4	2061.964	4
435		9	max	.012	3	-.012	15	.25	4	0	1	NC	1	NC	1
436			min	-.011	2	-.284	1	0	1	-2.518e-3	4	7931.316	4	1881.462	4
437		10	max	.013	3	-.013	15	.278	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	-.013	2	-.318	1	0	1	-2.542e-3	4	7814.056	4	1767.852	4
439		11	max	.013	3	-.015	15	.306	4	0	1	NC	1	NC	1
440			min	-.015	2	-.352	1	0	1	-2.566e-3	4	7931.316	4	1708.266	4
441		12	max	.014	3	-.016	15	.332	4	0	1	NC	1	NC	1
442			min	-.016	2	-.386	1	0	1	-2.59e-3	4	8301.976	4	1698.634	4
443		13	max	.015	3	-.017	15	.356	4	0	1	NC	1	NC	1
444			min	-.018	2	-.42	1	0	1	-2.615e-3	4	8990.605	4	1743.078	4
445		14	max	.016	3	-.018	15	.379	4	0	1	NC	1	NC	1
446			min	-.02	2	-.453	1	0	1	-2.639e-3	4	NC	1	1856.979	4
447		15	max	.017	3	-.019	15	.401	4	0	1	NC	1	NC	1
448			min	-.022	2	-.487	1	0	1	-2.663e-3	4	NC	1	2077.437	4
449		16	max	.018	3	-.02	15	.42	4	0	1	NC	1	NC	1
450			min	-.023	2	-.52	1	0	1	-2.687e-3	4	NC	1	2496.593	4
451		17	max	.019	3	-.021	15	.438	4	0	1	NC	1	NC	1
452			min	-.025	2	-.553	1	0	1	-2.711e-3	4	NC	1	3396.536	4
453		18	max	.02	3	-.021	15	.454	4	0	1	NC	1	NC	1
454			min	-.027	2	-.586	1	0	1	-2.736e-3	4	NC	1	6195.636	4
455		19	max	.021	3	-.022	15	.467	4	0	1	NC	1	NC	1
456			min	-.029	2	-.619	1	0	1	-2.76e-3	4	NC	1	NC	1
457	M9	1	max	.003	1	0	5	.002	4	4.666e-4	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-2.402e-3	4	NC	1	NC	1
459		2	max	.003	1	.002	5	.034	4	5.603e-4	3	NC	1	NC	3
460			min	0	5	-.029	1	-.006	3	-2.428e-3	4	NC	1	5814.701	2
461		3	max	.003	3	.004	5	.066	4	6.54e-4	3	NC	1	NC	9
462			min	0	5	-.056	1	-.011	3	-2.454e-3	4	NC	1	2929.655	2
463		4	max	.003	3	.006	5	.099	4	7.477e-4	3	NC	1	8938.675	9
464			min	0	5	-.082	1	-.016	3	-2.48e-3	4	NC	1	1981.081	2
465		5	max	.004	3	.008	5	.131	4	8.414e-4	3	NC	1	6844.016	9
466			min	0	5	-.109	1	-.021	3	-2.506e-3	4	9679.832	5	1517.477	2
467		6	max	.004	3	.01	5	.163	4	9.351e-4	3	NC	1	5630.754	9
468			min	0	5	-.136	1	-.026	3	-2.532e-3	4	7633.594	5	1248.945	2
469		7	max	.004	3	.012	5	.194	4	1.029e-3	3	NC	1	4864.191	9
470			min	-.001	2	-.162	1	-.03	3	-2.558e-3	4	6257.985	5	1079.291	2
471		8	max	.004	3	.015	5	.225	4	1.123e-3	3	NC	1	4360.37	9
472			min	-.002	2	-.188	1	-.033	3	-2.584e-3	4	5268.298	5	967.81	2
473		9	max	.005	3	.017	5	.254	4	1.216e-3	3	NC	1	4030.3	9
474			min	-.003	2	-.214	1	-.036	3	-2.775e-3	2	4521.996	5	894.813	2
475		10	max	.005	3	.02	5	.283	4	1.31e-3	3	NC	1	3828.602	9
476			min	-.003	2	-.24	1	-.037	3	-2.97e-3	2	3939.692	5	850.263	2
477		11	max	.005	3	.022	5	.31	4	1.404e-3	3	NC	1	3733.931	9
478			min	-.004	2	-.266	1	-.038	3	-3.164e-3	2	3473.565	5	829.447	2
479		12	max	.006	3	.025	5	.336	4	1.497e-3	3	NC	1	3741.831	9
480			min	-.005	2	-.291	1	-.038	3	-3.358e-3	2	3093.013	5	831.397	2
481		13	max	.006	3	.028	5	.36	4	1.591e-3	3	NC	1	3864.627	9
482			min	-.005	2	-.316	1	-.037	3	-3.553e-3	2	2777.485	5	858.868	2
483		14	max	.006	3	.031	5	.382	4	1.685e-3	3	NC	1	4139.058	9
484			min	-.006	2	-.341	1	-.035	3	-3.747e-3	2	2512.63	5	920.045	2
485		15	max	.007	3	.034	5	.403	4	1.779e-3	3	NC	1	4650.271	9
486			min	-.007	2	-.366	1	-.031	3	-3.941e-3	2	2288.097	5	1033.877	2
487		16	max	.007	3	.037	5	.421	4	1.872e-3	3	NC	1	5607.271	9
488			min	-.007	2	-.39	1	-.026	3	-4.136e-3	2	2096.217	5	1246.866	2
489		17	max	.007	3	.04	5	.437	4	1.966e-3	3	NC	1	7647.702	9
490			min	-.008	2	-.415	1	-.019	3	-4.33e-3	2	1931.178	5	1700.875	2
491		18	max	.007	3	.043	5	.451	4	2.06e-3	3	NC	1	NC	9
492			min	-.009	2	-.439	1	-.011	3	-4.524e-3	2	1788.495	5	3108.518	2
493		19	max	.008	3	.046	5	.462	4	2.153e-3	3	NC	1	NC	1
494			min	-.009	2	-.463	1	-.01	1	-4.718e-3	2	1664.652	5	NC	1