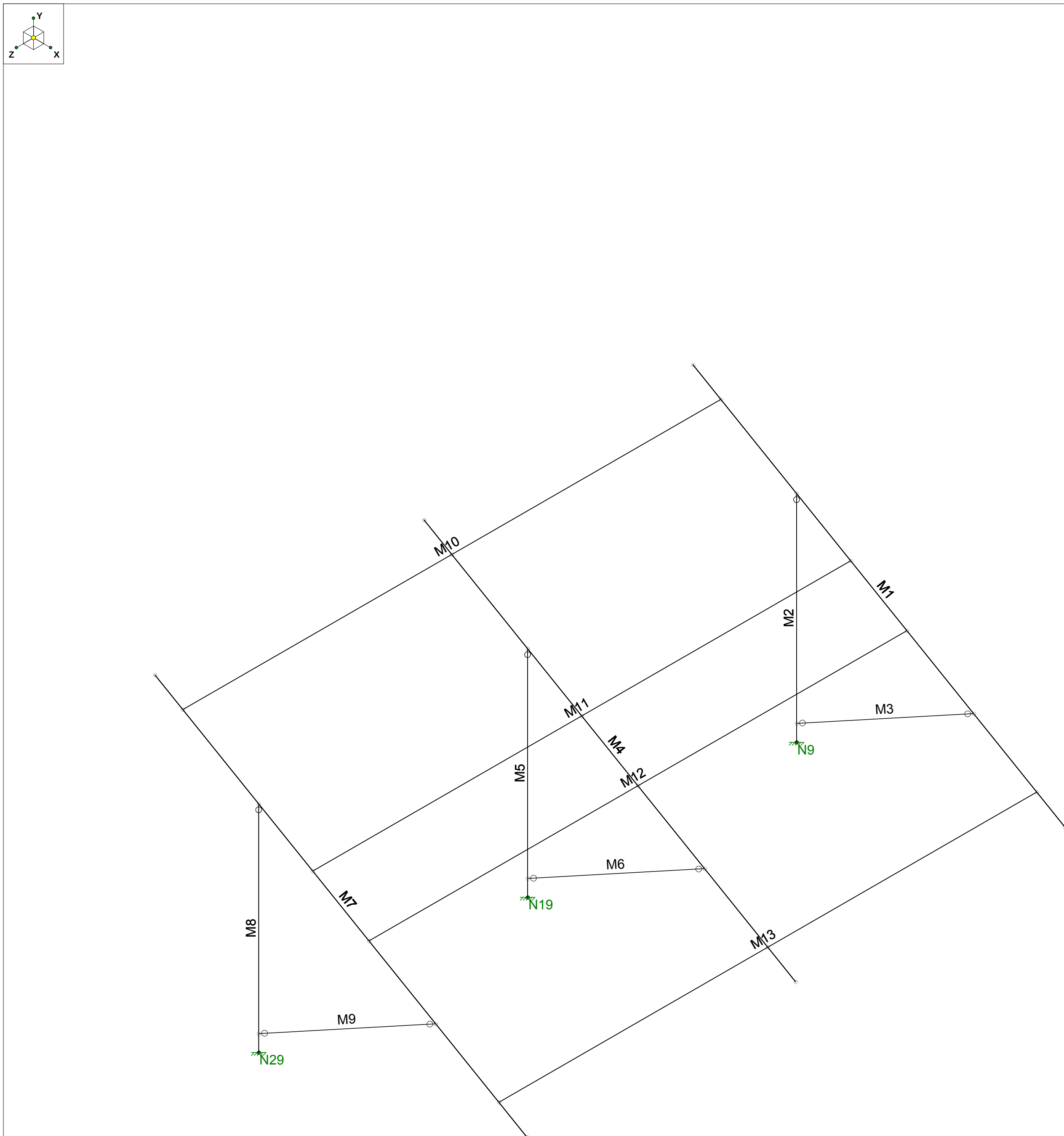


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

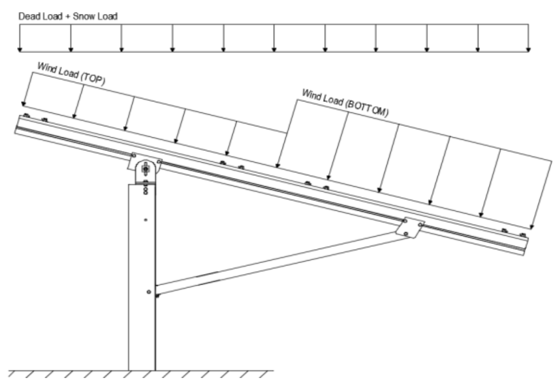
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

Modules Per Row = 2
Module Tilt = 30°
Maximum Height Above Grade = 3 ft



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

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

2. LOAD ACTIONS

2.1 Permanent Loads
g_{MAX} = 3.00 psf
g_{MIN} = 1.75 psf

Self-weight of the PV modules.

2.2 Snow Loads
Ground Snow Load, P_g = 30.00 psf
Sloped Roof Snow Load, P_s = 16.49 psf *(ASCE 7-10, Eq. 7.4-1)*
I_s = 1.00
C_s = 0.73
C_e = 0.90
C_t = 1.20

2.3 Wind Loads
Design Wind Speed, V = 130 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 26.53 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
M10	Top
M11	Mid-Top
M12	Mid-Bottom
M13	Bottom

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

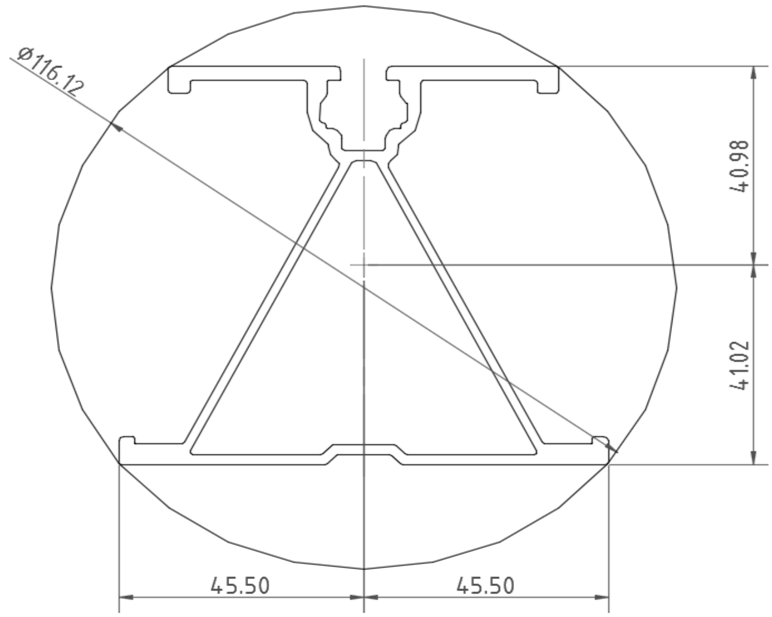
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	126	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 =	1.735	k-ft
M_z =	0.278	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	87%	

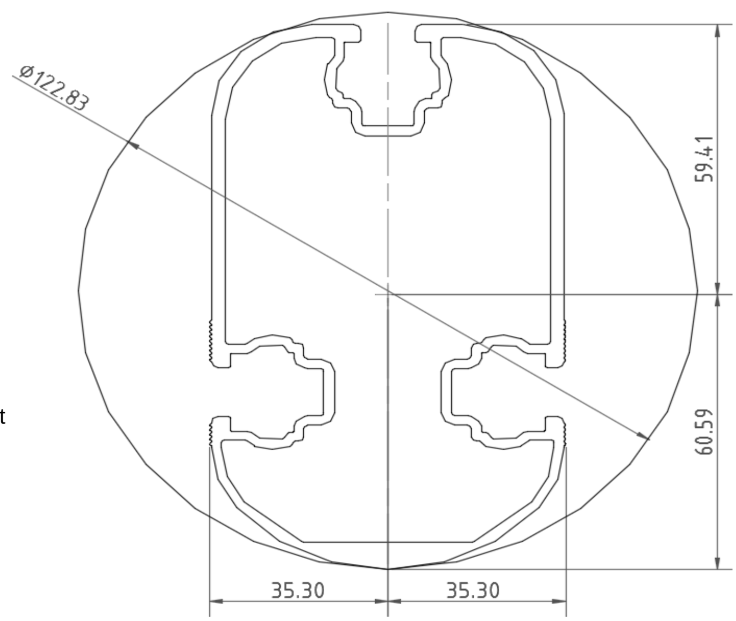


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.464	k-ft
M_z =	0.000	k-ft
P_n =	0.013	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	



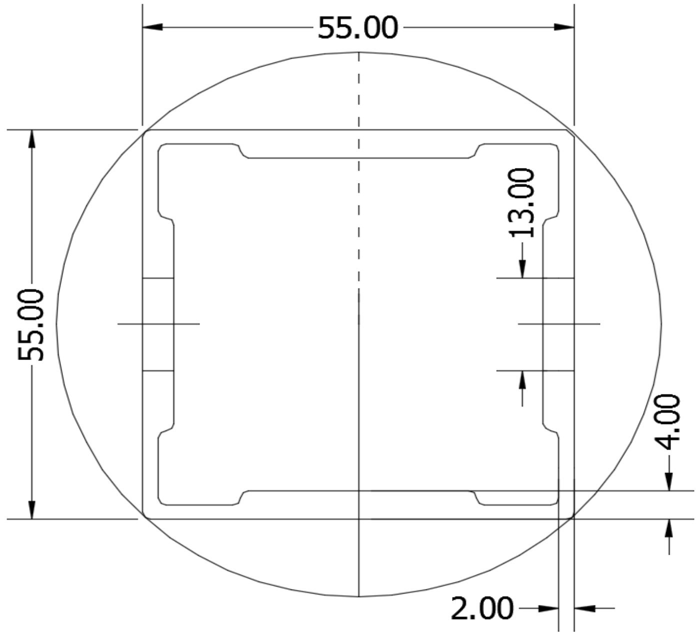
DETAIL VIEW

SCHLETTER

4.3 Strut Design

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

Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.400	k-ft
P_n =	4.589	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	63%	

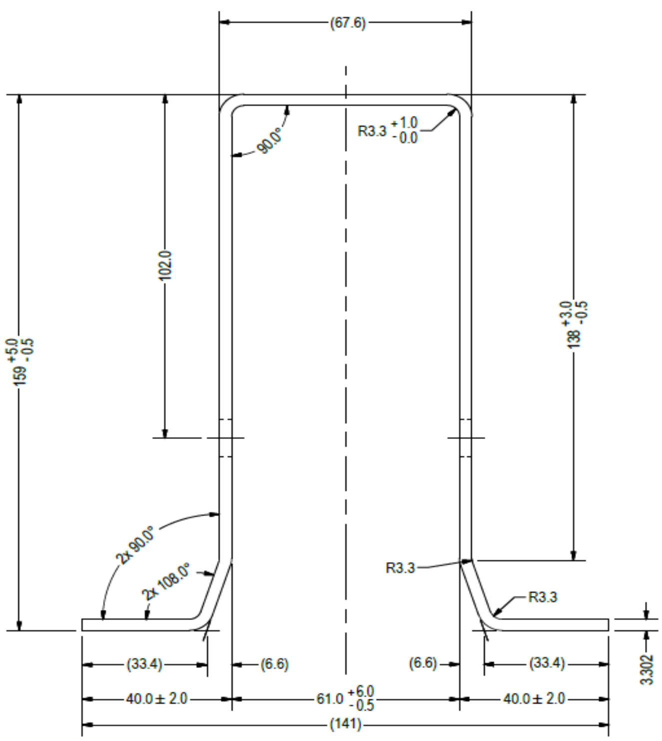


DETAIL VIEW

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 =	79.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	14.574	k-ft
M_z =	0.000	k-ft
P_r =	-5.168	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	88%	



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 =	6.68	k
Maximum Lateral Load =	3.94	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)

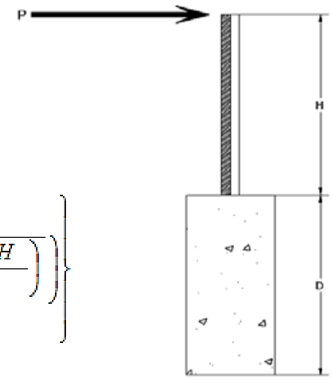
Lateral Force @ Top of Pole, P =	0.94	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.94	k
Height of Pole Above Grade, H =	6.61	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 =	5.06	
Required Footing Depth, D =	9.07	ft

2nd Trial @ D_2 =	6.16	ft
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf
Lateral Soil Bearing @ D, S_3 =	1.23	ksf
Constant $2.34P/(S_1B)$, A =	2.67	
Required Footing Depth, D =	5.92	ft

3rd Trial @ D_3 =	6.04	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.21	ksf
Constant $2.34P/(S_1B)$, A =	2.72	
Required Footing Depth, D =	5.99	ft

4th Trial @ D_4 =	6.02	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.20	ksf
Constant $2.34P/(S_1B)$, A =	2.73	
Required Footing Depth, D =	6.01	ft

5th Trial @ D_5 =	6.01	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.20	ksf
Constant $2.34P/(S_1B)$, A =	2.73	
Required Footing Depth, D =	6.25	ft

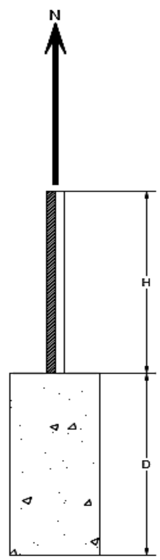
A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.06	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 =	1.98	k
Required Concrete Volume, V =	13.63	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.62
2	0.4	0.2	118.10	6.52
3	0.6	0.2	118.10	6.41
4	0.8	0.2	118.10	6.31
5	1	0.2	118.10	6.20
6	1.2	0.2	118.10	6.10
7	1.4	0.2	118.10	6.00
8	1.6	0.2	118.10	5.89
9	1.8	0.2	118.10	5.79
10	2	0.2	118.10	5.69
11	2.2	0.2	118.10	5.58
12	2.4	0.2	118.10	5.48
13	2.6	0.2	118.10	5.37
14	2.8	0.2	118.10	5.27
15	3	0.2	118.10	5.17
16	3.2	0.2	118.10	5.06
17	3.4	0.2	118.10	4.96
18	3.6	0.2	118.10	4.86
19	3.8	0.2	118.10	4.75
20	4	0.2	118.10	4.65
21	4.2	0.2	118.10	4.54
22	4.4	0.2	118.10	4.44
23	4.6	0.2	118.10	4.34
24	0	0.0	0.00	4.34
25	0	0.0	0.00	4.34
26	0	0.0	0.00	4.34
27	0	0.0	0.00	4.34
28	0	0.0	0.00	4.34
29	0	0.0	0.00	4.34
30	0	0.0	0.00	4.34
31	0	0.0	0.00	4.34
32	0	0.0	0.00	4.34
33	0	0.0	0.00	4.34
34	0	0.0	0.00	4.34
Max	4.6	Sum	1.09	

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 =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.14	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

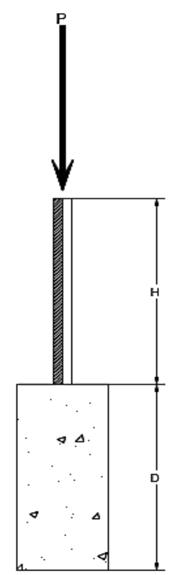
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	6.99	k
Utilization =	67%	

A 2ft diameter footing passes at a depth of 6.25ft.



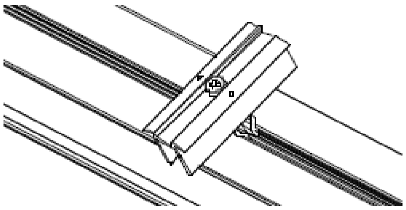
6. DESIGN OF JOINTS AND CONNECTIONS

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.

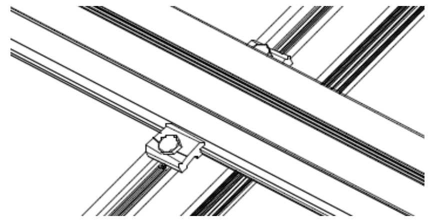
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.571	k
Allowable Uplift =	1.214	k
Utilization =	47%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.134	k
Allowable Uplift =	2.180	k
Utilization =	98%	

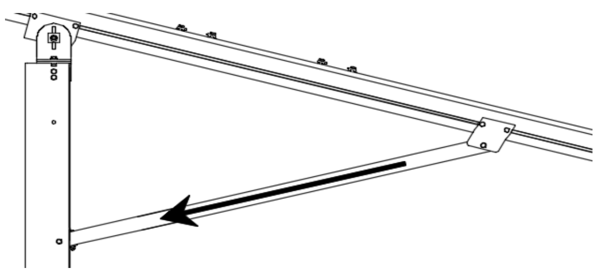


6.2 Strut Connections

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

Maximum Axial Load =	4.589	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	52%	

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

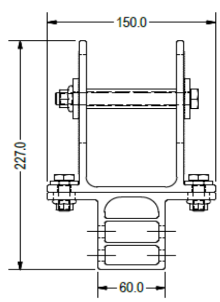


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

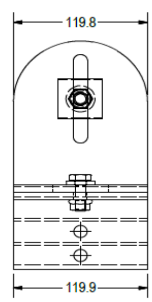
6.3 Girder to Post Connection

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.

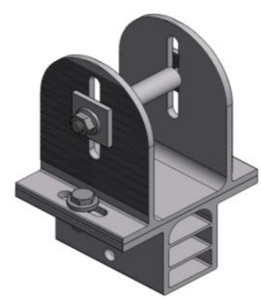
Maximum Tensile Load =	4.527	k
Allowable Load =	5.649	k
Utilization =	80%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

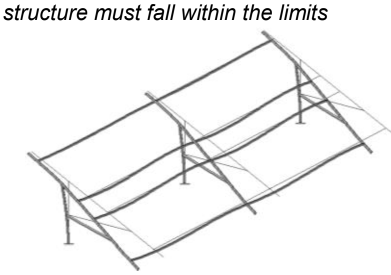
7.1 Seismic Drift

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

Mean Height, h_{sx} =	74.11	in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$	
	1.482	in
Max Drift, Δ_{MAX} =	0.707	in

$0.707 \leq 1.482$, 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 = 126 in

J = 0.432

348.575

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

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= 27.2 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

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

Weak Axis:

3.4.14

L_b = 126

J = 0.432

221.673

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

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= 28.5

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

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

Compression

3.4.9

b/t = 32.195
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
$\varphi F_L = \varphi c[Bp-1.6Dp*b/t]$
$\varphi F_L =$ 25.1 ksi

b/t = 37.0588
S1 = 12.21
S2 = 32.70
$\varphi F_L = (\varphi ck2*\sqrt{(BpE)})/(1.6b/t)$
$\varphi F_L =$ 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
$\varphi F_L = \varphi yFcy$
$\varphi F_L =$ 33.25 ksi

$\varphi F_L =$ 21.94 ksi
A = 1215.13 mm^2
1.88 in^2
$P_{max} =$ 41.32 kips

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

Girder = **T5**

Strong Axis:

3.4.14

$L_b =$ 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

S2 = 1701.56
$\varphi F_L = \varphi b[Bc-1.6Dc*\sqrt{((LbSc)/(Cb*\sqrt{(IyJ)}/2))}]$
$\varphi F_L =$ 30.5 ksi

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
$\varphi F_L = \varphi yFcy$
$\varphi F_L =$ 33.3 ksi

Weak Axis:

3.4.14

$L_b =$ 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

S2 = 1701.56
$\varphi F_L = \varphi b[Bc-1.6Dc*\sqrt{((LbSc)/(Cb*\sqrt{(IyJ)}/2))}]$
$\varphi F_L =$ 30.3

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

S2 = 46.7
$\varphi F_L = \varphi b[Bp-1.6Dp*b/t]$
$\varphi F_L =$ 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

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_LSt= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

M_{max}St = 5.001 k-ft

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 = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

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 = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

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

$\lambda =$ 1.41113

r = 0.81 in

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

$S1^* =$ 0.33515

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

$S2^* =$ 1.23671

$\varphi cc =$ 0.77756

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

$\varphi F_L =$ 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

$\varphi F_L =$ 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

$\varphi F_L =$ 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

$\varphi F_L =$ 13.67 ksi

A = 663.99 mm^2

1.03 in^2

$P_{max} =$ 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	79.31	in	
Pr =	-5.17	k	(LRFD Factored Load)
Mr (Strong) =	14.57	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	114.11	
4.71√(E/Fy) =	103.55 =>	kL/r > 4.71√(E/Fy)
Fcr =	19.28 ksi	
Fe =	21.98 ksi	
Pn =	42.988 k	

Torsional/Flexural Torsional Buckling:

Fcr =	14.4957 ksi
Fey =	56.0686 ksi
Fez =	18.5443 ksi
Pn =	32.3254 k

Bending (Strong Axis):

Yielding:			
Mn =	21.95 k-ft		
Flange Local Buckling:			
Mn =	19.207 k-ft		
Pr/Pc =	0.1202 <	0.2	
Utilization =	0.88 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.120 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 88%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-39.836	-39.836	0	0
2	M11	Y	-39.836	-39.836	0	0
3	M12	Y	-39.836	-39.836	0	0
4	M13	Y	-39.836	-39.836	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	-85.097	-85.097	0	0
2	M11	y	-85.097	-85.097	0	0
3	M12	y	-136.895	-136.895	0	0
4	M13	y	-136.895	-136.895	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	170.194	170.194	0	0
2	M11	y	170.194	170.194	0	0
3	M12	y	81.397	81.397	0	0
4	M13	y	81.397	81.397	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	857.505	2	2301.191	2	274.974	2	.36	2	.02	5	4.07	1
2		min	-1126.153	3	-1685.514	3	-348.056	5	-1.513	5	-.018	2	.512	15
3	N19	max	2946.821	2	6410.208	2	0	1	0	3	.021	4	7.623	3
4		min	-3031.105	3	-5127.447	3	-379.678	5	-1.59	4	0	10	.327	15
5	N29	max	857.505	2	2301.191	2	306.652	3	.451	3	.023	4	4.07	1
6		min	-1126.153	3	-1685.514	3	-402.577	4	-1.609	4	-.009	3	-.167	5
7	Totals:	max	4661.832	2	11012.591	2	0	3						
8		min	-5283.411	3	-8498.474	3	-1096.311	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	.007	1	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	12	0	1	0	12	0	6
4			min	-1.11	6	-1.921	6	-1.499	5	0	1	0	5	0	15
5		3	max	-15.905	12	311.096	3	-12.533	12	.075	3	.281	1	.304	2
6			min	-203.947	1	-703.531	2	-163.785	1	-.266	2	.039	12	-.131	3
7		4	max	-16.337	12	309.972	3	-12.533	12	.075	3	.18	1	.741	2
8			min	-204.813	1	-705.029	2	-163.785	1	-.266	2	.021	10	-.324	3
9		5	max	-16.77	12	308.848	3	-12.533	12	.075	3	.078	1	1.18	2
10			min	-205.678	1	-706.528	2	-163.785	1	-.266	2	0	10	-.516	3
11		6	max	275.876	3	622.486	2	17.327	3	.089	2	.117	2	1.13	2
12			min	-908.503	2	-192.138	3	-229.491	1	-.095	3	-.047	3	-.524	3
13		7	max	275.227	3	620.988	2	17.327	3	.089	2	.013	10	.744	2
14			min	-909.368	2	-193.262	3	-229.491	1	-.095	3	-.076	4	-.405	3
15		8	max	274.578	3	619.489	2	17.327	3	.089	2	-.016	12	.359	2
16			min	-910.234	2	-194.386	3	-229.491	1	-.095	3	-.175	1	-.284	3
17		9	max	249.635	3	98.427	3	2.591	3	.019	5	.094	1	.134	1
18			min	-1085.561	1	-73.112	2	-235.435	1	-.208	2	-.003	10	-.227	3
19		10	max	248.986	3	97.303	3	2.591	3	.019	5	.061	3	.18	2
20			min	-1086.427	1	-74.611	2	-235.435	1	-.208	2	-.058	2	-.288	3
21		11	max	248.337	3	96.179	3	2.591	3	.019	5	.062	3	.227	2
22			min	-1087.292	1	-76.109	2	-235.435	1	-.208	2	-.199	1	-.348	3
23		12	max	219.621	3	826.247	3	163.185	2	.43	3	.168	1	.462	2
24			min	-1295.847	1	-544.965	2	-353.472	3	-.379	2	-.047	5	-.693	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	218.972	3	825.123	3	163.185	2	.43	3	.21	1	.801	2
26			min	-1296.712	1	-546.463	2	-353.472	3	-.379	2	-.197	3	-1.205	3
27		14	max	206.419	1	494.783	2	74.416	5	.278	2	.121	3	1.126	2
28			min	11.022	15	-736.561	3	-114.321	1	-.497	3	-.203	4	-1.696	3
29		15	max	205.553	1	493.285	2	72.916	5	.278	2	.069	3	.82	2
30			min	10.761	15	-737.685	3	-114.321	1	-.497	3	-.175	4	-1.238	3
31		16	max	204.688	1	491.786	2	71.416	5	.278	2	.017	3	.514	2
32			min	10.5	15	-738.809	3	-114.321	1	-.497	3	-.233	1	-.78	3
33		17	max	203.823	1	490.288	2	69.916	5	.278	2	-.023	12	.209	2
34			min	10.239	15	-739.933	3	-114.321	1	-.497	3	-.304	1	-.321	3
35		18	max	1.11	4	1.923	6	1.5	4	0	1	0	12	0	6
36			min	.261	15	.452	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.003	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.006	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.017	2	.002	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	6
42			min	-1.11	6	-1.919	6	-1.499	5	0	1	0	5	0	15
43		3	max	-8.297	12	982.811	3	0	1	.044	4	.218	4	.791	2
44			min	-390.905	1	-2048.464	2	-107.968	5	0	1	0	1	-.385	3
45		4	max	-8.73	12	981.687	3	0	1	.044	4	.151	4	2.063	2
46			min	-391.77	1	-2049.962	2	-109.467	5	0	1	0	1	-.995	3
47		5	max	-9.162	12	980.563	3	0	1	.044	4	.083	4	3.336	2
48			min	-392.635	1	-2051.461	2	-110.967	5	0	1	0	1	-1.604	3
49		6	max	1047.871	3	1871.958	2	0	1	0	1	0	1	3.169	2
50			min	-2566.587	2	-749.901	3	-94.874	4	-.038	4	-.03	5	-1.577	3
51		7	max	1047.222	3	1870.459	2	0	1	0	1	0	1	2.008	2
52			min	-2567.453	2	-751.025	3	-96.374	4	-.038	4	-.088	4	-1.112	3
53		8	max	1046.573	3	1868.961	2	0	1	0	1	0	1	.848	2
54			min	-2568.318	2	-752.149	3	-97.873	4	-.038	4	-.149	4	-.645	3
55		9	max	1038.247	3	266.192	3	0	1	.016	4	.091	5	.162	1
56			min	-2714.42	2	-216.017	2	-208.666	4	0	1	0	1	-.411	3
57		10	max	1037.598	3	265.069	3	0	1	.016	4	0	1	.295	1
58			min	-2715.285	2	-217.515	2	-210.166	4	0	1	-.039	4	-.576	3
59		11	max	1036.949	3	263.945	3	0	1	.016	4	0	1	.429	1
60			min	-2716.15	2	-219.014	2	-211.665	4	0	1	-.17	4	-.74	3
61		12	max	1036.169	3	2269.518	3	0	1	.161	4	0	1	1.121	2
62			min	-3090.688	1	-1664.42	2	-235.659	5	0	1	-.029	4	-1.707	3
63		13	max	1035.52	3	2268.394	3	0	1	.161	4	0	1	2.155	2
64			min	-3091.553	1	-1665.919	2	-237.159	5	0	1	-.175	4	-3.115	3
65		14	max	393.75	1	1400.111	2	71.053	5	0	1	0	1	3.147	2
66			min	9.947	12	-1987.652	3	0	1	-.114	4	-.162	5	-4.464	3
67		15	max	392.884	1	1398.612	2	69.553	5	0	1	0	1	2.279	2
68			min	9.515	12	-1988.776	3	0	1	-.114	4	-.118	5	-3.23	3
69		16	max	392.019	1	1397.113	2	68.053	5	0	1	0	1	1.411	2
70			min	9.082	12	-1989.9	3	0	1	-.114	4	-.076	5	-1.996	3
71		17	max	391.154	1	1395.615	2	66.553	5	0	1	0	1	.545	2
72			min	8.65	12	-1991.024	3	0	1	-.114	4	-.034	4	-.76	3
73		18	max	1.11	4	1.924	6	1.5	5	0	1	0	1	0	6
74			min	.261	15	.452	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.009	2	0	1	0	1	0	1	0	1
76			min	0	1	-.015	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.007	1	.003	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	.001	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	10.673	5	311.096	3	163.785	1	.266	2	.098	5	.304	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	-203.947	1	-703.531	2	-47.214	5	-.075	3	-.281	1	-.131	3
83		4	max	10.269	5	309.972	3	163.785	1	.266	2	.069	5	.741	2
84			min	-204.813	1	-705.029	2	-48.714	5	-.075	3	-.18	1	-.324	3
85		5	max	9.866	5	308.848	3	163.785	1	.266	2	.038	5	1.18	2
86			min	-205.678	1	-706.528	2	-50.214	5	-.075	3	-.078	1	-.516	3
87		6	max	275.876	3	622.486	2	229.491	1	.095	3	.047	3	1.13	2
88			min	-908.503	2	-192.138	3	-32.222	5	-.089	2	-.117	2	-.524	3
89		7	max	275.227	3	620.988	2	229.491	1	.095	3	.036	3	.744	2
90			min	-909.368	2	-193.262	3	-33.721	5	-.089	2	-.058	5	-.405	3
91		8	max	274.578	3	619.489	2	229.491	1	.095	3	.175	1	.359	2
92			min	-910.234	2	-194.386	3	-35.221	5	-.089	2	-.079	5	-.284	3
93		9	max	249.635	3	98.427	3	235.435	1	.208	2	.023	5	.134	1
94			min	-1085.561	1	-73.112	2	-86.873	5	.018	15	-.094	1	-.227	3
95		10	max	248.986	3	97.303	3	235.435	1	.208	2	.058	2	.18	2
96			min	-1086.427	1	-74.611	2	-88.372	5	.018	15	-.061	3	-.288	3
97		11	max	248.337	3	96.179	3	235.435	1	.208	2	.199	1	.227	2
98			min	-1087.292	1	-76.109	2	-89.872	5	.018	15	-.086	5	-.348	3
99		12	max	219.621	3	826.247	3	353.472	3	.379	2	-.014	12	.462	2
100			min	-1295.847	1	-544.965	2	-202.678	5	-.43	3	-.168	1	-.693	3
101		13	max	218.972	3	825.123	3	353.472	3	.379	2	.197	3	.801	2
102			min	-1296.712	1	-546.463	2	-204.177	5	-.43	3	-.232	4	-1.205	3
103		14	max	206.419	1	494.783	2	121.431	4	.497	3	.093	2	1.126	2
104			min	10.433	15	-736.561	3	4.931	10	-.278	2	-.181	5	-1.696	3
105		15	max	205.553	1	493.285	2	119.932	4	.497	3	.162	1	.82	2
106			min	10.172	15	-737.685	3	4.931	10	-.278	2	-.124	5	-1.238	3
107		16	max	204.688	1	491.786	2	118.432	4	.497	3	.233	1	.514	2
108			min	9.911	15	-738.809	3	4.931	10	-.278	2	-.068	5	-.78	3
109		17	max	203.823	1	490.288	2	116.932	4	.497	3	.304	1	.209	2
110			min	9.65	15	-739.933	3	4.931	10	-.278	2	-.013	5	-.321	3
111		18	max	1.11	4	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.003	2	0	15	0	1	0	1	0	1
114			min	0	1	-.006	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	114.329	1	486.961	2	-9.131	15	.01	2	.35	1	.278	2
116			min	4.928	10	-742.253	3	-202.283	1	-.022	3	.015	15	-.497	3
117		2	max	114.329	1	355.59	2	-7.047	15	.01	2	.14	1	.257	3
118			min	4.928	10	-549.108	3	-158.194	1	-.022	3	.005	15	-.213	2
119		3	max	114.329	1	224.219	2	-4.963	15	.01	2	.022	3	.785	3
120			min	4.928	10	-355.962	3	-114.104	1	-.022	3	-.019	1	-.551	2
121		4	max	114.329	1	92.848	2	-2.879	15	.01	2	.004	3	1.087	3
122			min	4.928	10	-162.817	3	-70.015	1	-.022	3	-.126	1	-.736	2
123		5	max	114.329	1	30.329	3	-.794	15	.01	2	-.007	12	1.164	3
124			min	4.928	10	-40.295	1	-25.926	1	-.022	3	-.182	1	-.768	2
125		6	max	114.329	1	223.474	3	18.164	1	.01	2	-.008	15	1.016	3
126			min	4.928	10	-169.894	2	-7.513	3	-.022	3	-.187	1	-.647	2
127		7	max	114.329	1	416.619	3	62.253	1	.01	2	-.005	15	.643	3
128			min	4.928	10	-301.266	2	-4.387	3	-.022	3	-.14	1	-.372	2
129		8	max	114.329	1	609.765	3	106.342	1	.01	2	0	15	.07	1
130			min	.553	15	-432.637	2	-1.261	3	-.022	3	-.041	1	-.02	5
131		9	max	114.329	1	802.91	3	150.432	1	.01	2	.109	1	.638	2
132			min	-10.746	5	-564.008	2	1.766	12	-.022	3	-.031	3	-.78	3
133		10	max	114.329	1	996.056	3	194.521	1	0	15	.31	1	1.372	2
134			min	4.928	10	-695.379	2	-108.182	14	-.022	3	-.027	3	-1.829	3
135		11	max	114.329	1	564.008	2	-1.766	12	.022	3	.109	1	.638	2
136			min	4.928	10	-802.91	3	-150.432	1	-.01	2	-.031	3	-.78	3
137		12	max	114.329	1	432.637	2	1.261	3	.022	3	-.003	15	.07	1
138			min	4.928	10	-609.765	3	-106.342	1	-.01	2	-.041	1	.019	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	114.329	1	301.266	2	4.387	3	.022	3	-.007	15	.643	3
140			min	3.074	15	-416.619	3	-62.253	1	-.01	2	-.14	1	-.372	2
141		14	max	114.329	1	169.894	2	7.513	3	.022	3	-.009	15	1.016	3
142			min	-7.048	5	-223.474	3	-18.164	1	-.01	2	-.187	1	-.647	2
143		15	max	114.329	1	40.295	1	25.926	1	.022	3	-.007	12	1.164	3
144			min	-19.024	5	-30.329	3	1.38	15	-.01	2	-.182	1	-.768	2
145		16	max	114.329	1	162.817	3	70.015	1	.022	3	.004	3	1.087	3
146			min	-31	5	-92.848	2	3.464	15	-.01	2	-.126	1	-.736	2
147		17	max	114.329	1	355.962	3	114.104	1	.022	3	.022	3	.785	3
148			min	-42.977	5	-224.219	2	5.549	15	-.01	2	-.019	1	-.551	2
149		18	max	114.329	1	549.108	3	158.194	1	.022	3	.14	1	.257	3
150			min	-54.953	5	-355.59	2	7.633	15	-.01	2	.007	15	-.213	2
151		19	max	114.329	1	742.253	3	202.283	1	.022	3	.35	1	.278	2
152			min	-66.929	5	-486.961	2	9.717	15	-.01	2	.017	15	-.497	3
153	M11	1	max	303.824	1	465.5	2	12.139	5	0	15	.392	1	.196	1
154			min	-356.009	3	-731.749	3	-208.2	1	-.004	1	-.117	5	-.563	3
155		2	max	303.824	1	334.128	2	15.363	5	0	15	.175	1	.178	3
156			min	-356.009	3	-538.604	3	-164.111	1	-.004	1	-.101	5	-.296	2
157		3	max	303.824	1	202.757	2	18.588	5	0	15	.043	3	.694	3
158			min	-356.009	3	-345.459	3	-120.021	1	-.004	1	-.081	5	-.609	2
159		4	max	303.824	1	72.602	1	21.812	5	0	15	.02	3	.984	3
160			min	-356.009	3	-152.313	3	-75.932	1	-.004	1	-.105	1	-.769	2
161		5	max	303.824	1	40.832	3	25.036	5	0	15	0	3	1.049	3
162			min	-356.009	3	-59.985	2	-31.843	1	-.004	1	-.168	1	-.775	2
163		6	max	303.824	1	233.978	3	31.776	4	0	15	.001	15	.889	3
164			min	-356.009	3	-191.356	2	-11.952	3	-.004	1	-.18	1	-.629	2
165		7	max	303.824	1	427.123	3	56.336	1	0	15	.036	5	.503	3
166			min	-356.009	3	-322.727	2	-8.826	3	-.004	1	-.14	1	-.329	2
167		8	max	303.824	1	620.269	3	100.425	1	0	15	.074	5	.124	2
168			min	-356.009	3	-454.098	2	-5.7	3	-.004	1	-.048	1	-.108	3
169		9	max	303.824	1	813.414	3	144.515	1	0	15	.142	4	.731	2
170			min	-356.009	3	-585.47	2	-2.574	3	-.004	1	-.041	3	-.944	3
171		10	max	303.824	1	1006.559	3	188.604	1	0	15	.289	1	1.49	2
172			min	-356.009	3	-716.841	2	-91.107	14	-.004	1	-.042	3	-2.006	3
173		11	max	303.824	1	585.47	2	16.429	5	.004	1	.095	1	.731	2
174			min	-356.009	3	-813.414	3	-144.515	1	0	5	-.101	5	-.944	3
175		12	max	303.824	1	454.098	2	19.653	5	.004	1	-.014	10	.124	2
176			min	-356.009	3	-620.269	3	-100.425	1	0	5	-.09	4	-.108	3
177		13	max	303.824	1	322.727	2	22.877	5	.004	1	-.017	12	.503	3
178			min	-356.009	3	-427.123	3	-56.336	1	0	5	-.14	1	-.329	2
179		14	max	303.824	1	191.356	2	26.102	5	.004	1	-.01	12	.889	3
180			min	-356.009	3	-233.978	3	-12.247	1	0	5	-.18	1	-.629	2
181		15	max	303.824	1	59.985	2	36.28	4	.004	1	.005	5	1.049	3
182			min	-356.009	3	-40.832	3	6.41	10	0	5	-.168	1	-.775	2
183		16	max	303.824	1	152.313	3	75.932	1	.004	1	.042	5	.984	3
184			min	-356.009	3	-72.602	1	11.358	12	0	5	-.105	1	-.769	2
185		17	max	303.824	1	345.459	3	120.021	1	.004	1	.082	4	.694	3
186			min	-356.009	3	-202.757	2	13.442	12	0	5	.002	9	-.609	2
187		18	max	303.824	1	538.604	3	164.111	1	.004	1	.175	1	.178	3
188			min	-356.009	3	-334.128	2	15.526	12	0	5	.03	10	-.296	2
189		19	max	303.824	1	731.749	3	208.2	1	.004	1	.392	1	.196	1
190			min	-356.009	3	-465.5	2	17.61	12	0	5	.061	10	-.563	3
191	M12	1	max	50.077	5	689.631	2	15.903	5	0	15	.412	1	.298	2
192			min	-24.261	9	-294.318	3	-211.121	1	-.005	1	-.136	5	.024	12
193		2	max	47.78	2	497.829	2	19.127	5	0	15	.191	1	.33	3
194			min	-24.261	9	-204.769	3	-167.032	1	-.005	1	-.115	5	-.395	2
195		3	max	47.78	2	306.027	2	22.351	5	0	15	.027	3	.517	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	-24.261	9	-115.22	3	-122.942	1	-.005	1	-.091	5	-.864	2
197		4	max	47.78	2	114.225	2	25.575	5	0	15	.008	3	.599	3
198			min	-24.261	9	-25.671	3	-78.853	1	-.005	1	-.095	1	-1.109	2
199		5	max	47.78	2	63.878	3	28.8	5	0	15	-.005	12	.577	3
200			min	-24.261	9	-77.577	2	-34.764	1	-.005	1	-.162	1	-1.131	2
201		6	max	47.78	2	153.427	3	35.201	4	0	15	.004	5	.45	3
202			min	-24.261	9	-269.38	2	-8.645	3	-.005	1	-.177	1	-.928	2
203		7	max	47.78	2	242.976	3	53.415	1	0	15	.043	5	.219	3
204			min	-30.327	4	-461.182	2	-5.519	3	-.005	1	-.14	1	-.502	2
205		8	max	47.78	2	332.525	3	97.505	1	0	15	.086	5	.148	2
206			min	-42.303	4	-652.984	2	-2.393	3	-.005	1	-.052	1	-.117	3
207		9	max	47.78	2	422.073	3	141.594	1	0	15	.157	4	1.022	2
208			min	-54.279	4	-844.786	2	.733	3	-.005	1	-.033	3	-.557	3
209		10	max	47.78	2	511.622	3	185.683	1	.003	2	.278	1	2.119	2
210			min	-66.255	4	-1036.588	2	3.122	12	-.005	1	-.031	3	-1.102	3
211		11	max	47.78	2	844.786	2	20.438	5	.005	1	.088	1	1.022	2
212			min	-24.261	9	-422.073	3	-141.594	1	0	5	-.118	5	-.557	3
213		12	max	47.78	2	652.984	2	23.662	5	.005	1	-.017	10	.148	2
214			min	-24.261	9	-332.525	3	-97.505	1	0	5	-.102	4	-.117	3
215		13	max	47.78	2	461.182	2	26.886	5	.005	1	-.017	12	.219	3
216			min	-24.261	9	-242.976	3	-53.415	1	0	5	-.14	1	-.502	2
217		14	max	47.78	2	269.38	2	30.11	5	.005	1	-.013	12	.45	3
218			min	-24.261	9	-153.427	3	-9.326	1	0	5	-.177	1	-.928	2
219		15	max	47.78	2	77.577	2	40.72	4	.005	1	.007	5	.577	3
220			min	-24.261	9	-63.878	3	7.297	12	0	5	-.162	1	-1.131	2
221		16	max	47.78	2	25.671	3	78.853	1	.005	1	.048	5	.599	3
222			min	-29.006	14	-114.225	2	9.381	12	0	5	-.095	1	-1.109	2
223		17	max	47.78	2	115.22	3	122.942	1	.005	1	.096	4	.517	3
224			min	-40.653	4	-306.027	2	11.465	12	0	5	.007	9	-.864	2
225		18	max	47.78	2	204.769	3	167.032	1	.005	1	.191	1	.33	3
226			min	-52.629	4	-497.829	2	13.549	12	0	5	.031	12	-.395	2
227		19	max	47.78	2	294.318	3	211.121	1	.005	1	.412	1	.298	2
228			min	-64.605	4	-689.631	2	15.633	12	0	5	.048	12	-.046	5
229	M13	1	max	44.167	5	701.116	2	11.484	5	.006	3	.347	1	.266	2
230			min	-163.635	1	-313.375	3	-201.937	1	-.019	2	-.118	5	-.075	3
231		2	max	32.191	5	509.314	2	14.708	5	.006	3	.138	1	.239	3
232			min	-163.635	1	-223.827	3	-157.848	1	-.019	2	-.103	5	-.44	2
233		3	max	20.215	5	317.512	2	17.932	5	.006	3	.023	3	.448	3
234			min	-163.635	1	-134.278	3	-113.759	1	-.019	2	-.091	4	-.922	2
235		4	max	8.239	5	125.71	2	21.156	5	.006	3	.005	3	.552	3
236			min	-163.635	1	-44.729	3	-69.669	1	-.019	2	-.128	1	-1.18	2
237		5	max	-2.195	15	44.82	3	24.38	5	.006	3	-.007	12	.552	3
238			min	-163.635	1	-66.092	2	-25.58	1	-.019	2	-.183	1	-1.215	2
239		6	max	-10.256	15	134.369	3	32.632	4	.006	3	-.002	15	.447	3
240			min	-163.635	1	-257.895	2	-7.719	3	-.019	2	-.188	1	-1.026	2
241		7	max	-12.533	12	223.918	3	62.599	1	.006	3	.03	5	.238	3
242			min	-163.635	1	-449.697	2	-4.593	3	-.019	2	-.14	1	-.614	2
243		8	max	-12.533	12	313.467	3	106.688	1	.006	3	.068	5	.023	2
244			min	-163.635	1	-641.499	2	-1.467	3	-.019	2	-.041	1	-.075	3
245		9	max	-12.533	12	403.016	3	150.778	1	.006	3	.138	4	.883	2
246			min	-163.635	1	-833.301	2	1.642	12	-.019	2	-.031	3	-.493	3
247		10	max	-12.533	12	492.565	3	194.867	1	.019	2	.31	1	1.967	2
248			min	-163.635	1	-1025.103	2	3.726	12	-.006	3	-.027	3	-1.015	3
249		11	max	29.507	5	833.301	2	14.815	5	.019	2	.109	1	.883	2
250			min	-163.635	1	-403.016	3	-150.778	1	-.006	3	-.092	5	-.493	3
251		12	max	17.531	5	641.499	2	18.039	5	.019	2	-.014	10	.023	2
252			min	-163.635	1	-313.467	3	-106.688	1	-.006	3	-.08	4	-.075	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
253		13	max	5.555	5	449.697	2	21.263	5	.019	2	-.017	12	.238	3
254			min	-163.635	1	-223.918	3	-62.599	1	-.006	3	-.14	1	-.614	2
255		14	max	-3.992	15	257.895	2	24.488	5	.019	2	-.013	12	.447	3
256			min	-163.635	1	-134.369	3	-18.51	1	-.006	3	-.188	1	-1.026	2
257		15	max	-12.053	15	66.092	2	33.093	4	.019	2	.008	5	.552	3
258			min	-163.635	1	-44.82	3	5.994	10	-.006	3	-.183	1	-1.215	2
259		16	max	-12.533	12	44.729	3	69.669	1	.019	2	.042	5	.552	3
260			min	-163.635	1	-125.71	2	8.777	12	-.006	3	-.128	1	-1.18	2
261		17	max	-12.533	12	134.278	3	113.759	1	.019	2	.08	5	.448	3
262			min	-163.635	1	-317.512	2	10.861	12	-.006	3	-.021	1	-.922	2
263		18	max	-12.533	12	223.827	3	157.848	1	.019	2	.152	4	.239	3
264			min	-163.635	1	-509.314	2	12.945	12	-.006	3	.028	10	-.44	2
265		19	max	-12.533	12	313.375	3	201.937	1	.019	2	.347	1	.266	2
266			min	-163.635	1	-701.116	2	15.029	12	-.006	3	.044	12	-.075	3
267	M2	1	max	2301.191	2	1125.51	3	275.18	2	.02	5	1.513	5	4.07	1
268			min	-1685.514	3	-857.045	2	-348.11	5	-.018	2	-.36	2	.512	15
269		2	max	2298.354	2	1125.51	3	275.18	2	.02	5	1.405	5	4.167	1
270			min	-1687.642	3	-857.045	2	-345.651	5	-.018	2	-.275	1	.49	15
271		3	max	1661.008	1	810.657	1	196.697	2	.002	2	1.288	5	4.042	1
272			min	-1414.241	3	92.89	15	-322.235	5	-.001	3	-.225	1	.463	15
273		4	max	1658.17	1	810.657	1	196.697	2	.002	2	1.188	5	3.789	1
274			min	-1416.369	3	92.89	15	-319.776	5	-.001	3	-.168	1	.434	15
275		5	max	1655.333	1	810.657	1	196.697	2	.002	2	1.089	5	3.536	1
276			min	-1418.497	3	92.89	15	-317.317	5	-.001	3	-.111	1	.405	15
277		6	max	1652.495	1	810.657	1	196.697	2	.002	2	.99	5	3.284	1
278			min	-1420.625	3	92.89	15	-314.858	5	-.001	3	-.054	1	.376	15
279		7	max	1649.658	1	810.657	1	196.697	2	.002	2	.899	4	3.031	1
280			min	-1422.753	3	92.89	15	-312.398	5	-.001	3	-.058	3	.347	15
281		8	max	1646.82	1	810.657	1	196.697	2	.002	2	.809	4	2.779	1
282			min	-1424.881	3	92.89	15	-309.939	5	-.001	3	-.143	3	.318	15
283		9	max	1643.983	1	810.657	1	196.697	2	.002	2	.72	4	2.526	1
284			min	-1427.009	3	92.89	15	-307.48	5	-.001	3	-.227	3	.289	15
285		10	max	1641.146	1	810.657	1	196.697	2	.002	2	.631	4	2.273	1
286			min	-1429.138	3	92.89	15	-305.021	5	-.001	3	-.311	3	.261	15
287		11	max	1638.308	1	810.657	1	196.697	2	.002	2	.543	4	2.021	1
288			min	-1431.266	3	92.89	15	-302.562	5	-.001	3	-.395	3	.232	15
289		12	max	1635.471	1	810.657	1	196.697	2	.002	2	.456	4	1.768	1
290			min	-1433.394	3	92.89	15	-300.103	5	-.001	3	-.479	3	.203	15
291		13	max	1632.633	1	810.657	1	196.697	2	.002	2	.39	2	1.516	1
292			min	-1435.522	3	92.89	15	-297.644	5	-.001	3	-.564	3	.174	15
293		14	max	1629.796	1	810.657	1	196.697	2	.002	2	.451	2	1.263	1
294			min	-1437.65	3	92.89	15	-295.185	5	-.001	3	-.648	3	.145	15
295		15	max	1626.958	1	810.657	1	196.697	2	.002	2	.513	2	1.01	1
296			min	-1439.778	3	92.89	15	-292.726	5	-.001	3	-.732	3	.116	15
297		16	max	1624.121	1	810.657	1	196.697	2	.002	2	.574	2	.758	1
298			min	-1441.906	3	92.89	15	-290.266	5	-.001	3	-.816	3	.087	15
299		17	max	1621.283	1	810.657	1	196.697	2	.002	2	.635	2	.505	1
300			min	-1444.034	3	92.89	15	-287.807	5	-.001	3	-.9	3	.058	15
301		18	max	1618.446	1	810.657	1	196.697	2	.002	2	.696	2	.253	1
302			min	-1446.162	3	92.89	15	-285.348	5	-.001	3	-.985	3	.029	15
303		19	max	1615.609	1	810.657	1	196.697	2	.002	2	.758	2	0	1
304			min	-1448.29	3	92.89	15	-282.889	5	-.001	3	-1.069	3	0	1
305	M5	1	max	6410.208	2	3026.922	3	0	1	.021	4	1.59	4	7.623	3
306			min	-5127.447	3	-2944.533	2	-379.796	5	0	1	0	1	.327	15
307		2	max	6407.37	2	3026.922	3	0	1	.021	4	1.472	4	7.97	1
308			min	-5129.575	3	-2944.533	2	-377.337	5	0	1	0	1	.332	15
309		3	max	4349.804	1	1574.829	1	0	1	0	1	1.348	4	7.852	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	-4171.894	3	64.264	15	-353.484	4	0	4	0	1	.32	15
311		4	max	4346.967	1	1574.829	1	0	1	0	1	1.238	4	7.361	1
312			min	-4174.022	3	64.264	15	-351.025	4	0	4	0	1	.3	15
313		5	max	4344.129	1	1574.829	1	0	1	0	1	1.129	4	6.87	1
314			min	-4176.15	3	64.264	15	-348.565	4	0	4	0	1	.28	15
315		6	max	4341.292	1	1574.829	1	0	1	0	1	1.021	4	6.379	1
316			min	-4178.278	3	64.264	15	-346.106	4	0	4	0	1	.26	15
317		7	max	4338.455	1	1574.829	1	0	1	0	1	.913	4	5.889	1
318			min	-4180.406	3	64.264	15	-343.647	4	0	4	0	1	.24	15
319		8	max	4335.617	1	1574.829	1	0	1	0	1	.807	4	5.398	1
320			min	-4182.534	3	64.264	15	-341.188	4	0	4	0	1	.22	15
321		9	max	4332.78	1	1574.829	1	0	1	0	1	.701	4	4.907	1
322			min	-4184.662	3	64.264	15	-338.729	4	0	4	0	1	.2	15
323		10	max	4329.942	1	1574.829	1	0	1	0	1	.595	4	4.417	1
324			min	-4186.79	3	64.264	15	-336.27	4	0	4	0	1	.18	15
325		11	max	4327.105	1	1574.829	1	0	1	0	1	.491	4	3.926	1
326			min	-4188.918	3	64.264	15	-333.811	4	0	4	0	1	.16	15
327		12	max	4324.267	1	1574.829	1	0	1	0	1	.387	4	3.435	1
328			min	-4191.046	3	64.264	15	-331.352	4	0	4	0	1	.14	15
329		13	max	4321.43	1	1574.829	1	0	1	0	1	.285	4	2.944	1
330			min	-4193.174	3	64.264	15	-328.893	4	0	4	0	1	.12	15
331		14	max	4318.593	1	1574.829	1	0	1	0	1	.182	4	2.454	1
332			min	-4195.303	3	64.264	15	-326.433	4	0	4	0	1	.1	15
333		15	max	4315.755	1	1574.829	1	0	1	0	1	.081	4	1.963	1
334			min	-4197.431	3	64.264	15	-323.974	4	0	4	0	1	.08	15
335		16	max	4312.918	1	1574.829	1	0	1	0	1	0	1	1.472	1
336			min	-4199.559	3	64.264	15	-321.515	4	0	4	-.02	5	.06	15
337		17	max	4310.08	1	1574.829	1	0	1	0	1	0	1	.981	1
338			min	-4201.687	3	64.264	15	-319.056	4	0	4	-.119	4	.04	15
339		18	max	4307.243	1	1574.829	1	0	1	0	1	0	1	.491	1
340			min	-4203.815	3	64.264	15	-316.597	4	0	4	-.218	4	.02	15
341		19	max	4304.405	1	1574.829	1	0	1	0	1	0	1	0	1
342			min	-4205.943	3	64.264	15	-314.138	4	0	4	-.317	4	0	1
343	M8	1	max	2301.191	2	1125.51	3	306.462	3	.023	4	1.609	4	4.07	1
344			min	-1685.514	3	-857.045	2	-402.786	4	-.009	3	-.451	3	-.167	5
345		2	max	2298.354	2	1125.51	3	306.462	3	.023	4	1.484	4	4.167	1
346			min	-1687.642	3	-857.045	2	-400.327	4	-.009	3	-.356	3	-.141	5
347		3	max	1661.008	1	810.657	1	270.191	3	.001	3	1.355	4	4.042	1
348			min	-1414.241	3	-25.352	5	-365.751	4	-.002	2	-.278	3	-.126	5
349		4	max	1658.17	1	810.657	1	270.191	3	.001	3	1.241	4	3.789	1
350			min	-1416.369	3	-25.352	5	-363.292	4	-.002	2	-.194	3	-.118	5
351		5	max	1655.333	1	810.657	1	270.191	3	.001	3	1.128	4	3.536	1
352			min	-1418.497	3	-25.352	5	-360.833	4	-.002	2	-.11	3	-.111	5
353		6	max	1652.495	1	810.657	1	270.191	3	.001	3	1.016	4	3.284	1
354			min	-1420.625	3	-25.352	5	-358.374	4	-.002	2	-.026	3	-.103	5
355		7	max	1649.658	1	810.657	1	270.191	3	.001	3	.905	4	3.031	1
356			min	-1422.753	3	-25.352	5	-355.915	4	-.002	2	-.022	2	-.095	5
357		8	max	1646.82	1	810.657	1	270.191	3	.001	3	.794	4	2.779	1
358			min	-1424.881	3	-25.352	5	-353.456	4	-.002	2	-.084	2	-.087	5
359		9	max	1643.983	1	810.657	1	270.191	3	.001	3	.691	5	2.526	1
360			min	-1427.009	3	-25.352	5	-350.997	4	-.002	2	-.145	2	-.079	5
361		10	max	1641.146	1	810.657	1	270.191	3	.001	3	.591	5	2.273	1
362			min	-1429.138	3	-25.352	5	-348.538	4	-.002	2	-.206	2	-.071	5
363		11	max	1638.308	1	810.657	1	270.191	3	.001	3	.491	5	2.021	1
364			min	-1431.266	3	-25.352	5	-346.079	4	-.002	2	-.267	2	-.063	5
365		12	max	1635.471	1	810.657	1	270.191	3	.001	3	.479	3	1.768	1
366			min	-1433.394	3	-25.352	5	-343.619	4	-.002	2	-.329	2	-.055	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	1632.633	1	810.657	1	270.191	3	.001	3	.564	3	1.516	1
368			min	-1435.522	3	-25.352	5	-341.16	4	-.002	2	-.39	2	-.047	5
369		14	max	1629.796	1	810.657	1	270.191	3	.001	3	.648	3	1.263	1
370			min	-1437.65	3	-25.352	5	-338.701	4	-.002	2	-.451	2	-.039	5
371		15	max	1626.958	1	810.657	1	270.191	3	.001	3	.732	3	1.01	1
372			min	-1439.778	3	-25.352	5	-336.242	4	-.002	2	-.513	2	-.032	5
373		16	max	1624.121	1	810.657	1	270.191	3	.001	3	.816	3	.758	1
374			min	-1441.906	3	-25.352	5	-333.783	4	-.002	2	-.574	2	-.024	5
375		17	max	1621.283	1	810.657	1	270.191	3	.001	3	.9	3	.505	1
376			min	-1444.034	3	-25.352	5	-331.324	4	-.002	2	-.635	2	-.016	5
377		18	max	1618.446	1	810.657	1	270.191	3	.001	3	.985	3	.253	1
378			min	-1446.162	3	-25.352	5	-328.865	4	-.002	2	-.696	2	-.008	5
379		19	max	1615.609	1	810.657	1	270.191	3	.001	3	1.069	3	0	1
380			min	-1448.29	3	-25.352	5	-326.406	4	-.002	2	-.758	2	0	1
381	M3	1	max	1561.386	2	4.384	4	77.893	2	.014	3	.025	5	0	1
382			min	-581.186	3	1.031	15	-36.758	3	-.026	2	-.009	2	0	1
383		2	max	1561.178	2	3.897	4	77.893	2	.014	3	.02	4	0	15
384			min	-581.342	3	.916	15	-36.758	3	-.026	2	-.007	3	-.001	4
385		3	max	1560.97	2	3.41	4	77.893	2	.014	3	.037	2	0	15
386			min	-581.498	3	.802	15	-36.758	3	-.026	2	-.018	3	-.002	4
387		4	max	1560.762	2	2.923	4	77.893	2	.014	3	.059	2	0	15
388			min	-581.654	3	.687	15	-36.758	3	-.026	2	-.029	3	-.003	4
389		5	max	1560.554	2	2.436	4	77.893	2	.014	3	.082	2	0	15
390			min	-581.81	3	.573	15	-36.758	3	-.026	2	-.039	3	-.004	4
391		6	max	1560.346	2	1.949	4	77.893	2	.014	3	.105	2	-.001	15
392			min	-581.966	3	.458	15	-36.758	3	-.026	2	-.05	3	-.005	4
393		7	max	1560.137	2	1.461	4	77.893	2	.014	3	.128	2	-.001	15
394			min	-582.123	3	.344	15	-36.758	3	-.026	2	-.061	3	-.005	4
395		8	max	1559.929	2	.974	4	77.893	2	.014	3	.15	2	-.001	15
396			min	-582.279	3	.229	15	-36.758	3	-.026	2	-.071	3	-.005	4
397		9	max	1559.721	2	.487	4	77.893	2	.014	3	.173	2	-.001	15
398			min	-582.435	3	.115	15	-36.758	3	-.026	2	-.082	3	-.006	4
399		10	max	1559.513	2	0	1	77.893	2	.014	3	.196	2	-.001	15
400			min	-582.591	3	0	1	-36.758	3	-.026	2	-.093	3	-.006	4
401		11	max	1559.305	2	-.115	15	77.893	2	.014	3	.218	2	-.001	15
402			min	-582.747	3	-.487	6	-36.758	3	-.026	2	-.104	3	-.006	4
403		12	max	1559.097	2	-.229	15	77.893	2	.014	3	.241	2	-.001	15
404			min	-582.903	3	-.974	6	-36.758	3	-.026	2	-.114	3	-.005	4
405		13	max	1558.889	2	-.344	15	77.893	2	.014	3	.264	2	-.001	15
406			min	-583.059	3	-1.461	6	-36.758	3	-.026	2	-.125	3	-.005	4
407		14	max	1558.681	2	-.458	15	77.893	2	.014	3	.287	2	-.001	15
408			min	-583.215	3	-1.949	6	-36.758	3	-.026	2	-.136	3	-.005	4
409		15	max	1558.473	2	-.573	15	77.893	2	.014	3	.309	2	0	15
410			min	-583.371	3	-2.436	6	-36.758	3	-.026	2	-.147	3	-.004	4
411		16	max	1558.265	2	-.687	15	77.893	2	.014	3	.332	2	0	15
412			min	-583.527	3	-2.923	6	-36.758	3	-.026	2	-.157	3	-.003	4
413		17	max	1558.057	2	-.802	15	77.893	2	.014	3	.355	2	0	15
414			min	-583.683	3	-3.41	6	-36.758	3	-.026	2	-.168	3	-.002	4
415		18	max	1557.849	2	-.916	15	77.893	2	.014	3	.378	2	0	15
416			min	-583.839	3	-3.897	6	-36.758	3	-.026	2	-.179	3	-.001	4
417		19	max	1557.641	2	-1.031	15	77.893	2	.014	3	.4	2	0	1
418			min	-583.995	3	-4.384	6	-36.758	3	-.026	2	-.189	3	0	1
419	M6	1	max	4589.239	2	4.384	6	0	1	0	5	.025	4	0	1
420			min	-2024.194	3	1.031	15	-26.374	4	0	1	0	1	0	1
421		2	max	4589.031	2	3.897	6	0	1	0	5	.018	4	0	15
422			min	-2024.35	3	.916	15	-25.999	4	0	1	0	1	-.001	6
423		3	max	4588.823	2	3.41	6	0	1	0	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	-2024.506	3	.802	15	-25.624	4	0	1	0	1	-.002	6
425		4	max	4588.614	2	2.923	6	0	1	0	5	.003	4	0	15
426			min	-2024.663	3	.687	15	-25.249	4	0	1	0	1	-.003	6
427		5	max	4588.406	2	2.436	6	0	1	0	5	0	1	0	15
428			min	-2024.819	3	.573	15	-24.874	4	0	1	-.005	4	-.004	6
429		6	max	4588.198	2	1.949	6	0	1	0	5	0	1	-.001	15
430			min	-2024.975	3	.458	15	-24.499	4	0	1	-.012	4	-.005	6
431		7	max	4587.99	2	1.461	6	0	1	0	5	0	1	-.001	15
432			min	-2025.131	3	.344	15	-24.124	4	0	1	-.019	4	-.005	6
433		8	max	4587.782	2	.974	6	0	1	0	5	0	1	-.001	15
434			min	-2025.287	3	.229	15	-23.748	4	0	1	-.026	4	-.005	6
435		9	max	4587.574	2	.487	6	0	1	0	5	0	1	-.001	15
436			min	-2025.443	3	.115	15	-23.373	4	0	1	-.033	4	-.006	6
437		10	max	4587.366	2	0	1	0	1	0	5	0	1	-.001	15
438			min	-2025.599	3	0	1	-22.998	4	0	1	-.04	4	-.006	6
439		11	max	4587.158	2	-.115	15	0	1	0	5	0	1	-.001	15
440			min	-2025.755	3	-.487	4	-22.623	4	0	1	-.046	4	-.006	6
441		12	max	4586.95	2	-.229	15	0	1	0	5	0	1	-.001	15
442			min	-2025.911	3	-.974	4	-22.248	4	0	1	-.053	4	-.005	6
443		13	max	4586.742	2	-.344	15	0	1	0	5	0	1	-.001	15
444			min	-2026.067	3	-1.461	4	-21.873	4	0	1	-.059	4	-.005	6
445		14	max	4586.534	2	-.458	15	0	1	0	5	0	1	-.001	15
446			min	-2026.223	3	-1.949	4	-21.497	4	0	1	-.066	4	-.005	6
447		15	max	4586.326	2	-.573	15	0	1	0	5	0	1	0	15
448			min	-2026.379	3	-2.436	4	-21.122	4	0	1	-.072	4	-.004	6
449		16	max	4586.118	2	-.687	15	0	1	0	5	0	1	0	15
450			min	-2026.535	3	-2.923	4	-20.747	4	0	1	-.078	4	-.003	6
451		17	max	4585.91	2	-.802	15	0	1	0	5	0	1	0	15
452			min	-2026.691	3	-3.41	4	-20.372	4	0	1	-.084	4	-.002	6
453		18	max	4585.702	2	-.916	15	0	1	0	5	0	1	0	15
454			min	-2026.847	3	-3.897	4	-19.997	4	0	1	-.09	4	-.001	6
455		19	max	4585.493	2	-1.031	15	0	1	0	5	0	1	0	1
456			min	-2027.003	3	-4.384	4	-19.622	4	0	1	-.096	4	0	1
457	M9	1	max	1561.386	2	4.384	6	36.758	3	.026	2	.027	4	0	1
458			min	-581.186	3	1.031	15	-77.893	2	-.014	3	-.004	3	0	1
459		2	max	1561.178	2	3.897	6	36.758	3	.026	2	.018	5	0	15
460			min	-581.342	3	.916	15	-77.893	2	-.014	3	-.014	2	-.001	6
461		3	max	1560.97	2	3.41	6	36.758	3	.026	2	.018	3	0	15
462			min	-581.498	3	.802	15	-77.893	2	-.014	3	-.037	2	-.002	6
463		4	max	1560.762	2	2.923	6	36.758	3	.026	2	.029	3	0	15
464			min	-581.654	3	.687	15	-77.893	2	-.014	3	-.059	2	-.003	6
465		5	max	1560.554	2	2.436	6	36.758	3	.026	2	.039	3	0	15
466			min	-581.81	3	.573	15	-77.893	2	-.014	3	-.082	2	-.004	6
467		6	max	1560.346	2	1.949	6	36.758	3	.026	2	.05	3	-.001	15
468			min	-581.966	3	.458	15	-77.893	2	-.014	3	-.105	2	-.005	6
469		7	max	1560.137	2	1.461	6	36.758	3	.026	2	.061	3	-.001	15
470			min	-582.123	3	.344	15	-77.893	2	-.014	3	-.128	2	-.005	6
471		8	max	1559.929	2	.974	6	36.758	3	.026	2	.071	3	-.001	15
472			min	-582.279	3	.229	15	-77.893	2	-.014	3	-.15	2	-.005	6
473		9	max	1559.721	2	.487	6	36.758	3	.026	2	.082	3	-.001	15
474			min	-582.435	3	.115	15	-77.893	2	-.014	3	-.173	2	-.006	6
475		10	max	1559.513	2	0	1	36.758	3	.026	2	.093	3	-.001	15
476			min	-582.591	3	0	1	-77.893	2	-.014	3	-.196	2	-.006	6
477		11	max	1559.305	2	-.115	15	36.758	3	.026	2	.104	3	-.001	15
478			min	-582.747	3	-.487	4	-77.893	2	-.014	3	-.218	2	-.006	6
479		12	max	1559.097	2	-.229	15	36.758	3	.026	2	.114	3	-.001	15
480			min	-582.903	3	-.974	4	-77.893	2	-.014	3	-.241	2	-.005	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1558.889	2	-.344	15	36.758	3	.026	2	.125	3	-.001	15
482			min	-583.059	3	-1.461	4	-77.893	2	-.014	3	-.264	2	-.005	6
483		14	max	1558.681	2	-.458	15	36.758	3	.026	2	.136	3	-.001	15
484			min	-583.215	3	-1.949	4	-77.893	2	-.014	3	-.287	2	-.005	6
485		15	max	1558.473	2	-.573	15	36.758	3	.026	2	.147	3	0	15
486			min	-583.371	3	-2.436	4	-77.893	2	-.014	3	-.309	2	-.004	6
487		16	max	1558.265	2	-.687	15	36.758	3	.026	2	.157	3	0	15
488			min	-583.527	3	-2.923	4	-77.893	2	-.014	3	-.332	2	-.003	6
489		17	max	1558.057	2	-.802	15	36.758	3	.026	2	.168	3	0	15
490			min	-583.683	3	-3.41	4	-77.893	2	-.014	3	-.355	2	-.002	6
491		18	max	1557.849	2	-.916	15	36.758	3	.026	2	.179	3	0	15
492			min	-583.839	3	-3.897	4	-77.893	2	-.014	3	-.378	2	-.001	6
493		19	max	1557.641	2	-1.031	15	36.758	3	.026	2	.189	3	0	1
494			min	-583.995	3	-4.384	4	-77.893	2	-.014	3	-.4	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	-.026	15	-.032	12	.027	1	1.112e-2	3	NC	3	NC	3
2			min	-.229	1	-.499	1	-.593	5	-2.732e-2	2	248.747	1	322.302	5
3		2	max	-.026	15	-.031	15	.008	1	1.112e-2	3	NC	12	NC	3
4			min	-.229	1	-.414	1	-.568	4	-2.732e-2	2	295.584	1	344.55	5
5		3	max	-.026	15	-.027	15	0	12	1.054e-2	3	8422.623	12	NC	2
6			min	-.229	1	-.328	1	-.543	4	-2.523e-2	2	364.246	1	371.36	5
7		4	max	-.026	15	-.022	15	-.001	12	9.64e-3	3	5861.27	12	NC	1
8			min	-.228	1	-.246	1	-.512	4	-2.203e-2	2	468.996	1	408.358	5
9		5	max	-.026	15	-.018	15	0	12	8.742e-3	3	NC	10	NC	1
10			min	-.228	1	-.172	1	-.476	4	-1.882e-2	2	632.147	1	458.833	5
11		6	max	-.026	15	-.013	15	.001	3	9.048e-3	3	NC	2	NC	1
12			min	-.228	1	-.112	1	-.437	4	-1.814e-2	2	881.799	1	526.806	5
13		7	max	-.026	15	-.009	15	.002	3	1.019e-2	3	5918.566	12	NC	2
14			min	-.228	1	-.089	3	-.399	4	-1.922e-2	2	1176.854	14	615.932	5
15		8	max	-.026	15	.001	10	.001	3	1.133e-2	3	NC	11	NC	2
16			min	-.228	1	-.077	3	-.363	4	-2.029e-2	2	1413.35	14	731.965	5
17		9	max	-.026	15	.018	2	0	9	1.264e-2	3	NC	3	NC	2
18			min	-.227	1	-.061	3	-.332	4	-2.008e-2	2	1381.352	2	882.739	5
19		10	max	-.026	15	.039	1	0	2	1.424e-2	3	NC	1	NC	2
20			min	-.227	1	-.041	3	-.3	4	-1.757e-2	2	1137.378	2	1111.475	5
21		11	max	-.026	15	.069	1	.002	3	1.585e-2	3	6258.561	12	NC	2
22			min	-.226	1	-.018	3	-.27	4	-1.507e-2	2	984.314	2	1479.133	5
23		12	max	-.026	15	.096	1	.007	3	1.313e-2	3	8501.574	9	NC	2
24			min	-.226	1	.007	12	-.244	4	-1.125e-2	2	884.809	2	2114.679	5
25		13	max	-.026	15	.117	1	.013	3	7.956e-3	3	NC	9	NC	2
26			min	-.225	1	.012	15	-.218	4	-6.684e-3	2	834.89	2	3506.967	5
27		14	max	-.026	15	.128	1	.012	3	3.031e-3	3	NC	9	NC	2
28			min	-.225	1	.015	15	-.198	4	-6.049e-3	4	845.702	2	5320.215	1
29		15	max	-.026	15	.179	3	.009	1	9.01e-3	3	NC	4	NC	3
30			min	-.225	1	.018	15	-.186	5	-5.646e-3	2	589.791	3	3892.283	1
31		16	max	-.026	15	.273	3	.013	1	1.499e-2	3	NC	4	NC	3
32			min	-.225	1	.007	10	-.18	5	-8.995e-3	2	416.961	3	3541.095	1
33		17	max	-.026	15	.378	3	.008	1	2.097e-2	3	NC	4	NC	3
34			min	-.225	1	-.014	10	-.178	4	-1.234e-2	2	314.307	3	4074.259	1
35		18	max	-.026	15	.488	3	-.001	10	2.487e-2	3	NC	4	NC	2
36			min	-.225	1	-.04	2	-.181	4	-1.453e-2	2	250.23	3	7544.944	1
37		19	max	-.026	15	.597	3	-.004	12	2.487e-2	3	NC	1	NC	1
38			min	-.225	1	-.079	2	-.185	4	-1.453e-2	2	207.899	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	.021	3	0	1	1.46e-4	4	NC	3	NC	1
40			min	-.444	1	-1.126	1	-.59	4	0	1	130.715	1	323.918	4
41		2	max	-.018	15	-.026	12	0	1	1.46e-4	4	4134.373	12	NC	1
42			min	-.444	1	-.923	1	-.568	4	0	1	162.964	1	342.199	4
43		3	max	-.018	15	-.024	15	0	1	0	1	4861.347	15	NC	1
44			min	-.444	1	-.72	1	-.544	4	-1.977e-4	4	216.523	1	364.587	4
45		4	max	-.018	15	-.019	15	0	1	0	1	6158.083	15	NC	1
46			min	-.444	1	-.525	1	-.513	4	-7.249e-4	4	316.174	1	398.551	4
47		5	max	-.018	15	-.013	15	0	1	0	1	NC	2	NC	1
48			min	-.444	1	-.353	1	-.476	4	-1.252e-3	4	532.253	1	447.442	4
49		6	max	-.018	15	-.009	15	0	1	0	1	NC	15	NC	1
50			min	-.443	1	-.219	1	-.437	4	-1.196e-3	4	626.668	3	515.244	4
51		7	max	-.018	15	-.006	15	0	1	0	1	NC	15	NC	1
52			min	-.442	1	-.185	3	-.398	4	-7.367e-4	4	597.689	2	604.807	4
53		8	max	-.018	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.441	1	-.162	3	-.363	4	-2.773e-4	4	476.144	2	719.583	4
55		9	max	-.018	15	.038	2	0	1	0	1	NC	5	NC	1
56			min	-.44	1	-.13	3	-.332	4	-5.264e-5	4	409.084	2	862.116	4
57		10	max	-.018	15	.082	1	0	1	0	1	NC	4	NC	1
58			min	-.439	1	-.093	3	-.3	4	-2.431e-4	4	360.023	2	1082.312	4
59		11	max	-.018	15	.142	1	0	1	0	1	NC	5	NC	1
60			min	-.438	1	-.047	3	-.27	4	-4.335e-4	4	324.517	2	1431.567	4
61		12	max	-.018	15	.196	1	0	1	0	1	NC	3	NC	1
62			min	-.437	1	.006	12	-.244	4	-1.737e-3	4	298.925	2	1986.699	4
63		13	max	-.018	15	.235	1	0	1	0	1	NC	5	NC	1
64			min	-.436	1	.009	15	-.219	4	-3.669e-3	4	285.996	2	3117.95	4
65		14	max	-.018	15	.245	1	0	1	0	1	NC	5	NC	1
66			min	-.435	1	.01	15	-.201	4	-5.529e-3	4	291.987	2	5403.21	4
67		15	max	-.018	15	.389	3	0	1	0	1	NC	5	NC	1
68			min	-.435	1	.01	15	-.191	4	-4.155e-3	4	329.361	2	9347.13	4
69		16	max	-.018	15	.615	3	0	1	0	1	NC	5	NC	1
70			min	-.435	1	-.002	10	-.184	4	-2.782e-3	4	225.487	3	NC	1
71		17	max	-.018	15	.869	3	0	1	0	1	NC	5	NC	1
72			min	-.435	1	-.07	2	-.181	4	-1.408e-3	4	158.005	3	NC	1
73		18	max	-.018	15	1.133	3	0	1	0	1	NC	4	NC	1
74			min	-.435	1	-.18	2	-.179	4	-5.128e-4	4	120.519	3	NC	1
75		19	max	-.018	15	1.396	3	0	1	0	1	NC	1	NC	1
76			min	-.435	1	-.29	2	-.176	4	-5.128e-4	4	97.456	3	NC	1
77	M7	1	max	.007	5	-.001	15	-.003	12	2.732e-2	2	NC	3	NC	3
78			min	-.229	1	-.499	1	-.606	4	-1.112e-2	3	248.747	1	307.19	4
79		2	max	.007	5	0	15	0	12	2.732e-2	2	NC	5	NC	3
80			min	-.229	1	-.414	1	-.573	4	-1.112e-2	3	295.584	1	332.921	4
81		3	max	.007	5	0	15	.008	1	2.523e-2	2	NC	5	NC	2
82			min	-.229	1	-.328	1	-.539	4	-1.054e-2	3	364.246	1	363.642	4
83		4	max	.007	5	.002	5	.015	1	2.203e-2	2	NC	5	NC	1
84			min	-.228	1	-.246	1	-.504	5	-9.64e-3	3	468.996	1	402.013	4
85		5	max	.007	5	.003	5	.016	1	1.882e-2	2	NC	5	NC	1
86			min	-.228	1	-.172	1	-.468	5	-8.742e-3	3	632.147	1	450.897	4
87		6	max	.007	5	.004	5	.013	1	1.814e-2	2	NC	2	NC	1
88			min	-.228	1	-.112	1	-.431	4	-9.048e-3	3	881.799	1	513.73	4
89		7	max	.007	5	.004	5	.006	1	1.922e-2	2	NC	4	NC	2
90			min	-.228	1	-.089	3	-.396	4	-1.019e-2	3	1243.491	9	592.503	4
91		8	max	.007	5	.003	5	.002	2	2.029e-2	2	NC	4	NC	2
92			min	-.228	1	-.077	3	-.363	4	-1.133e-2	3	1538.64	9	693.77	4
93		9	max	.007	5	.018	2	0	3	2.008e-2	2	NC	3	NC	2
94			min	-.227	1	-.061	3	-.332	4	-1.264e-2	3	1381.352	2	829.669	4
95		10	max	.007	5	.039	1	0	3	1.757e-2	2	NC	1	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.227	1	-.041	3	-.3	4	-1.424e-2	3	1137.378	2	1028.596	4
97		11	max	.007	5	.069	1	.001	2	1.507e-2	2	NC	5	NC	2
98			min	-.226	1	-.018	3	-.27	4	-1.585e-2	3	984.314	2	1341.172	4
99		12	max	.007	5	.096	1	.007	1	1.125e-2	2	NC	5	NC	2
100			min	-.226	1	0	15	-.241	4	-1.313e-2	3	884.809	2	1884.431	4
101		13	max	.007	5	.117	1	.008	2	6.684e-3	2	NC	5	NC	2
102			min	-.225	1	-.002	5	-.216	4	-7.956e-3	3	834.89	2	2901.186	4
103		14	max	.007	5	.128	1	.004	2	2.296e-3	2	NC	5	NC	2
104			min	-.225	1	-.004	5	-.2	4	-5.477e-3	5	845.702	2	4528.649	4
105		15	max	.007	5	.179	3	0	10	5.646e-3	2	NC	5	NC	3
106			min	-.225	1	-.008	5	-.191	4	-9.01e-3	3	589.791	3	3892.283	1
107		16	max	.007	5	.273	3	-.002	10	8.995e-3	2	NC	5	NC	3
108			min	-.225	1	-.012	5	-.187	4	-1.499e-2	3	416.961	3	3541.095	1
109		17	max	.007	5	.378	3	0	12	1.234e-2	2	NC	4	NC	3
110			min	-.225	1	-.017	5	-.182	4	-2.097e-2	3	314.307	3	4074.259	1
111		18	max	.007	5	.488	3	.007	1	1.453e-2	2	NC	4	NC	2
112			min	-.225	1	-.04	2	-.177	4	-2.487e-2	3	250.23	3	7544.944	1
113		19	max	.007	5	.597	3	.025	1	1.453e-2	2	NC	1	NC	1
114			min	-.225	1	-.079	2	-.174	5	-2.487e-2	3	207.899	3	NC	1
115	M10	1	max	.001	1	.45	3	.225	1	1.465e-2	3	NC	1	NC	1
116			min	-.179	4	-.029	10	-.007	5	-5.154e-3	2	NC	1	NC	1
117		2	max	.001	1	.81	3	.289	1	1.695e-2	3	NC	4	NC	3
118			min	-.179	4	-.236	2	0	15	-6.221e-3	2	699.984	3	3976.517	1
119		3	max	0	1	1.144	3	.383	1	1.925e-2	3	NC	5	NC	5
120			min	-.179	4	-.423	2	.005	15	-7.288e-3	2	362.942	3	1593.908	1
121		4	max	0	1	1.396	3	.475	1	2.155e-2	3	NC	5	NC	5
122			min	-.179	4	-.551	2	.01	15	-8.354e-3	2	266.405	3	1009.142	1
123		5	max	0	1	1.532	3	.54	1	2.385e-2	3	NC	5	NC	5
124			min	-.179	4	-.602	2	.014	15	-9.421e-3	2	232.875	3	800.235	1
125		6	max	0	1	1.544	3	.567	1	2.615e-2	3	NC	5	NC	5
126			min	-.179	4	-.571	2	.017	15	-1.049e-2	2	230.226	3	737.861	1
127		7	max	0	1	1.449	3	.554	1	2.845e-2	3	NC	5	NC	5
128			min	-.179	4	-.471	2	.017	15	-1.155e-2	2	252.186	3	766.903	1
129		8	max	0	1	1.286	3	.511	1	3.075e-2	3	NC	4	NC	5
130			min	-.179	4	-.333	2	.017	15	-1.262e-2	2	301.246	3	880.231	1
131		9	max	0	1	1.121	3	.461	1	3.304e-2	3	NC	4	NC	5
132			min	-.179	4	-.202	2	.017	15	-1.369e-2	2	375.544	3	1068.002	1
133		10	max	0	1	1.041	3	.435	1	3.534e-2	3	NC	9	NC	5
134			min	-.179	4	-.142	2	.018	15	-1.475e-2	2	425.838	3	1199.431	1
135		11	max	0	10	1.121	3	.461	1	3.304e-2	3	NC	4	NC	5
136			min	-.179	4	-.202	2	.022	15	-1.369e-2	2	375.544	3	1068.002	1
137		12	max	0	10	1.286	3	.511	1	3.075e-2	3	NC	4	NC	5
138			min	-.179	4	-.333	2	.027	15	-1.262e-2	2	301.246	3	880.231	1
139		13	max	0	10	1.449	3	.554	1	2.845e-2	3	NC	5	NC	5
140			min	-.179	4	-.471	2	.031	15	-1.155e-2	2	252.186	3	766.903	1
141		14	max	0	10	1.544	3	.567	1	2.615e-2	3	NC	5	NC	5
142			min	-.179	4	-.571	2	.033	15	-1.049e-2	2	230.226	3	737.861	1
143		15	max	0	10	1.532	3	.54	1	2.385e-2	3	NC	5	NC	5
144			min	-.179	4	-.602	2	.034	15	-9.421e-3	2	232.875	3	800.235	1
145		16	max	0	10	1.396	3	.475	1	2.155e-2	3	NC	5	NC	5
146			min	-.18	4	-.551	2	.033	15	-8.354e-3	2	266.405	3	1009.142	1
147		17	max	0	10	1.144	3	.383	1	1.925e-2	3	NC	5	NC	5
148			min	-.18	4	-.423	2	.03	15	-7.288e-3	2	362.942	3	1593.908	1
149		18	max	0	10	.81	3	.289	1	1.695e-2	3	NC	4	NC	3
150			min	-.18	4	-.236	2	.027	15	-6.221e-3	2	699.984	3	3976.517	1
151		19	max	0	10	.45	3	.225	1	1.465e-2	3	NC	1	NC	1
152			min	-.18	4	-.029	10	.026	15	-5.154e-3	2	4296.362	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	.003	1	.079	1	.226	1	3.707e-3	3	NC	1	NC	1
154			min	-.259	4	-.008	3	-.007	5	-1.502e-4	5	NC	1	NC	1
155		2	max	.003	1	.238	3	.274	1	4.104e-3	3	NC	4	NC	3
156			min	-.259	4	-.135	2	.021	15	-8.064e-5	5	1025.766	3	5283.405	1
157		3	max	.002	1	.466	3	.36	1	4.501e-3	3	NC	5	NC	3
158			min	-.26	4	-.302	2	.033	15	-1.582e-5	15	531.488	3	1877.681	1
159		4	max	.002	1	.622	3	.45	1	4.898e-3	3	NC	5	8944.243	12
160			min	-.26	4	-.405	2	.033	15	3.038e-5	15	400.185	3	1127.196	1
161		5	max	.002	1	.673	3	.517	1	5.295e-3	3	NC	5	NC	15
162			min	-.26	4	-.427	2	.025	15	7.659e-5	15	370.037	3	866.112	1
163		6	max	.001	1	.613	3	.549	1	5.692e-3	3	NC	5	NC	5
164			min	-.26	4	-.366	2	.012	15	1.228e-4	15	405.779	3	780.816	1
165		7	max	.001	1	.459	3	.543	1	6.094e-3	1	NC	5	NC	5
166			min	-.26	4	-.238	2	0	15	1.69e-4	15	539.533	3	796.374	1
167		8	max	0	1	.253	3	.507	1	6.497e-3	1	NC	4	NC	5
168			min	-.26	4	-.077	2	-.009	5	2.152e-4	15	966.284	3	897.683	1
169		9	max	0	1	.099	1	.462	1	6.9e-3	1	NC	1	NC	5
170			min	-.26	4	.002	15	-.003	5	2.614e-4	15	3695.703	3	1070.287	1
171		10	max	0	1	.162	1	.438	1	7.303e-3	1	NC	3	NC	5
172			min	-.26	4	-.028	3	.018	15	3.076e-4	15	3035.966	1	1190.769	1
173		11	max	0	3	.099	1	.462	1	6.9e-3	1	NC	1	8613.384	15
174			min	-.26	4	.006	15	.041	15	3.247e-4	15	3695.703	3	1070.287	1
175		12	max	0	3	.253	3	.507	1	6.497e-3	1	NC	4	6969.096	15
176			min	-.26	4	-.077	2	.05	15	3.419e-4	15	966.284	3	897.683	1
177		13	max	.001	3	.459	3	.543	1	6.094e-3	1	NC	5	8025.079	15
178			min	-.26	4	-.238	2	.047	15	3.59e-4	15	539.533	3	796.374	1
179		14	max	.002	3	.613	3	.549	1	5.692e-3	3	NC	15	NC	15
180			min	-.26	4	-.366	2	.036	15	3.761e-4	15	405.779	3	780.816	1
181		15	max	.002	3	.673	3	.517	1	5.295e-3	3	9518.082	15	NC	5
182			min	-.26	4	-.427	2	.021	15	3.933e-4	15	370.037	3	866.112	1
183		16	max	.002	3	.622	3	.45	1	4.898e-3	3	8752.13	15	NC	5
184			min	-.26	4	-.405	2	.007	15	4.104e-4	15	400.185	3	1127.196	1
185		17	max	.003	3	.466	3	.36	1	4.501e-3	3	9811.403	15	NC	3
186			min	-.261	4	-.302	2	0	15	4.275e-4	15	531.488	3	1877.681	1
187		18	max	.003	3	.238	3	.274	1	4.104e-3	3	NC	5	NC	3
188			min	-.261	4	-.135	2	.004	15	4.447e-4	15	1025.766	3	5283.405	1
189		19	max	.004	3	.079	1	.226	1	3.707e-3	3	NC	1	NC	1
190			min	-.261	4	-.008	3	.026	15	4.618e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.01	2	.227	1	4.558e-3	1	NC	1	NC	1
192			min	-.343	4	-.067	3	-.007	5	-1.029e-4	5	NC	1	NC	1
193		2	max	0	2	.094	3	.267	1	5.029e-3	1	NC	5	NC	2
194			min	-.343	4	-.286	2	.024	15	-2.965e-5	5	851.86	2	5028.433	4
195		3	max	0	2	.22	3	.35	1	5.5e-3	1	NC	5	NC	10
196			min	-.343	4	-.541	2	.036	15	1.954e-5	15	457.37	2	2052.425	1
197		4	max	0	2	.291	3	.438	1	5.971e-3	1	NC	5	7190.356	15
198			min	-.343	4	-.705	2	.035	15	6.809e-5	15	352.54	2	1193.344	1
199		5	max	0	2	.298	3	.507	1	6.442e-3	1	NC	5	NC	15
200			min	-.343	4	-.751	2	.025	15	1.166e-4	15	331.208	2	900.72	1
201		6	max	0	2	.244	3	.542	1	6.913e-3	1	NC	5	NC	5
202			min	-.343	4	-.677	2	.01	15	1.652e-4	15	366.927	2	802.005	1
203		7	max	0	2	.143	3	.539	1	7.384e-3	1	NC	5	NC	5
204			min	-.343	4	-.504	2	-.004	5	2.137e-4	15	489.82	2	809.613	1
205		8	max	0	2	.018	3	.506	1	7.855e-3	1	NC	5	NC	7
206			min	-.343	4	-.28	2	-.016	5	2.623e-4	15	869.12	2	903.677	1
207		9	max	0	2	-.002	15	.463	1	8.326e-3	1	NC	4	NC	4
208			min	-.343	4	-.092	3	-.008	5	3.108e-4	15	3021.321	2	1067.244	1
209		10	max	0	1	.021	2	.441	1	8.797e-3	1	NC	1	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	-.343	4	-.142	3	.018	15	3.594e-4	15	3351.812	3	1181.357	1
211		11	max	0	9	-.004	15	.463	1	8.326e-3	1	NC	4	7714.92	15
212			min	-.343	4	-.092	3	.045	15	3.738e-4	15	3021.321	2	1067.244	1
213		12	max	0	9	.018	3	.506	1	7.855e-3	1	NC	5	6222.941	15
214			min	-.343	4	-.28	2	.054	15	3.882e-4	15	869.12	2	903.677	1
215		13	max	0	9	.143	3	.539	1	7.384e-3	1	NC	5	7217.32	15
216			min	-.343	4	-.504	2	.051	15	4.027e-4	15	489.82	2	809.613	1
217		14	max	0	9	.244	3	.542	1	6.913e-3	1	NC	15	NC	15
218			min	-.343	4	-.677	2	.038	15	4.171e-4	15	366.927	2	802.005	1
219		15	max	0	9	.298	3	.507	1	6.442e-3	1	9930.96	15	NC	5
220			min	-.343	4	-.751	2	.021	15	4.315e-4	15	331.208	2	900.72	1
221		16	max	0	9	.291	3	.438	1	5.971e-3	1	9934.907	15	NC	4
222			min	-.343	4	-.705	2	.005	15	4.46e-4	15	352.54	2	1193.344	1
223		17	max	0	9	.22	3	.35	1	5.5e-3	1	NC	15	NC	4
224			min	-.343	4	-.541	2	-.005	5	4.604e-4	15	457.37	2	2052.425	1
225		18	max	0	9	.094	3	.267	1	5.029e-3	1	NC	5	NC	2
226			min	-.343	4	-.286	2	0	15	4.748e-4	15	851.86	2	6275.797	1
227		19	max	0	9	.01	2	.227	1	4.558e-3	1	NC	1	NC	1
228			min	-.343	4	-.067	3	.026	15	4.893e-4	15	NC	1	NC	1
229	M13	1	max	0	12	0	15	.229	1	1.147e-2	1	NC	1	NC	1
230			min	-.561	4	-.384	1	-.007	5	-1.865e-3	3	NC	1	NC	1
231		2	max	0	12	.086	3	.294	1	1.33e-2	2	NC	5	NC	3
232			min	-.561	4	-.711	2	.024	15	-2.487e-3	3	658.416	2	3852.868	1
233		3	max	0	12	.215	3	.39	1	1.526e-2	2	NC	5	NC	12
234			min	-.561	4	-1.049	2	.037	15	-3.11e-3	3	349.999	2	1559.384	1
235		4	max	0	12	.296	3	.483	1	1.722e-2	2	NC	5	6479.572	15
236			min	-.561	4	-1.288	2	.039	15	-3.733e-3	3	262.581	2	991.33	1
237		5	max	0	12	.319	3	.549	1	1.918e-2	2	NC	5	8429.128	15
238			min	-.561	4	-1.403	2	.032	15	-4.356e-3	3	234.657	2	787.527	1
239		6	max	0	12	.282	3	.576	1	2.114e-2	2	NC	15	NC	5
240			min	-.561	4	-1.388	2	.019	15	-4.978e-3	3	237.99	2	726.437	1
241		7	max	0	12	.199	3	.563	1	2.31e-2	2	NC	15	NC	5
242			min	-.561	4	-1.264	2	.007	15	-5.601e-3	3	269.52	2	754.405	1
243		8	max	0	12	.09	3	.52	1	2.506e-2	2	NC	15	NC	5
244			min	-.561	4	-1.076	2	-.001	15	-6.224e-3	3	337.409	2	863.973	1
245		9	max	0	12	-.009	3	.47	1	2.701e-2	2	NC	5	NC	5
246			min	-.56	4	-.921	1	0	15	-6.846e-3	3	447.411	2	1044.59	1
247		10	max	0	1	-.028	15	.444	1	2.897e-2	2	NC	3	NC	5
248			min	-.56	4	-.853	1	.018	15	-7.469e-3	3	528.263	2	1170.269	1
249		11	max	0	1	-.009	3	.47	1	2.701e-2	2	NC	5	9598.68	15
250			min	-.56	4	-.921	1	.038	15	-6.846e-3	3	447.411	2	1044.59	1
251		12	max	0	1	.09	3	.52	1	2.506e-2	2	NC	15	8011.245	15
252			min	-.56	4	-1.076	2	.045	15	-6.224e-3	3	337.409	2	863.973	1
253		13	max	0	1	.199	3	.563	1	2.31e-2	2	9873.574	15	9642.978	15
254			min	-.56	4	-1.264	2	.042	15	-5.601e-3	3	269.52	2	754.405	1
255		14	max	0	1	.282	3	.576	1	2.114e-2	2	8556.664	15	NC	5
256			min	-.56	4	-1.388	2	.031	15	-4.978e-3	3	237.99	2	726.437	1
257		15	max	0	1	.319	3	.549	1	1.918e-2	2	8182.166	15	NC	5
258			min	-.56	4	-1.403	2	.017	15	-4.356e-3	3	234.657	2	787.527	1
259		16	max	.001	1	.296	3	.483	1	1.722e-2	2	8778.685	15	NC	5
260			min	-.56	4	-1.288	2	.005	15	-3.733e-3	3	262.581	2	991.33	1
261		17	max	.001	1	.215	3	.39	1	1.526e-2	2	NC	15	NC	4
262			min	-.56	4	-1.049	2	-.002	15	-3.11e-3	3	349.999	2	1559.384	1
263		18	max	.001	1	.086	3	.294	1	1.33e-2	2	NC	5	NC	3
264			min	-.56	4	-.711	2	.003	15	-2.487e-3	3	658.416	2	3852.868	1
265		19	max	.002	1	-.03	15	.229	1	1.147e-2	1	NC	1	NC	1
266			min	-.56	4	-.384	1	.026	15	-1.865e-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	5.72e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-6.175e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.004	5	7.426e-3	2	NC	1	NC	1
272			min	0	1	-.004	1	0	2	-8.277e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.009	5	6.828e-3	2	NC	2	NC	1
274			min	0	1	-.01	1	-.002	2	-8.042e-3	5	6783.557	1	7810.305	5
275		5	max	0	3	-.002	15	.015	5	6.231e-3	2	NC	5	NC	1
276			min	0	1	-.017	1	-.003	2	-7.806e-3	5	3853.565	1	4528.472	5
277		6	max	0	3	-.003	15	.023	5	5.633e-3	2	NC	5	NC	1
278			min	0	1	-.027	1	-.004	1	-7.571e-3	5	2504.04	1	2982.285	5
279		7	max	0	3	-.004	15	.032	5	5.035e-3	2	NC	7	NC	1
280			min	0	1	-.038	1	-.006	1	-7.335e-3	5	1770.111	1	2129.952	5
281		8	max	0	3	-.006	15	.042	5	4.438e-3	2	NC	15	NC	9
282			min	0	1	-.051	1	-.007	1	-7.1e-3	5	1325.436	1	1608.817	5
283		9	max	0	3	-.008	15	.053	5	3.84e-3	2	8863.77	15	NC	9
284			min	0	1	-.065	1	-.008	1	-6.865e-3	5	1035.51	1	1266.735	5
285		10	max	0	3	-.009	15	.065	5	3.242e-3	2	7165.753	15	NC	9
286			min	0	1	-.081	1	-.009	1	-6.629e-3	5	835.497	1	1029.543	5
287		11	max	0	3	-.011	15	.078	5	2.645e-3	2	5940.768	15	NC	9
288			min	0	1	-.097	1	-.01	1	-6.394e-3	5	691.613	1	858.226	5
289		12	max	0	3	-.013	15	.092	5	2.047e-3	2	5027.109	15	NC	9
290			min	-.001	1	-.115	1	-.011	1	-6.158e-3	5	584.536	1	730.336	5
291		13	max	.001	3	-.016	15	.106	5	1.449e-3	2	4326.894	15	NC	9
292			min	-.001	1	-.134	1	-.011	1	-5.938e-3	4	502.621	1	632.276	5
293		14	max	.001	3	-.018	15	.121	5	8.514e-4	2	3778.421	15	NC	9
294			min	-.001	1	-.153	1	-.011	1	-5.77e-3	4	438.554	1	555.451	5
295		15	max	.001	3	-.02	15	.136	5	8.613e-4	3	3340.531	15	NC	9
296			min	-.001	1	-.174	1	-.01	1	-5.602e-3	4	387.467	1	494.143	5
297		16	max	.001	3	-.023	15	.151	5	1.225e-3	3	2985.502	15	NC	9
298			min	-.001	1	-.194	1	-.009	1	-5.434e-3	4	346.091	1	444.48	5
299		17	max	.001	3	-.025	15	.167	4	1.588e-3	3	2693.724	15	NC	1
300			min	-.002	1	-.216	1	-.006	1	-5.266e-3	4	312.118	1	403.228	4
301		18	max	.001	3	-.027	15	.183	4	1.952e-3	3	2451.16	15	NC	1
302			min	-.002	1	-.237	1	-.005	3	-5.098e-3	4	283.898	1	368.554	4
303		19	max	.002	3	-.03	15	.198	4	2.315e-3	3	2247.526	15	NC	1
304			min	-.002	1	-.259	1	-.012	3	-4.93e-3	4	260.223	1	339.484	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	-6.611e-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	3	0	1	-8.842e-3	4	8246.807	3	NC	1
311		4	max	0	3	0	15	.009	4	0	1	NC	4	NC	1
312			min	0	2	-.019	1	0	1	-8.559e-3	4	3614.818	1	7444.867	4
313		5	max	.001	3	-.001	15	.016	4	0	1	NC	5	NC	1
314			min	-.001	2	-.033	1	0	1	-8.277e-3	4	2033.046	1	4320.821	4
315		6	max	.001	3	-.002	15	.024	4	0	1	NC	5	NC	1
316			min	-.001	1	-.051	1	0	1	-7.995e-3	4	1313.967	1	2848.583	4
317		7	max	.002	3	-.003	15	.033	4	0	1	NC	5	NC	1
318			min	-.002	1	-.073	1	0	1	-7.713e-3	4	925.742	1	2036.819	4
319		8	max	.002	3	-.004	15	.044	4	0	1	NC	5	NC	1
320			min	-.002	1	-.097	1	0	1	-7.43e-3	4	691.61	1	1540.395	4
321		9	max	.002	3	-.005	15	.055	4	0	1	NC	15	NC	1
322			min	-.002	1	-.125	1	0	1	-7.148e-3	4	539.444	1	1214.48	4
323		10	max	.002	3	-.006	15	.068	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	1	-.155	1	0	1	-6.866e-3	4	434.714	1	988.483	4
325		11	max	.002	3	-.008	15	.082	4	0	1	8704.224	15	NC	1
326			min	-.003	1	-.187	1	0	1	-6.584e-3	4	359.508	1	825.254	4
327		12	max	.003	3	-.009	15	.096	4	0	1	7357.921	15	NC	1
328			min	-.003	1	-.222	1	0	1	-6.301e-3	4	303.618	1	703.418	4
329		13	max	.003	3	-.011	15	.11	4	0	1	6327.721	15	NC	1
330			min	-.003	1	-.258	1	0	1	-6.019e-3	4	260.91	1	610.03	4
331		14	max	.003	3	-.012	15	.125	4	0	1	5521.799	15	NC	1
332			min	-.003	1	-.296	1	0	1	-5.737e-3	4	227.538	1	536.9	4
333		15	max	.003	3	-.014	15	.141	4	0	1	4879.05	15	NC	1
334			min	-.004	1	-.335	1	0	1	-5.454e-3	4	200.948	1	478.586	4
335		16	max	.004	3	-.015	15	.156	4	0	1	4358.4	15	NC	1
336			min	-.004	1	-.375	1	0	1	-5.172e-3	4	179.427	1	431.399	4
337		17	max	.004	3	-.017	15	.171	4	0	1	3930.841	15	NC	1
338			min	-.004	1	-.416	1	0	1	-4.89e-3	4	161.766	1	392.741	4
339		18	max	.004	3	-.019	15	.187	4	0	1	3575.64	15	NC	1
340			min	-.004	1	-.458	1	0	1	-4.608e-3	4	147.103	1	360.751	4
341		19	max	.004	3	-.021	15	.201	4	0	1	3277.627	15	NC	1
342			min	-.005	1	-.499	1	0	1	-4.325e-3	4	134.807	1	334.062	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	2.735e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-7.117e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	3.501e-3	3	NC	1	NC	1
348			min	0	1	-.004	1	-.001	3	-9.49e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.009	4	3.137e-3	3	NC	2	NC	1
350			min	0	1	-.01	1	-.002	3	-9.14e-3	4	6783.557	1	7376.098	4
351		5	max	0	3	0	5	.016	4	2.774e-3	3	NC	4	NC	1
352			min	0	1	-.017	1	-.004	3	-8.791e-3	4	3853.565	1	4285.734	4
353		6	max	0	3	0	5	.024	4	2.41e-3	3	NC	4	NC	1
354			min	0	1	-.027	1	-.005	3	-8.442e-3	4	2504.04	1	2828.244	4
355		7	max	0	3	.001	5	.033	4	2.047e-3	3	NC	5	NC	1
356			min	0	1	-.038	1	-.007	3	-8.093e-3	4	1770.111	1	2024.178	4
357		8	max	0	3	.002	5	.044	4	1.683e-3	3	NC	5	NC	9
358			min	0	1	-.051	1	-.008	3	-7.743e-3	4	1325.436	1	1532.271	4
359		9	max	0	3	.002	5	.056	4	1.32e-3	3	NC	5	NC	9
360			min	0	1	-.065	1	-.01	3	-7.394e-3	4	1035.51	1	1209.226	4
361		10	max	0	3	.003	5	.068	4	9.563e-4	3	NC	5	NC	9
362			min	0	1	-.081	1	-.011	3	-7.045e-3	4	835.497	1	985.178	4
363		11	max	0	3	.003	5	.082	4	5.928e-4	3	NC	5	NC	9
364			min	0	1	-.097	1	-.012	3	-6.695e-3	4	691.613	1	823.339	4
365		12	max	0	3	.004	5	.096	4	2.293e-4	3	NC	5	NC	9
366			min	-.001	1	-.115	1	-.012	3	-6.346e-3	4	584.536	1	702.542	4
367		13	max	.001	3	.004	5	.11	4	-6.272e-5	9	NC	5	NC	9
368			min	-.001	1	-.134	1	-.011	3	-5.997e-3	4	502.621	1	609.963	4
369		14	max	.001	3	.005	5	.125	4	1.318e-4	9	NC	5	NC	9
370			min	-.001	1	-.153	1	-.01	3	-5.658e-3	5	438.554	1	537.486	4
371		15	max	.001	3	.006	5	.14	4	3.263e-4	9	NC	5	NC	9
372			min	-.001	1	-.174	1	-.008	3	-5.38e-3	5	387.467	1	479.722	4
373		16	max	.001	3	.006	5	.155	4	7.972e-4	1	NC	5	NC	9
374			min	-.001	1	-.194	1	-.004	3	-5.101e-3	5	346.091	1	433.012	4
375		17	max	.001	3	.007	5	.17	4	1.33e-3	1	NC	7	NC	1
376			min	-.002	1	-.216	1	0	3	-4.822e-3	5	312.118	1	394.783	4
377		18	max	.001	3	.008	5	.185	4	1.862e-3	1	NC	7	NC	1
378			min	-.002	1	-.237	1	0	10	-4.544e-3	5	283.898	1	363.193	4
379		19	max	.002	3	.008	5	.2	4	2.395e-3	1	NC	15	NC	1
380			min	-.002	1	-.259	1	-.004	2	-4.265e-3	5	260.223	1	336.887	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	.002	3	0	15	.002	5	3.623e-3	2	NC	1	NC	1
382			min	0	15	-.001	1	0	2	-3.432e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.029	5	3.932e-3	2	NC	1	NC	4
384			min	0	10	-.017	1	-.025	2	-3.408e-3	5	NC	1	2531.434	2
385		3	max	.002	3	-.004	15	.057	5	4.242e-3	2	NC	1	NC	4
386			min	0	10	-.032	1	-.049	2	-3.385e-3	5	NC	1	1273.427	2
387		4	max	.002	3	-.006	15	.085	5	4.552e-3	2	NC	1	NC	4
388			min	0	2	-.048	1	-.072	2	-3.361e-3	5	NC	1	859.895	2
389		5	max	.003	3	-.008	15	.113	5	4.861e-3	2	NC	1	NC	4
390			min	-.001	2	-.063	1	-.094	2	-3.337e-3	5	NC	1	657.824	2
391		6	max	.003	3	-.009	15	.141	5	5.171e-3	2	NC	1	NC	4
392			min	-.002	2	-.079	1	-.114	2	-3.313e-3	5	NC	1	540.786	2
393		7	max	.003	3	-.011	15	.169	5	5.481e-3	2	NC	1	NC	4
394			min	-.002	2	-.094	1	-.132	2	-3.289e-3	5	NC	1	466.83	2
395		8	max	.003	3	-.013	15	.197	5	5.791e-3	2	NC	1	NC	4
396			min	-.003	2	-.109	1	-.147	2	-3.265e-3	5	NC	1	418.203	2
397		9	max	.003	3	-.015	15	.224	5	6.1e-3	2	NC	1	NC	4
398			min	-.003	2	-.124	1	-.159	2	-3.241e-3	5	NC	1	386.313	2
399		10	max	.004	3	-.016	15	.251	5	6.41e-3	2	NC	1	NC	4
400			min	-.004	2	-.139	1	-.167	2	-3.217e-3	5	NC	1	366.776	2
401		11	max	.004	3	-.018	15	.278	5	6.72e-3	2	NC	1	NC	6
402			min	-.004	2	-.154	1	-.171	2	-3.294e-3	3	NC	1	357.522	2
403		12	max	.004	3	-.02	15	.303	5	7.03e-3	2	NC	1	NC	6
404			min	-.005	2	-.169	1	-.17	2	-3.461e-3	3	NC	1	358.107	2
405		13	max	.004	3	-.021	15	.328	5	7.339e-3	2	NC	1	9707.829	6
406			min	-.005	2	-.184	1	-.164	2	-3.627e-3	3	NC	1	369.694	2
407		14	max	.004	3	-.023	15	.352	5	7.649e-3	2	NC	1	9741.897	6
408			min	-.006	2	-.198	1	-.152	2	-3.794e-3	3	NC	1	395.782	2
409		15	max	.005	3	-.024	15	.375	5	7.959e-3	2	NC	1	NC	6
410			min	-.007	2	-.213	1	-.134	2	-3.961e-3	3	NC	1	384.394	14
411		16	max	.005	3	-.026	15	.397	5	8.269e-3	2	NC	1	NC	4
412			min	-.007	2	-.228	1	-.109	2	-4.127e-3	3	NC	1	348.52	14
413		17	max	.005	3	-.028	15	.417	5	8.578e-3	2	NC	1	NC	4
414			min	-.008	2	-.242	1	-.077	2	-4.294e-3	3	NC	1	317.195	14
415		18	max	.005	3	-.029	15	.437	4	8.888e-3	2	NC	1	NC	4
416			min	-.008	2	-.256	1	-.038	2	-4.461e-3	3	NC	1	289.643	14
417		19	max	.005	3	-.031	15	.46	4	9.198e-3	2	NC	1	NC	1
418			min	-.009	2	-.271	1	0	3	-4.627e-3	3	NC	1	265.258	14
419	M6	1	max	.004	3	0	15	.002	4	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	-3.688e-3	4	NC	1	NC	1
421		2	max	.005	3	-.001	15	.031	4	0	1	NC	1	NC	1
422			min	0	10	-.032	1	0	1	-3.693e-3	4	NC	1	NC	1
423		3	max	.005	3	-.003	15	.061	4	0	1	NC	1	NC	1
424			min	-.002	2	-.062	1	0	1	-3.698e-3	4	NC	1	7964.952	4
425		4	max	.006	3	-.004	15	.091	4	0	1	NC	1	NC	1
426			min	-.003	2	-.092	1	0	1	-3.703e-3	4	NC	1	5133.93	4
427		5	max	.007	3	-.005	15	.12	4	0	1	NC	1	NC	1
428			min	-.005	2	-.122	1	0	1	-3.708e-3	4	NC	1	3774.954	4
429		6	max	.007	3	-.007	15	.15	4	0	1	NC	1	NC	1
430			min	-.006	2	-.151	1	0	1	-3.713e-3	4	NC	1	2999.41	4
431		7	max	.008	3	-.008	15	.18	4	0	1	NC	1	NC	1
432			min	-.008	2	-.181	1	0	1	-3.718e-3	4	NC	1	2513.887	4
433		8	max	.009	3	-.009	15	.209	4	0	1	NC	1	NC	1
434			min	-.009	2	-.211	1	0	1	-3.723e-3	4	NC	1	2194.724	4
435		9	max	.009	3	-.011	15	.237	4	0	1	NC	1	NC	1
436			min	-.011	2	-.24	1	0	1	-3.728e-3	4	NC	1	1982.002	4
437		10	max	.01	3	-.012	15	.265	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	-.27	1	0	1	-3.733e-3	4	NC	1	1844.568	4
439		11	max	.011	3	-.013	15	.292	4	0	1	NC	1	NC	1
440			min	-.014	2	-.299	1	0	1	-3.738e-3	4	NC	1	1766.512	4
441		12	max	.011	3	-.014	15	.318	4	0	1	NC	1	NC	1
442			min	-.016	2	-.328	1	0	1	-3.743e-3	4	NC	1	1741.807	4
443		13	max	.012	3	-.015	15	.343	4	0	1	NC	1	NC	1
444			min	-.017	2	-.357	1	0	1	-3.748e-3	4	NC	1	1773.152	4
445		14	max	.013	3	-.016	15	.366	4	0	1	NC	1	NC	1
446			min	-.019	2	-.386	1	0	1	-3.753e-3	4	NC	1	1874.67	4
447		15	max	.013	3	-.017	15	.388	4	0	1	NC	1	NC	1
448			min	-.02	2	-.415	1	0	1	-3.758e-3	4	NC	1	2081.95	4
449		16	max	.014	3	-.018	15	.409	4	0	1	NC	1	NC	1
450			min	-.022	2	-.444	1	0	1	-3.763e-3	4	NC	1	2484.447	4
451		17	max	.015	3	-.019	15	.428	4	0	1	NC	1	NC	1
452			min	-.023	2	-.473	1	0	1	-3.768e-3	4	NC	1	3357.034	4
453		18	max	.015	3	-.02	15	.445	4	0	1	NC	1	NC	1
454			min	-.025	2	-.502	1	0	1	-3.772e-3	4	NC	1	6083.126	4
455		19	max	.016	3	-.021	15	.46	4	0	1	NC	1	NC	1
456			min	-.026	2	-.531	1	0	1	-3.777e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.002	4	1.628e-3	3	NC	1	NC	1
458			min	0	5	-.001	1	0	3	-4.014e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.033	4	1.795e-3	3	NC	1	NC	5
460			min	0	5	-.017	1	-.012	3	-4.033e-3	4	NC	1	2531.434	2
461		3	max	.002	3	0	5	.065	4	1.961e-3	3	NC	1	NC	15
462			min	0	10	-.032	1	-.024	3	-4.242e-3	2	NC	1	1273.427	2
463		4	max	.002	3	0	5	.097	4	2.128e-3	3	NC	1	7647.948	15
464			min	0	2	-.048	1	-.035	3	-4.552e-3	2	NC	1	859.895	2
465		5	max	.003	3	0	5	.129	4	2.294e-3	3	NC	1	5620.993	15
466			min	-.001	2	-.063	1	-.046	3	-4.861e-3	2	NC	1	657.824	2
467		6	max	.003	3	.001	5	.16	4	2.461e-3	3	NC	1	4464.517	15
468			min	-.002	2	-.079	1	-.056	3	-5.171e-3	2	NC	1	540.786	2
469		7	max	.003	3	.001	5	.191	4	2.628e-3	3	NC	1	3740.638	15
470			min	-.002	2	-.094	1	-.064	3	-5.481e-3	2	NC	1	466.83	2
471		8	max	.003	3	.002	5	.222	4	2.794e-3	3	NC	1	3264.825	15
472			min	-.003	2	-.109	1	-.072	3	-5.791e-3	2	NC	1	418.203	2
473		9	max	.003	3	.002	5	.251	4	2.961e-3	3	NC	1	2947.673	15
474			min	-.003	2	-.124	1	-.078	3	-6.1e-3	2	NC	1	386.313	2
475		10	max	.004	3	.003	5	.279	4	3.128e-3	3	NC	1	2742.694	15
476			min	-.004	2	-.139	1	-.082	3	-6.41e-3	2	NC	1	366.776	2
477		11	max	.004	3	.003	5	.306	4	3.294e-3	3	NC	1	2626.135	15
478			min	-.004	2	-.154	1	-.084	3	-6.72e-3	2	NC	1	357.522	2
479		12	max	.004	3	.003	5	.332	4	3.461e-3	3	NC	1	2588.97	15
480			min	-.005	2	-.169	1	-.084	3	-7.03e-3	2	NC	1	358.107	2
481		13	max	.004	3	.004	5	.356	4	3.627e-3	3	NC	1	2635.156	15
482			min	-.005	2	-.184	1	-.081	3	-7.339e-3	2	NC	1	369.694	2
483		14	max	.004	3	.005	5	.378	4	3.794e-3	3	NC	1	2785.64	15
484			min	-.006	2	-.198	1	-.076	3	-7.649e-3	2	NC	1	395.782	2
485		15	max	.005	3	.005	5	.397	4	3.961e-3	3	NC	1	3093.253	15
486			min	-.007	2	-.213	1	-.067	3	-7.959e-3	2	NC	1	444.492	2
487		16	max	.005	3	.006	5	.415	4	4.127e-3	3	NC	1	3690.832	15
488			min	-.007	2	-.228	1	-.056	3	-8.269e-3	2	NC	1	535.77	2
489		17	max	.005	3	.007	5	.43	4	4.294e-3	3	NC	1	4986.591	15
490			min	-.008	2	-.242	1	-.041	3	-8.578e-3	2	9550.629	5	730.482	2
491		18	max	.005	3	.007	5	.443	4	4.461e-3	3	NC	1	9035.074	15
492			min	-.008	2	-.256	1	-.022	3	-8.888e-3	2	8626.573	5	1334.386	2
493		19	max	.005	3	.008	5	.452	5	4.627e-3	3	NC	1	NC	1
494			min	-.009	2	-.271	1	-.015	1	-9.198e-3	2	7856.308	5	NC	1