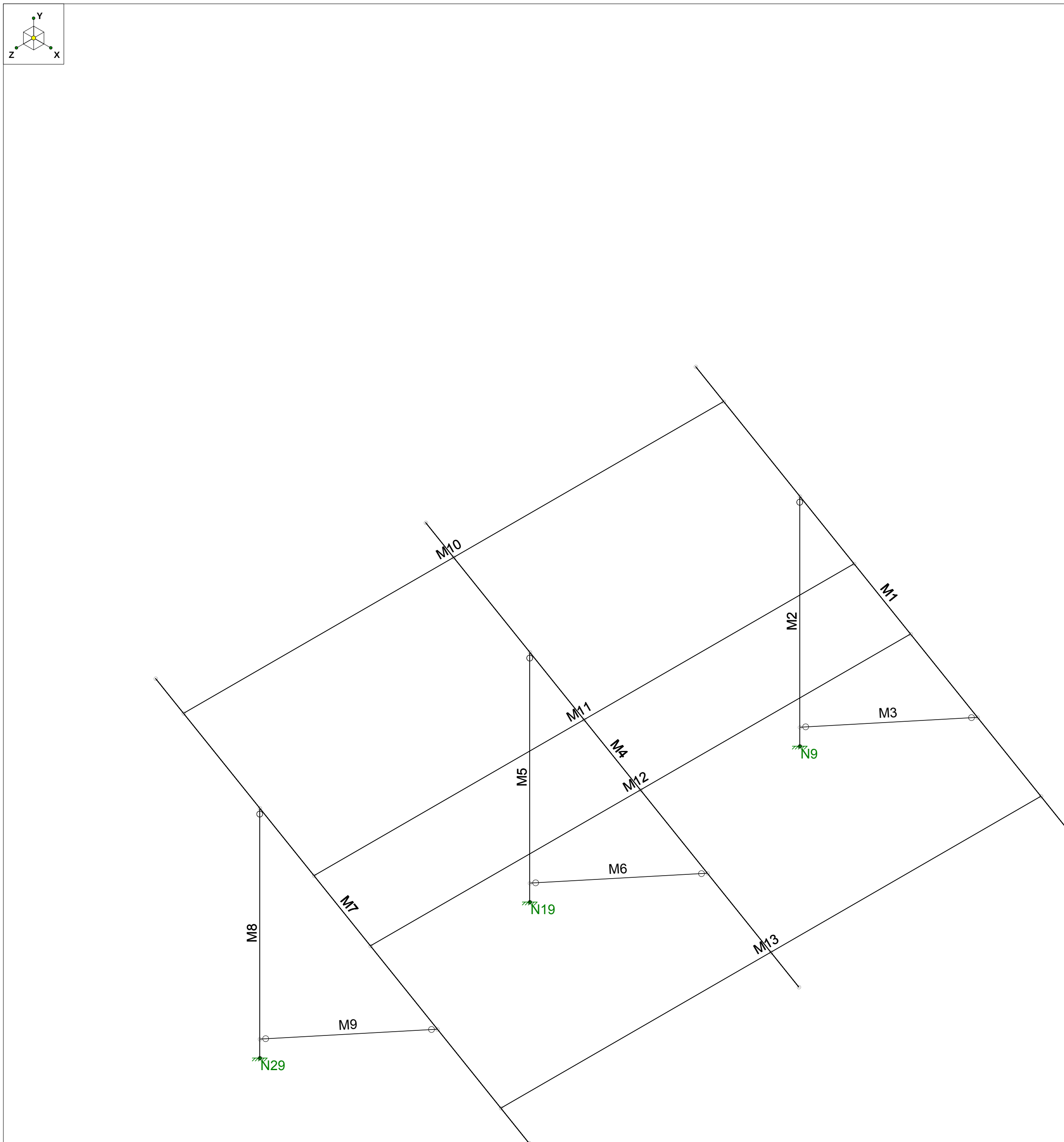


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

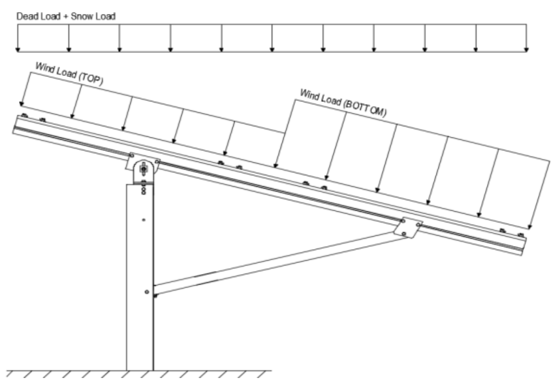
1.2 Construction

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

PV modules are required to meet the following specifications:

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

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} = 3.00 psf
g_{MIN} = 1.75 psf

Self-weight of the PV modules.

2.2 Snow Loads

Ground Snow Load, P_g = 30.00 psf
Sloped Roof Snow Load, P_s = 16.49 psf *(ASCE 7-05, Eq. 7-2)*
I_s = 1.00
C_s = 0.73
C_e = 0.90
C_t = 1.20

2.3 Wind Loads

Design Wind Speed, V = 100 mph — Exposure Category = C
Height < 15 ft — Importance Category = II

Peak Velocity Pressure, q_z = 15.70 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W ^{M}
1.54D + 1.3E + 0.2S ^{R}
0.56D + 1.3E ^{R}
1.54D + 1.25E + 0.2S ^{O}
0.56D + 1.25E ^{O}

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 1.0W
1.0D + 0.75L + 0.75W + 0.75S
0.6D + 1.0W ^{M}
1.238D + 0.875E ^{O}
1.1785D + 0.65625E + 0.75S ^{O}
0.362D + 0.875E ^{O}

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

^{M} *Uses the minimum allowable module dead load.*
^{R} *Include redundancy factor of 1.3.*
^{O} *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

Appendix B.1 contains outputs from the structural analysis software package, RISA. These outputs are used to accurately determine resultant member and reaction forces from the loads seen throughout Section 2.

3.2 RISA Components

A member and node list has been provided below to correlate the RISA components with the design calculations in Section 4. Items of significance have been listed.

Purlins	Location
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

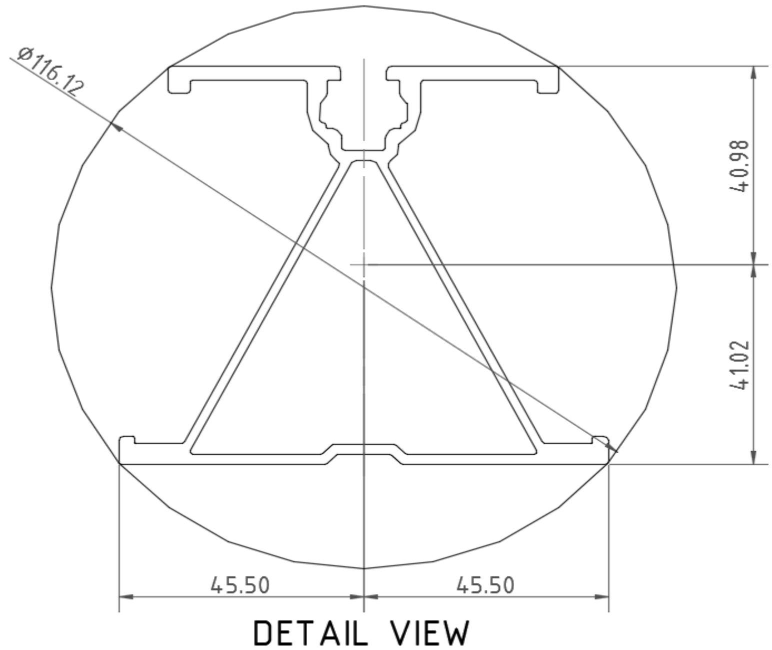
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

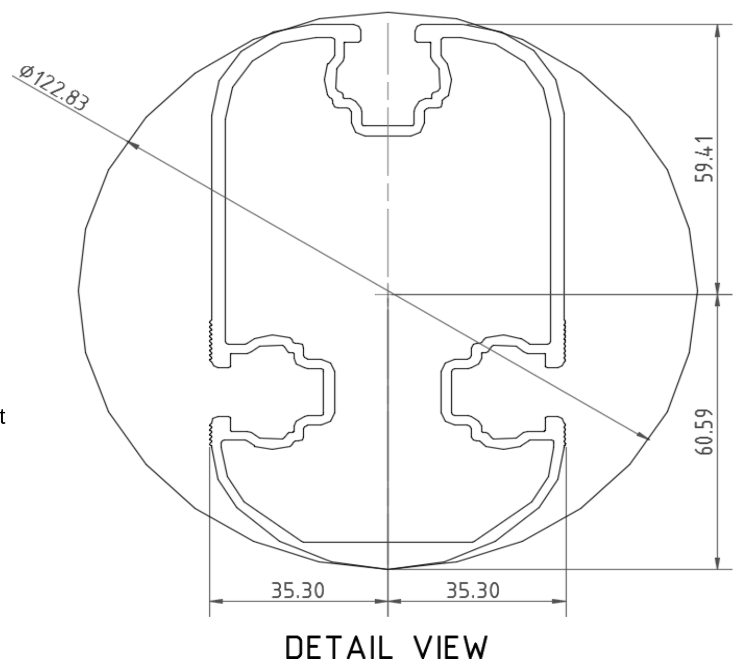
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	132	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.848	k-ft
M_z =	0.315	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	94%	



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).

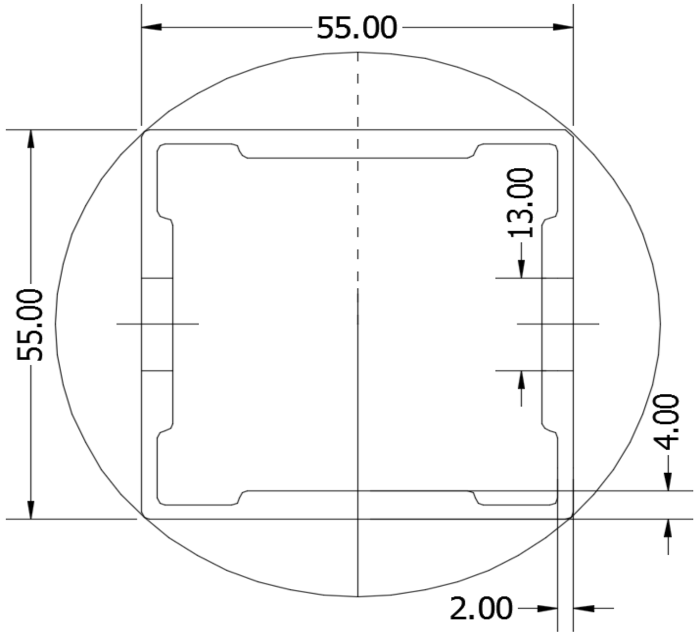
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.430	k-ft
M_z =	0.000	k-ft
P_n =	0.017	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	



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 =	0.432	k-ft
P_n =	4.594	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	65%	

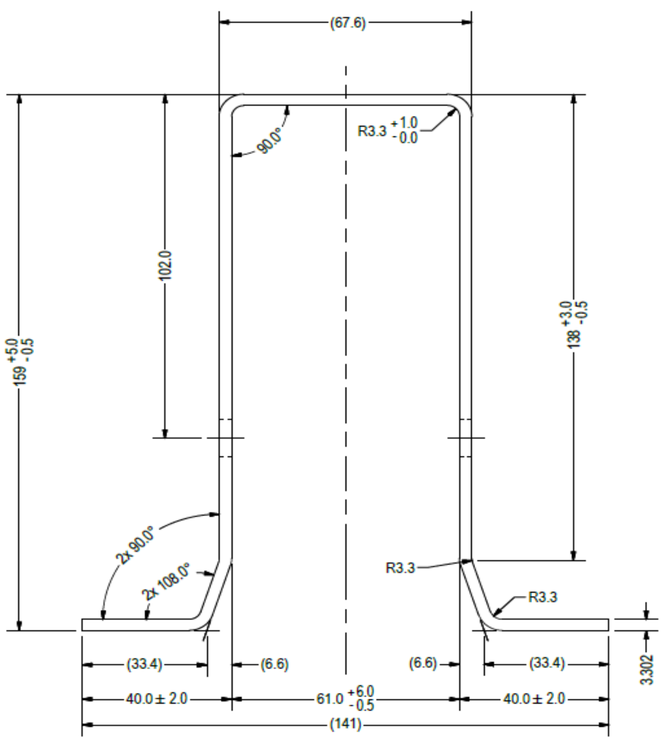


DETAIL VIEW

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 =	14.641	k-ft
M_z =	0.000	k-ft
P_r =	-5.101	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 =	6.60 k
Maximum Lateral Load =	3.91 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)

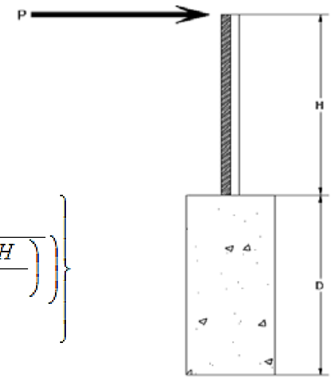
Lateral Force @ Top of Pole, P =	0.98 k
Height of Pole Above Grade, H =	6.61 ft
Diameter of Pole Footing, B =	2.00 ft
Lateral Soil Bearing Capacity, S =	0.10 ksf/ft
Isolated Pole Factor, F =	2
First Trial Depth, D =	3.25 ft

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

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

$$A = 2.34\,\frac{P}{S_1 B}$$

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



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

	Non-Constrained
Lateral Force @ Top of Pole, P =	0.98 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 =	5.27
Required Footing Depth, D =	9.34 ft

2nd Trial @ D_2 =	6.29 ft
Lateral Soil Bearing @ D/3, S_1 =	0.42 ksf
Lateral Soil Bearing @ D, S_3 =	1.26 ksf
Constant $2.34P/(S_1B)$, A =	2.72
Required Footing Depth, D =	5.99 ft

3rd Trial @ D_3 =	6.14 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 =	2.79
Required Footing Depth, D =	6.09 ft

4th Trial @ D_4 =	6.12 ft
Lateral Soil Bearing @ D/3, S_1 =	0.41 ksf
Lateral Soil Bearing @ D, S_3 =	1.22 ksf
Constant $2.34P/(S_1B)$, A =	2.80
Required Footing Depth, D =	6.11 ft

5th Trial @ D_5 =	6.11 ft
Lateral Soil Bearing @ D/3, S_1 =	0.41 ksf
Lateral Soil Bearing @ D, S_3 =	1.22 ksf
Constant $2.34P/(S_1B)$, A =	2.80
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.

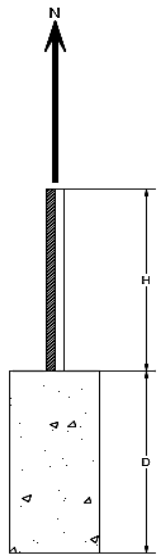
5.4 Uplifting Force Resistance

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 =	3.16	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 =	2.07	k
Required Concrete Volume, V =	14.28	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.83
2	0.4	0.2	118.10	6.72
3	0.6	0.2	118.10	6.62
4	0.8	0.2	118.10	6.52
5	1	0.2	118.10	6.41
6	1.2	0.2	118.10	6.31
7	1.4	0.2	118.10	6.21
8	1.6	0.2	118.10	6.10
9	1.8	0.2	118.10	6.00
10	2	0.2	118.10	5.90
11	2.2	0.2	118.10	5.79
12	2.4	0.2	118.10	5.69
13	2.6	0.2	118.10	5.58
14	2.8	0.2	118.10	5.48
15	3	0.2	118.10	5.38
16	3.2	0.2	118.10	5.27
17	3.4	0.2	118.10	5.17
18	3.6	0.2	118.10	5.07
19	3.8	0.2	118.10	4.96
20	4	0.2	118.10	4.86
21	4.2	0.2	118.10	4.75
22	4.4	0.2	118.10	4.65
23	4.6	0.2	118.10	4.55
24	0	0.0	0.00	4.55
25	0	0.0	0.00	4.55
26	0	0.0	0.00	4.55
27	0	0.0	0.00	4.55
28	0	0.0	0.00	4.55
29	0	0.0	0.00	4.55
30	0	0.0	0.00	4.55
31	0	0.0	0.00	4.55
32	0	0.0	0.00	4.55
33	0	0.0	0.00	4.55
34	0	0.0	0.00	4.55
Max	4.6	Sum	1.09	

A 2ft diameter x 4.75ft deep footing unrestrained at ground level is required for the racking structure.



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 =	4.30	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

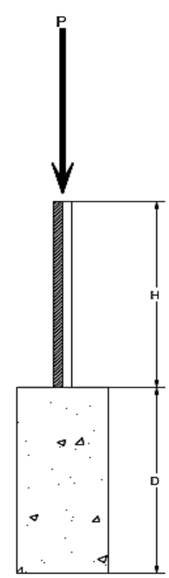
Weight of Concrete

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 =	7.15	k
Utilization =	69%	

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



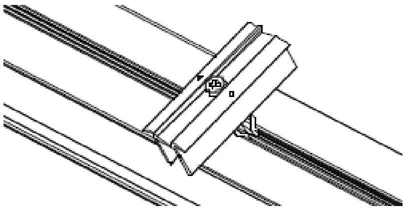
6. DESIGN OF JOINTS AND CONNECTIONS

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.

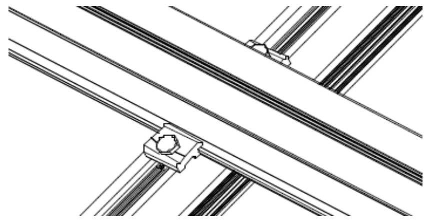
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.540	k
Allowable Uplift =	1.214	k
Utilization =	44%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.111	k
Allowable Uplift =	2.180	k
Utilization =	97%	

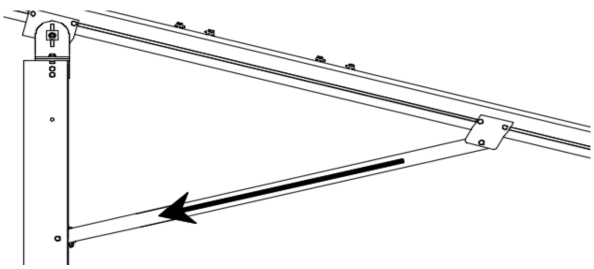


6.2 Strut Connections

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 =	4.594	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)

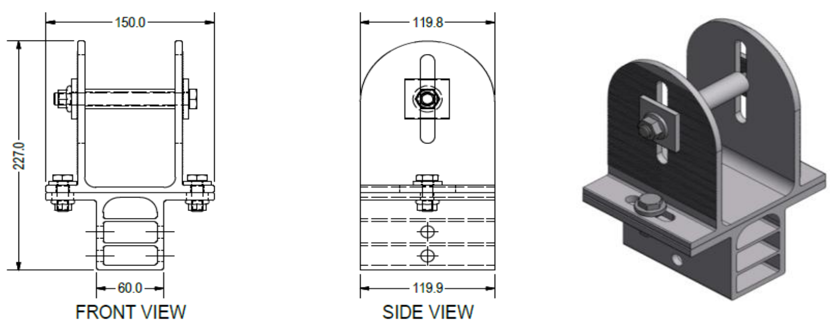


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

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 =	4.483	k
Allowable Load =	5.649	k
Utilization =	79%	



7. SEISMIC DESIGN

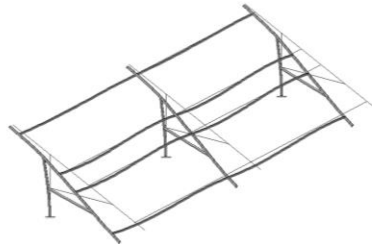
7.1 Seismic Drift

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} =	0.748	in

$0.748 \leq 1.482$, 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 = 132 in

J = 0.432

365.174

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 27.1 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 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 = 132

J = 0.432

232.229

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 28.4

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

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

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:
3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L= φyFcy
φF_L= 33.3 ksi

Weak Axis:
3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

$\varphi F_L = \varphi b[Bt-Dt*\sqrt{(Rb/t)}]$

$\varphi F_L =$ 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

$\varphi F_L St =$ 30.5 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

$\varphi F_L Wk =$ 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

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

$\varphi F_L =$ 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

$\varphi F_L = \varphi c[Bt-Dt*\sqrt{(Rb/t)}]$

$\varphi F_L =$ 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 = 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

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L= (φccFcy)/(λ²)

φF_L= 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L= φyFcy

φF_L= 33.25 ksi

φF_L= 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	79.31	in	
Pr =	-5.10	k	(LRFD Factored Load)
Mr (Strong) =	14.64	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 =	0.1187 <	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 =	0.119 <	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	-50.353	-50.353	0	0
2	M11	y	-50.353	-50.353	0	0
3	M12	y	-81.003	-81.003	0	0
4	M13	y	-81.003	-81.003	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	100.707	100.707	0	0
2	M11	y	100.707	100.707	0	0
3	M12	y	48.164	48.164	0	0
4	M13	y	48.164	48.164	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	851.568	2	2333.842	1	298.096	2	.39	2	.021	5	4.206	1
2		min	-1114.645	3	-1669.334	3	-359.928	5	-1.571	5	-.02	2	.517	15
3	N19	max	2920.595	2	6442.91	2	0	12	0	12	.023	4	7.82	1
4		min	-3010.97	3	-5063.631	3	-394.285	5	-1.654	4	0	1	.344	15
5	N29	max	851.568	2	2333.842	1	325.36	3	.478	3	.024	4	4.206	1
6		min	-1114.645	3	-1669.334	3	-421.601	4	-1.679	4	-.01	3	-.154	5
7	Totals:	max	4623.731	2	11073.647	2	0	12						
8		min	-5240.259	3	-8402.298	3	-1137.372	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	.007	1	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	-.002	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	-15.918	12	307.579	3	-11.968	12	.079	3	.304	1	.304	2
6			min	-212.47	1	-702.92	2	-177.518	1	-.282	2	.04	12	-.13	3
7		4	max	-16.351	12	306.455	3	-11.968	12	.079	3	.194	1	.74	2
8			min	-213.335	1	-704.418	2	-177.518	1	-.282	2	.022	10	-.32	3
9		5	max	-16.783	12	305.331	3	-11.968	12	.079	3	.084	1	1.178	2
10			min	-214.2	1	-705.917	2	-177.518	1	-.282	2	-.002	10	-.51	3
11		6	max	273.87	3	623.922	2	21.589	3	.102	2	.126	2	1.128	2
12			min	-912.178	2	-191.801	3	-249.521	1	-.104	3	-.05	3	-.517	3
13		7	max	273.221	3	622.424	2	21.589	3	.102	2	.016	10	.741	2
14			min	-913.043	2	-192.925	3	-249.521	1	-.104	3	-.08	4	-.398	3
15		8	max	272.572	3	620.925	2	21.589	3	.102	2	-.015	12	.355	2
16			min	-913.908	2	-194.049	3	-249.521	1	-.104	3	-.189	1	-.278	3
17		9	max	248.127	3	96.363	3	5.152	3	.02	5	.099	1	.133	1
18			min	-1114.325	1	-74.235	2	-252.903	1	-.223	2	-.005	10	-.22	3
19		10	max	247.478	3	95.239	3	5.152	3	.02	5	.065	3	.176	2
20			min	-1115.19	1	-75.734	2	-252.903	1	-.223	2	-.063	2	-.28	3
21		11	max	246.829	3	94.115	3	5.152	3	.02	5	.068	3	.224	2
22			min	-1116.055	1	-77.232	2	-252.903	1	-.223	2	-.215	1	-.338	3
23		12	max	218.701	3	819.211	3	178.764	2	.461	3	.182	1	.462	2
24			min	-1332.965	1	-550.482	2	-371.676	3	-.415	2	-.051	5	-.68	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	218.052	3	818.087	3	178.764	2	.461	3	.232	1	.804	2
26			min	-1333.83	1	-551.981	2	-371.676	3	-.415	2	-.211	3	-1.189	3
27		14	max	214.949	1	497.699	2	77.498	5	.299	2	.127	3	1.133	2
28			min	11.676	15	-727.7	3	-122.947	1	-.52	3	-.216	4	-1.675	3
29		15	max	214.084	1	496.2	2	75.998	5	.299	2	.074	3	.824	2
30			min	11.415	15	-728.824	3	-122.947	1	-.52	3	-.188	4	-1.223	3
31		16	max	213.219	1	494.702	2	74.499	5	.299	2	.021	3	.517	2
32			min	11.154	15	-729.948	3	-122.947	1	-.52	3	-.254	1	-.77	3
33		17	max	212.353	1	493.203	2	72.999	5	.299	2	-.022	12	.21	2
34			min	10.893	15	-731.072	3	-122.947	1	-.52	3	-.33	1	-.317	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	.002	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	4	-1.919	6	-1.499	5	0	1	0	5	0	15
43		3	max	-10.057	12	971.225	3	0	1	.046	4	.228	4	.794	2
44			min	-411.651	1	-2053.345	2	-112.912	5	0	1	0	1	-.381	3
45		4	max	-10.489	12	970.101	3	0	1	.046	4	.158	4	2.069	2
46			min	-412.516	1	-2054.843	2	-114.412	5	0	1	0	1	-.984	3
47		5	max	-10.922	12	968.977	3	0	1	.046	4	.087	4	3.345	2
48			min	-413.381	1	-2056.342	2	-115.912	5	0	1	0	1	-1.585	3
49		6	max	1029.212	3	1871.37	2	0	1	0	1	0	1	3.18	2
50			min	-2579.541	2	-736.603	3	-98.815	4	-.04	4	-.031	5	-1.561	3
51		7	max	1028.563	3	1869.872	2	0	1	0	1	0	1	2.019	2
52			min	-2580.406	2	-737.727	3	-100.315	4	-.04	4	-.092	4	-1.103	3
53		8	max	1027.914	3	1868.373	2	0	1	0	1	0	1	.859	2
54			min	-2581.271	2	-738.851	3	-101.814	4	-.04	4	-.155	4	-.645	3
55		9	max	1015.912	3	265.796	3	0	1	.017	4	.092	5	.176	1
56			min	-2789.545	1	-217.081	1	-216.522	4	0	1	0	1	-.416	3
57		10	max	1015.264	3	264.672	3	0	1	.017	4	0	1	.311	1
58			min	-2790.41	1	-218.58	1	-218.022	4	0	1	-.042	4	-.581	3
59		11	max	1014.615	3	263.548	3	0	1	.017	4	0	1	.447	1
60			min	-2791.275	1	-220.078	1	-219.521	4	0	1	-.178	4	-.745	3
61		12	max	1009.977	3	2245.454	3	0	1	.168	4	0	1	1.134	1
62			min	-3191.45	1	-1668.312	2	-246.501	5	0	1	-.032	4	-1.702	3
63		13	max	1009.329	3	2244.33	3	0	1	.168	4	0	1	2.17	2
64			min	-3192.316	1	-1669.811	2	-248	5	0	1	-.186	4	-3.095	3
65		14	max	414.479	1	1407.3	2	73.676	5	0	1	0	1	3.164	2
66			min	11.774	12	-1971.632	3	0	1	-.12	4	-.172	5	-4.43	3
67		15	max	413.614	1	1405.801	2	72.176	5	0	1	0	1	2.291	2
68			min	11.341	12	-1972.756	3	0	1	-.12	4	-.127	5	-3.206	3
69		16	max	412.749	1	1404.303	2	70.676	5	0	1	0	1	1.419	2
70			min	10.909	12	-1973.88	3	0	1	-.12	4	-.082	5	-1.981	3
71		17	max	411.884	1	1402.804	2	69.177	5	0	1	0	1	.548	2
72			min	10.476	12	-1975.004	3	0	1	-.12	4	-.039	4	-.756	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	.004	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	.002	1	0	1	0	1	0	4
80			min	-1.11	6	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	9.91	5	307.579	3	177.518	1	.282	2	.101	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	-212.47	1	-702.92	2	-48.869	5	-.079	3	-.304	1	-.13	3
83		4	max	9.506	5	306.455	3	177.518	1	.282	2	.071	5	.74	2
84			min	-213.335	1	-704.418	2	-50.368	5	-.079	3	-.194	1	-.32	3
85		5	max	9.102	5	305.331	3	177.518	1	.282	2	.039	5	1.178	2
86			min	-214.2	1	-705.917	2	-51.868	5	-.079	3	-.084	1	-.51	3
87		6	max	273.87	3	623.922	2	249.521	1	.104	3	.05	3	1.128	2
88			min	-912.178	2	-191.801	3	-32.62	5	-.102	2	-.126	2	-.517	3
89		7	max	273.221	3	622.424	2	249.521	1	.104	3	.037	3	.741	2
90			min	-913.043	2	-192.925	3	-34.12	5	-.102	2	-.06	5	-.398	3
91		8	max	272.572	3	620.925	2	249.521	1	.104	3	.189	1	.355	2
92			min	-913.908	2	-194.049	3	-35.62	5	-.102	2	-.082	5	-.278	3
93		9	max	248.127	3	96.363	3	252.903	1	.223	2	.023	5	.133	1
94			min	-1114.325	1	-74.235	2	-90.409	5	.019	15	-.099	1	-.22	3
95		10	max	247.478	3	95.239	3	252.903	1	.223	2	.063	2	.176	2
96			min	-1115.19	1	-75.734	2	-91.909	5	.019	15	-.065	3	-.28	3
97		11	max	246.829	3	94.115	3	252.903	1	.223	2	.215	1	.224	2
98			min	-1116.055	1	-77.232	2	-93.409	5	.019	15	-.091	5	-.338	3
99		12	max	218.701	3	819.211	3	371.676	3	.415	2	-.013	12	.462	2
100			min	-1332.965	1	-550.482	2	-211.455	5	-.461	3	-.182	1	-.68	3
101		13	max	218.052	3	818.087	3	371.676	3	.415	2	.211	3	.804	2
102			min	-1333.83	1	-551.981	2	-212.954	5	-.461	3	-.248	4	-1.189	3
103		14	max	214.949	1	497.699	2	128.331	4	.52	3	.101	1	1.133	2
104			min	10.613	15	-727.7	3	4.058	10	-.299	2	-.192	5	-1.675	3
105		15	max	214.084	1	496.2	2	126.832	4	.52	3	.177	1	.824	2
106			min	10.352	15	-728.824	3	4.058	10	-.299	2	-.132	5	-1.223	3
107		16	max	213.219	1	494.702	2	125.332	4	.52	3	.254	1	.517	2
108			min	10.091	15	-729.948	3	4.058	10	-.299	2	-.073	5	-.77	3
109		17	max	212.353	1	493.203	2	123.832	4	.52	3	.33	1	.21	2
110			min	9.83	15	-731.072	3	4.058	10	-.299	2	-.015	5	-.317	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	-.002	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	-.002	1	0	1	0	1	0	1
115	M10	1	max	122.953	1	489.866	2	-9.312	15	.01	2	.38	1	.299	2
116			min	4.054	10	-733.397	3	-210.831	1	-.021	3	.015	15	-.52	3
117		2	max	122.953	1	357.778	2	-7.128	15	.01	2	.15	1	.26	3
118			min	4.054	10	-542.131	3	-164.642	1	-.021	3	.005	15	-.221	1
119		3	max	122.953	1	225.691	2	-4.945	15	.01	2	.02	3	.806	3
120			min	4.054	10	-350.865	3	-118.453	1	-.021	3	-.023	1	-.575	2
121		4	max	122.953	1	93.603	2	-2.761	15	.01	2	.002	3	1.118	3
122			min	4.054	10	-159.599	3	-72.264	1	-.021	3	-.139	1	-.77	2
123		5	max	122.953	1	31.667	3	-.578	15	.01	2	-.008	12	1.196	3
124			min	4.054	10	-40.815	1	-26.075	1	-.021	3	-.199	1	-.804	2
125		6	max	122.953	1	222.933	3	20.114	1	.01	2	-.009	15	1.04	3
126			min	4.054	10	-170.572	2	-6.356	3	-.021	3	-.203	1	-.676	2
127		7	max	122.953	1	414.199	3	66.302	1	.01	2	-.005	15	.651	3
128			min	4.054	10	-302.659	2	-3.081	3	-.021	3	-.15	1	-.387	2
129		8	max	122.953	1	605.465	3	112.491	1	.01	2	0	5	.078	1
130			min	.908	15	-434.747	2	.194	3	-.021	3	-.041	1	-.021	5
131		9	max	122.953	1	796.731	3	158.68	1	.01	2	.125	1	.681	1
132			min	-10.755	5	-566.835	2	2.576	12	-.021	3	-.027	3	-.829	3
133		10	max	122.953	1	987.997	3	204.869	1	.01	2	.347	1	1.449	2
134			min	4.054	10	-698.922	2	-113.531	14	-.021	3	-.021	3	-1.92	3
135		11	max	122.953	1	566.835	2	-2.576	12	.021	3	.125	1	.681	1
136			min	4.054	10	-796.731	3	-158.68	1	-.01	2	-.027	3	-.829	3
137		12	max	122.953	1	434.747	2	-.194	3	.021	3	-.004	15	.078	1
138			min	4.054	10	-605.465	3	-112.491	1	-.01	2	-.041	1	.018	12

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	122.953	1	302.659	2	3.081	3	.021	3	-.008	15	.651	3
140			min	3.283	15	-414.199	3	-66.302	1	-.01	2	-.15	1	-.387	2
141		14	max	122.953	1	170.572	2	6.356	3	.021	3	-.01	15	1.04	3
142			min	-7.282	5	-222.933	3	-20.114	1	-.01	2	-.203	1	-.676	2
143		15	max	122.953	1	40.815	1	26.075	1	.021	3	-.008	12	1.196	3
144			min	-19.828	5	-31.667	3	1.637	15	-.01	2	-.199	1	-.804	2
145		16	max	122.953	1	159.599	3	72.264	1	.021	3	.002	3	1.118	3
146			min	-32.374	5	-93.603	2	3.821	15	-.01	2	-.139	1	-.77	2
147		17	max	122.953	1	350.865	3	118.453	1	.021	3	.02	3	.806	3
148			min	-44.921	5	-225.691	2	6.004	15	-.01	2	-.023	1	-.575	2
149		18	max	122.953	1	542.131	3	164.642	1	.021	3	.15	1	.26	3
150			min	-57.467	5	-357.778	2	8.188	15	-.01	2	.008	15	-.221	1
151		19	max	122.953	1	733.397	3	210.831	1	.021	3	.38	1	.299	2
152			min	-70.013	5	-489.866	2	10.371	15	-.01	2	.02	15	-.52	3
153	M11	1	max	332.539	1	469.887	2	11.172	5	0	15	.422	1	.223	1
154			min	-376.774	3	-726.767	3	-216.611	1	-.004	1	-.119	5	-.599	3
155		2	max	332.539	1	337.799	2	14.55	5	0	15	.186	1	.172	3
156			min	-376.774	3	-535.501	3	-170.422	1	-.004	1	-.104	5	-.302	2
157		3	max	332.539	1	205.727	1	17.928	5	0	15	.041	3	.71	3
158			min	-376.774	3	-344.235	3	-124.233	1	-.004	1	-.084	4	-.634	2
159		4	max	332.539	1	76.491	1	21.305	5	0	15	.018	3	1.014	3
160			min	-376.774	3	-152.969	3	-78.044	1	-.004	1	-.118	1	-.805	2
161		5	max	332.539	1	38.297	3	24.683	5	0	15	-.001	3	1.084	3
162			min	-376.774	3	-58.464	2	-31.855	1	-.004	1	-.185	1	-.814	2
163		6	max	332.539	1	229.563	3	31.99	4	0	15	0	15	.92	3
164			min	-376.774	3	-190.551	2	-10.603	3	-.004	1	-.196	1	-.662	2
165		7	max	332.539	1	420.829	3	60.523	1	0	15	.037	5	.522	3
166			min	-376.774	3	-322.639	2	-7.328	3	-.004	1	-.15	1	-.348	2
167		8	max	332.539	1	612.095	3	106.711	1	0	15	.077	5	.127	2
168			min	-376.774	3	-454.726	2	-4.053	3	-.004	1	-.048	1	-.109	3
169		9	max	332.539	1	803.361	3	152.9	1	0	15	.151	4	.763	2
170			min	-376.774	3	-586.814	2	-.778	3	-.004	1	-.037	3	-.974	3
171		10	max	332.539	1	994.627	3	199.089	1	.004	1	.326	1	1.561	2
172			min	-376.774	3	-718.901	2	-96.851	14	-.004	3	-.036	3	-2.073	3
173		11	max	332.539	1	586.814	2	15.511	5	.004	1	.111	1	.763	2
174			min	-376.774	3	-803.361	3	-152.9	1	0	5	-.104	5	-.974	3
175		12	max	332.539	1	454.726	2	18.889	5	.004	1	-.014	10	.127	2
176			min	-376.774	3	-612.095	3	-106.711	1	0	5	-.093	4	-.109	3
177		13	max	332.539	1	322.639	2	22.267	5	.004	1	-.018	12	.522	3
178			min	-376.774	3	-420.829	3	-60.523	1	0	5	-.15	1	-.348	2
179		14	max	332.539	1	190.551	2	25.645	5	.004	1	-.011	12	.92	3
180			min	-376.774	3	-229.563	3	-14.334	1	0	5	-.196	1	-.662	2
181		15	max	332.539	1	58.464	2	36.058	4	.004	1	.005	5	1.084	3
182			min	-376.774	3	-38.297	3	6.171	10	0	5	-.185	1	-.814	2
183		16	max	332.539	1	152.969	3	78.044	1	.004	1	.042	5	1.014	3
184			min	-376.774	3	-76.491	1	11.022	12	0	5	-.118	1	-.805	2
185		17	max	332.539	1	344.235	3	124.233	1	.004	1	.084	4	.71	3
186			min	-376.774	3	-205.727	1	13.205	12	0	5	0	9	-.634	2
187		18	max	332.539	1	535.501	3	170.422	1	.004	1	.186	1	.172	3
188			min	-376.774	3	-337.799	2	15.388	12	0	5	.031	10	-.302	2
189		19	max	332.539	1	726.767	3	216.611	1	.004	1	.422	1	.223	1
190			min	-376.774	3	-469.887	2	17.571	12	0	5	.063	12	-.599	3
191	M12	1	max	53.212	5	692.214	2	14.875	5	0	15	.443	1	.325	2
192			min	-24.295	9	-291.906	3	-219.546	1	-.005	1	-.139	5	.022	12
193		2	max	53.126	2	500.188	2	18.253	5	0	15	.203	1	.337	3
194			min	-24.295	9	-203.391	3	-173.357	1	-.005	1	-.119	5	-.404	2
195		3	max	53.126	2	308.163	2	21.631	5	0	15	.025	3	.532	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	-24.295	9	-114.876	3	-127.168	1	-.005	1	-.094	5	-.898	2
197		4	max	53.126	2	116.138	2	25.009	5	0	15	.006	3	.618	3
198			min	-24.295	9	-26.36	3	-80.979	1	-.005	1	-.108	1	-1.157	2
199		5	max	53.126	2	62.155	3	28.386	5	0	15	-.006	12	.596	3
200			min	-24.295	9	-75.888	2	-34.791	1	-.005	1	-.178	1	-1.182	2
201		6	max	53.126	2	150.67	3	35.344	4	0	15	.003	5	.466	3
202			min	-24.295	9	-267.913	2	-7.401	3	-.005	1	-.193	1	-.971	2
203		7	max	53.126	2	239.186	3	57.587	1	0	15	.044	5	.228	3
204			min	-30.617	4	-459.938	2	-4.126	3	-.005	1	-.15	1	-.527	2
205		8	max	53.126	2	327.701	3	103.776	1	0	15	.089	5	.153	2
206			min	-43.163	4	-651.964	2	-.851	3	-.005	1	-.052	1	-.118	3
207		9	max	53.126	2	416.216	3	149.965	1	0	15	.166	4	1.067	2
208			min	-55.709	4	-843.989	2	1.891	12	-.005	1	-.029	3	-.573	3
209		10	max	53.126	2	504.731	3	196.154	1	.005	1	.315	1	2.216	2
210			min	-68.256	4	-1036.014	2	4.074	12	-.002	14	-.024	3	-1.136	3
211		11	max	53.126	2	843.989	2	19.467	5	.005	1	.103	1	1.067	2
212			min	-24.295	9	-416.216	3	-149.965	1	0	5	-.121	5	-.573	3
213		12	max	53.126	2	651.964	2	22.844	5	.005	1	-.016	10	.153	2
214			min	-24.295	9	-327.701	3	-103.776	1	0	5	-.106	4	-.118	3
215		13	max	53.126	2	459.938	2	26.222	5	.005	1	-.018	12	.228	3
216			min	-24.295	9	-239.186	3	-57.587	1	0	5	-.15	1	-.527	2
217		14	max	53.126	2	267.913	2	29.6	5	.005	1	-.013	12	.466	3
218			min	-24.295	9	-150.67	3	-11.398	1	0	5	-.193	1	-.971	2
219		15	max	53.126	2	75.888	2	40.456	4	.005	1	.007	5	.596	3
220			min	-24.295	9	-62.155	3	6.842	12	0	5	-.178	1	-1.182	2
221		16	max	53.126	2	26.36	3	80.979	1	.005	1	.049	5	.618	3
222			min	-30.158	4	-116.138	2	9.025	12	0	5	-.108	1	-1.157	2
223		17	max	53.126	2	114.876	3	127.168	1	.005	1	.098	4	.532	3
224			min	-42.704	4	-308.163	2	11.208	12	0	5	.006	9	-.898	2
225		18	max	53.126	2	203.391	3	173.357	1	.005	1	.203	1	.337	3
226			min	-55.25	4	-500.188	2	13.392	12	0	5	.031	12	-.404	2
227		19	max	53.126	2	291.906	3	219.546	1	.005	1	.443	1	.325	2
228			min	-67.797	4	-692.214	2	15.575	12	0	5	.049	12	-.048	5
229	M13	1	max	45.822	5	700.523	2	10.72	5	.006	3	.376	1	.282	2
230			min	-177.348	1	-309.857	3	-210.433	1	-.019	2	-.122	5	-.079	3
231		2	max	33.276	5	508.498	2	14.098	5	.006	3	.147	1	.245	3
232			min	-177.348	1	-221.342	3	-164.244	1	-.019	2	-.107	5	-.457	2
233		3	max	20.729	5	316.473	2	17.476	5	.006	3	.021	3	.462	3
234			min	-177.348	1	-132.827	3	-118.055	1	-.019	2	-.095	4	-.961	2
235		4	max	8.183	5	124.447	2	20.853	5	.006	3	.003	3	.57	3
236			min	-177.348	1	-44.312	3	-71.866	1	-.019	2	-.141	1	-1.23	2
237		5	max	-2.589	15	44.204	3	24.231	5	.006	3	-.007	12	.57	3
238			min	-177.348	1	-67.578	2	-25.677	1	-.019	2	-.201	1	-1.265	2
239		6	max	-11.034	15	132.719	3	33.035	4	.006	3	-.003	15	.462	3
240			min	-177.348	1	-259.603	2	-6.601	3	-.019	2	-.204	1	-1.065	2
241		7	max	-11.968	12	221.234	3	66.7	1	.006	3	.031	5	.246	3
242			min	-177.348	1	-451.629	2	-3.327	3	-.019	2	-.151	1	-.631	2
243		8	max	-11.968	12	309.75	3	112.889	1	.006	3	.071	5	.039	2
244			min	-177.348	1	-643.654	2	-.052	3	-.019	2	-.041	1	-.079	3
245		9	max	-11.968	12	398.265	3	159.078	1	.006	3	.147	4	.943	2
246			min	-177.348	1	-835.679	2	2.423	12	-.019	2	-.027	3	-.511	3
247		10	max	-11.968	12	486.78	3	205.267	1	.006	3	.348	1	2.082	2
248			min	-177.348	1	-1027.705	2	4.606	12	-.019	2	-.021	3	-1.052	3
249		11	max	30.42	5	835.679	2	14.11	5	.019	2	.125	1	.943	2
250			min	-177.348	1	-398.265	3	-159.078	1	-.006	3	-.095	5	-.511	3
251		12	max	17.874	5	643.654	2	17.487	5	.019	2	-.014	10	.039	2
252			min	-177.348	1	-309.75	3	-112.889	1	-.006	3	-.083	4	-.079	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	5.328	5	451.629	2	20.865	5	.019	2	-.017	12	.246	3
254			min	-177.348	1	-221.234	3	-66.7	1	-.006	3	-.151	1	-.631	2
255		14	max	-4.5	15	259.603	2	24.243	5	.019	2	-.014	12	.462	3
256			min	-177.348	1	-132.719	3	-20.512	1	-.006	3	-.204	1	-1.065	2
257		15	max	-11.968	12	67.578	2	33.097	4	.019	2	.007	5	.57	3
258			min	-177.348	1	-44.204	3	5.808	10	-.006	3	-.201	1	-1.265	2
259		16	max	-11.968	12	44.312	3	71.866	1	.019	2	.043	5	.57	3
260			min	-177.348	1	-124.447	2	8.493	12	-.006	3	-.141	1	-1.23	2
261		17	max	-11.968	12	132.827	3	118.055	1	.019	2	.083	5	.462	3
262			min	-177.348	1	-316.473	2	10.676	12	-.006	3	-.025	1	-.961	2
263		18	max	-11.968	12	221.342	3	164.244	1	.019	2	.159	4	.245	3
264			min	-177.348	1	-508.498	2	12.86	12	-.006	3	.028	12	-.457	2
265		19	max	-11.968	12	309.857	3	210.433	1	.019	2	.376	1	.282	2
266			min	-177.348	1	-700.523	2	15.043	12	-.006	3	.045	12	-.079	3
267	M2	1	max	2333.842	1	1114.015	3	298.321	2	.021	5	1.571	5	4.206	1
268			min	-1669.334	3	-851.096	2	-359.986	5	-.02	2	-.39	2	.517	15
269		2	max	2331.005	1	1114.015	3	298.321	2	.021	5	1.459	5	4.301	1
270			min	-1671.462	3	-851.096	2	-357.527	5	-.02	2	-.304	1	.495	15
271		3	max	1708.583	1	836.316	1	213.706	2	.002	2	1.338	5	4.17	1
272			min	-1400.208	3	93.885	15	-333.495	5	-.001	3	-.248	1	.468	15
273		4	max	1705.746	1	836.316	1	213.706	2	.002	2	1.235	5	3.909	1
274			min	-1402.336	3	93.885	15	-331.036	5	-.001	3	-.185	1	.439	15
275		5	max	1702.908	1	836.316	1	213.706	2	.002	2	1.132	5	3.648	1
276			min	-1404.464	3	93.885	15	-328.577	5	-.001	3	-.122	1	.41	15
277		6	max	1700.071	1	836.316	1	213.706	2	.002	2	1.03	5	3.388	1
278			min	-1406.592	3	93.885	15	-326.118	5	-.001	3	-.059	1	.38	15
279		7	max	1697.233	1	836.316	1	213.706	2	.002	2	.936	4	3.127	1
280			min	-1408.72	3	93.885	15	-323.658	5	-.001	3	-.062	3	.351	15
281		8	max	1694.396	1	836.316	1	213.706	2	.002	2	.843	4	2.867	1
282			min	-1410.848	3	93.885	15	-321.199	5	-.001	3	-.151	3	.322	15
283		9	max	1691.559	1	836.316	1	213.706	2	.002	2	.752	4	2.606	1
284			min	-1412.976	3	93.885	15	-318.74	5	-.001	3	-.24	3	.293	15
285		10	max	1688.721	1	836.316	1	213.706	2	.002	2	.661	4	2.345	1
286			min	-1415.104	3	93.885	15	-316.281	5	-.001	3	-.33	3	.263	15
287		11	max	1685.884	1	836.316	1	213.706	2	.002	2	.57	4	2.085	1
288			min	-1417.232	3	93.885	15	-313.822	5	-.001	3	-.419	3	.234	15
289		12	max	1683.046	1	836.316	1	213.706	2	.002	2	.481	4	1.824	1
290			min	-1419.36	3	93.885	15	-311.363	5	-.001	3	-.508	3	.205	15
291		13	max	1680.209	1	836.316	1	213.706	2	.002	2	.425	2	1.564	1
292			min	-1421.488	3	93.885	15	-308.904	5	-.001	3	-.597	3	.176	15
293		14	max	1677.371	1	836.316	1	213.706	2	.002	2	.491	2	1.303	1
294			min	-1423.616	3	93.885	15	-306.445	5	-.001	3	-.686	3	.146	15
295		15	max	1674.534	1	836.316	1	213.706	2	.002	2	.558	2	1.042	1
296			min	-1425.744	3	93.885	15	-303.985	5	-.001	3	-.775	3	.117	15
297		16	max	1671.697	1	836.316	1	213.706	2	.002	2	.624	2	.782	1
298			min	-1427.873	3	93.885	15	-301.526	5	-.001	3	-.864	3	.088	15
299		17	max	1668.859	1	836.316	1	213.706	2	.002	2	.691	2	.521	1
300			min	-1430.001	3	93.885	15	-299.067	5	-.001	3	-.953	3	.059	15
301		18	max	1666.022	1	836.316	1	213.706	2	.002	2	.758	2	.261	1
302			min	-1432.129	3	93.885	15	-296.608	5	-.001	3	-1.042	3	.029	15
303		19	max	1663.184	1	836.316	1	213.706	2	.002	2	.824	2	0	1
304			min	-1434.257	3	93.885	15	-294.149	5	-.001	3	-1.132	3	0	1
305	M5	1	max	6442.91	2	3006.83	3	0	1	.023	4	1.654	4	7.82	1
306			min	-5063.631	3	-2918.18	2	-394.414	5	0	1	0	1	.344	15
307		2	max	6440.073	2	3006.83	3	0	1	.023	4	1.532	4	8.348	1
308			min	-5065.759	3	-2918.18	2	-391.955	5	0	1	0	1	.349	15
309		3	max	4471.166	1	1647.646	1	0	1	0	1	1.402	4	8.215	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	-4121.997	3	67.546	15	-367.392	4	0	4	0	1	.337	15
311		4	max	4468.328	1	1647.646	1	0	1	0	1	1.288	4	7.701	1
312			min	-4124.125	3	67.546	15	-364.933	4	0	4	0	1	.316	15
313		5	max	4465.491	1	1647.646	1	0	1	0	1	1.175	4	7.188	1
314			min	-4126.253	3	67.546	15	-362.474	4	0	4	0	1	.295	15
315		6	max	4462.654	1	1647.646	1	0	1	0	1	1.062	4	6.674	1
316			min	-4128.381	3	67.546	15	-360.015	4	0	4	0	1	.274	15
317		7	max	4459.816	1	1647.646	1	0	1	0	1	.95	4	6.161	1
318			min	-4130.509	3	67.546	15	-357.556	4	0	4	0	1	.253	15
319		8	max	4456.979	1	1647.646	1	0	1	0	1	.839	4	5.648	1
320			min	-4132.637	3	67.546	15	-355.097	4	0	4	0	1	.232	15
321		9	max	4454.141	1	1647.646	1	0	1	0	1	.729	4	5.134	1
322			min	-4134.765	3	67.546	15	-352.638	4	0	4	0	1	.21	15
323		10	max	4451.304	1	1647.646	1	0	1	0	1	.62	4	4.621	1
324			min	-4136.893	3	67.546	15	-350.178	4	0	4	0	1	.189	15
325		11	max	4448.466	1	1647.646	1	0	1	0	1	.511	4	4.107	1
326			min	-4139.021	3	67.546	15	-347.719	4	0	4	0	1	.168	15
327		12	max	4445.629	1	1647.646	1	0	1	0	1	.403	4	3.594	1
328			min	-4141.149	3	67.546	15	-345.26	4	0	4	0	1	.147	15
329		13	max	4442.791	1	1647.646	1	0	1	0	1	.296	4	3.081	1
330			min	-4143.277	3	67.546	15	-342.801	4	0	4	0	1	.126	15
331		14	max	4439.954	1	1647.646	1	0	1	0	1	.189	4	2.567	1
332			min	-4145.405	3	67.546	15	-340.342	4	0	4	0	1	.105	15
333		15	max	4437.117	1	1647.646	1	0	1	0	1	.084	4	2.054	1
334			min	-4147.534	3	67.546	15	-337.883	4	0	4	0	1	.084	15
335		16	max	4434.279	1	1647.646	1	0	1	0	1	0	1	1.54	1
336			min	-4149.662	3	67.546	15	-335.424	4	0	4	-.022	5	.063	15
337		17	max	4431.442	1	1647.646	1	0	1	0	1	0	1	1.027	1
338			min	-4151.79	3	67.546	15	-332.965	4	0	4	-.125	4	.042	15
339		18	max	4428.604	1	1647.646	1	0	1	0	1	0	1	.513	1
340			min	-4153.918	3	67.546	15	-330.505	4	0	4	-.229	4	.021	15
341		19	max	4425.767	1	1647.646	1	0	1	0	1	0	1	0	1
342			min	-4156.046	3	67.546	15	-328.046	4	0	4	-.331	4	0	1
343	M8	1	max	2333.842	1	1114.015	3	325.162	3	.024	4	1.679	4	4.206	1
344			min	-1669.334	3	-851.096	2	-421.828	4	-.01	3	-.478	3	-.154	5
345		2	max	2331.005	1	1114.015	3	325.162	3	.024	4	1.548	4	4.301	1
346			min	-1671.462	3	-851.096	2	-419.369	4	-.01	3	-.376	3	-.128	5
347		3	max	1708.583	1	836.316	1	285.954	3	.001	3	1.413	4	4.17	1
348			min	-1400.208	3	-22.861	5	-382.764	4	-.002	2	-.294	3	-.114	5
349		4	max	1705.746	1	836.316	1	285.954	3	.001	3	1.294	4	3.909	1
350			min	-1402.336	3	-22.861	5	-380.304	4	-.002	2	-.205	3	-.107	5
351		5	max	1702.908	1	836.316	1	285.954	3	.001	3	1.176	4	3.648	1
352			min	-1404.464	3	-22.861	5	-377.845	4	-.002	2	-.116	3	-.1	5
353		6	max	1700.071	1	836.316	1	285.954	3	.001	3	1.059	4	3.388	1
354			min	-1406.592	3	-22.861	5	-375.386	4	-.002	2	-.027	3	-.093	5
355		7	max	1697.233	1	836.316	1	285.954	3	.001	3	.942	4	3.127	1
356			min	-1408.72	3	-22.861	5	-372.927	4	-.002	2	-.025	2	-.085	5
357		8	max	1694.396	1	836.316	1	285.954	3	.001	3	.826	4	2.867	1
358			min	-1410.848	3	-22.861	5	-370.468	4	-.002	2	-.092	2	-.078	5
359		9	max	1691.559	1	836.316	1	285.954	3	.001	3	.719	5	2.606	1
360			min	-1412.976	3	-22.861	5	-368.009	4	-.002	2	-.158	2	-.071	5
361		10	max	1688.721	1	836.316	1	285.954	3	.001	3	.614	5	2.345	1
362			min	-1415.104	3	-22.861	5	-365.55	4	-.002	2	-.225	2	-.064	5
363		11	max	1685.884	1	836.316	1	285.954	3	.001	3	.511	5	2.085	1
364			min	-1417.232	3	-22.861	5	-363.091	4	-.002	2	-.291	2	-.057	5
365		12	max	1683.046	1	836.316	1	285.954	3	.001	3	.508	3	1.824	1
366			min	-1419.36	3	-22.861	5	-360.632	4	-.002	2	-.358	2	-.05	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	1680.209	1	836.316	1	285.954	3	.001	3	.597	3	1.564	1
368			min	-1421.488	3	-22.861	5	-358.172	4	-.002	2	-.425	2	-.043	5
369		14	max	1677.371	1	836.316	1	285.954	3	.001	3	.686	3	1.303	1
370			min	-1423.616	3	-22.861	5	-355.713	4	-.002	2	-.491	2	-.036	5
371		15	max	1674.534	1	836.316	1	285.954	3	.001	3	.775	3	1.042	1
372			min	-1425.744	3	-22.861	5	-353.254	4	-.002	2	-.558	2	-.028	5
373		16	max	1671.697	1	836.316	1	285.954	3	.001	3	.864	3	.782	1
374			min	-1427.873	3	-22.861	5	-350.795	4	-.002	2	-.624	2	-.021	5
375		17	max	1668.859	1	836.316	1	285.954	3	.001	3	.953	3	.521	1
376			min	-1430.001	3	-22.861	5	-348.336	4	-.002	2	-.691	2	-.014	5
377		18	max	1666.022	1	836.316	1	285.954	3	.001	3	1.042	3	.261	1
378			min	-1432.129	3	-22.861	5	-345.877	4	-.002	2	-.758	2	-.007	5
379		19	max	1663.184	1	836.316	1	285.954	3	.001	3	1.132	3	0	1
380			min	-1434.257	3	-22.861	5	-343.418	4	-.002	2	-.824	2	0	1
381	M3	1	max	1562.384	2	4.384	4	83.971	2	.015	3	.026	5	0	1
382			min	-576.656	3	1.031	15	-39.72	3	-.028	2	-.009	2	0	1
383		2	max	1562.176	2	3.897	4	83.971	2	.015	3	.021	4	0	15
384			min	-576.812	3	.916	15	-39.72	3	-.028	2	-.008	3	-.001	4
385		3	max	1561.968	2	3.41	4	83.971	2	.015	3	.04	2	0	15
386			min	-576.968	3	.802	15	-39.72	3	-.028	2	-.019	3	-.002	4
387		4	max	1561.759	2	2.923	4	83.971	2	.015	3	.064	2	0	15
388			min	-577.124	3	.687	15	-39.72	3	-.028	2	-.031	3	-.003	4
389		5	max	1561.551	2	2.436	4	83.971	2	.015	3	.089	2	0	15
390			min	-577.28	3	.573	15	-39.72	3	-.028	2	-.042	3	-.004	4
391		6	max	1561.343	2	1.949	4	83.971	2	.015	3	.113	2	-.001	15
392			min	-577.436	3	.458	15	-39.72	3	-.028	2	-.054	3	-.005	4
393		7	max	1561.135	2	1.461	4	83.971	2	.015	3	.138	2	-.001	15
394			min	-577.592	3	.344	15	-39.72	3	-.028	2	-.066	3	-.005	4
395		8	max	1560.927	2	.974	4	83.971	2	.015	3	.162	2	-.001	15
396			min	-577.748	3	.229	15	-39.72	3	-.028	2	-.077	3	-.005	4
397		9	max	1560.719	2	.487	4	83.971	2	.015	3	.187	2	-.001	15
398			min	-577.904	3	.115	15	-39.72	3	-.028	2	-.089	3	-.006	4
399		10	max	1560.511	2	0	1	83.971	2	.015	3	.211	2	-.001	15
400			min	-578.06	3	0	1	-39.72	3	-.028	2	-.1	3	-.006	4
401		11	max	1560.303	2	-.115	15	83.971	2	.015	3	.236	2	-.001	15
402			min	-578.216	3	-.487	6	-39.72	3	-.028	2	-.112	3	-.006	4
403		12	max	1560.095	2	-.229	15	83.971	2	.015	3	.26	2	-.001	15
404			min	-578.372	3	-.974	6	-39.72	3	-.028	2	-.124	3	-.005	4
405		13	max	1559.887	2	-.344	15	83.971	2	.015	3	.285	2	-.001	15
406			min	-578.528	3	-1.461	6	-39.72	3	-.028	2	-.135	3	-.005	4
407		14	max	1559.679	2	-.458	15	83.971	2	.015	3	.309	2	-.001	15
408			min	-578.684	3	-1.949	6	-39.72	3	-.028	2	-.147	3	-.005	4
409		15	max	1559.471	2	-.573	15	83.971	2	.015	3	.334	2	0	15
410			min	-578.84	3	-2.436	6	-39.72	3	-.028	2	-.158	3	-.004	4
411		16	max	1559.263	2	-.687	15	83.971	2	.015	3	.358	2	0	15
412			min	-578.996	3	-2.923	6	-39.72	3	-.028	2	-.17	3	-.003	4
413		17	max	1559.055	2	-.802	15	83.971	2	.015	3	.383	2	0	15
414			min	-579.152	3	-3.41	6	-39.72	3	-.028	2	-.181	3	-.002	4
415		18	max	1558.847	2	-.916	15	83.971	2	.015	3	.407	2	0	15
416			min	-579.308	3	-3.897	6	-39.72	3	-.028	2	-.193	3	-.001	4
417		19	max	1558.638	2	-1.031	15	83.971	2	.015	3	.432	2	0	1
418			min	-579.464	3	-4.384	6	-39.72	3	-.028	2	-.205	3	0	1
419	M6	1	max	4594.265	2	4.384	6	0	1	0	5	.027	4	0	1
420			min	-1995.038	3	1.031	15	-27.577	4	0	1	0	1	0	1
421		2	max	4594.057	2	3.897	6	0	1	0	5	.019	4	0	15
422			min	-1995.194	3	.916	15	-27.202	4	0	1	0	1	-.001	6
423		3	max	4593.849	2	3.41	6	0	1	0	5	.011	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	-1995.35	3	.802	15	-26.827	4	0	1	0	1	-.002	6
425		4	max	4593.641	2	2.923	6	0	1	0	5	.003	4	0	15
426			min	-1995.506	3	.687	15	-26.452	4	0	1	0	1	-.003	6
427		5	max	4593.433	2	2.436	6	0	1	0	5	0	1	0	15
428			min	-1995.662	3	.573	15	-26.076	4	0	1	-.005	4	-.004	6
429		6	max	4593.225	2	1.949	6	0	1	0	5	0	1	-.001	15
430			min	-1995.818	3	.458	15	-25.701	4	0	1	-.012	4	-.005	6
431		7	max	4593.017	2	1.461	6	0	1	0	5	0	1	-.001	15
432			min	-1995.974	3	.344	15	-25.326	4	0	1	-.02	4	-.005	6
433		8	max	4592.809	2	.974	6	0	1	0	5	0	1	-.001	15
434			min	-1996.13	3	.229	15	-24.951	4	0	1	-.027	4	-.005	6
435		9	max	4592.601	2	.487	6	0	1	0	5	0	1	-.001	15
436			min	-1996.286	3	.115	15	-24.576	4	0	1	-.034	4	-.006	6
437		10	max	4592.393	2	0	1	0	1	0	5	0	1	-.001	15
438			min	-1996.442	3	0	1	-24.201	4	0	1	-.041	4	-.006	6
439		11	max	4592.185	2	-.115	15	0	1	0	5	0	1	-.001	15
440			min	-1996.598	3	-.487	4	-23.825	4	0	1	-.048	4	-.006	6
441		12	max	4591.977	2	-.229	15	0	1	0	5	0	1	-.001	15
442			min	-1996.754	3	-.974	4	-23.45	4	0	1	-.055	4	-.005	6
443		13	max	4591.769	2	-.344	15	0	1	0	5	0	1	-.001	15
444			min	-1996.911	3	-1.461	4	-23.075	4	0	1	-.062	4	-.005	6
445		14	max	4591.561	2	-.458	15	0	1	0	5	0	1	-.001	15
446			min	-1997.067	3	-1.949	4	-22.7	4	0	1	-.069	4	-.005	6
447		15	max	4591.353	2	-.573	15	0	1	0	5	0	1	0	15
448			min	-1997.223	3	-2.436	4	-22.325	4	0	1	-.075	4	-.004	6
449		16	max	4591.144	2	-.687	15	0	1	0	5	0	1	0	15
450			min	-1997.379	3	-2.923	4	-21.95	4	0	1	-.082	4	-.003	6
451		17	max	4590.936	2	-.802	15	0	1	0	5	0	1	0	15
452			min	-1997.535	3	-3.41	4	-21.575	4	0	1	-.088	4	-.002	6
453		18	max	4590.728	2	-.916	15	0	1	0	5	0	1	0	15
454			min	-1997.691	3	-3.897	4	-21.199	4	0	1	-.094	4	-.001	6
455		19	max	4590.52	2	-1.031	15	0	1	0	5	0	1	0	1
456			min	-1997.847	3	-4.384	4	-20.824	4	0	1	-.101	4	0	1
457	M9	1	max	1562.384	2	4.384	4	39.72	3	.028	2	.028	4	0	1
458			min	-576.656	3	1.031	15	-83.971	2	-.015	3	-.004	3	0	1
459		2	max	1562.176	2	3.897	4	39.72	3	.028	2	.019	5	0	15
460			min	-576.812	3	.916	15	-83.971	2	-.015	3	-.015	2	-.001	4
461		3	max	1561.968	2	3.41	4	39.72	3	.028	2	.019	3	0	15
462			min	-576.968	3	.802	15	-83.971	2	-.015	3	-.04	2	-.002	4
463		4	max	1561.759	2	2.923	4	39.72	3	.028	2	.031	3	0	15
464			min	-577.124	3	.687	15	-83.971	2	-.015	3	-.064	2	-.003	4
465		5	max	1561.551	2	2.436	4	39.72	3	.028	2	.042	3	0	15
466			min	-577.28	3	.573	15	-83.971	2	-.015	3	-.089	2	-.004	4
467		6	max	1561.343	2	1.949	4	39.72	3	.028	2	.054	3	-.001	15
468			min	-577.436	3	.458	15	-83.971	2	-.015	3	-.113	2	-.005	4
469		7	max	1561.135	2	1.461	4	39.72	3	.028	2	.066	3	-.001	15
470			min	-577.592	3	.344	15	-83.971	2	-.015	3	-.138	2	-.005	4
471		8	max	1560.927	2	.974	4	39.72	3	.028	2	.077	3	-.001	15
472			min	-577.748	3	.229	15	-83.971	2	-.015	3	-.162	2	-.005	4
473		9	max	1560.719	2	.487	4	39.72	3	.028	2	.089	3	-.001	15
474			min	-577.904	3	.115	15	-83.971	2	-.015	3	-.187	2	-.006	4
475		10	max	1560.511	2	0	1	39.72	3	.028	2	.1	3	-.001	15
476			min	-578.06	3	0	1	-83.971	2	-.015	3	-.211	2	-.006	4
477		11	max	1560.303	2	-.115	15	39.72	3	.028	2	.112	3	-.001	15
478			min	-578.216	3	-.487	6	-83.971	2	-.015	3	-.236	2	-.006	4
479		12	max	1560.095	2	-.229	15	39.72	3	.028	2	.124	3	-.001	15
480			min	-578.372	3	-.974	6	-83.971	2	-.015	3	-.26	2	-.005	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	1559.887	2	-.344	15	39.72	3	.028	2	.135	3	-.001	15
482			min	-578.528	3	-1.461	6	-83.971	2	-.015	3	-.285	2	-.005	4
483		14	max	1559.679	2	-.458	15	39.72	3	.028	2	.147	3	-.001	15
484			min	-578.684	3	-1.949	6	-83.971	2	-.015	3	-.309	2	-.005	4
485		15	max	1559.471	2	-.573	15	39.72	3	.028	2	.158	3	0	15
486			min	-578.84	3	-2.436	6	-83.971	2	-.015	3	-.334	2	-.004	4
487		16	max	1559.263	2	-.687	15	39.72	3	.028	2	.17	3	0	15
488			min	-578.996	3	-2.923	6	-83.971	2	-.015	3	-.358	2	-.003	4
489		17	max	1559.055	2	-.802	15	39.72	3	.028	2	.181	3	0	15
490			min	-579.152	3	-3.41	6	-83.971	2	-.015	3	-.383	2	-.002	4
491		18	max	1558.847	2	-.916	15	39.72	3	.028	2	.193	3	0	15
492			min	-579.308	3	-3.897	6	-83.971	2	-.015	3	-.407	2	-.001	4
493		19	max	1558.638	2	-1.031	15	39.72	3	.028	2	.205	3	0	1
494			min	-579.464	3	-4.384	6	-83.971	2	-.015	3	-.432	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	-.027	15	-.032	12	.03	1	1.196e-2	3	NC	3	NC	3
2			min	-.236	1	-.511	1	-.631	5	-2.927e-2	2	241.801	1	299.16	5
3		2	max	-.027	15	-.032	15	.009	1	1.196e-2	3	NC	12	NC	3
4			min	-.236	1	-.424	1	-.603	4	-2.927e-2	2	286.892	1	319.868	5
5		3	max	-.027	15	-.027	15	0	12	1.134e-2	3	8157.962	12	NC	2
6			min	-.236	1	-.337	1	-.577	4	-2.706e-2	2	352.748	1	344.799	5
7		4	max	-.026	15	-.022	15	-.001	12	1.039e-2	3	5676.678	12	NC	1
8			min	-.236	1	-.253	1	-.543	4	-2.366e-2	2	452.684	1	379.058	5
9		5	max	-.026	15	-.018	15	0	12	9.433e-3	3	NC	10	NC	1
10			min	-.236	1	-.177	1	-.504	4	-2.026e-2	2	607.142	1	425.636	5
11		6	max	-.026	15	-.014	15	.001	3	9.78e-3	3	NC	2	NC	1
12			min	-.235	1	-.116	1	-.463	4	-1.96e-2	2	840.949	1	488.182	5
13		7	max	-.026	15	-.01	15	.002	3	1.103e-2	3	5729.682	12	NC	2
14			min	-.235	1	-.088	3	-.422	4	-2.082e-2	2	1145.646	14	570.058	5
15		8	max	-.026	15	.001	10	.001	3	1.227e-2	3	NC	11	NC	2
16			min	-.235	1	-.076	3	-.383	4	-2.204e-2	2	1377.723	14	676.541	5
17		9	max	-.026	15	.018	2	0	9	1.367e-2	3	NC	3	NC	2
18			min	-.234	1	-.059	3	-.35	4	-2.185e-2	2	1420.626	2	814.884	5
19		10	max	-.026	15	.04	1	0	2	1.534e-2	3	NC	1	NC	2
20			min	-.234	1	-.04	3	-.316	4	-1.916e-2	2	1161.014	2	1023.827	5
21		11	max	-.026	15	.071	1	.002	3	1.7e-2	3	6149.785	12	NC	2
22			min	-.234	1	-.017	3	-.284	4	-1.647e-2	2	999.47	2	1357.516	5
23		12	max	-.026	15	.099	1	.008	3	1.406e-2	3	8407.687	9	NC	2
24			min	-.233	1	.007	12	-.255	4	-1.231e-2	2	894.782	2	1928.718	5
25		13	max	-.026	15	.121	1	.014	3	8.509e-3	3	NC	9	NC	2
26			min	-.233	1	.012	15	-.228	4	-7.308e-3	2	841.719	2	3154.059	5
27		14	max	-.026	15	.132	1	.013	3	3.218e-3	3	NC	9	NC	2
28			min	-.232	1	.015	15	-.206	4	-6.386e-3	4	850.836	2	4958.557	1
29		15	max	-.026	15	.177	3	.01	1	9.473e-3	3	NC	4	NC	3
30			min	-.232	1	.018	15	-.193	5	-6.103e-3	2	595.8	3	3605.963	1
31		16	max	-.026	15	.27	3	.014	1	1.573e-2	3	NC	4	NC	3
32			min	-.232	1	.007	10	-.186	5	-9.709e-3	2	421.744	3	3273.944	1
33		17	max	-.026	15	.373	3	.008	1	2.198e-2	3	NC	4	NC	3
34			min	-.232	1	-.015	10	-.184	4	-1.331e-2	2	318.141	3	3764.294	1
35		18	max	-.026	15	.481	3	-.001	10	2.606e-2	3	NC	4	NC	2
36			min	-.232	1	-.038	2	-.187	4	-1.566e-2	2	253.395	3	6970.267	1
37		19	max	-.026	15	.588	3	-.004	12	2.606e-2	3	NC	1	NC	1
38			min	-.232	1	-.077	2	-.191	4	-1.566e-2	2	210.592	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	-.019	15	.016	3	0	1	1.321e-4	4	NC	3	NC	1
40			min	-.465	1	-1.165	1	-.628	4	0	1	125.07	1	300.557	4
41		2	max	-.019	15	-.029	12	0	1	1.321e-4	4	4009.133	12	NC	1
42			min	-.465	1	-.956	1	-.604	4	0	1	155.387	1	317.708	4
43		3	max	-.019	15	-.026	15	0	1	0	1	4613.311	15	NC	1
44			min	-.464	1	-.746	1	-.577	4	-2.287e-4	4	205.276	1	338.665	4
45		4	max	-.019	15	-.02	15	0	1	0	1	5840.141	15	NC	1
46			min	-.464	1	-.545	1	-.544	4	-7.822e-4	4	296.644	1	370.196	4
47		5	max	-.019	15	-.014	15	0	1	0	1	NC	2	NC	1
48			min	-.464	1	-.368	1	-.504	4	-1.336e-3	4	488.795	1	415.359	4
49		6	max	-.019	15	-.01	15	0	1	0	1	NC	15	NC	1
50			min	-.463	1	-.229	1	-.462	4	-1.275e-3	4	638.826	3	477.777	4
51		7	max	-.019	15	-.006	15	0	1	0	1	NC	15	NC	1
52			min	-.463	1	-.186	3	-.421	4	-7.896e-4	4	620.595	2	560.06	4
53		8	max	-.019	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.462	1	-.162	3	-.383	4	-3.042e-4	4	487.746	2	665.456	4
55		9	max	-.019	15	.038	2	0	1	0	1	NC	5	NC	1
56			min	-.461	1	-.13	3	-.35	4	-6.797e-5	4	415.775	2	796.565	4
57		10	max	-.019	15	.086	1	0	1	0	1	NC	4	NC	1
58			min	-.46	1	-.093	3	-.316	4	-2.722e-4	4	363.941	2	998.037	4
59		11	max	-.019	15	.148	1	0	1	0	1	NC	5	NC	1
60			min	-.459	1	-.047	3	-.283	4	-4.765e-4	4	326.812	2	1315.889	4
61		12	max	-.019	15	.204	1	0	1	0	1	NC	3	NC	1
62			min	-.457	1	.007	12	-.255	4	-1.84e-3	4	300.225	2	1819.092	4
63		13	max	-.019	15	.246	1	0	1	0	1	NC	5	NC	1
64			min	-.456	1	.01	15	-.229	4	-3.859e-3	4	286.703	2	2830.601	4
65		14	max	-.019	15	.257	1	0	1	0	1	NC	5	NC	1
66			min	-.455	1	.011	15	-.209	4	-5.801e-3	4	292.355	2	4839.06	4
67		15	max	-.019	15	.389	3	0	1	0	1	NC	5	NC	1
68			min	-.455	1	.01	15	-.198	4	-4.36e-3	4	329.549	2	8272.225	4
69		16	max	-.019	15	.615	3	0	1	0	1	NC	5	NC	1
70			min	-.455	1	0	10	-.191	4	-2.918e-3	4	223.749	3	NC	1
71		17	max	-.019	15	.868	3	0	1	0	1	NC	5	NC	1
72			min	-.455	1	-.064	2	-.187	4	-1.477e-3	4	157.33	3	NC	1
73		18	max	-.019	15	1.131	3	0	1	0	1	NC	4	NC	1
74			min	-.456	1	-.174	2	-.184	4	-5.369e-4	4	120.238	3	NC	1
75		19	max	-.019	15	1.393	3	0	1	0	1	NC	1	NC	1
76			min	-.456	1	-.284	2	-.182	4	-5.369e-4	4	97.345	3	NC	1
77	M7	1	max	.006	5	-.002	15	-.003	12	2.927e-2	2	NC	3	NC	3
78			min	-.236	1	-.511	1	-.645	4	-1.196e-2	3	241.801	1	284.923	4
79		2	max	.006	5	0	15	0	12	2.927e-2	2	NC	5	NC	3
80			min	-.236	1	-.424	1	-.608	4	-1.196e-2	3	286.892	1	308.894	4
81		3	max	.006	5	0	15	.009	1	2.706e-2	2	NC	5	NC	2
82			min	-.236	1	-.337	1	-.572	4	-1.134e-2	3	352.748	1	337.494	4
83		4	max	.006	5	.002	5	.016	1	2.366e-2	2	NC	5	NC	1
84			min	-.236	1	-.253	1	-.534	5	-1.039e-2	3	452.684	1	373.051	4
85		5	max	.006	5	.003	5	.017	1	2.026e-2	2	NC	5	NC	1
86			min	-.236	1	-.177	1	-.495	5	-9.433e-3	3	607.142	1	418.161	4
87		6	max	.006	5	.004	5	.014	1	1.96e-2	2	NC	2	NC	1
88			min	-.235	1	-.116	1	-.456	4	-9.78e-3	3	840.949	1	475.94	4
89		7	max	.006	5	.004	5	.007	1	2.082e-2	2	NC	4	NC	2
90			min	-.235	1	-.088	3	-.419	4	-1.103e-2	3	1200.749	9	548.184	4
91		8	max	.006	5	.003	5	.002	2	2.204e-2	2	NC	4	NC	2
92			min	-.235	1	-.076	3	-.384	4	-1.227e-2	3	1486.644	9	640.944	4
93		9	max	.006	5	.018	2	0	1	2.185e-2	2	NC	3	NC	2
94			min	-.234	1	-.059	3	-.35	4	-1.367e-2	3	1420.626	2	765.488	4
95		10	max	.006	5	.04	1	0	3	1.916e-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	-.234	1	-.04	3	-.316	4	-1.534e-2	3	1161.014	2	947.113	4
97		11	max	.006	5	.071	1	.001	2	1.647e-2	2	NC	5	NC	2
98			min	-.234	1	-.017	3	-.283	4	-1.7e-2	3	999.47	2	1231.075	4
99		12	max	.006	5	.099	1	.007	1	1.231e-2	2	NC	5	NC	2
100			min	-.233	1	0	15	-.252	4	-1.406e-2	3	894.782	2	1721.098	4
101		13	max	.006	5	.121	1	.009	2	7.308e-3	2	NC	5	NC	2
102			min	-.233	1	-.002	5	-.226	4	-8.509e-3	3	841.719	2	2622.938	4
103		14	max	.006	5	.132	1	.005	2	2.498e-3	2	NC	5	NC	2
104			min	-.232	1	-.004	5	-.208	4	-5.741e-3	5	850.836	2	4034.597	4
105		15	max	.006	5	.177	3	0	10	6.103e-3	2	NC	5	NC	3
106			min	-.232	1	-.007	5	-.199	4	-9.473e-3	3	595.8	3	3605.963	1
107		16	max	.006	5	.27	3	-.002	10	9.709e-3	2	NC	5	NC	3
108			min	-.232	1	-.012	5	-.193	4	-1.573e-2	3	421.744	3	3273.944	1
109		17	max	.006	5	.373	3	0	12	1.331e-2	2	NC	4	NC	3
110			min	-.232	1	-.016	5	-.188	4	-2.198e-2	3	318.141	3	3764.294	1
111		18	max	.006	5	.481	3	.008	1	1.566e-2	2	NC	4	NC	2
112			min	-.232	1	-.038	2	-.182	4	-2.606e-2	3	253.395	3	6970.267	1
113		19	max	.006	5	.588	3	.027	1	1.566e-2	2	NC	1	NC	1
114			min	-.232	1	-.077	2	-.179	5	-2.606e-2	3	210.592	3	NC	1
115	M10	1	max	.001	1	.443	3	.232	1	1.444e-2	3	NC	1	NC	1
116			min	-.184	4	-.03	10	-.006	5	-5.133e-3	2	NC	1	NC	1
117		2	max	.001	1	.839	3	.306	1	1.675e-2	3	NC	4	NC	3
118			min	-.184	4	-.261	2	0	15	-6.202e-3	2	666.564	3	3594.504	1
119		3	max	0	1	1.207	3	.416	1	1.905e-2	3	NC	5	NC	5
120			min	-.185	4	-.473	2	.007	15	-7.271e-3	2	345.723	3	1436.201	1
121		4	max	0	1	1.481	3	.522	1	2.136e-2	3	NC	5	NC	5
122			min	-.185	4	-.618	2	.013	15	-8.34e-3	2	254.341	3	910.624	1
123		5	max	0	1	1.625	3	.596	1	2.367e-2	3	NC	5	NC	5
124			min	-.185	4	-.674	2	.017	15	-9.409e-3	2	223.321	3	725.348	1
125		6	max	0	1	1.63	3	.624	1	2.598e-2	3	NC	5	NC	5
126			min	-.185	4	-.636	2	.019	15	-1.048e-2	2	222.429	3	674.054	1
127		7	max	0	1	1.514	3	.604	1	2.828e-2	3	NC	5	NC	5
128			min	-.185	4	-.519	2	.02	15	-1.155e-2	2	246.583	3	709.421	1
129		8	max	0	1	1.323	3	.55	1	3.059e-2	3	NC	5	NC	5
130			min	-.185	4	-.358	2	.018	15	-1.262e-2	2	300.161	3	830.283	1
131		9	max	0	1	1.131	3	.488	1	3.29e-2	3	NC	4	NC	5
132			min	-.185	4	-.206	2	.017	15	-1.368e-2	2	384.031	3	1034.584	1
133		10	max	0	1	1.039	3	.456	1	3.521e-2	3	NC	4	NC	5
134			min	-.185	4	-.136	2	.019	15	-1.475e-2	2	442.981	3	1182.59	1
135		11	max	0	10	1.131	3	.488	1	3.29e-2	3	NC	4	NC	5
136			min	-.185	4	-.206	2	.023	15	-1.368e-2	2	384.031	3	1034.584	1
137		12	max	0	10	1.323	3	.55	1	3.059e-2	3	NC	5	NC	5
138			min	-.185	4	-.358	2	.029	15	-1.262e-2	2	300.161	3	830.283	1
139		13	max	0	10	1.514	3	.604	1	2.828e-2	3	NC	15	NC	15
140			min	-.185	4	-.519	2	.033	15	-1.155e-2	2	246.583	3	709.421	1
141		14	max	0	10	1.63	3	.624	1	2.598e-2	3	9971.1	15	NC	15
142			min	-.185	4	-.636	2	.036	15	-1.048e-2	2	222.429	3	674.054	1
143		15	max	0	10	1.625	3	.596	1	2.367e-2	3	8120.809	15	NC	5
144			min	-.185	4	-.674	2	.036	15	-9.409e-3	2	223.321	3	725.348	1
145		16	max	0	10	1.481	3	.522	1	2.136e-2	3	7795.668	15	NC	5
146			min	-.185	4	-.618	2	.034	15	-8.34e-3	2	254.341	3	910.624	1
147		17	max	0	10	1.207	3	.416	1	1.905e-2	3	9015.487	15	NC	5
148			min	-.185	4	-.473	2	.031	15	-7.271e-3	2	345.723	3	1436.201	1
149		18	max	0	10	.839	3	.306	1	1.675e-2	3	NC	15	NC	3
150			min	-.185	4	-.261	2	.028	15	-6.202e-3	2	666.564	3	3594.504	1
151		19	max	0	10	.443	3	.232	1	1.444e-2	3	NC	1	NC	1
152			min	-.185	4	-.03	10	.026	15	-5.133e-3	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.003	1	.081	1	.233	1	3.813e-3	1	NC	1	NC	1
154			min	-.272	4	-.007	3	-.006	5	-1.379e-4	5	NC	1	NC	1
155		2	max	.003	1	.269	3	.289	1	4.237e-3	1	NC	4	NC	3
156			min	-.272	4	-.164	2	.025	15	-6.708e-5	5	953.396	3	4730.161	1
157		3	max	.003	1	.528	3	.39	1	4.662e-3	1	NC	5	NC	3
158			min	-.272	4	-.358	2	.038	15	-6.22e-6	15	492.793	3	1682.282	1
159		4	max	.002	1	.705	3	.494	1	5.086e-3	1	NC	5	8776.93	12
160			min	-.272	4	-.478	2	.038	15	4.076e-5	15	370.411	3	1013.58	1
161		5	max	.002	1	.764	3	.57	1	5.511e-3	1	NC	5	9984.717	15
162			min	-.272	4	-.504	2	.029	15	8.775e-5	15	342.02	3	783.456	1
163		6	max	.002	1	.697	3	.604	1	5.936e-3	1	NC	5	NC	5
164			min	-.273	4	-.436	2	.014	15	1.347e-4	15	374.519	3	712.648	1
165		7	max	.001	1	.524	3	.592	1	6.36e-3	1	NC	5	NC	5
166			min	-.273	4	-.29	2	0	15	1.817e-4	15	497.002	3	736.701	1
167		8	max	0	1	.29	3	.545	1	6.785e-3	1	NC	4	NC	5
168			min	-.273	4	-.105	2	-.012	5	2.287e-4	15	886.374	3	847.292	1
169		9	max	0	1	.095	1	.488	1	7.21e-3	1	NC	1	NC	5
170			min	-.273	4	.001	15	-.006	5	2.757e-4	15	3312.229	3	1037.447	1
171		10	max	0	1	.169	1	.458	1	7.634e-3	1	NC	3	NC	5
172			min	-.273	4	-.028	3	.019	15	3.227e-4	15	3001.742	1	1174.307	1
173		11	max	0	3	.095	1	.488	1	7.21e-3	1	NC	1	8015.988	15
174			min	-.273	4	.007	15	.045	15	3.387e-4	15	3312.229	3	1037.447	1
175		12	max	0	3	.29	3	.545	1	6.785e-3	1	NC	4	6428.24	15
176			min	-.273	4	-.105	2	.055	15	3.547e-4	15	886.374	3	847.292	1
177		13	max	.001	3	.524	3	.592	1	6.36e-3	1	NC	5	7342.252	15
178			min	-.273	4	-.29	2	.052	15	3.707e-4	15	497.002	3	736.701	1
179		14	max	.002	3	.697	3	.604	1	5.936e-3	1	NC	15	NC	15
180			min	-.273	4	-.436	2	.039	15	3.867e-4	15	374.519	3	712.648	1
181		15	max	.002	3	.764	3	.57	1	5.511e-3	1	8553.945	15	NC	5
182			min	-.273	4	-.504	2	.022	15	4.027e-4	15	342.02	3	783.456	1
183		16	max	.003	3	.705	3	.494	1	5.086e-3	1	7897.793	15	NC	5
184			min	-.273	4	-.478	2	.006	15	4.188e-4	15	370.411	3	1013.58	1
185		17	max	.003	3	.528	3	.39	1	4.662e-3	1	8885.755	15	NC	3
186			min	-.273	4	-.358	2	-.003	5	4.348e-4	15	492.793	3	1682.282	1
187		18	max	.003	3	.269	3	.289	1	4.237e-3	1	NC	15	NC	3
188			min	-.273	4	-.164	2	.001	15	4.508e-4	15	953.396	3	4730.161	1
189		19	max	.004	3	.081	1	.233	1	3.813e-3	1	NC	1	NC	1
190			min	-.273	4	-.007	3	.026	15	4.668e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.01	2	.235	1	4.694e-3	1	NC	1	NC	1
192			min	-.362	4	-.065	3	-.006	5	-8.924e-5	5	NC	1	NC	1
193		2	max	0	2	.117	3	.282	1	5.196e-3	1	NC	5	NC	2
194			min	-.362	4	-.328	2	.028	15	-1.907e-5	15	781.226	2	4602.722	4
195		3	max	0	2	.261	3	.378	1	5.698e-3	1	NC	5	NC	10
196			min	-.362	4	-.621	2	.042	15	3.055e-5	15	418.833	2	1837.874	1
197		4	max	0	2	.343	3	.481	1	6.199e-3	1	NC	5	6589.346	15
198			min	-.362	4	-.809	2	.04	15	8.017e-5	15	322.494	2	1073.047	1
199		5	max	0	2	.353	3	.558	1	6.701e-3	1	NC	5	9950.748	15
200			min	-.362	4	-.863	2	.029	15	1.298e-4	15	302.724	2	815.048	1
201		6	max	0	2	.293	3	.595	1	7.203e-3	1	NC	5	NC	5
202			min	-.362	4	-.778	2	.012	15	1.794e-4	15	335.113	2	732.459	1
203		7	max	0	2	.179	3	.587	1	7.705e-3	1	NC	5	NC	5
204			min	-.362	4	-.581	2	-.005	5	2.29e-4	15	446.956	2	749.594	1
205		8	max	0	2	.039	3	.544	1	8.206e-3	1	NC	5	NC	13
206			min	-.362	4	-.324	2	-.019	5	2.786e-4	15	791.808	2	853.729	1
207		9	max	0	2	-.002	15	.49	1	8.708e-3	1	NC	3	NC	4
208			min	-.362	4	-.096	1	-.011	5	3.283e-4	15	2732.962	2	1035.129	1
209		10	max	0	1	.021	2	.461	1	9.21e-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	-.362	4	-.142	3	.019	15	3.779e-4	15	3433.413	3	1165.294	1
211		11	max	0	9	-.004	15	.49	1	8.708e-3	1	NC	3	7180.042	15
212			min	-.362	4	-.096	1	.049	15	3.909e-4	15	2732.962	2	1035.129	1
213		12	max	0	9	.039	3	.544	1	8.206e-3	1	NC	5	5747.074	15
214			min	-.362	4	-.324	2	.06	15	4.038e-4	15	791.808	2	853.729	1
215		13	max	0	9	.179	3	.587	1	7.705e-3	1	NC	15	6620.008	15
216			min	-.362	4	-.581	2	.056	15	4.168e-4	15	446.956	2	749.594	1
217		14	max	0	9	.293	3	.595	1	7.203e-3	1	NC	15	NC	15
218			min	-.362	4	-.778	2	.041	15	4.298e-4	15	335.113	2	732.459	1
219		15	max	0	9	.353	3	.558	1	6.701e-3	1	8861.957	15	NC	5
220			min	-.362	4	-.863	2	.022	15	4.428e-4	15	302.724	2	815.048	1
221		16	max	0	9	.343	3	.481	1	6.199e-3	1	8873.673	15	NC	5
222			min	-.362	4	-.809	2	.003	15	4.558e-4	15	322.494	2	1073.047	1
223		17	max	0	9	.261	3	.378	1	5.698e-3	1	NC	15	NC	4
224			min	-.362	4	-.621	2	-.009	5	4.688e-4	15	418.833	2	1837.874	1
225		18	max	0	9	.117	3	.282	1	5.196e-3	1	NC	5	NC	2
226			min	-.362	4	-.328	2	-.002	5	4.817e-4	15	781.226	2	5610.661	1
227		19	max	0	9	.01	2	.235	1	4.694e-3	1	NC	1	NC	1
228			min	-.361	4	-.065	3	.026	15	4.947e-4	15	NC	1	NC	1
229	M13	1	max	0	12	0	15	.236	1	1.17e-2	1	NC	1	NC	1
230			min	-.596	4	-.394	1	-.006	5	-1.821e-3	3	NC	1	NC	1
231		2	max	0	12	.106	3	.312	1	1.352e-2	1	NC	5	NC	3
232			min	-.596	4	-.762	1	.028	15	-2.434e-3	3	614.315	2	3482.154	1
233		3	max	0	12	.251	3	.424	1	1.534e-2	1	NC	5	NC	12
234			min	-.596	4	-1.138	2	.043	15	-3.047e-3	3	326.868	2	1405.416	1
235		4	max	0	12	.343	3	.531	1	1.732e-2	2	NC	5	6175.881	12
236			min	-.596	4	-1.404	2	.045	15	-3.661e-3	3	245.811	2	894.923	1
237		5	max	0	12	.367	3	.605	1	1.931e-2	2	NC	15	7733.351	15
238			min	-.595	4	-1.527	2	.036	15	-4.274e-3	3	220.59	2	714.231	1
239		6	max	0	12	.326	3	.633	1	2.13e-2	2	NC	15	NC	15
240			min	-.595	4	-1.502	2	.022	15	-4.887e-3	3	225.268	2	664.087	1
241		7	max	0	12	.23	3	.614	1	2.329e-2	2	NC	15	NC	5
242			min	-.595	4	-1.353	2	.007	15	-5.501e-3	3	258.031	2	698.457	1
243		8	max	0	12	.106	3	.56	1	2.528e-2	2	NC	15	NC	5
244			min	-.595	4	-1.137	1	-.003	15	-6.114e-3	3	329.217	2	815.73	1
245		9	max	0	12	-.007	3	.497	1	2.727e-2	2	NC	5	NC	5
246			min	-.595	4	-.965	1	0	15	-6.728e-3	3	449.293	2	1012.813	1
247		10	max	0	1	-.03	15	.465	1	2.926e-2	2	NC	3	NC	5
248			min	-.595	4	-.883	1	.019	15	-7.341e-3	3	539.193	1	1154.679	1
249		11	max	0	1	-.007	3	.497	1	2.727e-2	2	NC	5	8874.433	15
250			min	-.595	4	-.965	1	.042	15	-6.728e-3	3	449.293	2	1012.813	1
251		12	max	0	1	.106	3	.56	1	2.528e-2	2	NC	15	7325.455	15
252			min	-.595	4	-1.137	1	.05	15	-6.114e-3	3	329.217	2	815.73	1
253		13	max	0	1	.23	3	.614	1	2.329e-2	2	9138.485	15	8723.357	15
254			min	-.595	4	-1.353	2	.046	15	-5.501e-3	3	258.031	2	698.457	1
255		14	max	0	1	.326	3	.633	1	2.13e-2	2	7835.166	15	NC	5
256			min	-.595	4	-1.502	2	.034	15	-4.887e-3	3	225.268	2	664.087	1
257		15	max	.001	1	.367	3	.605	1	1.931e-2	2	7445.169	15	NC	5
258			min	-.595	4	-1.527	2	.018	15	-4.274e-3	3	220.59	2	714.231	1
259		16	max	.001	1	.343	3	.531	1	1.732e-2	2	7959.698	15	NC	5
260			min	-.595	4	-1.404	2	.003	15	-3.661e-3	3	245.811	2	894.923	1
261		17	max	.001	1	.251	3	.424	1	1.534e-2	1	NC	15	NC	4
262			min	-.595	4	-1.138	2	-.006	5	-3.047e-3	3	326.868	2	1405.416	1
263		18	max	.002	1	.106	3	.312	1	1.352e-2	1	NC	5	NC	3
264			min	-.595	4	-.762	1	0	15	-2.434e-3	3	614.315	2	3482.154	1
265		19	max	.002	1	-.03	15	.236	1	1.17e-2	1	NC	1	NC	1
266			min	-.595	4	-.394	1	.027	15	-1.821e-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	6.168e-3	2	NC	1	NC	1
270			min	0	1	-.001	3	0	2	-6.514e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.004	5	8.006e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-8.732e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.009	5	7.361e-3	2	NC	2	NC	1
274			min	0	1	-.01	1	-.002	1	-8.487e-3	5	6569.538	1	7519.515	5
275		5	max	0	3	-.002	15	.015	5	6.715e-3	2	NC	5	NC	1
276			min	0	1	-.018	1	-.003	1	-8.241e-3	5	3732.942	1	4359.43	5
277		6	max	0	3	-.003	15	.023	5	6.07e-3	2	NC	5	NC	1
278			min	0	1	-.028	1	-.005	1	-7.996e-3	5	2425.997	1	2870.686	5
279		7	max	0	3	-.005	15	.033	5	5.425e-3	2	NC	7	NC	1
280			min	0	1	-.039	1	-.006	1	-7.75e-3	5	1715.091	1	2050.054	5
281		8	max	0	3	-.006	15	.043	5	4.779e-3	2	NC	15	NC	9
282			min	0	1	-.052	1	-.008	1	-7.505e-3	5	1284.314	1	1548.321	5
283		9	max	0	3	-.008	15	.055	5	4.134e-3	2	8771.261	15	NC	9
284			min	0	1	-.067	1	-.009	1	-7.259e-3	5	1003.425	1	1218.986	5
285		10	max	0	3	-.009	15	.068	5	3.488e-3	2	7090.847	15	NC	9
286			min	0	1	-.083	1	-.01	1	-7.014e-3	5	809.636	1	990.639	5
287		11	max	0	3	-.011	15	.082	5	2.843e-3	2	5878.59	15	NC	9
288			min	-.001	1	-.1	1	-.011	1	-6.768e-3	5	670.222	1	825.715	5
289		12	max	0	3	-.014	15	.096	5	2.198e-3	2	4974.441	15	NC	9
290			min	-.001	1	-.119	1	-.012	1	-6.523e-3	5	566.468	1	702.601	5
291		13	max	.001	3	-.016	15	.111	5	1.552e-3	2	4281.527	15	NC	9
292			min	-.001	1	-.138	1	-.012	1	-6.292e-3	4	487.093	1	608.203	5
293		14	max	.001	3	-.018	15	.126	5	9.069e-4	2	3738.778	15	NC	9
294			min	-.001	1	-.158	1	-.012	1	-6.122e-3	4	425.01	1	534.249	5
295		15	max	.001	3	-.02	15	.142	5	9.075e-4	3	3305.463	15	NC	9
296			min	-.001	1	-.179	1	-.011	1	-5.952e-3	4	375.505	1	475.232	5
297		16	max	.001	3	-.023	15	.157	5	1.298e-3	3	2954.147	15	NC	9
298			min	-.002	1	-.201	1	-.009	1	-5.782e-3	4	335.41	1	427.424	5
299		17	max	.001	3	-.025	15	.174	4	1.689e-3	3	2665.422	15	NC	9
300			min	-.002	1	-.223	1	-.007	1	-5.612e-3	4	302.488	1	387.645	4
301		18	max	.001	3	-.028	15	.19	4	2.08e-3	3	2425.398	15	NC	1
302			min	-.002	1	-.245	1	-.006	3	-5.442e-3	4	275.14	1	354.187	4
303		19	max	.001	3	-.03	15	.206	4	2.471e-3	3	2223.897	15	NC	1
304			min	-.002	1	-.267	1	-.013	3	-5.272e-3	4	252.197	1	326.13	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	-6.994e-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	-9.355e-3	4	7967.015	1	NC	1
311		4	max	0	3	0	15	.009	4	0	1	NC	4	NC	1
312			min	0	1	-.02	1	0	1	-9.058e-3	4	3445.886	1	7156.194	4
313		5	max	.001	3	-.001	15	.016	4	0	1	NC	5	NC	1
314			min	-.001	1	-.035	1	0	1	-8.761e-3	4	1939.543	1	4153.127	4
315		6	max	.001	3	-.002	15	.025	4	0	1	NC	5	NC	1
316			min	-.001	1	-.054	1	0	1	-8.464e-3	4	1254.058	1	2737.946	4
317		7	max	.002	3	-.003	15	.034	4	0	1	NC	5	NC	1
318			min	-.002	1	-.076	1	0	1	-8.167e-3	4	883.761	1	1957.661	4
319		8	max	.002	3	-.004	15	.045	4	0	1	NC	5	NC	1
320			min	-.002	1	-.102	1	0	1	-7.87e-3	4	660.361	1	1480.497	4
321		9	max	.002	3	-.005	15	.058	4	0	1	NC	15	NC	1
322			min	-.002	1	-.131	1	0	1	-7.573e-3	4	515.135	1	1167.233	4
323		10	max	.002	3	-.007	15	.071	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	-.162	1	0	1	-7.276e-3	4	415.164	1	950.014	4
325		11	max	.002	3	-.008	15	.085	4	0	1	8280.626	15	NC	1
326			min	-.003	1	-.196	1	0	1	-6.979e-3	4	343.364	1	793.128	4
327		12	max	.003	3	-.01	15	.1	4	0	1	6999.886	15	NC	1
328			min	-.003	1	-.232	1	0	1	-6.682e-3	4	290.001	1	676.03	4
329		13	max	.003	3	-.011	15	.115	4	0	1	6019.847	15	NC	1
330			min	-.003	1	-.27	1	0	1	-6.385e-3	4	249.22	1	586.275	4
331		14	max	.003	3	-.013	15	.13	4	0	1	5253.159	15	NC	1
332			min	-.003	1	-.31	1	0	1	-6.088e-3	4	217.352	1	515.993	4
333		15	max	.003	3	-.015	15	.146	4	0	1	4641.696	15	NC	1
334			min	-.004	1	-.351	1	0	1	-5.791e-3	4	191.958	1	459.952	4
335		16	max	.004	3	-.016	15	.162	4	0	1	4146.387	15	NC	1
336			min	-.004	1	-.393	1	0	1	-5.494e-3	4	171.405	1	414.606	4
337		17	max	.004	3	-.018	15	.178	4	0	1	3739.636	15	NC	1
338			min	-.004	1	-.436	1	0	1	-5.197e-3	4	154.537	1	377.459	4
339		18	max	.004	3	-.02	15	.194	4	0	1	3401.72	15	NC	1
340			min	-.005	1	-.479	1	0	1	-4.9e-3	4	140.532	1	346.722	4
341		19	max	.004	3	-.022	15	.21	4	0	1	3118.208	15	NC	1
342			min	-.005	1	-.523	1	0	1	-4.603e-3	4	128.787	1	321.08	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	2.954e-3	3	NC	1	NC	1
346			min	0	1	-.001	3	0	3	-7.571e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	3.782e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	-.001	3	-1.009e-2	4	NC	1	NC	1
349		4	max	0	3	0	5	.01	4	3.391e-3	3	NC	2	NC	1
350			min	0	1	-.01	1	-.002	3	-9.721e-3	4	6569.538	1	7070.324	4
351		5	max	0	3	0	5	.016	4	3.001e-3	3	NC	4	NC	1
352			min	0	1	-.018	1	-.004	3	-9.348e-3	4	3732.942	1	4108.479	4
353		6	max	0	3	0	5	.025	4	2.61e-3	3	NC	4	NC	1
354			min	0	1	-.028	1	-.006	3	-8.975e-3	4	2425.997	1	2711.543	4
355		7	max	0	3	.001	5	.035	4	2.219e-3	3	NC	5	NC	1
356			min	0	1	-.039	1	-.007	3	-8.602e-3	4	1715.091	1	1940.861	4
357		8	max	0	3	.002	5	.046	4	1.828e-3	3	NC	5	NC	9
358			min	0	1	-.052	1	-.009	3	-8.228e-3	4	1284.314	1	1469.37	4
359		9	max	0	3	.002	5	.058	4	1.437e-3	3	NC	5	NC	9
360			min	0	1	-.067	1	-.01	3	-7.855e-3	4	1003.425	1	1159.729	4
361		10	max	0	3	.002	5	.071	4	1.047e-3	3	NC	5	NC	9
362			min	0	1	-.083	1	-.011	3	-7.482e-3	4	809.636	1	944.979	4
363		11	max	0	3	.003	5	.085	4	6.557e-4	3	NC	5	NC	9
364			min	-.001	1	-.1	1	-.012	3	-7.109e-3	4	670.222	1	789.859	4
365		12	max	0	3	.003	5	.1	4	2.649e-4	3	NC	5	NC	9
366			min	-.001	1	-.119	1	-.012	3	-6.736e-3	4	566.468	1	674.082	4
367		13	max	.001	3	.004	5	.115	4	-7.576e-5	9	NC	5	NC	9
368			min	-.001	1	-.138	1	-.012	3	-6.362e-3	4	487.093	1	585.355	4
369		14	max	.001	3	.005	5	.13	4	1.424e-4	9	NC	5	NC	9
370			min	-.001	1	-.158	1	-.01	3	-6.e-3	5	425.01	1	515.9	4
371		15	max	.001	3	.005	5	.146	4	3.606e-4	9	NC	5	NC	9
372			min	-.001	1	-.179	1	-.008	3	-5.706e-3	5	375.505	1	460.551	4
373		16	max	.001	3	.006	5	.162	4	8.868e-4	1	NC	5	NC	9
374			min	-.002	1	-.201	1	-.005	3	-5.412e-3	5	335.41	1	415.802	4
375		17	max	.001	3	.006	5	.178	4	1.472e-3	1	NC	5	NC	9
376			min	-.002	1	-.223	1	0	3	-5.118e-3	5	302.488	1	379.188	4
377		18	max	.001	3	.007	5	.193	4	2.057e-3	1	NC	7	NC	1
378			min	-.002	1	-.245	1	0	10	-4.824e-3	5	275.14	1	348.941	4
379		19	max	.001	3	.008	5	.208	4	2.642e-3	1	NC	7	NC	1
380			min	-.002	1	-.267	1	-.005	2	-4.53e-3	5	252.197	1	323.765	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	3.905e-3	2	NC	1	NC	1
382			min	0	15	-.001	1	0	2	-3.63e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.031	5	4.239e-3	2	NC	1	NC	4
384			min	0	10	-.017	1	-.027	2	-3.606e-3	5	NC	1	2348.023	2
385		3	max	.002	3	-.004	15	.06	5	4.574e-3	2	NC	1	NC	4
386			min	0	10	-.033	1	-.053	2	-3.582e-3	5	NC	1	1181.168	2
387		4	max	.002	3	-.006	15	.09	5	4.908e-3	2	NC	1	NC	4
388			min	0	2	-.049	1	-.078	2	-3.558e-3	5	NC	1	797.599	2
389		5	max	.003	3	-.008	15	.119	5	5.242e-3	2	NC	1	NC	4
390			min	-.001	2	-.065	1	-.101	2	-3.534e-3	5	NC	1	610.169	2
391		6	max	.003	3	-.009	15	.149	5	5.577e-3	2	NC	1	NC	4
392			min	-.002	2	-.081	1	-.123	2	-3.51e-3	5	NC	1	501.611	2
393		7	max	.003	3	-.011	15	.178	5	5.911e-3	2	NC	1	NC	4
394			min	-.002	2	-.097	1	-.142	2	-3.486e-3	5	NC	1	433.014	2
395		8	max	.003	3	-.013	15	.208	5	6.245e-3	2	NC	1	NC	4
396			min	-.003	2	-.112	1	-.158	2	-3.462e-3	5	NC	1	387.91	2
397		9	max	.003	3	-.015	15	.237	5	6.58e-3	2	NC	1	NC	4
398			min	-.003	2	-.128	1	-.171	2	-3.438e-3	5	NC	1	358.331	2
399		10	max	.004	3	-.017	15	.265	5	6.914e-3	2	NC	1	NC	4
400			min	-.004	2	-.144	1	-.18	2	-3.414e-3	5	NC	1	340.21	2
401		11	max	.004	3	-.018	15	.293	5	7.248e-3	2	NC	1	NC	4
402			min	-.004	2	-.159	1	-.184	2	-3.553e-3	3	NC	1	331.627	2
403		12	max	.004	3	-.02	15	.32	5	7.582e-3	2	NC	1	NC	4
404			min	-.005	2	-.174	1	-.183	2	-3.732e-3	3	NC	1	332.17	2
405		13	max	.004	3	-.022	15	.347	5	7.917e-3	2	NC	1	NC	4
406			min	-.005	2	-.189	1	-.177	2	-3.911e-3	3	NC	1	342.919	2
407		14	max	.004	3	-.023	15	.372	5	8.251e-3	2	NC	1	NC	4
408			min	-.006	2	-.205	1	-.164	2	-4.09e-3	3	NC	1	367.118	2
409		15	max	.004	3	-.025	15	.396	5	8.585e-3	2	NC	1	NC	4
410			min	-.007	2	-.22	1	-.144	2	-4.27e-3	3	NC	1	367.384	14
411		16	max	.005	3	-.026	15	.42	5	8.92e-3	2	NC	1	NC	4
412			min	-.007	2	-.235	1	-.118	2	-4.449e-3	3	NC	1	331.962	14
413		17	max	.005	3	-.028	15	.441	5	9.254e-3	2	NC	1	NC	4
414			min	-.008	2	-.25	1	-.083	2	-4.628e-3	3	NC	1	301.091	14
415		18	max	.005	3	-.029	15	.463	4	9.588e-3	2	NC	1	NC	4
416			min	-.008	2	-.265	1	-.041	2	-4.807e-3	3	NC	1	273.998	14
417		19	max	.005	3	-.031	15	.487	4	9.923e-3	2	NC	1	NC	1
418			min	-.009	2	-.279	1	0	3	-4.986e-3	3	NC	1	250.078	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	-3.913e-3	4	NC	1	NC	1
421		2	max	.005	3	-.002	15	.033	4	0	1	NC	1	NC	1
422			min	0	10	-.033	1	0	1	-3.92e-3	4	NC	1	NC	1
423		3	max	.005	3	-.003	15	.064	4	0	1	NC	1	NC	1
424			min	-.002	2	-.065	1	0	1	-3.927e-3	4	NC	1	7636.631	4
425		4	max	.006	3	-.004	15	.096	4	0	1	NC	1	NC	1
426			min	-.003	2	-.096	1	0	1	-3.935e-3	4	NC	1	4919.364	4
427		5	max	.007	3	-.006	15	.127	4	0	1	NC	1	NC	1
428			min	-.005	2	-.127	1	0	1	-3.942e-3	4	NC	1	3615.293	4
429		6	max	.007	3	-.007	15	.159	4	0	1	NC	1	NC	1
430			min	-.006	2	-.158	1	0	1	-3.949e-3	4	NC	1	2871.208	4
431		7	max	.008	3	-.008	15	.19	4	0	1	NC	1	NC	1
432			min	-.008	2	-.189	1	0	1	-3.956e-3	4	NC	1	2405.418	4
433		8	max	.009	3	-.01	15	.221	4	0	1	NC	1	NC	1
434			min	-.009	2	-.22	1	0	1	-3.964e-3	4	NC	1	2099.206	4
435		9	max	.009	3	-.011	15	.251	4	0	1	NC	1	NC	1
436			min	-.011	2	-.251	1	0	1	-3.971e-3	4	NC	1	1895.053	4
437		10	max	.01	3	-.012	15	.28	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.012	2	-.282	1	0	1	-3.978e-3	4	NC	1	1763.046	4
439		11	max	.011	3	-.014	15	.309	4	0	1	NC	1	NC	1
440			min	-.014	2	-.313	1	0	1	-3.985e-3	4	NC	1	1687.892	4
441		12	max	.011	3	-.015	15	.336	4	0	1	NC	1	NC	1
442			min	-.016	2	-.343	1	0	1	-3.993e-3	4	NC	1	1663.772	4
443		13	max	.012	3	-.016	15	.363	4	0	1	NC	1	NC	1
444			min	-.017	2	-.374	1	0	1	-4.e-3	4	NC	1	1693.208	4
445		14	max	.013	3	-.017	15	.388	4	0	1	NC	1	NC	1
446			min	-.019	2	-.404	1	0	1	-4.007e-3	4	NC	1	1789.635	4
447		15	max	.013	3	-.018	15	.411	4	0	1	NC	1	NC	1
448			min	-.02	2	-.434	1	0	1	-4.015e-3	4	NC	1	1986.958	4
449		16	max	.014	3	-.019	15	.433	4	0	1	NC	1	NC	1
450			min	-.022	2	-.464	1	0	1	-4.022e-3	4	NC	1	2370.445	4
451		17	max	.015	3	-.02	15	.453	4	0	1	NC	1	NC	1
452			min	-.023	2	-.495	1	0	1	-4.029e-3	4	NC	1	3202.142	4
453		18	max	.015	3	-.021	15	.471	4	0	1	NC	1	NC	1
454			min	-.025	2	-.525	1	0	1	-4.036e-3	4	NC	1	5800.939	4
455		19	max	.016	3	-.023	15	.487	4	0	1	NC	1	NC	1
456			min	-.026	2	-.555	1	0	1	-4.044e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.002	4	1.762e-3	3	NC	1	NC	1
458			min	0	5	-.001	1	0	3	-4.283e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.035	4	1.941e-3	3	NC	1	NC	5
460			min	0	5	-.017	1	-.013	3	-4.308e-3	4	NC	1	2348.023	2
461		3	max	.002	3	0	5	.069	4	2.12e-3	3	NC	1	NC	15
462			min	0	10	-.033	1	-.026	3	-4.574e-3	2	NC	1	1181.168	2
463		4	max	.002	3	0	5	.103	4	2.299e-3	3	NC	1	7291.326	15
464			min	0	2	-.049	1	-.038	3	-4.908e-3	2	NC	1	797.599	2
465		5	max	.003	3	0	5	.137	4	2.478e-3	3	NC	1	5357.273	15
466			min	-.001	2	-.065	1	-.05	3	-5.242e-3	2	NC	1	610.169	2
467		6	max	.003	3	0	5	.17	4	2.658e-3	3	NC	1	4253.852	15
468			min	-.002	2	-.081	1	-.06	3	-5.577e-3	2	NC	1	501.611	2
469		7	max	.003	3	.001	5	.203	4	2.837e-3	3	NC	1	3563.172	15
470			min	-.002	2	-.097	1	-.07	3	-5.911e-3	2	NC	1	433.014	2
471		8	max	.003	3	.001	5	.235	4	3.016e-3	3	NC	1	3109.131	15
472			min	-.003	2	-.112	1	-.078	3	-6.245e-3	2	NC	1	387.91	2
473		9	max	.003	3	.002	5	.267	4	3.195e-3	3	NC	1	2806.403	15
474			min	-.003	2	-.128	1	-.084	3	-6.58e-3	2	NC	1	358.331	2
475		10	max	.004	3	.002	5	.297	4	3.374e-3	3	NC	1	2610.614	15
476			min	-.004	2	-.144	1	-.088	3	-6.914e-3	2	NC	1	340.21	2
477		11	max	.004	3	.003	5	.325	4	3.553e-3	3	NC	1	2499.074	15
478			min	-.004	2	-.159	1	-.091	3	-7.248e-3	2	NC	1	331.627	2
479		12	max	.004	3	.003	5	.352	4	3.732e-3	3	NC	1	2463.131	15
480			min	-.005	2	-.174	1	-.09	3	-7.582e-3	2	NC	1	332.17	2
481		13	max	.004	3	.004	5	.377	4	3.911e-3	3	NC	1	2506.495	15
482			min	-.005	2	-.189	1	-.087	3	-7.917e-3	2	NC	1	342.919	2
483		14	max	.004	3	.004	5	.401	4	4.09e-3	3	NC	1	2649.028	15
484			min	-.006	2	-.205	1	-.082	3	-8.251e-3	2	NC	1	367.118	2
485		15	max	.004	3	.005	5	.422	4	4.27e-3	3	NC	1	2940.89	15
486			min	-.007	2	-.22	1	-.073	3	-8.585e-3	2	NC	1	412.3	2
487		16	max	.005	3	.005	5	.44	4	4.449e-3	3	NC	1	3508.246	15
488			min	-.007	2	-.235	1	-.06	3	-8.92e-3	2	NC	1	496.969	2
489		17	max	.005	3	.006	5	.456	4	4.628e-3	3	NC	1	4738.846	15
490			min	-.008	2	-.25	1	-.044	3	-9.254e-3	2	NC	1	677.58	2
491		18	max	.005	3	.007	5	.469	4	4.807e-3	3	NC	1	8584.28	15
492			min	-.008	2	-.265	1	-.024	3	-9.588e-3	2	9654.506	5	1237.75	2
493		19	max	.005	3	.007	5	.479	5	4.986e-3	3	NC	1	NC	1
494			min	-.009	2	-.279	1	-.016	1	-9.923e-3	2	8755.193	5	NC	1