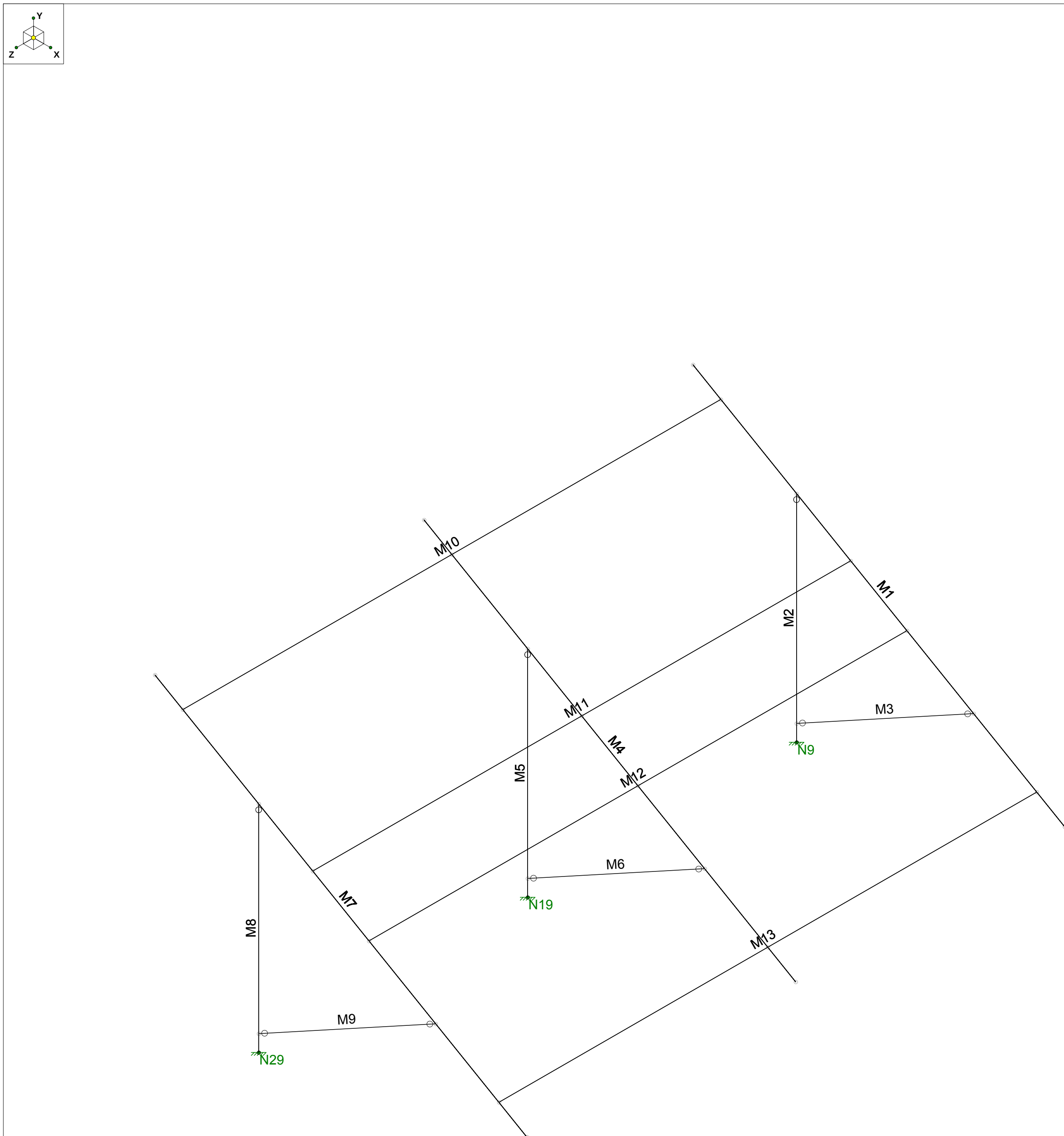


Schletter, Inc.	Standard FS Racking System	30° Tilt w/ Seismic Design
HCV	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

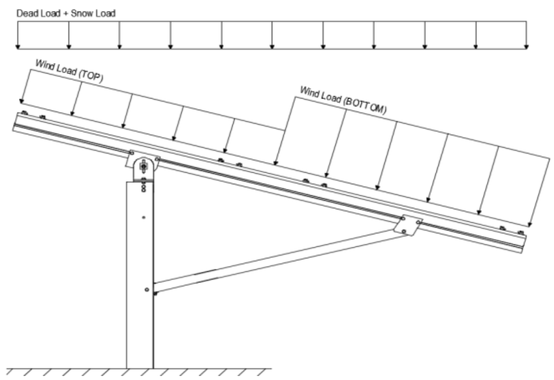
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	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 = 150 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 35.33 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

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

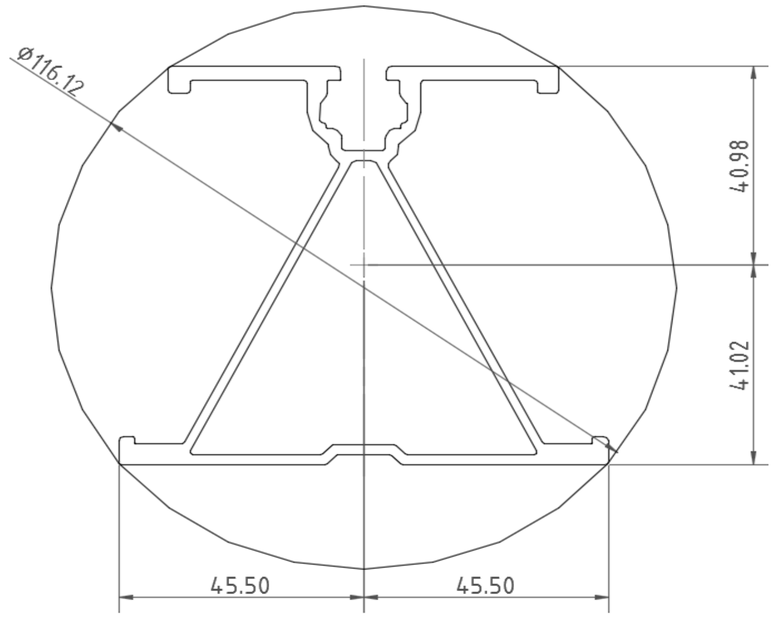
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	96	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 =	1.581	k-ft
M_z =	0.108	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	66%	

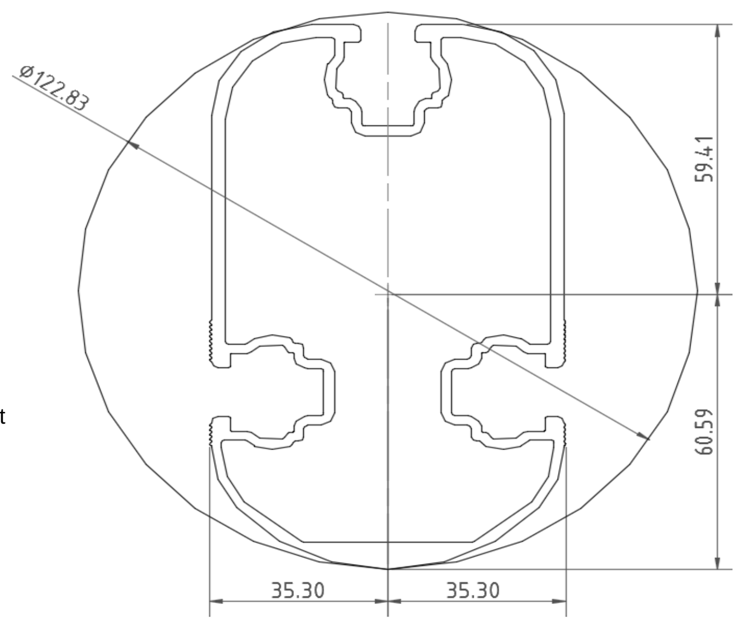


DETAIL VIEW

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 =	4.469	k-ft
M_z =	0.000	k-ft
P_n =	0.008	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	

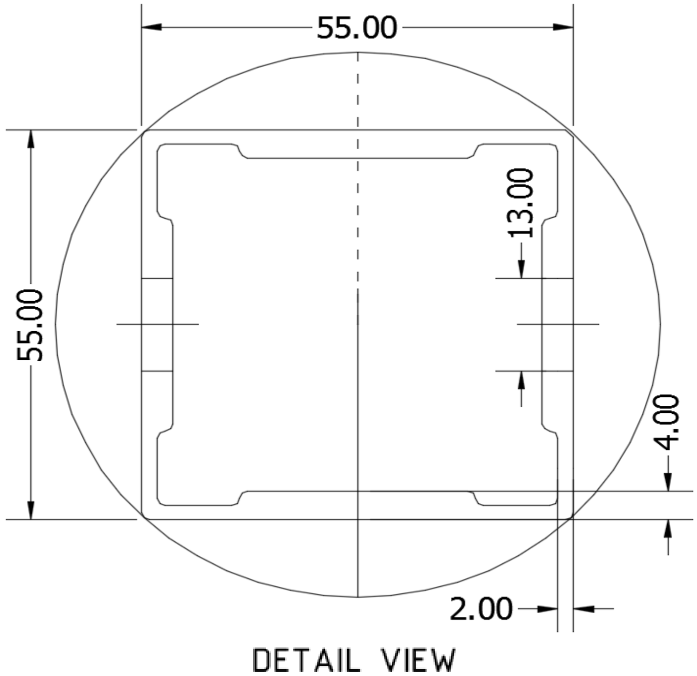


DETAIL VIEW

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).

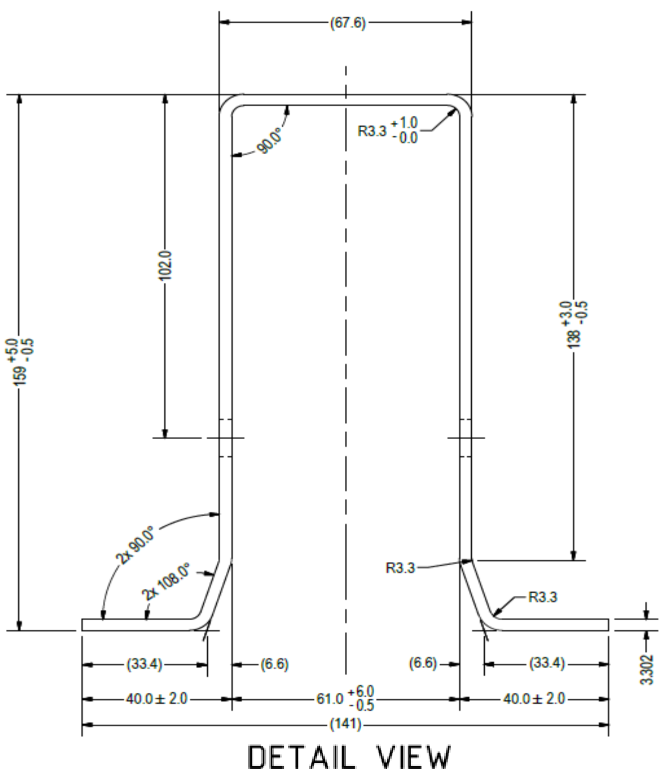
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.446	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	33%	



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 =	13.684	k-ft
M_z =	0.000	k-ft
P_r =	-5.349	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	84%	



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 =	6.91	k
Maximum Lateral Load =	3.93	k

5.2 Design of Drilled Shaft Foundations

The galvanized steel post is to be embedded into a cylindrical drilled shaft foundation. For the purpose of design, the post is considered to be fixed to the ground. The applicable lateral force, uplift, and compression resistance checks are seen below.

5.3 Lateral Force Resistance

The equivalent lateral force is applied at the top of the post to determine the required embedment depth. A lateral soil bearing capacity for clay is assumed. Footing is unrestrained at ground level. (IBC, Eq. 18-1)

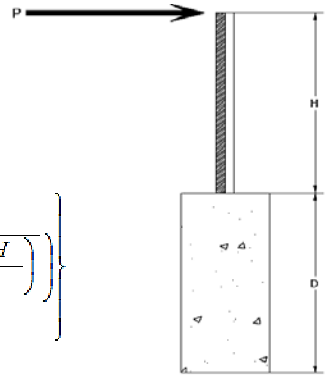
Lateral Force @ Top of Pole, P =	0.88	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.88	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 =	4.75	
Required Footing Depth, D =	8.69	ft
2nd Trial @ D_2 =	5.97	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.19	ksf
Constant $2.34P/(S_1B)$, A =	2.59	
Required Footing Depth, D =	5.80	ft
3rd Trial @ D_3 =	5.89	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.18	ksf
Constant $2.34P/(S_1B)$, A =	2.62	
Required Footing Depth, D =	5.85	ft
4th Trial @ D_4 =	5.87	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant $2.34P/(S_1B)$, A =	2.63	
Required Footing Depth, D =	5.86	ft
5th Trial @ D_5 =	5.87	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant $2.34P/(S_1B)$, A =	2.63	
Required Footing Depth, D =	6.00	ft

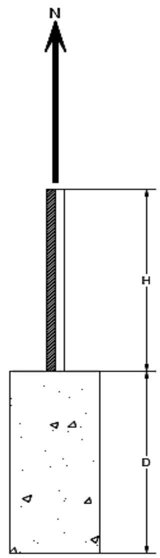
A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.17	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 =	2.09	k
Required Concrete Volume, V =	14.38	ft^3
Required Footing Depth, D =	4.75	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.86
2	0.4	0.2	118.10	6.76
3	0.6	0.2	118.10	6.65
4	0.8	0.2	118.10	6.55
5	1	0.2	118.10	6.44
6	1.2	0.2	118.10	6.34
7	1.4	0.2	118.10	6.24
8	1.6	0.2	118.10	6.13
9	1.8	0.2	118.10	6.03
10	2	0.2	118.10	5.93
11	2.2	0.2	118.10	5.82
12	2.4	0.2	118.10	5.72
13	2.6	0.2	118.10	5.62
14	2.8	0.2	118.10	5.51
15	3	0.2	118.10	5.41
16	3.2	0.2	118.10	5.30
17	3.4	0.2	118.10	5.20
18	3.6	0.2	118.10	5.10
19	3.8	0.2	118.10	4.99
20	4	0.2	118.10	4.89
21	4.2	0.2	118.10	4.79
22	4.4	0.2	118.10	4.68
23	4.6	0.2	118.10	4.58
24	0	0.0	0.00	4.58
25	0	0.0	0.00	4.58
26	0	0.0	0.00	4.58
27	0	0.0	0.00	4.58
28	0	0.0	0.00	4.58
29	0	0.0	0.00	4.58
30	0	0.0	0.00	4.58
31	0	0.0	0.00	4.58
32	0	0.0	0.00	4.58
33	0	0.0	0.00	4.58
34	0	0.0	0.00	4.58
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 =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.70	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

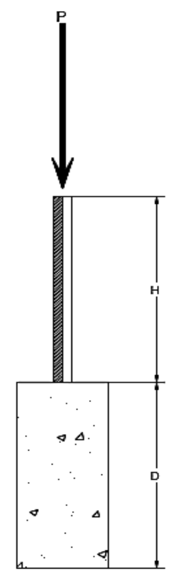
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.44	k
Utilization =	64%	

A 2ft diameter footing passes at a depth of 6ft.



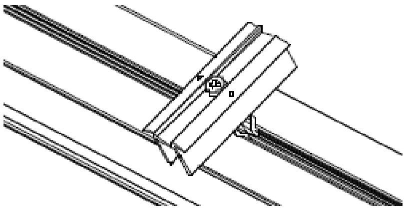
6. DESIGN OF JOINTS AND CONNECTIONS

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.

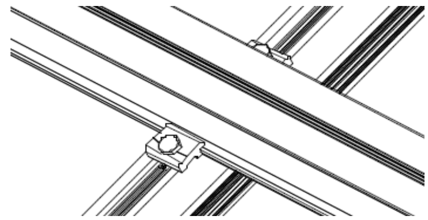
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.765	k
Allowable Uplift =	1.214	k
Utilization =	63%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.190	k
Allowable Uplift =	2.180	k
Utilization =	100%	

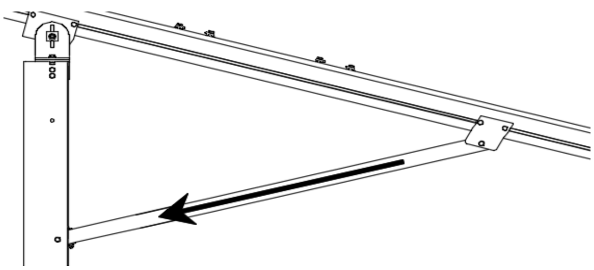


6.2 Strut Connections

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 =	4.446	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	50%	

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

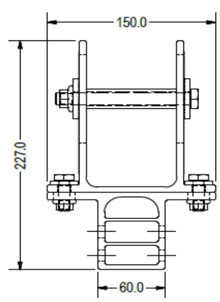


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

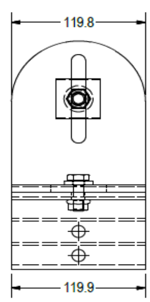
6.3 Girder to Post Connection

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.

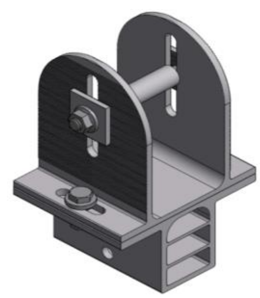
Maximum Tensile Load =	4.622	k
Allowable Load =	5.649	k
Utilization =	82%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

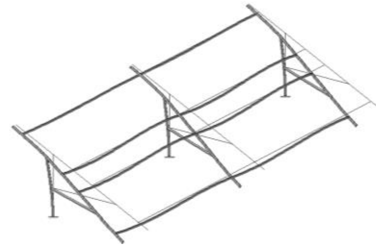
7.1 Seismic Drift

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} =	0.519	in

$0.519 \le 1.482$, 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 = 96 in

J = 0.432

265.581

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

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= 28.0 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 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 = 96

J = 0.432

168.894

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.1

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

$$S2=\frac{k_1Bp}{1.6Dp}$$

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

$$S2=\frac{k_1Bp}{1.6Dp}$$

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

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 = **<u>55x55</u>**

<u>Strong Axis:</u>

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 <u>Not Used</u>

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

<u>Weak Axis:</u>

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

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

$S2^*$ = 0.23671

φcc = 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)

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

$\varphi F_L =$ 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

$\varphi F_L =$ 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.25 ksi

$\varphi F_L =$ 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 =	-5.35	k	(LRFD Factored Load)
Mr (Strong) =	13.68	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 =	0.1244 <	0.2	
Utilization =	0.84 <	1.0	OK

Bending (Weak Axis):

Yielding:		
Mn =	14.65	k-ft
Flange Local Buckling:		
Mn =	14.39	k-ft

Pr/Pc =	0.124 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 84%

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	-113.295	-113.295	0	0
2	M11	y	-113.295	-113.295	0	0
3	M12	y	-182.257	-182.257	0	0
4	M13	y	-182.257	-182.257	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	226.59	226.59	0	0
2	M11	y	226.59	226.59	0	0
3	M12	y	108.369	108.369	0	0
4	M13	y	108.369	108.369	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	861.853	2	2199.06	2	170.9	2	.224	2	.015	5	3.855	3
2		min	-1167.544	3	-1720.659	3	-287.032	5	-1.219	5	-.012	2	.489	15
3	N19	max	3005.125	2	6095.258	2	0	1	0	3	.016	4	7.166	3
4		min	-3024.255	3	-5295.851	3	-306.905	5	-1.27	4	0	10	.242	15
5	N29	max	861.853	2	2199.06	2	212.797	3	.318	3	.016	4	3.855	3
6		min	-1167.544	3	-1720.659	3	-313.838	4	-1.268	4	-.005	3	-.236	5
7	Totals:	max	4728.832	2	10493.379	2	0	2						
8		min	-5359.344	3	-8737.169	3	-891.007	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	2	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	0	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	4	-1.921	6	-1.499	5	0	1	0	5	0	15
5		3	max	-18.018	12	322.061	3	-16.251	12	.055	3	.182	1	.305	2
6			min	-162.563	1	-698.251	2	-105.286	1	-.196	2	.036	10	-.138	3
7		4	max	-18.451	12	320.937	3	-16.251	12	.055	3	.116	1	.739	2
8			min	-163.428	1	-699.75	2	-105.286	1	-.196	2	.019	10	-.338	3
9		5	max	-18.883	12	319.813	3	-16.251	12	.055	3	.053	4	1.173	2
10			min	-164.293	1	-701.248	2	-105.286	1	-.196	2	.002	10	-.536	3
11		6	max	273.853	3	601.708	2	-2.749	12	.033	2	.076	2	1.131	2
12			min	-878.238	2	-183.814	3	-144.42	1	-.05	3	-.028	3	-.55	3
13		7	max	273.204	3	600.21	2	-2.749	12	.033	2	.007	10	.758	2
14			min	-879.103	2	-184.938	3	-144.42	1	-.05	3	-.058	4	-.436	3
15		8	max	272.555	3	598.711	2	-2.749	12	.033	2	-.02	12	.386	2
16			min	-879.968	2	-186.062	3	-144.42	1	-.05	3	-.114	1	-.321	3
17		9	max	242.673	3	109.677	3	-9.257	12	.015	5	.07	1	.166	2
18			min	-961.878	2	-65.247	2	-159.78	1	-.135	2	.004	10	-.269	3
19		10	max	242.024	3	108.553	3	-9.257	12	.015	5	.041	3	.207	2
20			min	-962.743	2	-66.746	2	-159.78	1	-.135	2	-.036	2	-.337	3
21		11	max	241.375	3	107.429	3	-9.257	12	.015	5	.032	3	.249	2
22			min	-963.608	2	-68.244	2	-159.78	1	-.135	2	-.128	1	-.404	3
23		12	max	207.235	3	840.701	3	91.903	2	.271	3	.107	1	.468	2
24			min	-1108.632	1	-505.224	2	-261.525	3	-.215	2	-.027	5	-.757	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	206.586	3	839.577	3	91.903	2	.271	3	.122	1	.782	2
26			min	-1109.497	1	-506.723	2	-261.525	3	-.215	2	-.13	3	-1.279	3
27		14	max	164.891	1	474.542	2	58.759	5	.185	2	.086	3	1.083	2
28			min	7.555	15	-770.626	3	-76.935	1	-.381	3	-.142	4	-1.777	3
29		15	max	164.026	1	473.044	2	57.259	5	.185	2	.042	3	.789	2
30			min	7.294	15	-771.75	3	-76.935	1	-.381	3	-.117	4	-1.299	3
31		16	max	163.161	1	471.545	2	55.76	5	.185	2	-.002	12	.496	2
32			min	7.033	15	-772.874	3	-76.935	1	-.381	3	-.146	1	-.82	3
33		17	max	162.296	1	470.047	2	54.26	5	.185	2	-.02	15	.204	2
34			min	6.772	15	-773.998	3	-76.935	1	-.381	3	-.194	1	-.34	3
35		18	max	1.11	6	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	0	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	.001	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	-1.92	6	-1.499	5	0	1	0	5	0	15
43		3	max	10.153	3	1008.758	3	0	1	.034	4	.169	4	.752	2
44			min	-284.713	1	-1964.65	2	-83.106	5	0	1	0	1	-.391	3
45		4	max	9.504	3	1007.634	3	0	1	.034	4	.117	4	1.972	2
46			min	-285.578	1	-1966.149	2	-84.606	5	0	1	0	1	-1.017	3
47		5	max	8.855	3	1006.51	3	0	1	.034	4	.064	4	3.193	2
48			min	-286.443	1	-1967.647	2	-86.106	5	0	1	0	1	-1.642	3
49		6	max	1117.071	3	1832.617	2	0	1	0	1	0	1	3.019	2
50			min	-2436.351	2	-804.187	3	-74.793	4	-.028	4	-.023	5	-1.602	3
51		7	max	1116.422	3	1831.119	2	0	1	0	1	0	1	1.882	2
52			min	-2437.216	2	-805.311	3	-76.293	4	-.028	4	-.07	4	-1.103	3
53		8	max	1115.773	3	1829.62	2	0	1	0	1	0	1	.746	2
54			min	-2438.082	2	-806.435	3	-77.793	4	-.028	4	-.117	4	-.603	3
55		9	max	1130.721	3	253.673	3	0	1	.011	4	.08	4	.077	1
56			min	-2530.953	2	-215.152	2	-168.326	4	0	1	0	1	-.345	3
57		10	max	1130.072	3	252.549	3	0	1	.011	4	0	1	.197	2
58			min	-2531.818	2	-216.651	2	-169.825	4	0	1	-.025	4	-.502	3
59		11	max	1129.423	3	251.425	3	0	1	.011	4	0	1	.332	2
60			min	-2532.683	2	-218.15	2	-171.325	4	0	1	-.131	4	-.658	3
61		12	max	1152.888	3	2324.68	3	0	1	.126	4	0	1	1.014	2
62			min	-2632.987	2	-1613.662	2	-181.759	4	0	1	-.011	4	-1.644	3
63		13	max	1152.239	3	2323.556	3	0	1	.126	4	0	1	2.016	2
64			min	-2633.852	2	-1615.161	2	-183.259	4	0	1	-.125	4	-3.086	3
65		14	max	287.843	1	1328.033	2	57.541	5	0	1	0	1	2.979	2
66			min	-8.193	3	-1993.594	3	0	1	-.086	4	-.114	5	-4.469	3
67		15	max	286.978	1	1326.535	2	56.042	5	0	1	0	1	2.155	2
68			min	-8.842	3	-1994.718	3	0	1	-.086	4	-.079	5	-3.231	3
69		16	max	286.113	1	1325.036	2	54.542	5	0	1	0	1	1.332	2
70			min	-9.491	3	-1995.842	3	0	1	-.086	4	-.045	5	-1.993	3
71		17	max	285.248	1	1323.538	2	53.042	5	0	1	0	1	.511	2
72			min	-10.14	3	-1996.966	3	0	1	-.086	4	-.012	4	-.754	3
73		18	max	1.11	6	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	.008	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	2	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	0	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	14.568	5	322.061	3	105.286	1	.196	2	.082	5	.305	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	-162.563	1	-698.251	2	-38.258	5	-.055	3	-.182	1	-.138	3
83		4	max	14.164	5	320.937	3	105.286	1	.196	2	.057	5	.739	2
84			min	-163.428	1	-699.75	2	-39.758	5	-.055	3	-.116	1	-.338	3
85		5	max	13.761	5	319.813	3	105.286	1	.196	2	.032	5	1.173	2
86			min	-164.293	1	-701.248	2	-41.257	5	-.055	3	-.051	1	-.536	3
87		6	max	273.853	3	601.708	2	144.42	1	.05	3	.028	3	1.131	2
88			min	-878.238	2	-183.814	3	-28.997	5	-.033	2	-.076	2	-.55	3
89		7	max	273.204	3	600.21	2	144.42	1	.05	3	.03	3	.758	2
90			min	-879.103	2	-184.938	3	-30.497	5	-.033	2	-.046	5	-.436	3
91		8	max	272.555	3	598.711	2	144.42	1	.05	3	.114	1	.386	2
92			min	-879.968	2	-186.062	3	-31.997	5	-.033	2	-.065	5	-.321	3
93		9	max	242.673	3	109.677	3	159.78	1	.135	2	.024	5	.166	2
94			min	-961.878	2	-65.247	2	-68.484	5	.013	15	-.07	1	-.269	3
95		10	max	242.024	3	108.553	3	159.78	1	.135	2	.036	2	.207	2
96			min	-962.743	2	-66.746	2	-69.984	5	.013	15	-.041	3	-.337	3
97		11	max	241.375	3	107.429	3	159.78	1	.135	2	.128	1	.249	2
98			min	-963.608	2	-68.244	2	-71.483	5	.013	15	-.063	5	-.404	3
99		12	max	207.235	3	840.701	3	261.525	3	.215	2	-.02	12	.468	2
100			min	-1108.632	1	-505.224	2	-159.01	5	-.271	3	-.107	1	-.757	3
101		13	max	206.586	3	839.577	3	261.525	3	.215	2	.13	3	.782	2
102			min	-1109.497	1	-506.723	2	-160.51	5	-.271	3	-.159	4	-1.279	3
103		14	max	164.891	1	474.542	2	88.946	4	.381	3	.057	2	1.083	2
104			min	9.785	15	-770.626	3	7.3	10	-.185	2	-.131	5	-1.777	3
105		15	max	164.026	1	473.044	2	87.446	4	.381	3	.099	1	.789	2
106			min	9.524	15	-771.75	3	7.3	10	-.185	2	-.088	5	-1.299	3
107		16	max	163.161	1	471.545	2	85.946	4	.381	3	.146	1	.496	2
108			min	9.263	15	-772.874	3	7.3	10	-.185	2	-.046	5	-.82	3
109		17	max	162.296	1	470.047	2	84.447	4	.381	3	.194	1	.204	2
110			min	9.002	15	-773.998	3	7.3	10	-.185	2	-.004	5	-.34	3
111		18	max	1.11	6	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	0	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	-.007	3	0	1	0	1	0	1	0	1
115	M10	1	max	81.47	4	466.776	2	-8.483	15	.013	2	.225	1	.185	2
116			min	7.298	10	-776.238	3	-160.676	1	-.027	3	.015	15	-.381	3
117		2	max	76.943	1	341.619	2	-6.895	15	.013	2	.097	1	.221	3
118			min	7.298	10	-578.95	3	-127.085	1	-.027	3	.008	15	-.174	2
119		3	max	76.943	1	216.462	2	-5.307	15	.013	2	.031	3	.648	3
120			min	7.298	10	-381.662	3	-93.493	1	-.027	3	-.007	9	-.422	2
121		4	max	76.943	1	91.305	2	-3.719	15	.013	2	.012	3	.9	3
122			min	7.298	10	-184.373	3	-59.902	1	-.027	3	-.069	1	-.559	2
123		5	max	76.943	1	12.915	3	-2.131	15	.013	2	-.003	12	.976	3
124			min	7.298	10	-33.852	2	-26.31	1	-.027	3	-.107	1	-.585	2
125		6	max	76.943	1	210.203	3	7.947	9	.013	2	-.005	15	.877	3
126			min	7.298	10	-159.009	2	-15.348	3	-.027	3	-.116	1	-.499	2
127		7	max	76.943	1	407.491	3	40.873	1	.013	2	-.005	15	.602	3
128			min	5.326	15	-284.166	2	-12.966	3	-.027	3	-.094	1	-.302	2
129		8	max	76.943	1	604.779	3	74.464	1	.013	2	-.003	15	.152	3
130			min	-.948	5	-409.323	2	-10.585	3	-.027	3	-.043	1	-.016	5
131		9	max	76.943	1	802.068	3	108.056	1	.013	2	.038	1	.426	2
132			min	-10.072	5	-534.48	2	-8.203	3	-.027	3	-.051	3	-.473	3
133		10	max	76.943	1	659.637	2	141.648	1	.007	10	.149	1	.956	2
134			min	7.298	10	-999.356	3	-81.269	14	-.027	3	-.057	3	-1.274	3
135		11	max	76.943	1	534.48	2	8.203	3	.027	3	.038	1	.426	2
136			min	7.298	10	-802.068	3	-108.056	1	-.013	2	-.051	3	-.473	3
137		12	max	76.943	1	409.323	2	10.585	3	.027	3	0	15	.152	3
138			min	7.298	10	-604.779	3	-74.464	1	-.013	2	-.043	1	0	10

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	76.943	1	284.166	2	12.966	3	.027	3	-.004	15	.602	3
140			min	2.185	15	-407.491	3	-40.873	1	-.013	2	-.094	1	-.302	2
141		14	max	76.943	1	159.009	2	15.348	3	.027	3	-.006	15	.877	3
142			min	-5.642	5	-210.203	3	-7.947	9	-.013	2	-.116	1	-.499	2
143		15	max	76.943	1	33.852	2	26.31	1	.027	3	-.003	12	.976	3
144			min	-14.766	5	-12.915	3	-.101	15	-.013	2	-.107	1	-.585	2
145		16	max	76.943	1	184.373	3	59.902	1	.027	3	.012	3	.9	3
146			min	-23.891	5	-91.305	2	1.487	15	-.013	2	-.069	1	-.559	2
147		17	max	76.943	1	381.662	3	93.493	1	.027	3	.031	3	.648	3
148			min	-33.016	5	-216.462	2	3.075	15	-.013	2	-.008	14	-.422	2
149		18	max	76.943	1	578.95	3	127.085	1	.027	3	.097	1	.221	3
150			min	-42.14	5	-341.619	2	4.663	15	-.013	2	0	15	-.174	2
151		19	max	76.943	1	776.238	3	160.676	1	.027	3	.225	1	.185	2
152			min	-51.265	5	-466.776	2	6.251	15	-.013	2	.004	15	-.381	3
153	M11	1	max	183.864	2	433.671	2	17.33	5	0	15	.262	1	.103	4
154			min	-247.66	3	-734.94	3	-167.581	1	-.004	1	-.101	5	-.373	3
155		2	max	183.864	2	308.514	2	19.787	5	0	15	.128	1	.192	3
156			min	-247.66	3	-537.652	3	-133.989	1	-.004	1	-.085	5	-.251	2
157		3	max	183.864	2	183.357	2	22.243	5	0	15	.052	3	.582	3
158			min	-247.66	3	-340.364	3	-100.398	1	-.004	1	-.066	5	-.469	2
159		4	max	183.864	2	58.2	2	24.7	5	0	15	.028	3	.797	3
160			min	-247.66	3	-143.076	3	-66.806	1	-.004	1	-.058	4	-.577	2
161		5	max	183.864	2	54.212	3	27.156	5	0	15	.006	3	.837	3
162			min	-247.66	3	-66.957	2	-33.215	1	-.004	1	-.095	1	-.573	2
163		6	max	183.864	2	251.501	3	30.888	4	0	15	.003	5	.701	3
164			min	-247.66	3	-192.114	2	-21.23	3	-.004	1	-.11	1	-.457	2
165		7	max	183.864	2	448.789	3	41.184	4	0	15	.031	5	.39	3
166			min	-247.66	3	-317.271	2	-18.848	3	-.004	1	-.095	1	-.231	2
167		8	max	183.864	2	646.077	3	67.56	1	0	15	.06	5	.107	2
168			min	-247.66	3	-442.428	2	-16.467	3	-.004	1	-.049	1	-.097	3
169		9	max	183.864	2	843.365	3	101.151	1	0	15	.102	4	.555	2
170			min	-247.66	3	-567.585	2	-14.085	3	-.004	1	-.061	3	-.759	3
171		10	max	183.864	2	1040.653	3	19.026	5	0	15	.161	4	1.116	2
172			min	-247.66	3	27.054	15	-134.743	1	-.004	1	-.072	3	-1.596	3
173		11	max	183.864	2	567.585	2	21.482	5	.004	1	.027	9	.555	2
174			min	-247.66	3	-843.365	3	-101.151	1	0	5	-.086	5	-.759	3
175		12	max	183.864	2	442.428	2	23.939	5	.004	1	-.018	10	.107	2
176			min	-247.66	3	-646.077	3	-67.56	1	0	5	-.074	4	-.097	3
177		13	max	183.864	2	317.271	2	26.395	5	.004	1	-.02	12	.39	3
178			min	-247.66	3	-448.789	3	-33.968	1	0	5	-.095	1	-.231	2
179		14	max	183.864	2	192.114	2	28.852	5	.004	1	-.009	12	.701	3
180			min	-247.66	3	-251.501	3	-3.344	9	0	5	-.11	1	-.457	2
181		15	max	183.864	2	66.957	2	38.029	4	.004	1	.008	5	.837	3
182			min	-247.66	3	-54.212	3	9.026	10	0	5	-.095	1	-.573	2
183		16	max	183.864	2	143.076	3	66.806	1	.004	1	.037	5	.797	3
184			min	-247.66	3	-58.2	2	13.413	10	0	5	-.051	1	-.577	2
185		17	max	183.864	2	340.364	3	100.398	1	.004	1	.072	4	.582	3
186			min	-247.66	3	-183.357	2	17.625	12	0	5	.01	9	-.469	2
187		18	max	183.864	2	537.652	3	133.989	1	.004	1	.128	4	.192	3
188			min	-247.66	3	-308.514	2	19.213	12	0	5	.03	10	-.251	2
189		19	max	183.864	2	734.94	3	167.581	1	.004	1	.262	1	.084	1
190			min	-247.66	3	-433.671	2	20.801	12	0	5	.051	10	-.373	3
191	M12	1	max	34.924	5	660.874	2	21.452	5	0	15	.277	1	.169	2
192			min	-22.117	9	-297.277	3	-170.464	1	-.004	1	-.117	5	.024	9
193		2	max	25.8	5	474.418	2	23.909	5	0	15	.14	1	.276	3
194			min	-22.117	9	-205.074	3	-136.872	1	-.004	1	-.097	5	-.336	2
195		3	max	23.246	2	287.961	2	26.365	5	0	15	.039	3	.417	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	-22.117	9	-112.872	3	-103.281	1	-.004	1	-.074	5	-.675	2
197		4	max	23.246	2	101.505	2	28.822	5	0	15	.018	3	.476	3
198			min	-22.117	9	-20.669	3	-69.689	1	-.004	1	-.062	4	-.848	2
199		5	max	23.246	2	71.534	3	31.278	5	0	15	0	3	.454	3
200			min	-22.117	9	-84.952	2	-36.098	1	-.004	1	-.09	1	-.855	2
201		6	max	23.246	2	163.737	3	34.72	4	0	15	.006	5	.349	3
202			min	-22.553	14	-271.408	2	-17.31	3	-.004	1	-.108	1	-.697	2
203		7	max	23.246	2	255.94	3	45.017	4	0	15	.037	5	.163	3
204			min	-27.642	4	-457.865	2	-14.929	3	-.004	1	-.095	1	-.373	2
205		8	max	23.246	2	348.143	3	64.677	1	0	15	.07	5	.117	2
206			min	-36.767	4	-644.321	2	-12.547	3	-.004	1	-.052	1	-.106	3
207		9	max	23.246	2	440.346	3	98.269	1	0	15	.115	4	.773	2
208			min	-45.891	4	-830.778	2	-10.165	3	-.004	1	-.054	3	-.456	3
209		10	max	23.246	2	1017.235	2	92.825	14	0	15	.178	4	1.594	2
210			min	-55.016	4	-172.026	14	-131.86	1	-.004	1	-.062	3	-.889	3
211		11	max	32.814	5	830.778	2	25.817	5	.004	1	.026	9	.773	2
212			min	-22.117	9	-440.346	3	-98.269	1	0	5	-.1	5	-.456	3
213		12	max	23.69	5	644.321	2	28.274	5	.004	1	-.02	10	.117	2
214			min	-22.117	9	-348.143	3	-64.677	1	0	5	-.085	4	-.106	3
215		13	max	23.246	2	457.865	2	30.73	5	.004	1	-.019	12	.163	3
216			min	-22.117	9	-255.94	3	-31.085	1	0	5	-.095	1	-.373	2
217		14	max	23.246	2	271.408	2	33.187	5	.004	1	-.011	12	.349	3
218			min	-22.117	9	-163.737	3	-2.407	9	0	5	-.108	1	-.697	2
219		15	max	23.246	2	84.952	2	42.739	4	.004	1	.01	5	.454	3
220			min	-22.117	9	-71.534	3	10.965	10	0	5	-.09	1	-.855	2
221		16	max	23.246	2	20.669	3	69.689	1	.004	1	.042	5	.476	3
222			min	-23.681	14	-101.505	2	13.691	12	0	5	-.043	1	-.848	2
223		17	max	23.246	2	112.872	3	103.281	1	.004	1	.082	4	.417	3
224			min	-29.808	4	-287.961	2	15.279	12	0	5	.013	9	-.675	2
225		18	max	23.246	2	205.074	3	136.872	1	.004	1	.143	4	.276	3
226			min	-38.932	4	-474.418	2	16.867	12	0	5	.038	12	-.336	2
227		19	max	23.246	2	297.277	3	170.464	1	.004	1	.277	1	.169	2
228			min	-48.057	4	-660.874	2	18.455	12	0	5	.054	12	-.037	5
229	M13	1	max	35.214	5	695.763	2	15.377	5	.008	3	.224	1	.196	2
230			min	-105.213	1	-324.342	3	-160.676	1	-.022	2	-.098	5	-.055	3
231		2	max	26.09	5	509.307	2	17.834	5	.008	3	.096	1	.193	3
232			min	-105.213	1	-232.139	3	-127.084	1	-.022	2	-.083	5	-.34	2
233		3	max	16.965	5	322.85	2	20.291	5	.008	3	.031	3	.358	3
234			min	-105.213	1	-139.936	3	-93.493	1	-.022	2	-.069	4	-.709	2
235		4	max	7.841	5	136.393	2	22.747	5	.008	3	.013	3	.442	3
236			min	-105.213	1	-47.734	3	-59.901	1	-.022	2	-.07	1	-.914	2
237		5	max	-.664	15	44.469	3	25.204	5	.008	3	-.003	12	.443	3
238			min	-105.213	1	-50.063	2	-26.31	1	-.022	2	-.108	1	-.952	2
239		6	max	-6.805	15	136.672	3	30.545	4	.008	3	-.001	15	.362	3
240			min	-105.213	1	-236.52	2	-15.215	3	-.022	2	-.117	1	-.824	2
241		7	max	-12.947	15	228.875	3	40.873	1	.008	3	.024	5	.2	3
242			min	-105.213	1	-422.976	2	-12.834	3	-.022	2	-.095	1	-.531	2
243		8	max	-16.25	12	321.078	3	74.465	1	.008	3	.051	5	-.007	15
244			min	-105.213	1	-609.433	2	-10.452	3	-.022	2	-.044	1	-.079	1
245		9	max	-16.25	12	413.281	3	108.057	1	.008	3	.094	4	.552	2
246			min	-105.213	1	-795.889	2	-8.07	3	-.022	2	-.05	3	-.371	3
247		10	max	-16.25	12	982.346	2	94.018	14	0	15	.153	4	1.342	2
248			min	-105.213	1	-161.438	14	-141.648	1	-.022	2	-.056	3	-.779	3
249		11	max	24.142	5	795.889	2	18.512	5	.022	2	.037	1	.552	2
250			min	-105.213	1	-413.281	3	-108.057	1	-.008	3	-.074	5	-.371	3
251		12	max	15.017	5	609.433	2	20.969	5	.022	2	-.018	10	.002	5
252			min	-105.213	1	-321.078	3	-74.465	1	-.008	3	-.064	4	-.079	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	5.893	5	422.976	2	23.425	5	.022	2	-.019	12	.2	3
254			min	-105.213	1	-228.875	3	-40.873	1	-.008	3	-.095	1	-.531	2
255		14	max	-1.969	15	236.52	2	25.882	5	.022	2	-.009	15	.362	3
256			min	-105.213	1	-136.672	3	-7.963	9	-.008	3	-.117	1	-.824	2
257		15	max	-8.111	15	50.063	2	33.393	4	.022	2	.01	5	.443	3
258			min	-105.213	1	-44.469	3	8.292	10	-.008	3	-.108	1	-.952	2
259		16	max	-14.252	15	47.734	3	59.901	1	.022	2	.036	5	.442	3
260			min	-105.213	1	-136.393	2	12.375	12	-.008	3	-.07	1	-.914	2
261		17	max	-16.25	12	139.936	3	93.493	1	.022	2	.064	5	.358	3
262			min	-105.213	1	-322.85	2	13.963	12	-.008	3	-.007	9	-.709	2
263		18	max	-16.25	12	232.139	3	127.084	1	.022	2	.115	4	.193	3
264			min	-105.213	1	-509.307	2	15.551	12	-.008	3	.026	10	-.34	2
265		19	max	-16.25	12	324.342	3	160.676	1	.022	2	.224	1	.196	2
266			min	-105.213	1	-695.763	2	17.139	12	-.008	3	.047	12	-.055	3
267	M2	1	max	2199.06	2	1166.85	3	171.023	2	.015	5	1.219	5	3.855	3
268			min	-1720.659	3	-861.449	2	-287.069	5	-.012	2	-.224	2	.489	15
269		2	max	2196.223	2	1166.85	3	171.023	2	.015	5	1.13	5	3.515	1
270			min	-1722.787	3	-861.449	2	-284.61	5	-.012	2	-.171	2	.466	15
271		3	max	1458.091	2	685.177	1	120.458	2	.001	2	1.034	5	3.416	1
272			min	-1447.963	3	88.325	15	-264.417	5	0	3	-.14	2	.44	15
273		4	max	1455.254	2	685.177	1	120.458	2	.001	2	.952	5	3.203	1
274			min	-1450.091	3	88.325	15	-261.958	5	0	3	-.102	2	.413	15
275		5	max	1452.416	2	685.177	1	120.458	2	.001	2	.871	5	2.989	1
276			min	-1452.219	3	88.325	15	-259.499	5	0	3	-.065	1	.385	15
277		6	max	1449.579	2	685.177	1	120.458	2	.001	2	.791	5	2.776	1
278			min	-1454.347	3	88.325	15	-257.04	5	0	3	-.034	1	.358	15
279		7	max	1446.741	2	685.177	1	120.458	2	.001	2	.714	4	2.562	1
280			min	-1456.475	3	88.325	15	-254.58	5	0	3	-.041	3	.33	15
281		8	max	1443.904	2	685.177	1	120.458	2	.001	2	.638	4	2.349	1
282			min	-1458.603	3	88.325	15	-252.121	5	0	3	-.1	3	.303	15
283		9	max	1441.067	2	685.177	1	120.458	2	.001	2	.563	4	2.135	1
284			min	-1460.731	3	88.325	15	-249.662	5	0	3	-.159	3	.275	15
285		10	max	1438.229	2	685.177	1	120.458	2	.001	2	.489	4	1.922	1
286			min	-1462.859	3	88.325	15	-247.203	5	0	3	-.219	3	.248	15
287		11	max	1435.392	2	685.177	1	120.458	2	.001	2	.415	4	1.708	1
288			min	-1464.987	3	88.325	15	-244.744	5	0	3	-.278	3	.22	15
289		12	max	1432.554	2	685.177	1	120.458	2	.001	2	.343	4	1.495	1
290			min	-1467.115	3	88.325	15	-242.285	5	0	3	-.337	3	.193	15
291		13	max	1429.717	2	685.177	1	120.458	2	.001	2	.271	4	1.281	1
292			min	-1469.244	3	88.325	15	-239.826	5	0	3	-.396	3	.165	15
293		14	max	1426.879	2	685.177	1	120.458	2	.001	2	.273	2	1.068	1
294			min	-1471.372	3	88.325	15	-237.367	5	0	3	-.456	3	.138	15
295		15	max	1424.042	2	685.177	1	120.458	2	.001	2	.311	2	.854	1
296			min	-1473.5	3	88.325	15	-234.908	5	0	3	-.515	3	.11	15
297		16	max	1421.204	2	685.177	1	120.458	2	.001	2	.348	2	.641	1
298			min	-1475.628	3	88.325	15	-232.448	5	0	3	-.574	3	.083	15
299		17	max	1418.367	2	685.177	1	120.458	2	.001	2	.386	2	.427	1
300			min	-1477.756	3	88.325	15	-229.989	5	0	3	-.634	3	.055	15
301		18	max	1415.53	2	685.177	1	120.458	2	.001	2	.423	2	.214	1
302			min	-1479.884	3	88.325	15	-227.53	5	0	3	-.693	3	.028	15
303		19	max	1412.692	2	685.177	1	120.458	2	.001	2	.461	2	0	1
304			min	-1482.012	3	88.325	15	-225.071	5	0	3	-.752	3	0	1
305	M5	1	max	6095.258	2	3020.169	3	0	1	.016	4	1.27	4	7.166	3
306			min	-5295.851	3	-3003.557	2	-306.98	5	0	1	0	1	.242	15
307		2	max	6092.421	2	3020.169	3	0	1	.016	4	1.175	4	6.225	3
308			min	-5297.979	3	-3003.557	2	-304.521	5	0	1	0	1	.246	15
309		3	max	3969.168	2	1192.875	1	0	1	0	1	1.075	4	5.947	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	-4294.971	3	47.686	15	-284.225	4	0	4	0	1	.238	15
311		4	max	3966.331	2	1192.875	1	0	1	0	1	.987	4	5.576	1
312			min	-4297.099	3	47.686	15	-281.766	4	0	4	0	1	.223	15
313		5	max	3963.493	2	1192.875	1	0	1	0	1	.899	4	5.204	1
314			min	-4299.227	3	47.686	15	-279.307	4	0	4	0	1	.208	15
315		6	max	3960.656	2	1192.875	1	0	1	0	1	.813	4	4.832	1
316			min	-4301.355	3	47.686	15	-276.848	4	0	4	0	1	.193	15
317		7	max	3957.818	2	1192.875	1	0	1	0	1	.727	4	4.46	1
318			min	-4303.484	3	47.686	15	-274.389	4	0	4	0	1	.178	15
319		8	max	3954.981	2	1192.875	1	0	1	0	1	.642	4	4.089	1
320			min	-4305.612	3	47.686	15	-271.93	4	0	4	0	1	.163	15
321		9	max	3952.144	2	1192.875	1	0	1	0	1	.557	4	3.717	1
322			min	-4307.74	3	47.686	15	-269.47	4	0	4	0	1	.149	15
323		10	max	3949.306	2	1192.875	1	0	1	0	1	.474	4	3.345	1
324			min	-4309.868	3	47.686	15	-267.011	4	0	4	0	1	.134	15
325		11	max	3946.469	2	1192.875	1	0	1	0	1	.391	4	2.974	1
326			min	-4311.996	3	47.686	15	-264.552	4	0	4	0	1	.119	15
327		12	max	3943.631	2	1192.875	1	0	1	0	1	.309	4	2.602	1
328			min	-4314.124	3	47.686	15	-262.093	4	0	4	0	1	.104	15
329		13	max	3940.794	2	1192.875	1	0	1	0	1	.227	4	2.23	1
330			min	-4316.252	3	47.686	15	-259.634	4	0	4	0	1	.089	15
331		14	max	3937.956	2	1192.875	1	0	1	0	1	.147	4	1.859	1
332			min	-4318.38	3	47.686	15	-257.175	4	0	4	0	1	.074	15
333		15	max	3935.119	2	1192.875	1	0	1	0	1	.067	4	1.487	1
334			min	-4320.508	3	47.686	15	-254.716	4	0	4	0	1	.059	15
335		16	max	3932.281	2	1192.875	1	0	1	0	1	0	1	1.115	1
336			min	-4322.636	3	47.686	15	-252.257	4	0	4	-.012	5	.045	15
337		17	max	3929.444	2	1192.875	1	0	1	0	1	0	1	.743	1
338			min	-4324.764	3	47.686	15	-249.798	4	0	4	-.09	4	.03	15
339		18	max	3926.607	2	1192.875	1	0	1	0	1	0	1	.372	1
340			min	-4326.892	3	47.686	15	-247.338	4	0	4	-.167	4	.015	15
341		19	max	3923.769	2	1192.875	1	0	1	0	1	0	1	0	1
342			min	-4329.02	3	47.686	15	-244.879	4	0	4	-.244	4	0	1
343	M8	1	max	2199.06	2	1166.85	3	212.661	3	.016	4	1.268	4	3.855	3
344			min	-1720.659	3	-861.449	2	-313.973	4	-.005	3	-.318	3	-.236	5
345		2	max	2196.223	2	1166.85	3	212.661	3	.016	4	1.171	4	3.515	1
346			min	-1722.787	3	-861.449	2	-311.514	4	-.005	3	-.251	3	-.208	5
347		3	max	1458.091	2	685.177	1	190.31	3	0	3	1.069	4	3.416	1
348			min	-1447.963	3	-38.16	5	-285.637	4	-.001	2	-.197	3	-.19	5
349		4	max	1455.254	2	685.177	1	190.31	3	0	3	.981	4	3.203	1
350			min	-1450.091	3	-38.16	5	-283.178	4	-.001	2	-.137	3	-.178	5
351		5	max	1452.416	2	685.177	1	190.31	3	0	3	.893	4	2.989	1
352			min	-1452.219	3	-38.16	5	-280.719	4	-.001	2	-.078	3	-.166	5
353		6	max	1449.579	2	685.177	1	190.31	3	0	3	.806	4	2.776	1
354			min	-1454.347	3	-38.16	5	-278.26	4	-.001	2	-.019	3	-.155	5
355		7	max	1446.741	2	685.177	1	190.31	3	0	3	.719	4	2.562	1
356			min	-1456.475	3	-38.16	5	-275.801	4	-.001	2	-.01	2	-.143	5
357		8	max	1443.904	2	685.177	1	190.31	3	0	3	.634	4	2.349	1
358			min	-1458.603	3	-38.16	5	-273.342	4	-.001	2	-.048	2	-.131	5
359		9	max	1441.067	2	685.177	1	190.31	3	0	3	.55	5	2.135	1
360			min	-1460.731	3	-38.16	5	-270.882	4	-.001	2	-.085	2	-.119	5
361		10	max	1438.229	2	685.177	1	190.31	3	0	3	.471	5	1.922	1
362			min	-1462.859	3	-38.16	5	-268.423	4	-.001	2	-.123	2	-.107	5
363		11	max	1435.392	2	685.177	1	190.31	3	0	3	.392	5	1.708	1
364			min	-1464.987	3	-38.16	5	-265.964	4	-.001	2	-.161	2	-.095	5
365		12	max	1432.554	2	685.177	1	190.31	3	0	3	.337	3	1.495	1
366			min	-1467.115	3	-38.16	5	-263.505	4	-.001	2	-.198	2	-.083	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	1429.717	2	685.177	1	190.31	3	0	3	.396	3	1.281	1
368			min	-1469.244	3	-38.16	5	-261.046	4	-.001	2	-.236	2	-.071	5
369		14	max	1426.879	2	685.177	1	190.31	3	0	3	.456	3	1.068	1
370			min	-1471.372	3	-38.16	5	-258.587	4	-.001	2	-.273	2	-.059	5
371		15	max	1424.042	2	685.177	1	190.31	3	0	3	.515	3	.854	1
372			min	-1473.5	3	-38.16	5	-256.128	4	-.001	2	-.311	2	-.048	5
373		16	max	1421.204	2	685.177	1	190.31	3	0	3	.574	3	.641	1
374			min	-1475.628	3	-38.16	5	-253.669	4	-.001	2	-.348	2	-.036	5
375		17	max	1418.367	2	685.177	1	190.31	3	0	3	.634	3	.427	1
376			min	-1477.756	3	-38.16	5	-251.21	4	-.001	2	-.386	2	-.024	5
377		18	max	1415.53	2	685.177	1	190.31	3	0	3	.693	3	.214	1
378			min	-1479.884	3	-38.16	5	-248.75	4	-.001	2	-.423	2	-.012	5
379		19	max	1412.692	2	685.177	1	190.31	3	0	3	.752	3	0	1
380			min	-1482.012	3	-38.16	5	-246.291	4	-.001	2	-.461	2	0	1
381	M3	1	max	1530.741	2	4.384	4	50.213	2	.009	3	.019	5	0	1
382			min	-584.375	3	1.031	15	-22.69	3	-.017	2	-.006	2	0	1
383		2	max	1530.533	2	3.897	4	50.213	2	.009	3	.014	4	0	15
384			min	-584.531	3	.916	15	-22.69	3	-.017	2	-.005	3	-.001	4
385		3	max	1530.325	2	3.41	4	50.213	2	.009	3	.024	2	0	15
386			min	-584.687	3	.802	15	-22.69	3	-.017	2	-.011	3	-.002	4
387		4	max	1530.117	2	2.923	4	50.213	2	.009	3	.038	2	0	15
388			min	-584.843	3	.687	15	-22.69	3	-.017	2	-.018	3	-.003	4
389		5	max	1529.909	2	2.436	4	50.213	2	.009	3	.053	2	0	15
390			min	-584.999	3	.573	15	-22.69	3	-.017	2	-.024	3	-.004	4
391		6	max	1529.701	2	1.949	4	50.213	2	.009	3	.068	2	-.001	15
392			min	-585.155	3	.458	15	-22.69	3	-.017	2	-.031	3	-.005	4
393		7	max	1529.493	2	1.461	4	50.213	2	.009	3	.082	2	-.001	15
394			min	-585.311	3	.344	15	-22.69	3	-.017	2	-.038	3	-.005	4
395		8	max	1529.285	2	.974	4	50.213	2	.009	3	.097	2	-.001	15
396			min	-585.467	3	.229	15	-22.69	3	-.017	2	-.044	3	-.005	4
397		9	max	1529.077	2	.487	4	50.213	2	.009	3	.111	2	-.001	15
398			min	-585.624	3	.115	15	-22.69	3	-.017	2	-.051	3	-.006	4
399		10	max	1528.869	2	0	1	50.213	2	.009	3	.126	2	-.001	15
400			min	-585.78	3	0	1	-22.69	3	-.017	2	-.057	3	-.006	4
401		11	max	1528.66	2	-.115	15	50.213	2	.009	3	.141	2	-.001	15
402			min	-585.936	3	-.487	6	-22.69	3	-.017	2	-.064	3	-.006	4
403		12	max	1528.452	2	-.229	15	50.213	2	.009	3	.155	2	-.001	15
404			min	-586.092	3	-.974	6	-22.69	3	-.017	2	-.071	3	-.005	4
405		13	max	1528.244	2	-.344	15	50.213	2	.009	3	.17	2	-.001	15
406			min	-586.248	3	-1.461	6	-22.69	3	-.017	2	-.077	3	-.005	4
407		14	max	1528.036	2	-.458	15	50.213	2	.009	3	.185	2	-.001	15
408			min	-586.404	3	-1.949	6	-22.69	3	-.017	2	-.084	3	-.005	4
409		15	max	1527.828	2	-.573	15	50.213	2	.009	3	.199	2	0	15
410			min	-586.56	3	-2.436	6	-22.69	3	-.017	2	-.091	3	-.004	4
411		16	max	1527.62	2	-.687	15	50.213	2	.009	3	.214	2	0	15
412			min	-586.716	3	-2.923	6	-22.69	3	-.017	2	-.097	3	-.003	4
413		17	max	1527.412	2	-.802	15	50.213	2	.009	3	.229	2	0	15
414			min	-586.872	3	-3.41	6	-22.69	3	-.017	2	-.104	3	-.002	4
415		18	max	1527.204	2	-.916	15	50.213	2	.009	3	.243	2	0	15
416			min	-587.028	3	-3.897	6	-22.69	3	-.017	2	-.11	3	-.001	4
417		19	max	1526.996	2	-1.031	15	50.213	2	.009	3	.258	2	0	1
418			min	-587.184	3	-4.384	6	-22.69	3	-.017	2	-.117	3	0	1
419	M6	1	max	4445.878	2	4.384	6	0	1	0	1	.019	4	0	1
420			min	-2117.768	3	1.031	15	-20.753	4	0	4	0	1	0	1
421		2	max	4445.67	2	3.897	6	0	1	0	1	.013	4	0	15
422			min	-2117.924	3	.916	15	-20.378	4	0	4	0	1	-.001	6
423		3	max	4445.462	2	3.41	6	0	1	0	1	.007	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	-2118.08	3	.802	15	-20.003	4	0	4	0	1	-.002	6
425		4	max	4445.254	2	2.923	6	0	1	0	1	.001	4	0	15
426			min	-2118.236	3	.687	15	-19.627	4	0	4	0	1	-.003	6
427		5	max	4445.046	2	2.436	6	0	1	0	1	0	1	0	15
428			min	-2118.392	3	.573	15	-19.252	4	0	4	-.004	4	-.004	6
429		6	max	4444.837	2	1.949	6	0	1	0	1	0	1	-.001	15
430			min	-2118.548	3	.458	15	-18.877	4	0	4	-.01	4	-.005	6
431		7	max	4444.629	2	1.461	6	0	1	0	1	0	1	-.001	15
432			min	-2118.704	3	.344	15	-18.502	4	0	4	-.016	4	-.005	6
433		8	max	4444.421	2	.974	6	0	1	0	1	0	1	-.001	15
434			min	-2118.86	3	.229	15	-18.127	4	0	4	-.021	4	-.005	6
435		9	max	4444.213	2	.487	6	0	1	0	1	0	1	-.001	15
436			min	-2119.016	3	.115	15	-17.752	4	0	4	-.026	4	-.006	6
437		10	max	4444.005	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2119.172	3	0	1	-17.377	4	0	4	-.031	4	-.006	6
439		11	max	4443.797	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2119.328	3	-.487	4	-17.001	4	0	4	-.036	4	-.006	6
441		12	max	4443.589	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2119.484	3	-.974	4	-16.626	4	0	4	-.041	4	-.005	6
443		13	max	4443.381	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2119.64	3	-1.461	4	-16.251	4	0	4	-.046	4	-.005	6
445		14	max	4443.173	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2119.796	3	-1.949	4	-15.876	4	0	4	-.051	4	-.005	6
447		15	max	4442.965	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2119.952	3	-2.436	4	-15.501	4	0	4	-.055	4	-.004	6
449		16	max	4442.757	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2120.108	3	-2.923	4	-15.126	4	0	4	-.06	4	-.003	6
451		17	max	4442.549	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2120.265	3	-3.41	4	-14.75	4	0	4	-.064	4	-.002	6
453		18	max	4442.341	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2120.421	3	-3.897	4	-14.375	4	0	4	-.068	4	-.001	6
455		19	max	4442.133	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2120.577	3	-4.384	4	-14	4	0	4	-.072	4	0	1
457	M9	1	max	1530.741	2	4.384	4	22.69	3	.017	2	.02	4	0	1
458			min	-584.375	3	1.031	15	-50.213	2	-.009	3	-.002	3	0	1
459		2	max	1530.533	2	3.897	4	22.69	3	.017	2	.013	5	0	15
460			min	-584.531	3	.916	15	-50.213	2	-.009	3	-.009	2	-.001	4
461		3	max	1530.325	2	3.41	4	22.69	3	.017	2	.011	3	0	15
462			min	-584.687	3	.802	15	-50.213	2	-.009	3	-.024	2	-.002	4
463		4	max	1530.117	2	2.923	4	22.69	3	.017	2	.018	3	0	15
464			min	-584.843	3	.687	15	-50.213	2	-.009	3	-.038	2	-.003	4
465		5	max	1529.909	2	2.436	4	22.69	3	.017	2	.024	3	0	15
466			min	-584.999	3	.573	15	-50.213	2	-.009	3	-.053	2	-.004	4
467		6	max	1529.701	2	1.949	4	22.69	3	.017	2	.031	3	-.001	15
468			min	-585.155	3	.458	15	-50.213	2	-.009	3	-.068	2	-.005	4
469		7	max	1529.493	2	1.461	4	22.69	3	.017	2	.038	3	-.001	15
470			min	-585.311	3	.344	15	-50.213	2	-.009	3	-.082	2	-.005	4
471		8	max	1529.285	2	.974	4	22.69	3	.017	2	.044	3	-.001	15
472			min	-585.467	3	.229	15	-50.213	2	-.009	3	-.097	2	-.005	4
473		9	max	1529.077	2	.487	4	22.69	3	.017	2	.051	3	-.001	15
474			min	-585.624	3	.115	15	-50.213	2	-.009	3	-.111	2	-.006	4
475		10	max	1528.869	2	0	1	22.69	3	.017	2	.057	3	-.001	15
476			min	-585.78	3	0	1	-50.213	2	-.009	3	-.126	2	-.006	4
477		11	max	1528.66	2	-.115	15	22.69	3	.017	2	.064	3	-.001	15
478			min	-585.936	3	-.487	6	-50.213	2	-.009	3	-.141	2	-.006	4
479		12	max	1528.452	2	-.229	15	22.69	3	.017	2	.071	3	-.001	15
480			min	-586.092	3	-.974	6	-50.213	2	-.009	3	-.155	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	1528.244	2	-.344	15	22.69	3	.017	2	.077	3	-.001	15
482			min	-586.248	3	-1.461	6	-50.213	2	-.009	3	-.17	2	-.005	4
483		14	max	1528.036	2	-.458	15	22.69	3	.017	2	.084	3	-.001	15
484			min	-586.404	3	-1.949	6	-50.213	2	-.009	3	-.185	2	-.005	4
485		15	max	1527.828	2	-.573	15	22.69	3	.017	2	.091	3	0	15
486			min	-586.56	3	-2.436	6	-50.213	2	-.009	3	-.199	2	-.004	4
487		16	max	1527.62	2	-.687	15	22.69	3	.017	2	.097	3	0	15
488			min	-586.716	3	-2.923	6	-50.213	2	-.009	3	-.214	2	-.003	4
489		17	max	1527.412	2	-.802	15	22.69	3	.017	2	.104	3	0	15
490			min	-586.872	3	-3.41	6	-50.213	2	-.009	3	-.229	2	-.002	4
491		18	max	1527.204	2	-.916	15	22.69	3	.017	2	.11	3	0	15
492			min	-587.028	3	-3.897	6	-50.213	2	-.009	3	-.243	2	-.001	4
493		19	max	1526.996	2	-1.031	15	22.69	3	.017	2	.117	3	0	1
494			min	-587.184	3	-4.384	6	-50.213	2	-.009	3	-.258	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	-.025	15	-.032	12	.017	1	7.213e-3	3	NC	3	NC	3
2			min	-.193	1	-.441	1	-.424	5	-1.849e-2	2	289.698	1	483.195	5
3		2	max	-.025	15	-.029	15	.005	1	7.213e-3	3	NC	12	NC	2
4			min	-.193	1	-.364	1	-.408	4	-1.849e-2	2	347.325	1	515.789	5
5		3	max	-.025	15	-.025	15	0	12	6.784e-3	3	7609.57	12	NC	1
6			min	-.193	1	-.287	1	-.391	4	-1.695e-2	2	433.689	1	555.254	5
7		4	max	-.025	15	-.021	15	-.002	12	6.127e-3	3	5284.325	12	NC	1
8			min	-.193	1	-.214	1	-.37	4	-1.459e-2	2	569.778	1	610.975	5
9		5	max	-.025	15	-.017	15	0	12	5.47e-3	3	NC	10	NC	1
10			min	-.193	1	-.147	1	-.345	4	-1.223e-2	2	792.401	1	688.347	5
11		6	max	-.025	15	-.013	15	0	3	5.559e-3	3	5622.1	2	NC	1
12			min	-.193	1	-.103	3	-.319	4	-1.15e-2	2	1155.578	14	793.971	5
13		7	max	-.025	15	-.009	15	.001	3	6.163e-3	3	7863.779	11	NC	1
14			min	-.192	1	-.097	3	-.293	4	-1.19e-2	2	1365.833	14	933.321	5
15		8	max	-.025	15	.003	10	0	3	6.767e-3	3	NC	11	NC	2
16			min	-.192	1	-.084	3	-.269	4	-1.23e-2	2	1526.12	2	1114.922	5
17		9	max	-.025	15	.022	2	0	10	7.6e-3	3	NC	1	NC	2
18			min	-.192	1	-.067	3	-.248	4	-1.197e-2	2	1224.728	2	1349.474	5
19		10	max	-.025	15	.042	2	0	2	8.837e-3	3	NC	3	NC	2
20			min	-.192	1	-.047	3	-.227	4	-1.034e-2	2	1039.436	2	1711.346	5
21		11	max	-.025	15	.062	1	.001	3	1.007e-2	3	6929.06	12	NC	2
22			min	-.191	1	-.022	3	-.206	4	-8.709e-3	2	920.61	2	2307.462	5
23		12	max	-.025	15	.084	1	.004	3	8.439e-3	3	9445.33	9	NC	1
24			min	-.191	1	.006	12	-.188	4	-6.469e-3	2	843.481	2	3377.479	5
25		13	max	-.025	15	.101	1	.009	3	5.181e-3	3	NC	9	NC	1
26			min	-.19	1	.011	15	-.171	4	-3.883e-3	2	808.003	2	5944.694	5
27		14	max	-.025	15	.108	3	.008	3	2.095e-3	3	NC	9	NC	2
28			min	-.19	1	.014	15	-.158	4	-4.508e-3	4	827.255	2	7898.01	1
29		15	max	-.025	15	.191	3	.006	1	6.683e-3	3	NC	9	NC	2
30			min	-.19	1	.017	15	-.15	5	-3.93e-3	4	558.605	3	5960.245	1
31		16	max	-.025	15	.292	3	.008	1	1.127e-2	3	NC	4	NC	2
32			min	-.19	1	.005	10	-.147	5	-5.858e-3	2	393.636	3	5477.822	1
33		17	max	-.025	15	.403	3	.005	1	1.586e-2	3	NC	4	NC	2
34			min	-.19	1	-.017	10	-.146	5	-8.084e-3	2	296.276	3	6321.857	1
35		18	max	-.025	15	.52	3	0	10	1.885e-2	3	NC	4	NC	1
36			min	-.19	1	-.049	2	-.149	4	-9.536e-3	2	235.669	3	NC	1
37		19	max	-.025	15	.636	3	-.003	10	1.885e-2	3	NC	1	NC	1
38			min	-.19	1	-.087	2	-.151	4	-9.536e-3	2	195.684	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	-.013	15	.047	3	0	1	2.257e-4	4	NC	3	NC	1
40			min	-.336	1	-.988	2	-.421	4	0	1	171.555	1	486.237	4
41		2	max	-.013	15	-.011	12	0	1	2.257e-4	4	5452.481	15	NC	1
42			min	-.336	1	-.79	2	-.407	4	0	1	218.562	1	511.887	4
43		3	max	-.013	15	-.018	15	0	1	0	1	6655.1	15	NC	1
44			min	-.336	1	-.592	2	-.392	4	-4.102e-5	4	301.378	1	543.688	4
45		4	max	-.013	15	-.014	15	0	1	0	1	8458.721	15	NC	1
46			min	-.336	1	-.415	1	-.371	4	-4.501e-4	4	472.811	1	594.179	4
47		5	max	-.013	15	-.01	15	0	1	0	1	NC	15	NC	1
48			min	-.336	1	-.274	1	-.346	4	-8.592e-4	4	640.66	3	668.721	4
49		6	max	-.013	15	-.007	15	0	1	0	1	NC	15	NC	1
50			min	-.335	1	-.179	3	-.319	4	-8.289e-4	4	595.179	3	773.789	4
51		7	max	-.013	15	-.004	15	0	1	0	1	NC	5	NC	1
52			min	-.335	1	-.172	3	-.292	4	-4.948e-4	4	525.19	2	913.61	4
53		8	max	-.013	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.334	1	-.15	3	-.268	4	-1.607e-4	4	443.42	2	1092.372	4
55		9	max	-.013	15	.032	2	0	1	5.036e-6	5	NC	4	NC	1
56			min	-.333	1	-.12	3	-.248	4	0	1	394.655	2	1310.613	4
57		10	max	-.013	15	.069	2	0	1	0	1	NC	4	NC	1
58			min	-.332	1	-.085	3	-.227	4	-1.273e-4	4	355.862	2	1655.623	4
59		11	max	-.013	15	.109	1	0	1	0	1	NC	4	NC	1
60			min	-.331	1	-.044	3	-.206	4	-2.596e-4	4	326.167	2	2213.222	4
61		12	max	-.013	15	.151	1	0	1	0	1	NC	5	NC	1
62			min	-.33	1	.005	12	-.189	4	-1.273e-3	4	303.908	2	3103.162	4
63		13	max	-.013	15	.18	1	0	1	0	1	NC	5	NC	1
64			min	-.329	1	.007	15	-.172	4	-2.786e-3	4	292.966	2	5006.472	4
65		14	max	-.013	15	.193	3	0	1	0	1	NC	5	NC	1
66			min	-.328	1	.008	15	-.16	4	-4.242e-3	4	300.517	2	9037.119	4
67		15	max	-.013	15	.369	3	0	1	0	1	NC	5	NC	1
68			min	-.329	1	.007	15	-.154	4	-3.204e-3	4	339.904	2	NC	1
69		16	max	-.013	15	.589	3	0	1	0	1	NC	5	NC	1
70			min	-.329	1	-.012	10	-.151	4	-2.167e-3	4	247.326	3	NC	1
71		17	max	-.013	15	.836	3	0	1	0	1	NC	5	NC	1
72			min	-.329	1	-.095	2	-.149	4	-1.129e-3	4	169.773	3	NC	1
73		18	max	-.013	15	1.094	3	0	1	0	1	NC	4	NC	1
74			min	-.329	1	-.201	2	-.147	4	-4.523e-4	4	128.024	3	NC	1
75		19	max	-.013	15	1.35	3	0	1	0	1	NC	1	NC	1
76			min	-.329	1	-.307	2	-.146	4	-4.523e-4	4	102.81	3	NC	1
77	M7	1	max	.011	5	.003	5	-.003	12	1.849e-2	2	NC	3	NC	3
78			min	-.193	1	-.441	1	-.432	4	-7.213e-3	3	289.698	1	462.661	4
79		2	max	.011	5	.004	5	0	12	1.849e-2	2	NC	5	NC	2
80			min	-.193	1	-.364	1	-.41	4	-7.213e-3	3	347.325	1	500.152	4
81		3	max	.011	5	.005	5	.005	1	1.695e-2	2	NC	5	NC	1
82			min	-.193	1	-.287	1	-.388	4	-6.784e-3	3	433.689	1	545.048	4
83		4	max	.011	5	.006	5	.01	1	1.459e-2	2	NC	5	NC	1
84			min	-.193	1	-.214	1	-.365	5	-6.127e-3	3	569.778	1	602.603	4
85		5	max	.011	5	.006	5	.01	1	1.223e-2	2	NC	5	NC	1
86			min	-.193	1	-.147	1	-.341	5	-5.47e-3	3	792.401	1	677.591	4
87		6	max	.011	5	.006	5	.008	1	1.15e-2	2	NC	4	NC	1
88			min	-.193	1	-.103	3	-.315	4	-5.559e-3	3	1159.175	1	775.708	4
89		7	max	.011	5	.005	5	.004	2	1.19e-2	2	NC	4	NC	1
90			min	-.192	1	-.097	3	-.291	4	-6.163e-3	3	1519.837	9	900.195	4
91		8	max	.011	5	.004	5	0	2	1.23e-2	2	NC	4	NC	2
92			min	-.192	1	-.084	3	-.269	4	-6.767e-3	3	1526.12	2	1060.664	4
93		9	max	.011	5	.022	2	0	3	1.197e-2	2	NC	1	NC	2
94			min	-.192	1	-.067	3	-.248	4	-7.6e-3	3	1224.728	2	1274.128	4
95		10	max	.011	5	.042	2	0	3	1.034e-2	2	NC	3	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	-.192	1	-.047	3	-.227	4	-8.837e-3	3	1039.436	2	1591.18	4
97		11	max	.011	5	.062	1	0	2	8.709e-3	2	NC	5	NC	2
98			min	-.191	1	-.022	3	-.206	4	-1.007e-2	3	920.61	2	2099.19	4
99		12	max	.011	5	.084	1	.003	2	6.469e-3	2	NC	5	NC	1
100			min	-.191	1	-.002	5	-.187	4	-8.439e-3	3	843.481	2	3006.424	4
101		13	max	.011	5	.101	1	.005	2	3.883e-3	2	NC	5	NC	1
102			min	-.19	1	-.004	5	-.17	4	-5.181e-3	3	808.003	2	4840.496	4
103		14	max	.011	5	.108	3	.002	2	1.404e-3	2	NC	5	NC	2
104			min	-.19	1	-.006	5	-.159	4	-4.221e-3	5	827.255	2	7898.01	1
105		15	max	.011	5	.191	3	0	10	3.631e-3	2	NC	5	NC	2
106			min	-.19	1	-.01	5	-.154	4	-6.683e-3	3	558.605	3	5960.245	1
107		16	max	.011	5	.292	3	-.002	10	5.858e-3	2	NC	9	NC	2
108			min	-.19	1	-.014	5	-.151	4	-1.127e-2	3	393.636	3	5477.822	1
109		17	max	.011	5	.403	3	0	12	8.084e-3	2	NC	4	NC	2
110			min	-.19	1	-.019	5	-.149	4	-1.586e-2	3	296.276	3	6321.857	1
111		18	max	.011	5	.52	3	.005	1	9.536e-3	2	NC	4	NC	1
112			min	-.19	1	-.049	2	-.146	4	-1.885e-2	3	235.669	3	NC	1
113		19	max	.011	5	.636	3	.016	1	9.536e-3	2	NC	1	NC	1
114			min	-.19	1	-.087	2	-.145	5	-1.885e-2	3	195.684	3	NC	1
115	M10	1	max	0	1	.479	3	.19	1	1.561e-2	3	NC	1	NC	1
116			min	-.147	4	-.035	2	-.011	5	-5.219e-3	2	NC	1	NC	1
117		2	max	0	1	.685	3	.218	1	1.77e-2	3	NC	4	NC	2
118			min	-.147	4	-.138	2	-.008	5	-6.224e-3	2	931.888	3	6917.149	1
119		3	max	0	1	.878	3	.258	1	1.98e-2	3	NC	4	NC	4
120			min	-.147	4	-.231	2	-.003	5	-7.229e-3	2	481.063	3	2820.207	1
121		4	max	0	1	1.032	3	.299	1	2.19e-2	3	NC	4	NC	5
122			min	-.147	4	-.298	2	0	15	-8.234e-3	2	347.524	3	1767.661	1
123		5	max	0	1	1.13	3	.331	1	2.4e-2	3	NC	4	NC	5
124			min	-.148	4	-.331	2	.004	15	-9.239e-3	2	295.226	3	1363.809	1
125		6	max	0	1	1.167	3	.35	1	2.609e-2	3	NC	4	NC	5
126			min	-.148	4	-.327	2	.007	15	-1.024e-2	2	279.091	3	1201.917	1
127		7	max	0	1	1.151	3	.355	1	2.819e-2	3	NC	4	NC	5
128			min	-.148	4	-.293	2	.009	15	-1.125e-2	2	285.93	3	1167.594	1
129		8	max	0	1	1.098	3	.348	1	3.029e-2	3	NC	4	NC	5
130			min	-.148	4	-.24	2	.011	15	-1.225e-2	2	310.579	3	1218.536	1
131		9	max	0	1	1.036	3	.336	1	3.238e-2	3	NC	4	NC	5
132			min	-.148	4	-.189	2	.012	15	-1.326e-2	2	345.155	3	1318.87	1
133		10	max	0	1	1.004	3	.329	1	3.448e-2	3	NC	9	NC	5
134			min	-.148	4	-.164	2	.013	15	-1.426e-2	2	365.771	3	1384.286	1
135		11	max	0	10	1.036	3	.336	1	3.238e-2	3	NC	13	NC	5
136			min	-.148	4	-.189	2	.015	15	-1.326e-2	2	345.155	3	1318.87	1
137		12	max	0	10	1.098	3	.348	1	3.029e-2	3	NC	4	NC	5
138			min	-.148	4	-.24	2	.018	15	-1.225e-2	2	310.579	3	1218.536	1
139		13	max	0	10	1.151	3	.355	1	2.819e-2	3	NC	4	NC	5
140			min	-.148	4	-.293	2	.021	15	-1.125e-2	2	285.93	3	1167.594	1
141		14	max	0	10	1.167	3	.35	1	2.609e-2	3	NC	4	NC	5
142			min	-.148	4	-.327	2	.023	15	-1.024e-2	2	279.091	3	1201.917	1
143		15	max	0	10	1.13	3	.331	1	2.4e-2	3	NC	4	NC	5
144			min	-.148	4	-.331	2	.025	15	-9.239e-3	2	295.226	3	1363.809	1
145		16	max	0	10	1.032	3	.299	1	2.19e-2	3	NC	4	NC	5
146			min	-.148	4	-.298	2	.025	15	-8.234e-3	2	347.524	3	1767.661	1
147		17	max	0	10	.878	3	.258	1	1.98e-2	3	NC	4	NC	5
148			min	-.148	4	-.231	2	.026	15	-7.229e-3	2	481.063	3	2820.207	1
149		18	max	0	10	.685	3	.218	1	1.77e-2	3	NC	14	NC	2
150			min	-.148	4	-.138	2	.025	15	-6.224e-3	2	931.888	3	6917.149	1
151		19	max	0	10	.479	3	.19	1	1.561e-2	3	NC	1	NC	1
152			min	-.148	4	-.035	2	.025	15	-5.219e-3	2	3188.038	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	.001	2	.07	1	.191	1	4.03e-3	3	NC	1	NC	1
154			min	-.199	4	-.011	3	-.011	5	-2.14e-4	5	NC	1	NC	1
155		2	max	.001	2	.106	3	.211	1	4.318e-3	3	NC	4	NC	2
156			min	-.199	4	-.022	2	.006	15	-1.503e-4	5	1637.975	3	8870.413	4
157		3	max	.001	2	.212	3	.247	1	4.607e-3	3	NC	4	NC	3
158			min	-.199	4	-.092	2	.012	15	-8.666e-5	5	859.817	3	3433.167	1
159		4	max	0	2	.283	3	.286	1	4.895e-3	3	NC	4	NC	15
160			min	-.199	4	-.133	2	.013	15	-2.299e-5	5	653.531	3	2013.213	1
161		5	max	0	2	.304	3	.32	1	5.184e-3	3	NC	4	NC	5
162			min	-.199	4	-.138	2	.01	15	1.987e-5	15	609.132	3	1491.461	1
163		6	max	0	2	.274	3	.341	1	5.472e-3	3	NC	4	NC	5
164			min	-.2	4	-.108	2	.005	15	6.229e-5	15	673.523	3	1276.485	1
165		7	max	0	2	.201	3	.35	1	5.761e-3	3	NC	4	NC	5
166			min	-.2	4	-.051	2	0	15	1.047e-4	15	906.066	3	1210.806	1
167		8	max	0	2	.104	3	.346	1	6.049e-3	3	NC	4	NC	5
168			min	-.2	4	.002	15	0	15	1.471e-4	15	1666.266	3	1237.648	1
169		9	max	0	2	.099	1	.337	1	6.338e-3	3	NC	4	NC	4
170			min	-.2	4	.003	15	.002	15	1.896e-4	15	6646.129	1	1317.049	1
171		10	max	0	1	.124	1	.331	1	6.626e-3	3	NC	3	NC	5
172			min	-.2	4	-.027	3	.013	15	2.32e-4	15	3549.558	1	1371.807	1
173		11	max	0	3	.099	1	.337	1	6.338e-3	3	NC	4	NC	15
174			min	-.2	4	.005	15	.025	15	2.549e-4	15	6646.129	1	1317.049	1
175		12	max	0	3	.104	3	.346	1	6.049e-3	3	NC	4	NC	15
176			min	-.2	4	.003	15	.029	15	2.779e-4	15	1666.266	3	1237.648	1
177		13	max	0	3	.201	3	.35	1	5.761e-3	3	NC	4	NC	15
178			min	-.2	4	-.051	2	.028	15	3.008e-4	15	906.066	3	1210.806	1
179		14	max	0	3	.274	3	.341	1	5.472e-3	3	NC	5	NC	5
180			min	-.2	4	-.108	2	.024	15	3.238e-4	15	673.523	3	1276.485	1
181		15	max	.001	3	.304	3	.32	1	5.184e-3	3	NC	5	NC	5
182			min	-.2	4	-.138	2	.017	15	3.468e-4	15	609.132	3	1491.461	1
183		16	max	.001	3	.283	3	.286	1	4.895e-3	3	NC	5	NC	4
184			min	-.2	4	-.133	2	.012	15	3.697e-4	15	653.531	3	2013.213	1
185		17	max	.001	3	.212	3	.247	1	4.607e-3	3	NC	5	NC	3
186			min	-.2	4	-.092	2	.009	15	3.927e-4	15	859.817	3	3433.167	1
187		18	max	.002	3	.106	3	.211	1	4.318e-3	3	NC	4	NC	2
188			min	-.2	4	-.022	2	.013	15	4.156e-4	15	1637.975	3	9716.42	1
189		19	max	.002	3	.07	1	.191	1	4.03e-3	3	NC	1	NC	1
190			min	-.2	4	-.011	3	.025	15	4.386e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.014	2	.192	1	3.902e-3	1	NC	1	NC	1
192			min	-.255	4	-.074	3	-.011	5	-1.728e-4	5	NC	1	NC	1
193		2	max	0	2	.004	5	.209	1	4.202e-3	1	NC	4	NC	1
194			min	-.255	4	-.119	2	.007	15	-1.079e-4	5	1442.1	2	8317.373	4
195		3	max	0	2	.053	3	.243	1	4.503e-3	1	NC	4	NC	10
196			min	-.255	4	-.232	2	.014	15	-4.308e-5	5	780.232	2	3750.798	1
197		4	max	0	2	.082	3	.282	1	4.804e-3	1	NC	5	NC	15
198			min	-.255	4	-.303	2	.014	15	6.381e-6	15	604.574	2	2125.884	1
199		5	max	0	2	.082	3	.316	1	5.104e-3	1	NC	5	NC	5
200			min	-.255	4	-.322	2	.01	15	4.957e-5	15	570.102	2	1544.708	1
201		6	max	0	2	.054	3	.339	1	5.405e-3	1	NC	5	NC	5
202			min	-.255	4	-.289	2	.004	15	9.276e-5	15	633.189	2	1304.297	1
203		7	max	0	2	.004	3	.349	1	5.705e-3	1	NC	5	NC	5
204			min	-.255	4	-.212	2	0	15	1.36e-4	15	846.39	2	1223.828	1
205		8	max	0	2	0	15	.347	1	6.006e-3	1	NC	3	NC	4
206			min	-.255	4	-.114	2	-.004	5	1.791e-4	15	1500.465	2	1239.245	1
207		9	max	0	2	0	15	.339	1	6.307e-3	1	NC	4	NC	4
208			min	-.255	4	-.108	3	0	15	2.223e-4	15	5149.527	2	1308.684	1
209		10	max	0	1	.019	2	.333	1	6.607e-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	-.255	4	-.131	3	.013	15	2.655e-4	15	3350.244	3	1358.364	1
211		11	max	0	9	-.002	15	.339	1	6.307e-3	1	NC	4	NC	15
212			min	-.255	4	-.108	3	.027	15	2.877e-4	15	5149.527	2	1308.684	1
213		12	max	0	9	-.005	15	.347	1	6.006e-3	1	NC	3	9858.894	15
214			min	-.255	4	-.114	2	.032	15	3.098e-4	15	1500.465	2	1239.245	1
215		13	max	0	9	.004	3	.349	1	5.705e-3	1	NC	5	NC	15
216			min	-.255	4	-.212	2	.03	15	3.319e-4	15	846.39	2	1223.828	1
217		14	max	0	9	.054	3	.339	1	5.405e-3	1	NC	5	NC	5
218			min	-.255	4	-.289	2	.025	15	3.54e-4	15	633.189	2	1304.297	1
219		15	max	0	9	.082	3	.316	1	5.104e-3	1	NC	5	NC	5
220			min	-.255	4	-.322	2	.017	15	3.762e-4	15	570.102	2	1544.708	1
221		16	max	0	9	.082	3	.282	1	4.804e-3	1	NC	5	NC	4
222			min	-.255	4	-.303	2	.011	15	3.983e-4	15	604.574	2	2125.884	1
223		17	max	0	9	.053	3	.243	1	4.503e-3	1	NC	5	NC	4
224			min	-.255	4	-.232	2	.008	15	4.204e-4	15	780.232	2	3750.798	1
225		18	max	0	9	-.001	12	.209	1	4.202e-3	1	NC	4	NC	1
226			min	-.255	4	-.119	2	.012	15	4.426e-4	15	1442.1	2	NC	1
227		19	max	0	9	.014	2	.192	1	3.902e-3	1	NC	1	NC	1
228			min	-.255	4	-.074	3	.025	15	4.647e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.004	5	.193	1	1.128e-2	2	NC	1	NC	1
230			min	-.403	4	-.338	1	-.011	5	-2.049e-3	3	NC	1	NC	1
231		2	max	0	12	.006	3	.222	1	1.298e-2	2	NC	4	NC	2
232			min	-.403	4	-.519	2	.007	15	-2.689e-3	3	974.445	2	6698.307	1
233		3	max	0	12	.07	3	.263	1	1.468e-2	2	NC	5	NC	10
234			min	-.403	4	-.695	2	.014	15	-3.329e-3	3	513.854	2	2751.232	1
235		4	max	0	12	.112	3	.304	1	1.638e-2	2	NC	5	NC	15
236			min	-.403	4	-.828	2	.016	15	-3.969e-3	3	378.963	2	1729.448	1
237		5	max	0	12	.127	3	.337	1	1.808e-2	2	NC	5	NC	15
238			min	-.403	4	-.905	2	.014	15	-4.609e-3	3	329.199	2	1335.481	1
239		6	max	0	12	.114	3	.356	1	1.978e-2	2	NC	5	NC	5
240			min	-.403	4	-.923	2	.009	15	-5.249e-3	3	319.465	2	1176.394	1
241		7	max	0	12	.079	3	.361	1	2.148e-2	2	NC	5	NC	5
242			min	-.403	4	-.89	2	.005	15	-5.889e-3	3	338.06	2	1140.959	1
243		8	max	0	12	.032	3	.355	1	2.318e-2	2	NC	5	NC	5
244			min	-.403	4	-.824	2	.003	15	-6.529e-3	3	382.138	2	1187.596	1
245		9	max	0	12	-.011	12	.343	1	2.488e-2	2	NC	5	NC	5
246			min	-.403	4	-.755	2	.005	15	-7.169e-3	3	443.169	2	1281.333	1
247		10	max	0	1	-.021	15	.336	1	2.658e-2	2	NC	5	NC	5
248			min	-.403	4	-.721	2	.013	15	-7.809e-3	3	480.566	2	1342.491	1
249		11	max	0	1	-.011	12	.343	1	2.488e-2	2	NC	5	NC	5
250			min	-.403	4	-.755	2	.023	15	-7.169e-3	3	443.169	2	1281.333	1
251		12	max	0	1	.032	3	.355	1	2.318e-2	2	NC	5	NC	15
252			min	-.403	4	-.824	2	.027	15	-6.529e-3	3	382.138	2	1187.596	1
253		13	max	0	1	.079	3	.361	1	2.148e-2	2	NC	15	NC	5
254			min	-.403	4	-.89	2	.025	15	-5.889e-3	3	338.06	2	1140.959	1
255		14	max	0	1	.114	3	.356	1	1.978e-2	2	NC	15	NC	5
256			min	-.403	4	-.923	2	.021	15	-5.249e-3	3	319.465	2	1176.394	1
257		15	max	0	1	.127	3	.337	1	1.808e-2	2	NC	15	NC	5
258			min	-.403	4	-.905	2	.015	15	-4.609e-3	3	329.199	2	1335.481	1
259		16	max	0	1	.112	3	.304	1	1.638e-2	2	NC	15	NC	4
260			min	-.403	4	-.828	2	.011	15	-3.969e-3	3	378.963	2	1729.448	1
261		17	max	0	1	.07	3	.263	1	1.468e-2	2	NC	5	NC	4
262			min	-.403	4	-.695	2	.009	15	-3.329e-3	3	513.854	2	2751.232	1
263		18	max	0	1	.006	3	.222	1	1.298e-2	2	NC	5	NC	2
264			min	-.402	4	-.519	2	.013	15	-2.689e-3	3	974.445	2	6698.307	1
265		19	max	0	1	-.028	15	.193	1	1.128e-2	2	NC	1	NC	1
266			min	-.402	4	-.338	1	.025	15	-2.049e-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	0	5	3.681e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-4.606e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	4.78e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-6.168e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.007	5	4.398e-3	2	NC	2	NC	1
274			min	0	2	-.009	3	-.001	2	-5.984e-3	5	7670.743	3	9709.74	5
275		5	max	0	3	-.002	15	.012	5	4.016e-3	2	NC	4	NC	1
276			min	0	2	-.015	3	-.002	2	-5.799e-3	5	4480.475	3	5633.029	5
277		6	max	0	3	-.003	15	.018	5	3.634e-3	2	NC	5	NC	1
278			min	0	2	-.023	3	-.003	2	-5.615e-3	5	2956.701	3	3711.719	5
279		7	max	0	3	-.004	15	.025	5	3.252e-3	2	NC	5	NC	1
280			min	0	2	-.032	1	-.003	2	-5.431e-3	5	2098.668	1	2652.321	5
281		8	max	0	3	-.006	15	.034	5	2.87e-3	2	NC	15	NC	1
282			min	0	2	-.043	1	-.004	2	-5.246e-3	5	1570.987	1	2004.437	5
283		9	max	0	3	-.007	15	.043	5	2.488e-3	2	9313.167	15	NC	1
284			min	0	2	-.055	1	-.005	2	-5.062e-3	5	1227.085	1	1579.065	5
285		10	max	0	3	-.009	15	.052	5	2.106e-3	2	7529.767	15	NC	1
286			min	0	2	-.068	1	-.006	2	-4.878e-3	5	989.909	1	1284.069	5
287		11	max	0	3	-.011	15	.063	5	1.724e-3	2	6243.01	15	NC	1
288			min	0	2	-.082	1	-.006	2	-4.694e-3	5	819.33	1	1070.965	5
289		12	max	0	3	-.013	15	.074	5	1.342e-3	2	5283.175	15	NC	1
290			min	0	2	-.097	1	-.006	2	-4.509e-3	5	692.41	1	911.859	5
291		13	max	.001	3	-.015	15	.085	5	9.595e-4	2	4547.509	15	NC	1
292			min	-.001	2	-.113	1	-.006	1	-4.34e-3	4	595.33	1	789.848	5
293		14	max	.001	3	-.017	15	.097	5	5.775e-4	2	3971.226	15	NC	1
294			min	-.001	2	-.13	1	-.006	1	-4.191e-3	4	519.411	1	694.25	5
295		15	max	.001	3	-.019	15	.109	5	6.125e-4	3	3511.105	15	NC	1
296			min	-.001	2	-.147	1	-.006	1	-4.042e-3	4	458.88	1	617.955	5
297		16	max	.001	3	-.021	15	.121	5	8.444e-4	3	3138.033	15	NC	1
298			min	-.001	2	-.164	1	-.005	1	-3.893e-3	4	409.859	1	556.15	5
299		17	max	.001	3	-.024	15	.133	4	1.076e-3	3	2831.413	15	NC	1
300			min	-.001	2	-.182	1	-.004	1	-3.744e-3	4	369.612	1	505.129	4
301		18	max	.001	3	-.026	15	.146	4	1.308e-3	3	2576.5	15	NC	1
302			min	-.001	2	-.2	1	-.004	3	-3.595e-3	4	336.182	1	462.43	4
303		19	max	.002	3	-.028	15	.158	4	1.54e-3	3	2362.493	15	NC	1
304			min	-.002	2	-.218	1	-.008	3	-3.445e-3	4	308.139	1	426.665	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	0	4	0	1	NC	1	NC	1
308			min	0	2	-.002	3	0	1	-4.857e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	1	NC	1
310			min	0	2	-.008	3	0	1	-6.493e-3	4	8775.658	3	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
312			min	0	2	-.016	3	0	1	-6.281e-3	4	4221.056	3	9326.805	4
313		5	max	.001	3	-.001	15	.012	4	0	1	NC	4	NC	1
314			min	-.001	2	-.027	3	0	1	-6.069e-3	4	2489.636	3	5414.525	4
315		6	max	.001	3	-.002	15	.019	4	0	1	NC	5	NC	1
316			min	-.001	2	-.041	3	0	1	-5.857e-3	4	1652.096	3	3570.434	4
317		7	max	.002	3	-.002	15	.026	4	0	1	NC	5	NC	1
318			min	-.002	2	-.057	3	0	1	-5.645e-3	4	1183.533	3	2553.469	4
319		8	max	.002	3	-.003	15	.035	4	0	1	NC	5	NC	1
320			min	-.002	2	-.075	3	0	1	-5.433e-3	4	894.385	3	1931.465	4
321		9	max	.002	3	-.004	15	.044	4	0	1	NC	5	NC	1
322			min	-.002	2	-.096	3	0	1	-5.222e-3	4	703.418	3	1523.047	4
323		10	max	.002	3	-.005	15	.054	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.118	3	0	1	-5.01e-3	4	570.422	3	1239.801	4
325		11	max	.003	3	-.006	15	.065	4	0	1	NC	15	NC	1
326			min	-.002	2	-.142	3	0	1	-4.798e-3	4	474.049	3	1035.192	4
327		12	max	.003	3	-.007	15	.076	4	0	1	9921.334	15	NC	1
328			min	-.003	2	-.167	3	0	1	-4.586e-3	4	401.915	3	882.447	4
329		13	max	.003	3	-.008	15	.088	4	0	1	8531.914	15	NC	1
330			min	-.003	2	-.195	1	0	1	-4.374e-3	4	345.914	1	765.344	4
331		14	max	.003	3	-.009	15	.1	4	0	1	7445.034	15	NC	1
332			min	-.003	2	-.223	1	0	1	-4.162e-3	4	301.592	1	673.626	4
333		15	max	.004	3	-.01	15	.112	4	0	1	6578.252	15	NC	1
334			min	-.003	2	-.253	1	0	1	-3.95e-3	4	266.292	1	600.473	4
335		16	max	.004	3	-.011	15	.124	4	0	1	5876.154	15	NC	1
336			min	-.004	2	-.283	1	0	1	-3.739e-3	4	237.731	1	541.261	4
337		17	max	.004	3	-.013	15	.137	4	0	1	5299.61	15	NC	1
338			min	-.004	2	-.314	1	0	1	-3.527e-3	4	214.299	1	492.735	4
339		18	max	.004	3	-.014	15	.149	4	0	1	4820.652	15	NC	1
340			min	-.004	2	-.345	1	0	1	-3.315e-3	4	194.849	1	452.562	4
341		19	max	.005	3	-.015	15	.161	4	0	1	4418.817	15	NC	1
342			min	-.004	2	-.377	1	0	1	-3.103e-3	4	178.544	1	419.028	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	0	4	1.699e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-5.096e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	2.17e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-6.798e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.007	4	1.939e-3	3	NC	2	NC	1
350			min	0	2	-.009	3	-.002	3	-6.554e-3	4	7670.743	3	9354.235	4
351		5	max	0	3	0	5	.012	4	1.707e-3	3	NC	4	NC	1
352			min	0	2	-.015	3	-.003	3	-6.31e-3	4	4480.475	3	5433.455	4
353		6	max	0	3	.001	5	.019	4	1.475e-3	3	NC	4	NC	1
354			min	0	2	-.023	3	-.004	3	-6.066e-3	4	2956.701	3	3584.505	4
355		7	max	0	3	.002	5	.026	4	1.243e-3	3	NC	4	NC	1
356			min	0	2	-.032	1	-.005	3	-5.822e-3	4	2098.668	1	2564.54	4
357		8	max	0	3	.003	5	.035	4	1.011e-3	3	NC	4	NC	1
358			min	0	2	-.043	1	-.006	3	-5.578e-3	4	1570.987	1	1940.564	4
359		9	max	0	3	.003	5	.044	4	7.79e-4	3	NC	5	NC	1
360			min	0	2	-.055	1	-.007	3	-5.334e-3	4	1227.085	1	1530.779	4
361		10	max	0	3	.004	5	.054	4	5.47e-4	3	NC	5	NC	1
362			min	0	2	-.068	1	-.008	3	-5.09e-3	4	989.909	1	1246.552	4
363		11	max	0	3	.005	5	.065	4	3.151e-4	3	NC	5	NC	1
364			min	0	2	-.082	1	-.008	3	-4.846e-3	4	819.33	1	1041.218	4
365		12	max	0	3	.006	5	.076	4	8.322e-5	3	NC	5	NC	1
366			min	0	2	-.097	1	-.008	3	-4.602e-3	4	692.41	1	887.926	4
367		13	max	.001	3	.007	5	.087	4	-1.933e-5	9	NC	5	NC	1
368			min	-.001	2	-.113	1	-.008	3	-4.358e-3	4	595.33	1	770.405	4
369		14	max	.001	3	.007	5	.099	4	8.252e-5	9	NC	15	NC	1
370			min	-.001	2	-.13	1	-.007	3	-4.123e-3	5	519.411	1	678.365	4
371		15	max	.001	3	.008	5	.111	4	1.844e-4	9	NC	15	NC	1
372			min	-.001	2	-.147	1	-.005	3	-3.916e-3	5	458.88	1	604.964	4
373		16	max	.001	3	.009	5	.123	4	4.373e-4	1	NC	15	NC	1
374			min	-.001	2	-.164	1	-.003	3	-3.709e-3	5	409.859	1	545.564	4
375		17	max	.001	3	.01	5	.135	4	7.507e-4	1	9165.002	15	NC	1
376			min	-.001	2	-.182	1	0	3	-3.502e-3	5	369.612	1	496.898	4
377		18	max	.001	3	.011	5	.147	4	1.064e-3	1	8343.928	15	NC	1
378			min	-.001	2	-.2	1	0	10	-3.295e-3	5	336.182	1	456.627	4
379		19	max	.002	3	.012	5	.159	4	1.378e-3	1	7654.024	15	NC	1
380			min	-.002	2	-.218	1	-.002	2	-3.088e-3	5	308.139	1	423.029	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	2.334e-3	2	NC	1	NC	1
382			min	0	15	0	1	0	2	-2.524e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.022	5	2.531e-3	2	NC	1	NC	4
384			min	0	10	-.014	1	-.016	2	-2.501e-3	5	NC	1	3929.593	2
385		3	max	.002	3	-.004	15	.043	5	2.729e-3	2	NC	1	NC	4
386			min	0	2	-.027	1	-.031	2	-2.479e-3	5	NC	1	1976.693	2
387		4	max	.002	3	-.005	15	.064	5	2.927e-3	2	NC	1	NC	4
388			min	0	2	-.041	1	-.046	2	-2.457e-3	5	NC	1	1334.741	2
389		5	max	.003	3	-.007	15	.085	5	3.124e-3	2	NC	1	NC	4
390			min	-.001	2	-.054	1	-.06	2	-2.435e-3	5	NC	1	1021.052	2
391		6	max	.003	3	-.009	15	.106	5	3.322e-3	2	NC	1	NC	6
392			min	-.002	2	-.067	1	-.073	2	-2.413e-3	5	NC	1	839.367	2
393		7	max	.003	3	-.011	15	.126	5	3.519e-3	2	NC	1	9450.641	13
394			min	-.002	2	-.08	1	-.085	2	-2.39e-3	5	NC	1	724.561	2
395		8	max	.003	3	-.012	15	.147	5	3.717e-3	2	NC	1	8081.086	13
396			min	-.003	2	-.093	1	-.095	2	-2.368e-3	5	NC	1	649.073	2
397		9	max	.003	3	-.014	15	.167	5	3.915e-3	2	NC	1	7173.85	13
398			min	-.003	2	-.106	1	-.102	2	-2.346e-3	5	NC	1	599.566	2
399		10	max	.004	3	-.016	15	.187	5	4.112e-3	2	NC	1	6581.976	13
400			min	-.004	2	-.118	1	-.107	2	-2.324e-3	5	NC	1	569.233	2
401		11	max	.004	3	-.017	15	.206	5	4.31e-3	2	NC	1	6228.796	13
402			min	-.004	2	-.131	1	-.11	2	-2.302e-3	5	NC	1	554.862	2
403		12	max	.004	3	-.019	15	.225	5	4.508e-3	2	NC	1	6080.56	13
404			min	-.005	2	-.143	1	-.109	2	-2.279e-3	5	NC	1	555.761	2
405		13	max	.004	3	-.02	15	.243	5	4.705e-3	2	NC	1	6138.111	13
406			min	-.005	2	-.156	1	-.105	2	-2.283e-3	3	NC	1	573.735	2
407		14	max	.004	3	-.022	15	.26	5	4.903e-3	2	NC	1	6443.755	13
408			min	-.006	2	-.168	1	-.098	2	-2.39e-3	3	NC	1	543.669	14
409		15	max	.005	3	-.023	15	.276	5	5.101e-3	2	NC	1	7113.819	13
410			min	-.006	2	-.181	1	-.086	2	-2.497e-3	3	NC	1	498.298	14
411		16	max	.005	3	-.025	15	.292	5	5.298e-3	2	NC	1	8447.026	13
412			min	-.007	2	-.193	1	-.07	2	-2.605e-3	3	NC	1	458.922	14
413		17	max	.005	3	-.026	15	.306	5	5.496e-3	2	NC	1	NC	13
414			min	-.008	2	-.205	1	-.049	2	-2.712e-3	3	NC	1	424.414	14
415		18	max	.005	3	-.028	15	.32	4	5.693e-3	2	NC	1	NC	4
416			min	-.008	2	-.217	1	-.024	2	-2.819e-3	3	NC	1	393.911	14
417		19	max	.005	3	-.029	15	.335	4	5.891e-3	2	NC	1	NC	1
418			min	-.009	2	-.229	1	0	12	-2.926e-3	3	NC	1	366.745	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	-2.668e-3	4	NC	1	NC	1
421		2	max	.004	3	-.001	15	.023	4	0	1	NC	1	NC	1
422			min	0	2	-.024	1	0	1	-2.664e-3	4	NC	1	NC	1
423		3	max	.005	3	-.002	15	.045	4	0	1	NC	1	NC	1
424			min	-.002	2	-.047	1	0	1	-2.661e-3	4	NC	1	9984.451	4
425		4	max	.006	3	-.003	15	.067	4	0	1	NC	1	NC	1
426			min	-.004	2	-.07	1	0	1	-2.657e-3	4	NC	1	6458.255	4
427		5	max	.007	3	-.004	15	.089	4	0	1	NC	1	NC	1
428			min	-.005	2	-.093	1	0	1	-2.653e-3	4	NC	1	4763.428	4
429		6	max	.007	3	-.005	15	.111	4	0	1	NC	1	NC	1
430			min	-.007	2	-.116	1	0	1	-2.65e-3	4	NC	1	3795.333	4
431		7	max	.008	3	-.006	15	.133	4	0	1	NC	1	NC	1
432			min	-.008	2	-.138	1	0	1	-2.646e-3	4	NC	1	3189.047	4
433		8	max	.009	3	-.007	15	.154	4	0	1	NC	1	NC	1
434			min	-.01	2	-.161	1	0	1	-2.642e-3	4	NC	1	2790.703	4
435		9	max	.009	3	-.008	15	.175	4	0	1	NC	1	NC	1
436			min	-.011	2	-.184	1	0	1	-2.639e-3	4	NC	1	2525.753	4
437		10	max	.01	3	-.009	15	.195	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	-.206	1	0	1	-2.635e-3	4	NC	1	2355.493	4
439		11	max	.011	3	-.01	15	.215	4	0	1	NC	1	NC	1
440			min	-.014	2	-.228	1	0	1	-2.631e-3	4	NC	1	2260.274	4
441		12	max	.012	3	-.011	15	.234	4	0	1	NC	1	NC	1
442			min	-.016	2	-.25	1	0	1	-2.628e-3	4	NC	1	2232.888	4
443		13	max	.012	3	-.012	15	.252	4	0	1	NC	1	NC	1
444			min	-.017	2	-.273	1	0	1	-2.624e-3	4	NC	1	2277.226	4
445		14	max	.013	3	-.012	15	.269	4	0	1	NC	1	NC	1
446			min	-.019	2	-.295	1	0	1	-2.62e-3	4	NC	1	2411.873	4
447		15	max	.014	3	-.013	15	.284	4	0	1	NC	1	NC	1
448			min	-.02	2	-.317	1	0	1	-2.617e-3	4	NC	1	2683.177	4
449		16	max	.014	3	-.014	15	.299	4	0	1	NC	1	NC	1
450			min	-.022	2	-.338	1	0	1	-2.613e-3	4	NC	1	3207.313	4
451		17	max	.015	3	-.015	15	.312	4	0	1	NC	1	NC	1
452			min	-.023	2	-.36	1	0	1	-2.61e-3	4	NC	1	4340.965	4
453		18	max	.016	3	-.015	15	.324	4	0	1	NC	1	NC	1
454			min	-.025	2	-.382	1	0	1	-2.606e-3	4	NC	1	7878.884	4
455		19	max	.017	3	-.016	15	.335	4	0	1	NC	1	NC	1
456			min	-.026	2	-.404	1	0	1	-2.602e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.002	4	9.971e-4	3	NC	1	NC	1
458			min	0	5	0	1	0	3	-2.826e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.024	4	1.104e-3	3	NC	1	NC	4
460			min	0	5	-.014	1	-.008	3	-2.825e-3	4	NC	1	3929.593	2
461		3	max	.002	3	0	5	.047	4	1.211e-3	3	NC	1	NC	5
462			min	0	2	-.027	1	-.015	3	-2.824e-3	4	NC	1	1976.693	2
463		4	max	.002	3	.001	5	.07	4	1.319e-3	3	NC	1	9785.297	15
464			min	0	2	-.041	1	-.022	3	-2.927e-3	2	NC	1	1334.741	2
465		5	max	.003	3	.002	5	.093	4	1.426e-3	3	NC	1	7208.991	15
466			min	-.001	2	-.054	1	-.029	3	-3.124e-3	2	NC	1	1021.052	2
467		6	max	.003	3	.002	5	.116	4	1.533e-3	3	NC	1	5738.305	15
468			min	-.002	2	-.067	1	-.035	3	-3.322e-3	2	NC	1	839.367	2
469		7	max	.003	3	.003	5	.138	4	1.64e-3	3	NC	1	4817.68	15
470			min	-.002	2	-.08	1	-.04	3	-3.519e-3	2	NC	1	724.561	2
471		8	max	.003	3	.003	5	.16	4	1.747e-3	3	NC	1	4212.939	15
472			min	-.003	2	-.093	1	-.045	3	-3.717e-3	2	NC	1	649.073	2
473		9	max	.003	3	.004	5	.181	4	1.854e-3	3	NC	1	3810.642	15
474			min	-.003	2	-.106	1	-.049	3	-3.915e-3	2	NC	1	599.566	2
475		10	max	.004	3	.005	5	.202	4	1.962e-3	3	NC	1	3551.883	15
476			min	-.004	2	-.118	1	-.051	3	-4.112e-3	2	NC	1	569.233	2
477		11	max	.004	3	.005	5	.221	4	2.069e-3	3	NC	1	3406.712	15
478			min	-.004	2	-.131	1	-.052	3	-4.31e-3	2	NC	1	554.862	2
479		12	max	.004	3	.006	5	.24	4	2.176e-3	3	NC	1	3364.05	15
480			min	-.005	2	-.143	1	-.052	3	-4.508e-3	2	NC	1	555.761	2
481		13	max	.004	3	.007	5	.257	4	2.283e-3	3	NC	1	3429.592	15
482			min	-.005	2	-.156	1	-.051	3	-4.705e-3	2	9216.707	5	573.735	2
483		14	max	.004	3	.008	5	.273	4	2.39e-3	3	NC	1	3631.188	15
484			min	-.006	2	-.168	1	-.047	3	-4.903e-3	2	8217.577	5	614.212	2
485		15	max	.005	3	.009	5	.288	4	2.497e-3	3	NC	1	4038.463	15
486			min	-.006	2	-.181	1	-.042	3	-5.101e-3	2	7382.34	5	689.796	2
487		16	max	.005	3	.009	5	.301	4	2.605e-3	3	NC	1	4826.068	15
488			min	-.007	2	-.193	1	-.035	3	-5.298e-3	2	6679.014	5	831.438	2
489		17	max	.005	3	.01	5	.313	4	2.712e-3	3	NC	1	6530.325	15
490			min	-.008	2	-.205	1	-.026	3	-5.496e-3	2	6083.261	5	1133.589	2
491		18	max	.005	3	.011	5	.322	4	2.819e-3	3	NC	1	NC	15
492			min	-.008	2	-.217	1	-.015	3	-5.693e-3	2	5576.272	5	2070.728	2
493		19	max	.005	3	.012	5	.33	5	2.926e-3	3	NC	1	NC	1
494			min	-.009	2	-.229	1	-.009	1	-5.891e-3	2	5143.328	5	NC	1