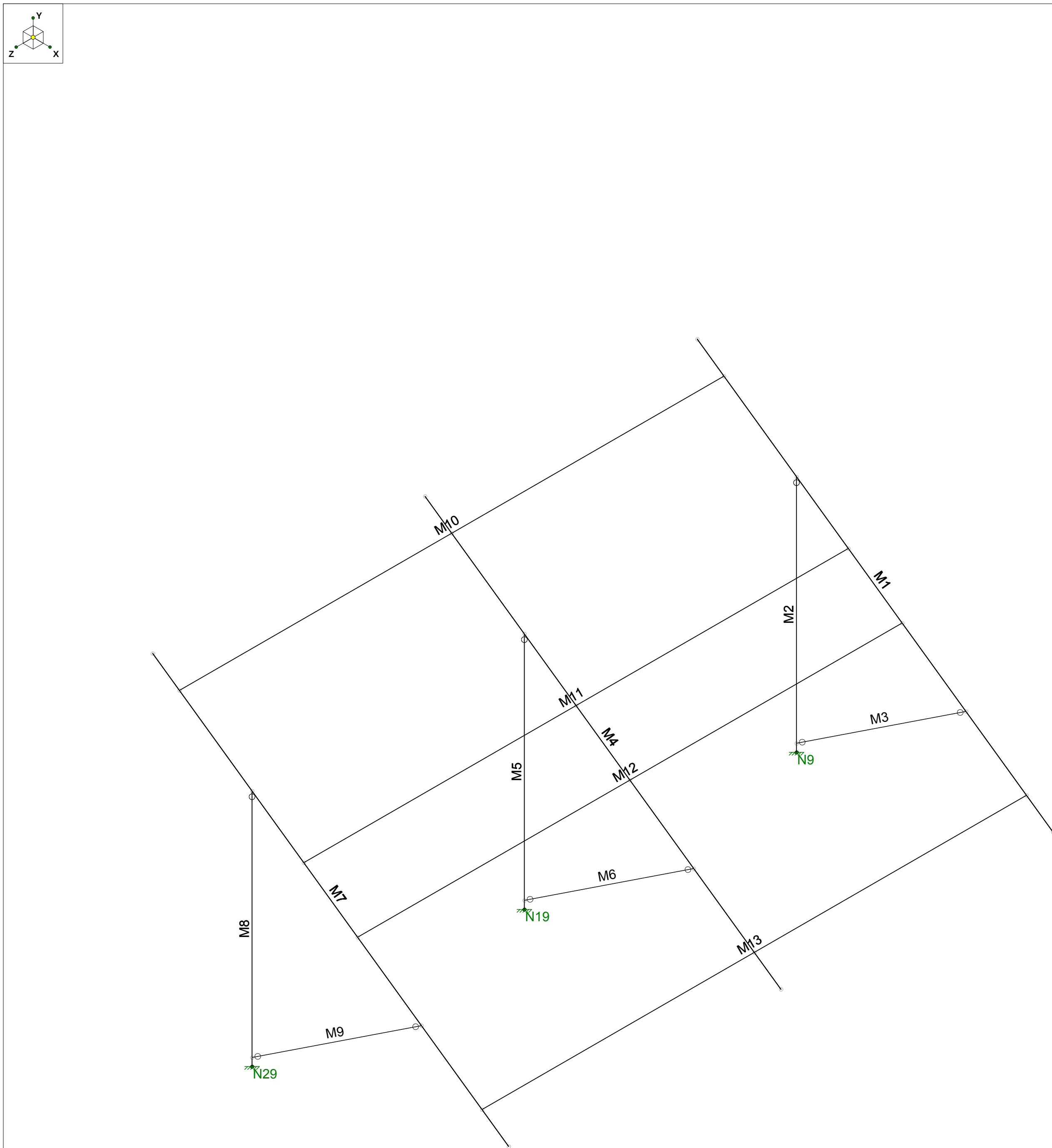


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

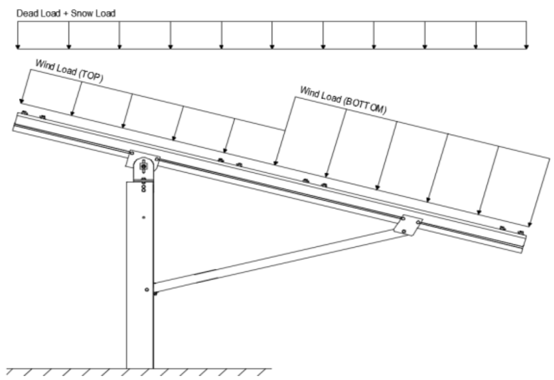
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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 = 35°
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 = 14.43 psf *(ASCE 7-05, Eq. 7-2)*
I_s = 1.00
C_s = 0.64
C_e = 0.90
C_t = 1.20

2.3 Wind Loads

Design Wind Speed, V = 100 mph
Height < 15 ft

Exposure Category = C
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

$Cf+_{TOP}$	=	1.2	*(Pressure)*
$Cf+_{BOTTOM}$	=	2	
$Cf-_{TOP}$	=	-2.4	*(Suction)*
$Cf-_{BOTTOM}$	=	-1.2	

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.

<u>Strength Design, LRFD</u>

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)

<u>Allowable Stress Design, ASD</u>

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

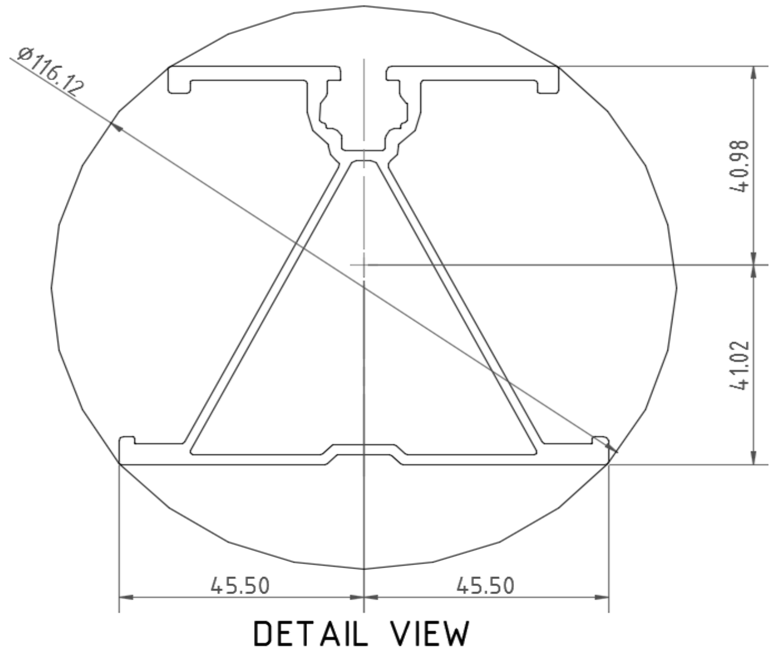
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

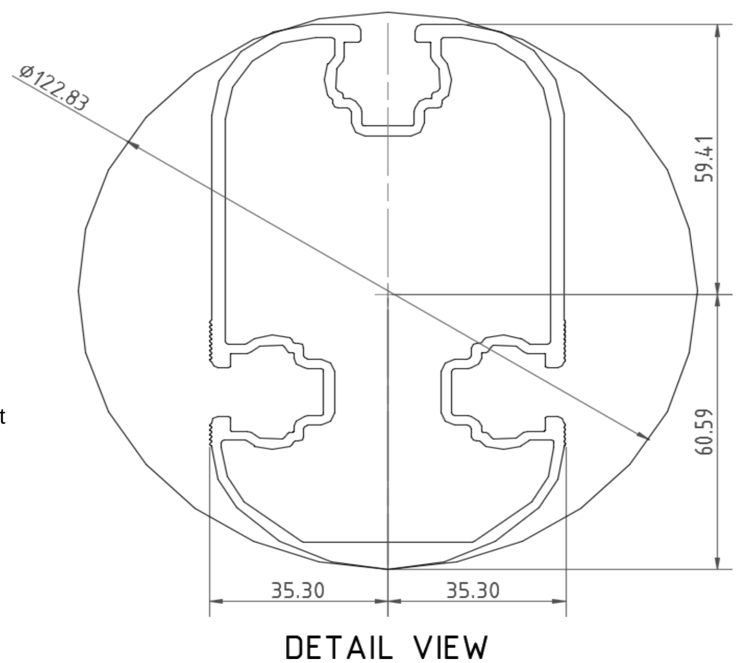
Purlin Type =	**S1.5**
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	114 in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07 ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08 ksi
S_y =	1.33 in^3
S_x =	0.6 in^3
E =	10100 ksi
I_y =	2.16 in^4
I_x =	1.07 in^4
A =	1.25 in^2
g =	1.50 lbs/ft
M_y =	1.738 k-ft
M_z =	0.123 k-ft
$M_{y\ allowable}$ =	2.779 k-ft
$M_{z\ allowable}$ =	1.154 k-ft
Utilization =	73%



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).

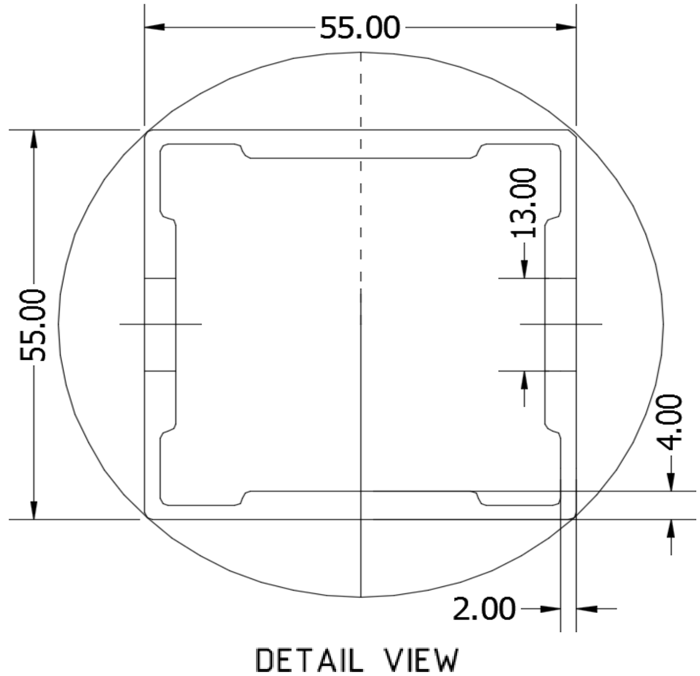
Girder Type =	**T5**
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	63.82 in
$\Phi F_{ty\ AXIAL}$ =	30.80 ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46 ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56 ksi
S_y =	1.98 in^3
S_x =	1.32 in^3
E =	10100 ksi
I_y =	4.74 in^4
I_x =	1.83 in^4
A =	1.93 in^2
g =	2.32 lbs/ft
M_y =	3.925 k-ft
M_z =	0.000 k-ft
P_n =	0.007 k
$M_{y\ allowable}$ =	5.026 k-ft
$M_{z\ allowable}$ =	3.472 k-ft
$P_{n\ allowable}$ =	59.439 k
Utilization =	78%



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).

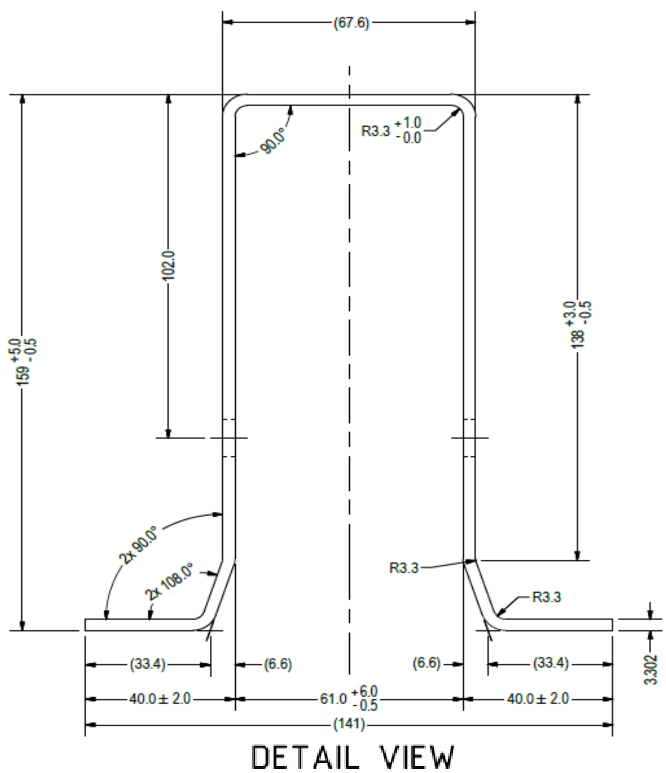
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.313	k-ft
P_n =	3.821	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	51%	



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 =	85.68	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 =	16.381	k-ft
M_z =	0.000	k-ft
P_r =	-4.477	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	97%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.77	k
Maximum Lateral Load =	4.00	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

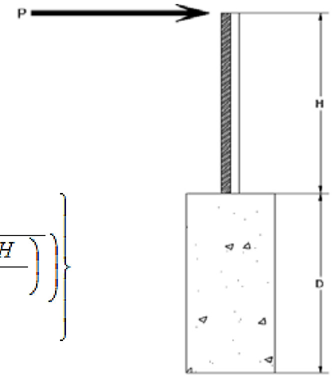
Lateral Force @ Top of Pole, P =	1.08	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	1.08	k
Height of Pole Above Grade, H =	7.14	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 =	5.85	
Required Footing Depth, D =	10.28	ft
2nd Trial @ D_2 =	6.76	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf
Lateral Soil Bearing @ D, S_3 =	1.35	ksf
Constant $2.34P/(S_1B)$, A =	2.81	
Required Footing Depth, D =	6.29	ft
3rd Trial @ D_3 =	6.53	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant $2.34P/(S_1B)$, A =	2.91	
Required Footing Depth, D =	6.44	ft
4th Trial @ D_4 =	6.48	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.30	ksf
Constant $2.34P/(S_1B)$, A =	2.93	
Required Footing Depth, D =	6.46	ft
5th Trial @ D_5 =	6.47	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.29	ksf
Constant $2.34P/(S_1B)$, A =	2.94	
Required Footing Depth, D =	6.50	ft

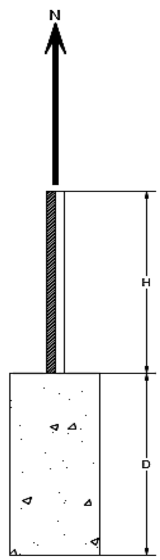
A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.76	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.82	k
Required Concrete Volume, V =	12.55	ft^3
Required Footing Depth, D =	4.00	ft

A 2ft diameter x 4ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.96
2	0.4	0.2	118.10	5.86
3	0.6	0.2	118.10	5.76
4	0.8	0.2	118.10	5.65
5	1	0.2	118.10	5.55
6	1.2	0.2	118.10	5.45
7	1.4	0.2	118.10	5.34
8	1.6	0.2	118.10	5.24
9	1.8	0.2	118.10	5.13
10	2	0.2	118.10	5.03
11	2.2	0.2	118.10	4.93
12	2.4	0.2	118.10	4.82
13	2.6	0.2	118.10	4.72
14	2.8	0.2	118.10	4.62
15	3	0.2	118.10	4.51
16	3.2	0.2	118.10	4.41
17	3.4	0.2	118.10	4.30
18	3.6	0.2	118.10	4.20
19	3.8	0.2	118.10	4.10
20	4	0.2	118.10	3.99
21	0	0.0	0.00	3.99
22	0	0.0	0.00	3.99
23	0	0.0	0.00	3.99
24	0	0.0	0.00	3.99
25	0	0.0	0.00	3.99
26	0	0.0	0.00	3.99
27	0	0.0	0.00	3.99
28	0	0.0	0.00	3.99
29	0	0.0	0.00	3.99
30	0	0.0	0.00	3.99
31	0	0.0	0.00	3.99
32	0	0.0	0.00	3.99
33	0	0.0	0.00	3.99
34	0	0.0	0.00	3.99
Max	4	Sum	0.94	

5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.53	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	21.99	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

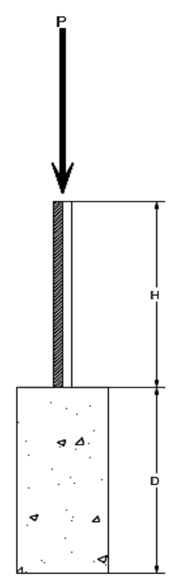
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	6.49	k
Utilization =	61%	

A 2ft diameter footing passes at a depth of 6.5ft.



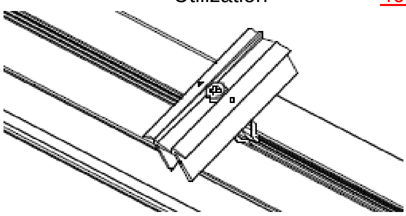
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

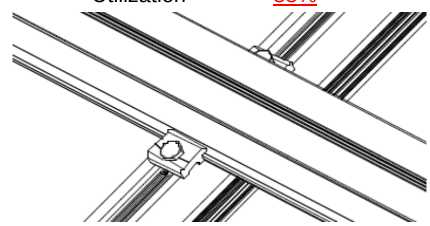
<u>Fastening of Modules to Purlins</u>

Maximum Uplifting Force =	0.564 k
Allowable Uplift =	1.214 k
Utilization =	46%



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

Maximum Uplifting Force =	1.911 k
Allowable Uplift =	2.180 k
Utilization =	88%

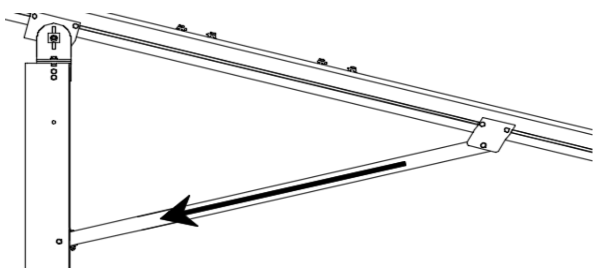


6.2 Strut Connections

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 =	3.821 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	43%

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

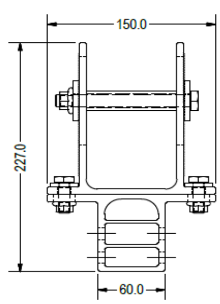


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

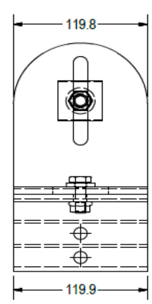
6.3 Girder to Post Connection

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.

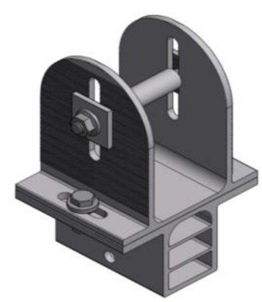
Maximum Tensile Load =	4.045 k
Allowable Load =	5.649 k
Utilization =	72%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

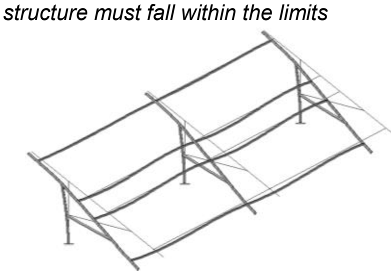
7.1 Seismic Drift

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} =	77.78 in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$ 1.556 in
Max Drift, Δ_{MAX} =	0.658 in

<u>*0.658 ≤ 1.556, OK.*</u>

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:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	114 in	L_b =	114
J =	0.432	J =	0.432
	315.377		200.561
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	27.5 ksi	φF_L=	28.8
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
$\varphi F_L St$=	25.1 ksi	$\varphi F_L Wk$=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
$M_{max}St$ =	2.788 k-ft	$M_{max}Wk$ =	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
φF_L = φb[Bt-Dt*√(Rb/t)]
φF_L = 30.8 ksi

3.4.16.1
N/A for Weak Direction

3.4.18
h/t = 16.3333

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

S1 = 37.9
m = 0.63
C_0 = 61.046
Cc = 58.954

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

S2 = 79.4
φF_L = 1.3φyFcy
φF_L = 43.2 ksi

φF_LSt= 30.5 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

3.4.18
h/t = 4.5

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

S1 = 36.9
m = 0.65
C_0 = 35
Cc = 35

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

S2 = 77.3
φF_L = 1.3φyFcy
φF_L = 43.2 ksi

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

Compression

3.4.9
b/t = 4.5
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
φF_L = φyFcy
φF_L = 33.3 ksi

b/t = 16.3333
S1 = 12.21
S2 = 32.70
φF_L = φc[Bp-1.6Dp*b/t]
φF_L = 31.6 ksi

3.4.10
Rb/t = 20.0

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

S1 = 6.87
S2 = 131.3
φF_L = φc[Bt-Dt*√(Rb/t)]
φF_L = 30.80 ksi

φF_L = 30.80 ksi
A = 1215.13 mm^2
1.88 in^2
P_{max} = 58.01 kips

A.3 Design of Aluminum Struts - Aluminum Design Manual, 2005 Edition

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

$\lambda =$ 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L = $(\varphi ccFcy)/(\lambda^2)$

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = $\varphi c[Bp-1.6Dp*b/t]$

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 = $\varphi yFcy$

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 =	85.68	in	
Pr =	-4.48	k	(LRFD Factored Load)
Mr (Strong) =	16.38	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	123.28		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	16.52	ksi	
Fe =	18.83	ksi	
Pn =	36.831	k	

Torsional/Flexural Torsional Buckling:

Fcr =	12.5831	ksi
Fey =	48.0382	ksi
Fez =	16.1601	ksi
Pn =	28.0602	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95 k-ft			
Flange Local Buckling:				
Mn =	19.207 k-ft			
Pr/Pc =	0.1216 <	0.2		
Utilization =	0.97 <	1.0	OK	

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.122 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 97%

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	-32.97	-32.97	0	0
2	M11	Y	-32.97	-32.97	0	0
3	M12	Y	-32.97	-32.97	0	0
4	M13	Y	-32.97	-32.97	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	-52.543	-52.543	0	0
2	M11	y	-52.543	-52.543	0	0
3	M12	y	-87.571	-87.571	0	0
4	M13	y	-87.571	-87.571	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	105.085	105.085	0	0
2	M11	y	105.085	105.085	0	0
3	M12	y	52.543	52.543	0	0
4	M13	y	52.543	52.543	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	938.786	2	1966.501	2	208.689	2	.304	2	.038	5	4.934	3
2		min	-1210.015	3	-1404.103	3	-328.554	5	-1.485	5	-.027	2	.036	10
3	N19	max	3008.685	2	5482.747	2	0	2	0	1	.041	4	9.838	3
4		min	-3077.002	3	-4421.782	3	-355.334	5	-1.555	4	0	10	-.236	10
5	N29	max	938.786	2	1966.501	2	244.855	3	.408	3	.042	4	4.934	3
6		min	-1210.015	3	-1404.103	3	-364.705	4	-1.558	4	-.014	3	-.177	5
7	Totals:	max	4886.258	2	9415.749	2	0	2						
8		min	-5497.032	3	-7229.988	3	-1026.664	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	1	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.299	15	-.427	15	0	12	0	1	0	12	0	6
4			min	-1.274	6	-1.817	6	-1.499	5	0	1	0	5	0	15
5		3	max	-23.077	12	289.23	3	-16.416	10	.057	3	.211	1	.272	2
6			min	-176.44	1	-630.169	2	-111.271	1	-.21	2	.026	10	-.121	3
7		4	max	-23.573	12	288.167	3	-16.416	10	.057	3	.142	1	.663	2
8			min	-177.433	1	-631.586	2	-111.271	1	-.21	2	.016	10	-.3	3
9		5	max	-24.07	12	287.104	3	-16.416	10	.057	3	.073	1	1.055	2
10			min	-178.425	1	-633.004	2	-111.271	1	-.21	2	.005	10	-.478	3
11		6	max	144.128	3	553.572	2	-8.099	12	.084	2	.078	2	1.013	2
12			min	-550.893	2	-177.768	3	-162.24	1	-.088	3	-.034	5	-.486	3
13		7	max	143.384	3	552.154	2	-8.099	12	.084	2	.01	10	.67	2
14			min	-551.886	2	-178.831	3	-162.24	1	-.088	3	-.074	4	-.376	3
15		8	max	142.639	3	550.737	2	-8.099	12	.084	2	-.024	10	.328	2
16			min	-552.878	2	-179.894	3	-162.24	1	-.088	3	-.131	1	-.264	3
17		9	max	105.546	3	97.311	3	-21.703	12	.017	5	.074	1	.125	2
18			min	-723.01	1	-68.887	2	-175.088	1	-.149	2	-.007	10	-.21	3
19		10	max	104.802	3	96.248	3	-21.703	12	.017	5	.047	3	.168	2
20			min	-724.003	1	-70.304	2	-175.088	1	-.149	2	-.043	2	-.27	3
21		11	max	104.057	3	95.184	3	-21.703	12	.017	5	.027	3	.212	2
22			min	-724.995	1	-71.722	2	-175.088	1	-.149	2	-.143	1	-.33	3
23		12	max	63.172	3	749.374	3	143.306	2	.326	3	.13	1	.416	2
24			min	-906.194	1	-473.224	2	-328.41	3	-.265	2	-.061	5	-.642	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	62.428	3	748.311	3	143.306	2	.326	3	.158	1	.71	2
26			min	-907.186	1	-474.641	2	-328.41	3	-.265	2	-.174	5	-1.107	3
27		14	max	179.28	1	434.919	2	66.367	5	.225	2	.149	3	.993	2
28			min	8.514	15	-672.768	3	-115.746	3	-.419	3	-.159	4	-1.552	3
29		15	max	178.287	1	433.502	2	64.867	5	.225	2	.077	3	.723	2
30			min	8.215	15	-673.831	3	-115.746	3	-.419	3	-.136	1	-1.134	3
31		16	max	177.295	1	432.084	2	63.368	5	.225	2	.005	3	.455	2
32			min	7.915	15	-674.894	3	-115.746	3	-.419	3	-.181	1	-.715	3
33		17	max	176.302	1	430.667	2	61.868	5	.225	2	-.018	15	.187	2
34			min	7.616	15	-675.957	3	-115.746	3	-.419	3	-.227	1	-.296	3
35		18	max	1.274	6	1.819	6	1.5	4	0	1	0	12	0	6
36			min	.299	15	.428	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.004	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.008	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	.002	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	-.299	15	-.427	15	0	1	0	1	0	1	0	6
42			min	-1.274	4	-1.816	6	-1.499	5	0	1	0	5	0	15
43		3	max	8.454	3	929.12	3	0	1	.055	4	.183	4	.716	2
44			min	-357.041	1	-1847.015	2	-95.788	5	0	1	0	1	-.367	3
45		4	max	7.71	3	928.057	3	0	1	.055	4	.123	4	1.863	2
46			min	-358.034	1	-1848.432	2	-97.287	5	0	1	0	1	-.943	3
47		5	max	6.965	3	926.994	3	0	1	.055	4	.062	4	3.011	2
48			min	-359.026	1	-1849.85	2	-98.787	5	0	1	0	1	-1.519	3
49		6	max	670.847	3	1701.907	2	0	1	0	1	0	1	2.855	2
50			min	-1568.344	2	-730.93	3	-73.699	4	-.048	4	-.036	5	-1.486	3
51		7	max	670.102	3	1700.489	2	0	1	0	1	0	1	1.8	2
52			min	-1569.337	2	-731.993	3	-75.199	4	-.048	4	-.081	4	-1.032	3
53		8	max	669.358	3	1699.072	2	0	1	0	1	0	1	.745	2
54			min	-1570.329	2	-733.057	3	-76.699	4	-.048	4	-.128	4	-.577	3
55		9	max	682.912	3	220.868	3	0	1	.013	4	.067	5	.114	1
56			min	-1754.04	1	-176.59	2	-173.327	4	0	1	0	1	-.345	3
57		10	max	682.167	3	219.805	3	0	1	.013	4	0	1	.22	2
58			min	-1755.033	1	-178.007	2	-174.827	4	0	1	-.041	4	-.482	3
59		11	max	681.423	3	218.742	3	0	1	.013	4	0	1	.331	2
60			min	-1756.025	1	-179.425	2	-176.327	4	0	1	-.15	4	-.618	3
61		12	max	702.561	3	2014.431	3	0	1	.157	4	0	1	.937	2
62			min	-2100.572	1	-1427.098	2	-200.791	4	0	1	-.055	4	-1.477	3
63		13	max	701.817	3	2013.368	3	0	1	.157	4	0	1	1.823	2
64			min	-2101.564	1	-1428.515	2	-202.29	4	0	1	-.18	4	-2.727	3
65		14	max	360.294	1	1192.613	2	68.757	5	0	1	0	1	2.674	2
66			min	-6.638	3	-1750.451	3	0	1	-.11	4	-.116	5	-3.925	3
67		15	max	359.301	1	1191.196	2	67.258	5	0	1	0	1	1.934	2
68			min	-7.382	3	-1751.514	3	0	1	-.11	4	-.074	5	-2.838	3
69		16	max	358.309	1	1189.778	2	65.758	5	0	1	0	1	1.195	2
70			min	-8.127	3	-1752.577	3	0	1	-.11	4	-.033	5	-1.751	3
71		17	max	357.316	1	1188.361	2	64.258	5	0	1	.007	4	.457	2
72			min	-8.871	3	-1753.64	3	0	1	-.11	4	0	1	-.663	3
73		18	max	1.274	4	1.82	6	1.5	4	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	4	0	15
75		19	max	0	1	.011	2	0	4	0	1	0	1	0	1
76			min	0	1	-.017	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.003	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	.001	1	0	1	0	1	0	4
80			min	-1.274	6	-1.818	4	-1.499	5	0	1	0	5	0	15
81		3	max	8.52	5	289.23	3	111.271	1	.21	2	.081	5	.272	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	-176.44	1	-630.169	2	-44.444	5	-.057	3	-.211	1	-.121	3
83		4	max	8.057	5	288.167	3	111.271	1	.21	2	.053	5	.663	2
84			min	-177.433	1	-631.586	2	-45.944	5	-.057	3	-.142	1	-.3	3
85		5	max	7.594	5	287.104	3	111.271	1	.21	2	.024	5	1.055	2
86			min	-178.425	1	-633.004	2	-47.444	5	-.057	3	-.073	1	-.478	3
87		6	max	144.128	3	553.572	2	162.24	1	.088	3	.029	3	1.013	2
88			min	-550.893	2	-177.768	3	-22	5	-.084	2	-.078	2	-.486	3
89		7	max	143.384	3	552.154	2	162.24	1	.088	3	.037	3	.67	2
90			min	-551.886	2	-178.831	3	-23.5	5	-.084	2	-.055	5	-.376	3
91		8	max	142.639	3	550.737	2	162.24	1	.088	3	.131	1	.328	2
92			min	-552.878	2	-179.894	3	-25	5	-.084	2	-.07	5	-.264	3
93		9	max	105.546	3	97.311	3	175.088	1	.149	2	.011	5	.125	2
94			min	-723.01	1	-68.887	2	-72.884	5	.015	15	-.074	1	-.21	3
95		10	max	104.802	3	96.248	3	175.088	1	.149	2	.043	2	.168	2
96			min	-724.003	1	-70.304	2	-74.384	5	.015	15	-.047	3	-.27	3
97		11	max	104.057	3	95.184	3	175.088	1	.149	2	.143	1	.212	2
98			min	-724.995	1	-71.722	2	-75.883	5	.015	15	-.081	5	-.33	3
99		12	max	63.172	3	749.374	3	328.41	3	.265	2	-.022	12	.416	2
100			min	-906.194	1	-473.224	2	-175.341	5	-.326	3	-.13	1	-.642	3
101		13	max	62.428	3	748.311	3	328.41	3	.265	2	.17	3	.71	2
102			min	-907.186	1	-474.641	2	-176.841	5	-.326	3	-.22	4	-1.107	3
103		14	max	179.28	1	434.919	2	115.746	3	.419	3	.104	2	.993	2
104			min	13.876	15	-672.768	3	-11.566	10	-.225	2	-.149	3	-1.552	3
105		15	max	178.287	1	433.502	2	115.746	3	.419	3	.136	1	.723	2
106			min	13.577	15	-673.831	3	-11.566	10	-.225	2	-.088	5	-1.134	3
107		16	max	177.295	1	432.084	2	115.746	3	.419	3	.181	1	.455	2
108			min	13.277	15	-674.894	3	-11.566	10	-.225	2	-.038	5	-.715	3
109		17	max	176.302	1	430.667	2	115.746	3	.419	3	.227	1	.187	2
110			min	12.978	15	-675.957	3	-11.566	10	-.225	2	.007	15	-.296	3
111		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.004	2	0	5	0	1	0	1	0	1
114			min	0	1	-.008	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	115.76	3	427.436	2	-12.383	15	.012	2	.256	1	.225	2
116			min	-11.568	10	-678.247	3	-174.373	1	-.023	3	.028	15	-.419	3
117		2	max	115.76	3	314.202	2	-10.219	15	.012	2	.093	1	.206	3
118			min	-11.568	10	-505.404	3	-135.264	1	-.023	3	.009	10	-.166	2
119		3	max	115.76	3	200.967	2	-8.056	15	.012	2	.047	3	.648	3
120			min	-11.568	10	-332.56	3	-96.155	1	-.023	3	-.029	1	-.438	2
121		4	max	115.76	3	87.733	2	-5.893	15	.012	2	.019	3	.908	3
122			min	-11.568	10	-159.717	3	-57.046	1	-.023	3	-.11	1	-.59	2
123		5	max	115.76	3	13.38	5	-1.422	10	.012	2	-.004	12	.986	3
124			min	-11.568	10	-28.627	1	-21.669	3	-.023	3	-.15	1	-.623	2
125		6	max	115.76	3	185.97	3	21.173	1	.012	2	-.008	15	.881	3
126			min	-11.568	10	-138.736	2	-18.425	3	-.023	3	-.148	1	-.537	2
127		7	max	115.76	3	358.813	3	60.282	1	.012	2	-.009	15	.593	3
128			min	-11.568	10	-251.97	2	-15.18	3	-.023	3	-.105	1	-.33	2
129		8	max	115.76	3	531.657	3	99.391	1	.012	2	0	10	.123	3
130			min	-11.568	10	-365.205	2	-11.936	3	-.023	3	-.059	3	-.02	5
131		9	max	115.76	3	704.5	3	138.5	1	.012	2	.105	1	.441	2
132			min	-11.775	5	-478.439	2	-8.692	3	-.023	3	-.069	3	-.529	3
133		10	max	115.76	3	591.674	2	5.447	3	.012	2	.272	1	1.005	2
134			min	-11.568	10	-877.343	3	-177.61	1	-.023	3	-.077	3	-1.364	3
135		11	max	115.76	3	478.439	2	8.692	3	.023	3	.105	1	.441	2
136			min	-11.568	10	-704.5	3	-138.5	1	-.012	2	-.069	3	-.529	3
137		12	max	115.76	3	365.205	2	11.936	3	.023	3	.007	5	.123	3
138			min	-11.568	10	-531.657	3	-99.391	1	-.012	2	-.059	3	-.007	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	115.76	3	251.97	2	15.18	3	.023	3	-.003	15	.593	3
140			min	-11.568	10	-358.813	3	-60.282	1	-.012	2	-.105	1	-.33	2
141		14	max	115.76	3	138.736	2	18.425	3	.023	3	-.008	15	.881	3
142			min	-11.568	10	-185.97	3	-21.173	1	-.012	2	-.148	1	-.537	2
143		15	max	115.76	3	28.627	1	21.669	3	.023	3	-.004	12	.986	3
144			min	-15.526	5	-13.126	3	-2.364	5	-.012	2	-.15	1	-.623	2
145		16	max	115.76	3	159.717	3	57.046	1	.023	3	.019	3	.908	3
146			min	-26.362	5	-87.733	2	.528	15	-.012	2	-.11	1	-.59	2
147		17	max	115.76	3	332.56	3	96.155	1	.023	3	.047	3	.648	3
148			min	-37.197	5	-200.967	2	2.691	15	-.012	2	-.029	1	-.438	2
149		18	max	115.76	3	505.404	3	135.264	1	.023	3	.093	1	.206	3
150			min	-48.033	5	-314.202	2	4.855	15	-.012	2	-.008	5	-.166	2
151		19	max	115.76	3	678.247	3	174.373	1	.023	3	.256	1	.225	2
152			min	-58.868	5	-427.436	2	7.018	15	-.012	2	0	15	-.419	3
153	M11	1	max	221.983	2	398.929	2	7.342	5	0	10	.294	1	.133	4
154			min	-295.224	3	-655.094	3	-180.378	1	-.006	3	-.085	5	-.44	3
155		2	max	221.983	2	285.695	2	10.689	5	0	10	.124	1	.16	3
156			min	-295.224	3	-482.251	3	-141.268	1	-.006	3	-.075	5	-.246	2
157		3	max	221.983	2	172.46	2	14.035	5	0	10	.068	3	.578	3
158			min	-295.224	3	-309.407	3	-102.159	1	-.006	3	-.062	5	-.487	2
159		4	max	221.983	2	59.226	2	17.382	5	0	10	.035	3	.814	3
160			min	-295.224	3	-136.564	3	-63.05	1	-.006	3	-.091	1	-.61	2
161		5	max	221.983	2	36.279	3	20.728	5	0	10	.005	3	.867	3
162			min	-295.224	3	-54.008	2	-26.483	3	-.006	3	-.137	1	-.612	2
163		6	max	221.983	2	209.123	3	27.545	4	0	10	0	15	.737	3
164			min	-295.224	3	-167.243	2	-23.239	3	-.006	3	-.142	1	-.496	2
165		7	max	221.983	2	381.966	3	54.278	1	0	10	.025	5	.425	3
166			min	-295.224	3	-280.477	2	-19.994	3	-.006	3	-.105	1	-.259	2
167		8	max	221.983	2	554.81	3	93.387	1	0	10	.056	5	.096	2
168			min	-295.224	3	-393.712	2	-16.75	3	-.006	3	-.064	3	-.069	3
169		9	max	221.983	2	727.653	3	132.496	1	0	10	.113	4	.572	2
170			min	-295.224	3	-506.946	2	-13.506	3	-.006	3	-.08	3	-.746	3
171		10	max	221.983	2	620.18	2	10.261	3	0	2	.252	1	1.167	2
172			min	-295.224	3	-900.497	3	-171.605	1	-.006	3	-.092	3	-1.606	3
173		11	max	221.983	2	506.946	2	13.506	3	.006	3	.092	1	.572	2
174			min	-295.224	3	-727.653	3	-132.496	1	0	5	-.08	3	-.746	3
175		12	max	221.983	2	393.712	2	16.75	3	.006	3	0	10	.096	2
176			min	-295.224	3	-554.81	3	-93.387	1	0	5	-.069	4	-.069	3
177		13	max	221.983	2	280.477	2	19.994	3	.006	3	-.014	10	.425	3
178			min	-295.224	3	-381.966	3	-54.278	1	0	5	-.105	1	-.259	2
179		14	max	221.983	2	167.243	2	23.239	3	.006	3	-.014	12	.737	3
180			min	-295.224	3	-209.123	3	-15.168	1	0	5	-.142	1	-.496	2
181		15	max	221.983	2	54.008	2	31.592	4	.006	3	.005	3	.867	3
182			min	-295.224	3	-36.279	3	1.645	10	0	5	-.137	1	-.612	2
183		16	max	221.983	2	136.564	3	63.05	1	.006	3	.035	3	.814	3
184			min	-295.224	3	-59.226	2	7.62	10	0	5	-.091	1	-.61	2
185		17	max	221.983	2	309.407	3	102.159	1	.006	3	.068	3	.578	3
186			min	-295.224	3	-172.46	2	13.596	10	0	5	-.011	2	-.487	2
187		18	max	221.983	2	482.251	3	141.268	1	.006	3	.131	4	.16	3
188			min	-295.224	3	-285.695	2	19.572	10	0	5	.01	10	-.246	2
189		19	max	221.983	2	655.094	3	180.378	1	.006	3	.294	1	.118	1
190			min	-295.224	3	-398.929	2	25.455	12	0	5	.034	10	-.44	3
191	M12	1	max	46.342	5	617.305	2	12.309	5	0	10	.309	1	.232	2
192			min	-25.453	9	-278.32	3	-182.738	1	-.004	3	-.108	5	.016	12
193		2	max	35.506	5	444.912	2	15.656	5	0	10	.137	1	.275	3
194			min	-25.453	9	-194.214	3	-143.629	1	-.004	3	-.093	5	-.328	2
195		3	max	34.977	2	272.519	2	19.002	5	0	10	.054	3	.436	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	-25.453	9	-110.108	3	-104.519	1	-.004	3	-.075	5	-.707	2
197		4	max	34.977	2	100.126	2	22.349	5	0	10	.025	3	.508	3
198			min	-25.453	9	-26.002	3	-65.41	1	-.004	3	-.084	1	-.904	2
199		5	max	34.977	2	58.103	3	25.695	5	0	10	-.001	12	.491	3
200			min	-25.453	9	-72.267	2	-26.301	1	-.004	3	-.132	1	-.918	2
201		6	max	34.977	2	142.209	3	32.266	4	0	10	.002	5	.385	3
202			min	-25.453	9	-244.659	2	-20.077	3	-.004	3	-.14	1	-.751	2
203		7	max	34.977	2	226.315	3	51.918	1	0	10	.034	5	.191	3
204			min	-29.243	14	-417.052	2	-16.833	3	-.004	3	-.105	1	-.402	2
205		8	max	34.977	2	310.421	3	91.027	1	0	10	.07	5	.129	2
206			min	-39.088	4	-589.445	2	-13.589	3	-.004	3	-.06	3	-.093	3
207		9	max	34.977	2	394.527	3	130.136	1	0	10	.131	4	.843	2
208			min	-49.924	4	-761.838	2	-10.344	3	-.004	3	-.073	3	-.465	3
209		10	max	34.977	2	934.231	2	109.24	14	0	10	.245	1	1.738	2
210			min	-60.759	4	-478.632	3	-169.245	1	-.004	3	-.082	3	-.926	3
211		11	max	34.977	2	761.838	2	16.878	5	.004	3	.087	1	.843	2
212			min	-25.453	9	-394.527	3	-130.136	1	0	5	-.095	5	-.465	3
213		12	max	34.977	2	589.445	2	20.224	5	.004	3	-.002	10	.129	2
214			min	-25.453	9	-310.421	3	-91.027	1	0	5	-.084	4	-.093	3
215		13	max	34.977	2	417.052	2	23.571	5	.004	3	-.014	10	.191	3
216			min	-25.453	9	-226.315	3	-51.918	1	0	5	-.105	1	-.402	2
217		14	max	34.977	2	244.659	2	26.917	5	.004	3	-.016	12	.385	3
218			min	-25.453	9	-142.209	3	-12.808	1	0	5	-.14	1	-.751	2
219		15	max	34.977	2	72.267	2	37.108	4	.004	3	.005	5	.491	3
220			min	-25.453	9	-58.103	3	3.307	10	0	5	-.132	1	-.918	2
221		16	max	34.977	2	26.002	3	65.41	1	.004	3	.038	5	.508	3
222			min	-30.507	4	-100.126	2	9.283	10	0	5	-.084	1	-.904	2
223		17	max	34.977	2	110.108	3	104.519	1	.004	3	.077	4	.436	3
224			min	-41.343	4	-272.519	2	15.258	10	0	5	0	10	-.707	2
225		18	max	34.977	2	194.214	3	143.629	1	.004	3	.151	4	.275	3
226			min	-52.178	4	-444.912	2	21.234	10	0	5	.019	10	-.328	2
227		19	max	34.977	2	278.32	3	182.738	1	.004	3	.309	1	.232	2
228			min	-63.013	4	-617.305	2	23.482	12	0	5	.045	10	-.054	5
229	M13	1	max	41.415	5	627.792	2	9.449	5	.004	3	.256	1	.21	2
230			min	-111.175	1	-291.351	3	-174.366	1	-.016	2	-.099	5	-.057	3
231		2	max	30.579	5	455.4	2	12.795	5	.004	3	.092	1	.206	3
232			min	-111.175	1	-207.245	3	-135.257	1	-.016	2	-.088	5	-.361	2
233		3	max	19.744	5	283.007	2	16.142	5	.004	3	.045	3	.38	3
234			min	-111.175	1	-123.139	3	-96.148	1	-.016	2	-.079	4	-.751	2
235		4	max	8.908	5	110.614	2	19.488	5	.004	3	.018	3	.466	3
236			min	-111.175	1	-39.034	3	-57.039	1	-.016	2	-.111	1	-.959	2
237		5	max	-1.019	15	45.072	3	22.834	5	.004	3	-.004	12	.463	3
238			min	-111.175	1	-61.779	2	-21.093	3	-.016	2	-.15	1	-.984	2
239		6	max	-8.312	15	129.178	3	31.303	4	.004	3	-.003	15	.371	3
240			min	-111.175	1	-234.172	2	-17.848	3	-.016	2	-.149	1	-.828	2
241		7	max	-15.605	15	213.284	3	60.289	1	.004	3	.024	5	.19	3
242			min	-111.175	1	-406.564	2	-14.604	3	-.016	2	-.106	1	-.49	2
243		8	max	-16.411	10	297.39	3	99.398	1	.004	3	.057	5	.03	2
244			min	-111.175	1	-578.957	2	-11.36	3	-.016	2	-.058	3	-.079	3
245		9	max	-16.411	10	381.495	3	138.507	1	.004	3	.119	4	.732	2
246			min	-111.175	1	-751.35	2	-8.115	3	-.016	2	-.068	3	-.438	3
247		10	max	-16.411	10	923.743	2	111.787	14	.016	2	.271	1	1.616	2
248			min	-111.175	1	-161.492	14	-177.617	1	-.013	1	-.075	3	-.885	3
249		11	max	25.959	5	751.35	2	12.69	5	.016	2	.104	1	.732	2
250			min	-111.175	1	-381.495	3	-138.507	1	-.004	3	-.076	5	-.438	3
251		12	max	15.124	5	578.957	2	16.037	5	.016	2	0	10	.03	2
252			min	-111.175	1	-297.39	3	-99.398	1	-.004	3	-.067	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	4.288	5	406.564	2	19.383	5	.016	2	-.014	10	.19	3
254			min	-111.175	1	-213.284	3	-60.289	1	-.004	3	-.106	1	-.49	2
255		14	max	-4.118	15	234.172	2	22.73	5	.016	2	-.013	15	.371	3
256			min	-111.175	1	-129.178	3	-21.18	1	-.004	3	-.149	1	-.828	2
257		15	max	-11.411	15	61.779	2	30.894	4	.016	2	.006	5	.463	3
258			min	-111.175	1	-45.072	3	1.411	10	-.004	3	-.15	1	-.984	2
259		16	max	-16.411	10	39.034	3	57.039	1	.016	2	.035	5	.466	3
260			min	-111.175	1	-110.614	2	7.387	10	-.004	3	-.111	1	-.959	2
261		17	max	-16.411	10	123.139	3	96.148	1	.016	2	.068	5	.38	3
262			min	-111.175	1	-283.007	2	13.362	10	-.004	3	-.03	1	-.751	2
263		18	max	-16.411	10	207.245	3	135.257	1	.016	2	.129	4	.206	3
264			min	-111.175	1	-455.4	2	19.338	10	-.004	3	.009	10	-.361	2
265		19	max	-16.411	10	291.351	3	174.366	1	.016	2	.256	1	.21	2
266			min	-111.175	1	-627.792	2	22.044	12	-.004	3	.032	10	-.057	3
267	M2	1	max	1966.501	2	1209.635	3	208.772	2	.038	5	1.485	5	4.934	3
268			min	-1404.103	3	-938.803	2	-328.579	5	-.027	2	-.304	2	.036	10
269		2	max	1328.93	1	789.718	3	142.957	2	.001	2	1.345	5	4.579	3
270			min	-1137.082	3	26.51	10	-296.416	5	0	3	-.232	2	.154	10
271		3	max	1325.824	1	789.718	3	142.957	2	.001	2	1.245	5	4.31	3
272			min	-1139.412	3	26.51	10	-293.724	5	0	3	-.183	2	.145	10
273		4	max	1322.718	1	789.718	3	142.957	2	.001	2	1.145	5	4.041	3
274			min	-1141.741	3	26.51	10	-291.032	5	0	3	-.134	2	.136	10
275		5	max	1319.612	1	789.718	3	142.957	2	.001	2	1.046	5	3.771	3
276			min	-1144.071	3	26.51	10	-288.34	5	0	3	-.086	2	.127	10
277		6	max	1316.506	1	789.718	3	142.957	2	.001	2	.948	5	3.502	3
278			min	-1146.4	3	26.51	10	-285.649	5	0	3	-.044	1	.118	10
279		7	max	1313.399	1	789.718	3	142.957	2	.001	2	.855	4	3.233	3
280			min	-1148.73	3	26.51	10	-282.957	5	0	3	-.037	3	.109	10
281		8	max	1310.293	1	789.718	3	142.957	2	.001	2	.764	4	2.963	3
282			min	-1151.059	3	26.51	10	-280.265	5	0	3	-.11	3	.099	10
283		9	max	1307.187	1	789.718	3	142.957	2	.001	2	.673	4	2.694	3
284			min	-1153.389	3	26.51	10	-277.573	5	0	3	-.182	3	.09	10
285		10	max	1304.081	1	789.718	3	142.957	2	.001	2	.583	4	2.424	3
286			min	-1155.719	3	26.51	10	-274.881	5	0	3	-.255	3	.081	10
287		11	max	1300.975	1	789.718	3	142.957	2	.001	2	.494	4	2.155	3
288			min	-1158.048	3	26.51	10	-272.189	5	0	3	-.328	3	.072	10
289		12	max	1297.869	1	789.718	3	142.957	2	.001	2	.407	4	1.886	3
290			min	-1160.378	3	26.51	10	-269.497	5	0	3	-.4	3	.063	10
291		13	max	1294.763	1	789.718	3	142.957	2	.001	2	.32	4	1.616	3
292			min	-1162.707	3	26.51	10	-266.805	5	0	3	-.473	3	.054	10
293		14	max	1291.657	1	789.718	3	142.957	2	.001	2	.353	2	1.347	3
294			min	-1165.037	3	26.51	10	-264.113	5	0	3	-.545	3	.045	10
295		15	max	1288.551	1	789.718	3	142.957	2	.001	2	.402	2	1.078	3
296			min	-1167.366	3	26.51	10	-261.421	5	0	3	-.618	3	.036	10
297		16	max	1285.445	1	789.718	3	142.957	2	.001	2	.451	2	.808	3
298			min	-1169.696	3	26.51	10	-258.729	5	0	3	-.69	3	.027	10
299		17	max	1282.339	1	789.718	3	142.957	2	.001	2	.5	2	.539	3
300			min	-1172.026	3	26.51	10	-256.037	5	0	3	-.763	3	.018	10
301		18	max	1279.232	1	789.718	3	142.957	2	.001	2	.548	2	.269	3
302			min	-1174.355	3	26.51	10	-253.345	5	0	3	-.836	3	.009	10
303		19	max	1276.126	1	789.718	3	142.957	2	.001	2	.597	2	0	1
304			min	-1176.685	3	26.51	10	-250.653	5	0	3	-.908	3	0	1
305	M5	1	max	5482.747	2	3074.507	3	0	1	.041	4	1.555	4	9.838	3
306			min	-4421.782	3	-3009.182	2	-355.388	5	0	1	0	1	-.236	10
307		2	max	3382.428	1	1552.282	3	0	1	0	1	1.406	4	9.001	3
308			min	-3456.877	3	23.046	10	-321.524	4	0	4	0	1	.134	10
309		3	max	3379.322	1	1552.282	3	0	1	0	1	1.297	4	8.472	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
310			min	-3459.207	3	23.046	10	-318.832	4	0	4	0	1	.126	10
311		4	max	3376.216	1	1552.282	3	0	1	0	1	1.189	4	7.942	3
312			min	-3461.537	3	23.046	10	-316.14	4	0	4	0	1	.118	10
313		5	max	3373.11	1	1552.282	3	0	1	0	1	1.081	4	7.413	3
314			min	-3463.866	3	23.046	10	-313.448	4	0	4	0	1	.11	10
315		6	max	3370.004	1	1552.282	3	0	1	0	1	.975	4	6.883	3
316			min	-3466.196	3	23.046	10	-310.756	4	0	4	0	1	.102	10
317		7	max	3366.898	1	1552.282	3	0	1	0	1	.869	4	6.354	3
318			min	-3468.525	3	23.046	10	-308.064	4	0	4	0	1	.094	10
319		8	max	3363.792	1	1552.282	3	0	1	0	1	.765	4	5.824	3
320			min	-3470.855	3	23.046	10	-305.372	4	0	4	0	1	.086	10
321		9	max	3360.686	1	1552.282	3	0	1	0	1	.661	4	5.295	3
322			min	-3473.184	3	23.046	10	-302.68	4	0	4	0	1	.079	10
323		10	max	3357.58	1	1552.282	3	0	1	0	1	.558	4	4.765	3
324			min	-3475.514	3	23.046	10	-299.988	4	0	4	0	1	.071	10
325		11	max	3354.473	1	1552.282	3	0	1	0	1	.456	4	4.236	3
326			min	-3477.844	3	23.046	10	-297.296	4	0	4	0	1	.063	10
327		12	max	3351.367	1	1552.282	3	0	1	0	1	.355	4	3.706	3
328			min	-3480.173	3	23.046	10	-294.604	4	0	4	0	1	.055	10
329		13	max	3348.261	1	1552.282	3	0	1	0	1	.255	4	3.177	3
330			min	-3482.503	3	23.046	10	-291.912	4	0	4	0	1	.047	10
331		14	max	3345.155	1	1552.282	3	0	1	0	1	.156	4	2.647	3
332			min	-3484.832	3	23.046	10	-289.22	4	0	4	0	1	.039	10
333		15	max	3342.049	1	1552.282	3	0	1	0	1	.058	4	2.118	3
334			min	-3487.162	3	23.046	10	-286.528	4	0	4	0	1	.031	10
335		16	max	3338.943	1	1552.282	3	0	1	0	1	0	1	1.588	3
336			min	-3489.491	3	23.046	10	-283.837	4	0	4	-.039	5	.024	10
337		17	max	3335.837	1	1552.282	3	0	1	0	1	0	1	1.059	3
338			min	-3491.821	3	23.046	10	-281.145	4	0	4	-.136	4	.016	10
339		18	max	3332.731	1	1552.282	3	0	1	0	1	0	1	.529	3
340			min	-3494.151	3	23.046	10	-278.453	4	0	4	-.231	4	.008	10
341		19	max	3329.625	1	1552.282	3	0	1	0	1	0	1	0	1
342			min	-3496.48	3	23.046	10	-275.761	4	0	4	-.326	4	0	1
343	M8	1	max	1966.501	2	1209.635	3	244.777	3	.042	4	1.558	4	4.934	3
344			min	-1404.103	3	-938.803	2	-364.798	4	-.014	3	-.408	3	-.177	5
345		2	max	1328.93	1	789.718	3	212.777	3	0	3	1.404	4	4.579	3
346			min	-1137.082	3	-27.143	5	-324.197	4	-.001	2	-.326	3	-.157	5
347		3	max	1325.824	1	789.718	3	212.777	3	0	3	1.294	4	4.31	3
348			min	-1139.412	3	-27.143	5	-321.505	4	-.001	2	-.253	3	-.148	5
349		4	max	1322.718	1	789.718	3	212.777	3	0	3	1.185	4	4.041	3
350			min	-1141.741	3	-27.143	5	-318.813	4	-.001	2	-.181	3	-.139	5
351		5	max	1319.612	1	789.718	3	212.777	3	0	3	1.077	4	3.771	3
352			min	-1144.071	3	-27.143	5	-316.122	4	-.001	2	-.108	3	-.13	5
353		6	max	1316.506	1	789.718	3	212.777	3	0	3	.969	4	3.502	3
354			min	-1146.4	3	-27.143	5	-313.43	4	-.001	2	-.035	3	-.12	5
355		7	max	1313.399	1	789.718	3	212.777	3	0	3	.863	4	3.233	3
356			min	-1148.73	3	-27.143	5	-310.738	4	-.001	2	-.012	2	-.111	5
357		8	max	1310.293	1	789.718	3	212.777	3	0	3	.757	4	2.963	3
358			min	-1151.059	3	-27.143	5	-308.046	4	-.001	2	-.061	2	-.102	5
359		9	max	1307.187	1	789.718	3	212.777	3	0	3	.655	5	2.694	3
360			min	-1153.389	3	-27.143	5	-305.354	4	-.001	2	-.109	2	-.093	5
361		10	max	1304.081	1	789.718	3	212.777	3	0	3	.557	5	2.424	3
362			min	-1155.719	3	-27.143	5	-302.662	4	-.001	2	-.158	2	-.083	5
363		11	max	1300.975	1	789.718	3	212.777	3	0	3	.46	5	2.155	3
364			min	-1158.048	3	-27.143	5	-299.97	4	-.001	2	-.207	2	-.074	5
365		12	max	1297.869	1	789.718	3	212.777	3	0	3	.4	3	1.886	3
366			min	-1160.378	3	-27.143	5	-297.278	4	-.001	2	-.256	2	-.065	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	1294.763	1	789.718	3	212.777	3	0	3	.473	3	1.616	3
368			min	-1162.707	3	-27.143	5	-294.586	4	-.001	2	-.304	2	-.056	5
369		14	max	1291.657	1	789.718	3	212.777	3	0	3	.545	3	1.347	3
370			min	-1165.037	3	-27.143	5	-291.894	4	-.001	2	-.353	2	-.046	5
371		15	max	1288.551	1	789.718	3	212.777	3	0	3	.618	3	1.078	3
372			min	-1167.366	3	-27.143	5	-289.202	4	-.001	2	-.402	2	-.037	5
373		16	max	1285.445	1	789.718	3	212.777	3	0	3	.69	3	.808	3
374			min	-1169.696	3	-27.143	5	-286.51	4	-.001	2	-.451	2	-.028	5
375		17	max	1282.339	1	789.718	3	212.777	3	0	3	.763	3	.539	3
376			min	-1172.026	3	-27.143	5	-283.818	4	-.001	2	-.5	2	-.019	5
377		18	max	1279.232	1	789.718	3	212.777	3	0	3	.836	3	.269	3
378			min	-1174.355	3	-27.143	5	-281.126	4	-.001	2	-.548	2	-.009	5
379		19	max	1276.126	1	789.718	3	212.777	3	0	3	.908	3	0	1
380			min	-1176.685	3	-27.143	5	-278.434	4	-.001	2	-.597	2	0	1
381	M3	1	max	1281.636	2	4.147	6	65.531	2	.005	3	.05	5	0	1
382			min	-494.623	3	.975	15	-32.215	3	-.007	2	-.029	2	0	1
383		2	max	1281.398	2	3.686	6	65.531	2	.005	3	.042	5	0	15
384			min	-494.802	3	.866	15	-32.215	3	-.007	2	-.01	2	-.001	6
385		3	max	1281.16	2	3.225	6	65.531	2	.005	3	.034	4	0	15
386			min	-494.98	3	.758	15	-32.215	3	-.007	2	-.004	3	-.002	6
387		4	max	1280.922	2	2.765	6	65.531	2	.005	3	.028	2	0	15
388			min	-495.159	3	.65	15	-32.215	3	-.007	2	-.014	3	-.003	6
389		5	max	1280.684	2	2.304	6	65.531	2	.005	3	.047	2	0	15
390			min	-495.337	3	.542	15	-32.215	3	-.007	2	-.023	3	-.004	6
391		6	max	1280.446	2	1.843	6	65.531	2	.005	3	.066	2	-.001	15
392			min	-495.516	3	.433	15	-32.215	3	-.007	2	-.033	3	-.004	6
393		7	max	1280.208	2	1.382	6	65.531	2	.005	3	.085	2	-.001	15
394			min	-495.694	3	.325	15	-32.215	3	-.007	2	-.042	3	-.005	6
395		8	max	1279.97	2	.922	6	65.531	2	.005	3	.104	2	-.001	15
396			min	-495.873	3	.217	15	-32.215	3	-.007	2	-.051	3	-.005	6
397		9	max	1279.732	2	.461	6	65.531	2	.005	3	.123	2	-.001	15
398			min	-496.051	3	.108	15	-32.215	3	-.007	2	-.061	3	-.005	6
399		10	max	1279.494	2	0	1	65.531	2	.005	3	.142	2	-.001	15
400			min	-496.23	3	0	1	-32.215	3	-.007	2	-.07	3	-.005	6
401		11	max	1279.256	2	-.108	15	65.531	2	.005	3	.161	2	-.001	15
402			min	-496.408	3	-.461	4	-32.215	3	-.007	2	-.079	3	-.005	6
403		12	max	1279.018	2	-.217	15	65.531	2	.005	3	.18	2	-.001	15
404			min	-496.587	3	-.922	4	-32.215	3	-.007	2	-.089	3	-.005	6
405		13	max	1278.78	2	-.325	15	65.531	2	.005	3	.199	2	-.001	15
406			min	-496.765	3	-1.382	4	-32.215	3	-.007	2	-.098	3	-.005	6
407		14	max	1278.542	2	-.433	15	65.531	2	.005	3	.218	2	-.001	15
408			min	-496.944	3	-1.843	4	-32.215	3	-.007	2	-.107	3	-.004	6
409		15	max	1278.304	2	-.542	15	65.531	2	.005	3	.237	2	0	15
410			min	-497.122	3	-2.304	4	-32.215	3	-.007	2	-.117	3	-.004	6
411		16	max	1278.066	2	-.65	15	65.531	2	.005	3	.256	2	0	15
412			min	-497.301	3	-2.765	4	-32.215	3	-.007	2	-.126	3	-.003	6
413		17	max	1277.828	2	-.758	15	65.531	2	.005	3	.275	2	0	15
414			min	-497.479	3	-3.225	4	-32.215	3	-.007	2	-.135	3	-.002	6
415		18	max	1277.59	2	-.866	15	65.531	2	.005	3	.294	2	0	15
416			min	-497.658	3	-3.686	4	-32.215	3	-.007	2	-.145	3	-.001	6
417		19	max	1277.352	2	-.975	15	65.531	2	.005	3	.313	2	0	1
418			min	-497.836	3	-4.147	4	-32.215	3	-.007	2	-.154	3	0	1
419	M6	1	max	3820.573	2	4.147	4	0	1	0	1	.053	4	0	1
420			min	-1778.577	3	.975	15	-35.031	4	-.005	4	0	1	0	1
421		2	max	3820.335	2	3.686	4	0	1	0	1	.043	4	0	15
422			min	-1778.755	3	.866	15	-34.658	4	-.005	4	0	1	-.001	4
423		3	max	3820.097	2	3.225	4	0	1	0	1	.033	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	-1778.934	3	.758	15	-34.285	4	-.005	4	0	1	-.002	4
425		4	max	3819.859	2	2.765	4	0	1	0	1	.023	4	0	15
426			min	-1779.112	3	.65	15	-33.911	4	-.005	4	0	1	-.003	4
427		5	max	3819.621	2	2.304	4	0	1	0	1	.013	4	0	15
428			min	-1779.291	3	.542	15	-33.538	4	-.005	4	0	1	-.004	4
429		6	max	3819.383	2	1.843	4	0	1	0	1	.003	4	-.001	15
430			min	-1779.47	3	.433	15	-33.165	4	-.005	4	0	1	-.004	4
431		7	max	3819.145	2	1.382	4	0	1	0	1	0	1	-.001	15
432			min	-1779.648	3	.325	15	-32.791	4	-.005	4	-.006	4	-.005	4
433		8	max	3818.907	2	.922	4	0	1	0	1	0	1	-.001	15
434			min	-1779.827	3	.217	15	-32.418	4	-.005	4	-.016	4	-.005	4
435		9	max	3818.669	2	.461	4	0	1	0	1	0	1	-.001	15
436			min	-1780.005	3	.108	15	-32.045	4	-.005	4	-.025	4	-.005	4
437		10	max	3818.431	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1780.184	3	0	1	-31.671	4	-.005	4	-.034	4	-.005	4
439		11	max	3818.193	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1780.362	3	-.461	6	-31.298	4	-.005	4	-.044	4	-.005	4
441		12	max	3817.955	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1780.541	3	-.922	6	-30.925	4	-.005	4	-.053	4	-.005	4
443		13	max	3817.717	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1780.719	3	-1.382	6	-30.551	4	-.005	4	-.062	4	-.005	4
445		14	max	3817.479	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1780.898	3	-1.843	6	-30.178	4	-.005	4	-.07	4	-.004	4
447		15	max	3817.241	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1781.076	3	-2.304	6	-29.805	4	-.005	4	-.079	4	-.004	4
449		16	max	3817.003	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1781.255	3	-2.765	6	-29.431	4	-.005	4	-.088	4	-.003	4
451		17	max	3816.765	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1781.433	3	-3.225	6	-29.058	4	-.005	4	-.096	4	-.002	4
453		18	max	3816.527	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1781.612	3	-3.686	6	-28.685	4	-.005	4	-.105	4	-.001	4
455		19	max	3816.289	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1781.79	3	-4.147	6	-28.311	4	-.005	4	-.113	4	0	1
457	M9	1	max	1281.636	2	4.147	4	32.215	3	.007	2	.055	4	0	1
458			min	-494.623	3	.975	15	-65.531	2	-.005	5	-.014	3	0	1
459		2	max	1281.398	2	3.686	4	32.215	3	.007	2	.044	4	0	15
460			min	-494.802	3	.866	15	-65.531	2	-.005	5	-.005	3	-.001	4
461		3	max	1281.16	2	3.225	4	32.215	3	.007	2	.033	5	0	15
462			min	-494.98	3	.758	15	-65.531	2	-.005	5	-.009	2	-.002	4
463		4	max	1280.922	2	2.765	4	32.215	3	.007	2	.023	5	0	15
464			min	-495.159	3	.65	15	-65.531	2	-.005	5	-.028	2	-.003	4
465		5	max	1280.684	2	2.304	4	32.215	3	.007	2	.023	3	0	15
466			min	-495.337	3	.542	15	-65.531	2	-.005	5	-.047	2	-.004	4
467		6	max	1280.446	2	1.843	4	32.215	3	.007	2	.033	3	-.001	15
468			min	-495.516	3	.433	15	-65.531	2	-.005	5	-.066	2	-.004	4
469		7	max	1280.208	2	1.382	4	32.215	3	.007	2	.042	3	-.001	15
470			min	-495.694	3	.325	15	-65.531	2	-.005	5	-.085	2	-.005	4
471		8	max	1279.97	2	.922	4	32.215	3	.007	2	.051	3	-.001	15
472			min	-495.873	3	.217	15	-65.531	2	-.005	5	-.104	2	-.005	4
473		9	max	1279.732	2	.461	4	32.215	3	.007	2	.061	3	-.001	15
474			min	-496.051	3	.108	15	-65.531	2	-.005	5	-.123	2	-.005	4
475		10	max	1279.494	2	0	1	32.215	3	.007	2	.07	3	-.001	15
476			min	-496.23	3	0	1	-65.531	2	-.005	5	-.142	2	-.005	4
477		11	max	1279.256	2	-.108	15	32.215	3	.007	2	.079	3	-.001	15
478			min	-496.408	3	-.461	6	-65.531	2	-.005	5	-.161	2	-.005	4
479		12	max	1279.018	2	-.217	15	32.215	3	.007	2	.089	3	-.001	15
480			min	-496.587	3	-.922	6	-65.531	2	-.005	5	-.18	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	1278.78	2	-.325	15	32.215	3	.007	2	.098	3	-.001	15
482			min	-496.765	3	-1.382	6	-65.531	2	-.005	5	-.199	2	-.005	4
483		14	max	1278.542	2	-.433	15	32.215	3	.007	2	.107	3	-.001	15
484			min	-496.944	3	-1.843	6	-65.531	2	-.005	5	-.218	2	-.004	4
485		15	max	1278.304	2	-.542	15	32.215	3	.007	2	.117	3	0	15
486			min	-497.122	3	-2.304	6	-65.531	2	-.005	5	-.237	2	-.004	4
487		16	max	1278.066	2	-.65	15	32.215	3	.007	2	.126	3	0	15
488			min	-497.301	3	-2.765	6	-65.531	2	-.005	5	-.256	2	-.003	4
489		17	max	1277.828	2	-.758	15	32.215	3	.007	2	.135	3	0	15
490			min	-497.479	3	-3.225	6	-65.531	2	-.005	5	-.275	2	-.002	4
491		18	max	1277.59	2	-.866	15	32.215	3	.007	2	.145	3	0	15
492			min	-497.658	3	-3.686	6	-65.531	2	-.005	5	-.294	2	-.001	4
493		19	max	1277.352	2	-.975	15	32.215	3	.007	2	.154	3	0	1
494			min	-497.836	3	-4.147	6	-65.531	2	-.005	5	-.313	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	-.01	10	-.029	15	.02	1	8.059e-3	3	NC	3	NC	3
2			min	-.273	3	-.332	1	-.527	5	-1.978e-2	2	401.147	1	452.325	5
3		2	max	-.01	10	-.025	15	.006	1	8.059e-3	3	NC	3	NC	2
4			min	-.273	3	-.267	1	-.507	4	-1.978e-2	2	497.032	1	487.307	5
5		3	max	-.01	10	-.021	15	-.001	10	7.611e-3	3	NC	3	NC	1
6			min	-.273	3	-.203	1	-.488	4	-1.813e-2	2	653.415	1	530.366	5
7		4	max	-.01	10	-.017	15	-.002	12	6.923e-3	3	NC	3	NC	1
8			min	-.273	3	-.141	1	-.463	4	-1.56e-2	2	829.696	14	591.83	5
9		5	max	-.01	10	-.013	15	-.001	12	6.236e-3	3	NC	3	NC	1
10			min	-.273	3	-.108	3	-.433	4	-1.306e-2	2	967.297	14	678.841	5
11		6	max	-.01	10	0	10	0	3	6.582e-3	3	NC	5	NC	1
12			min	-.273	3	-.095	3	-.402	4	-1.262e-2	2	817.81	2	801.017	5
13		7	max	-.01	10	.014	2	.001	3	7.643e-3	3	NC	1	NC	2
14			min	-.273	3	-.075	3	-.372	4	-1.363e-2	2	721.724	2	968.917	5
15		8	max	-.01	10	.027	2	.001	3	8.704e-3	3	NC	1	NC	2
16			min	-.273	3	-.051	3	-.344	4	-1.464e-2	2	676.033	2	1201.163	5
17		9	max	-.01	10	.037	1	0	10	9.878e-3	3	NC	5	NC	2
18			min	-.273	3	-.022	3	-.321	4	-1.463e-2	2	649.167	2	1527.409	5
19		10	max	-.01	10	.057	1	0	2	1.125e-2	3	NC	5	NC	2
20			min	-.273	3	.006	15	-.297	4	-1.284e-2	2	628.92	2	2089.153	5
21		11	max	-.01	10	.075	1	.002	3	1.262e-2	3	NC	5	NC	2
22			min	-.273	3	.009	15	-.275	4	-1.105e-2	2	616.432	2	3197.926	5
23		12	max	-.01	10	.091	1	.006	3	1.061e-2	3	NC	5	NC	2
24			min	-.273	3	.013	15	-.256	4	-8.366e-3	2	612.236	2	5989.713	5
25		13	max	-.009	10	.131	3	.01	3	6.689e-3	3	NC	5	NC	2
26			min	-.273	3	.015	10	-.238	4	-5.181e-3	2	542.361	3	8842.559	1
27		14	max	-.009	10	.195	3	.009	3	2.964e-3	3	NC	5	NC	2
28			min	-.273	3	.005	10	-.226	4	-5.889e-3	4	431.701	3	6379.472	1
29		15	max	-.009	10	.279	3	.009	1	8.003e-3	3	NC	5	NC	2
30			min	-.273	3	-.013	10	-.221	5	-5.178e-3	4	339.495	3	4778.973	1
31		16	max	-.009	10	.379	3	.011	1	1.304e-2	3	NC	5	NC	3
32			min	-.273	3	-.036	10	-.221	5	-7.549e-3	2	270.872	3	4438.944	1
33		17	max	-.009	10	.489	3	.006	1	1.808e-2	3	NC	5	NC	2
34			min	-.273	3	-.079	2	-.224	4	-1.026e-2	2	221.64	3	5188.062	1
35		18	max	-.009	10	.603	3	0	10	2.137e-2	3	NC	4	NC	2
36			min	-.273	3	-.125	2	-.231	4	-1.203e-2	2	186.538	3	9655.669	1
37		19	max	-.009	10	.716	3	-.003	10	2.137e-2	3	NC	1	NC	1
38			min	-.273	3	-.172	2	-.237	4	-1.203e-2	2	161.057	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	-.011	10	-.028	15	0	1	1.083e-4	4	NC	3	NC	1
40			min	-.535	3	-.717	1	-.525	4	0	1	256.713	1	452.818	4
41		2	max	-.011	10	-.023	15	0	1	1.083e-4	4	8612.14	12	NC	1
42			min	-.535	3	-.569	1	-.507	4	0	1	358.402	1	481.076	4
43		3	max	-.011	10	-.018	15	0	1	0	1	6154.57	15	NC	1
44			min	-.535	3	-.42	1	-.488	4	-3.223e-4	4	557.545	9	516.34	4
45		4	max	-.011	10	-.013	15	0	1	0	1	7914.316	15	NC	1
46			min	-.535	3	-.279	1	-.463	4	-9.827e-4	4	498.159	2	571.647	4
47		5	max	-.011	10	-.008	15	0	1	0	1	NC	15	NC	1
48			min	-.535	3	-.199	3	-.434	4	-1.643e-3	4	337.376	2	653.997	4
49		6	max	-.011	10	.004	10	0	1	0	1	NC	15	NC	1
50			min	-.535	3	-.186	3	-.402	4	-1.568e-3	4	277.64	2	772.692	4
51		7	max	-.011	10	.037	2	0	1	0	1	NC	5	NC	1
52			min	-.535	3	-.152	3	-.372	4	-9.849e-4	4	254.038	2	936.604	4
53		8	max	-.01	10	.057	2	0	1	0	1	NC	3	NC	1
54			min	-.535	3	-.104	3	-.344	4	-4.015e-4	4	244.782	2	1158.803	4
55		9	max	-.01	10	.069	1	0	1	0	1	NC	4	NC	1
56			min	-.535	3	-.048	3	-.321	4	-8.693e-5	4	240.302	2	1453.817	4
57		10	max	-.01	10	.102	1	0	1	0	1	NC	4	NC	1
58			min	-.536	3	.005	15	-.297	4	-2.474e-4	4	236.401	2	1962.538	4
59		11	max	-.009	10	.132	1	0	1	0	1	NC	5	NC	1
60			min	-.536	3	.007	15	-.274	4	-4.08e-4	4	233.861	2	2921.133	4
61		12	max	-.009	10	.157	1	0	1	0	1	NC	5	NC	1
62			min	-.536	3	.009	15	-.256	4	-1.672e-3	4	233.078	2	4909.485	4
63		13	max	-.008	10	.251	3	0	1	0	1	NC	5	NC	1
64			min	-.537	3	.01	15	-.24	4	-3.559e-3	4	237.481	2	NC	1
65		14	max	-.008	10	.384	3	0	1	0	1	NC	5	NC	1
66			min	-.537	3	.002	10	-.23	4	-5.376e-3	4	253.635	2	NC	1
67		15	max	-.008	10	.57	3	0	1	0	1	NC	5	NC	1
68			min	-.537	3	-.042	10	-.227	4	-4.047e-3	4	194.968	3	NC	1
69		16	max	-.008	10	.796	3	0	1	0	1	NC	5	NC	1
70			min	-.537	3	-.133	2	-.227	4	-2.718e-3	4	146.827	3	NC	1
71		17	max	-.008	10	1.046	3	0	1	0	1	NC	5	NC	1
72			min	-.537	3	-.248	2	-.228	4	-1.39e-3	4	115.299	3	NC	1
73		18	max	-.008	10	1.304	3	0	1	0	1	NC	4	NC	1
74			min	-.537	3	-.37	2	-.228	4	-5.233e-4	4	94.337	3	NC	1
75		19	max	-.008	10	1.562	3	0	1	0	1	NC	1	NC	1
76			min	-.537	3	-.491	2	-.229	4	-5.233e-4	4	79.853	3	NC	1
77	M7	1	max	.009	5	0	15	-.003	10	1.978e-2	2	NC	3	NC	3
78			min	-.273	3	-.332	1	-.538	4	-8.059e-3	3	401.147	1	427.064	4
79		2	max	.009	5	0	15	-.001	10	1.978e-2	2	NC	3	NC	2
80			min	-.273	3	-.267	1	-.511	4	-8.059e-3	3	497.032	1	467.694	4
81		3	max	.009	5	0	15	.006	1	1.813e-2	2	NC	3	NC	1
82			min	-.273	3	-.203	1	-.483	4	-7.611e-3	3	653.415	1	517.338	4
83		4	max	.009	5	.002	5	.012	1	1.56e-2	2	NC	3	NC	1
84			min	-.273	3	-.141	1	-.455	5	-6.923e-3	3	860.717	9	580.986	4
85		5	max	.009	5	.003	5	.012	1	1.306e-2	2	NC	3	NC	1
86			min	-.273	3	-.108	3	-.426	5	-6.236e-3	3	1026.668	9	664.374	4
87		6	max	.009	5	.003	5	.009	1	1.262e-2	2	NC	4	NC	1
88			min	-.273	3	-.095	3	-.397	4	-6.582e-3	3	817.81	2	774.917	4
89		7	max	.009	5	.014	2	.004	2	1.363e-2	2	NC	1	NC	2
90			min	-.273	3	-.075	3	-.37	4	-7.643e-3	3	721.724	2	918.948	4
91		8	max	.009	5	.027	2	.001	2	1.464e-2	2	NC	1	NC	2
92			min	-.273	3	-.051	3	-.345	4	-8.704e-3	3	676.033	2	1113.845	4
93		9	max	.009	5	.037	1	0	3	1.463e-2	2	NC	4	NC	2
94			min	-.273	3	-.022	3	-.32	4	-9.878e-3	3	649.167	2	1394.544	4
95		10	max	.009	5	.057	1	0	3	1.284e-2	2	NC	4	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	-.273	3	0	15	-.297	4	-1.125e-2	3	628.92	2	1847.648	4
97		11	max	.009	5	.075	1	0	2	1.105e-2	2	NC	5	NC	2
98			min	-.273	3	-.001	5	-.274	4	-1.262e-2	3	616.432	2	2676.9	4
99		12	max	.009	5	.091	1	.004	2	8.366e-3	2	NC	5	NC	2
100			min	-.273	3	-.003	5	-.254	4	-1.061e-2	3	612.236	2	4562.022	4
101		13	max	.009	5	.131	3	.006	2	5.181e-3	2	NC	5	NC	2
102			min	-.273	3	-.004	5	-.237	4	-6.689e-3	3	542.361	3	8842.559	1
103		14	max	.009	5	.195	3	.002	2	2.126e-3	2	NC	5	NC	2
104			min	-.273	3	-.007	5	-.228	4	-5.393e-3	5	431.701	3	6379.472	1
105		15	max	.009	5	.279	3	0	10	4.838e-3	2	NC	5	NC	2
106			min	-.273	3	-.013	10	-.227	4	-8.003e-3	3	339.495	3	4778.973	1
107		16	max	.009	5	.379	3	-.002	12	7.549e-3	2	NC	5	NC	3
108			min	-.273	3	-.036	10	-.228	4	-1.304e-2	3	270.872	3	4438.944	1
109		17	max	.009	5	.489	3	0	12	1.026e-2	2	NC	4	NC	2
110			min	-.273	3	-.079	2	-.228	4	-1.808e-2	3	221.64	3	5188.062	1
111		18	max	.009	5	.603	3	.005	1	1.203e-2	2	NC	4	NC	2
112			min	-.273	3	-.125	2	-.227	4	-2.137e-2	3	186.538	3	9655.669	1
113		19	max	.009	5	.716	3	.019	1	1.203e-2	2	NC	1	NC	1
114			min	-.273	3	-.172	2	-.227	5	-2.137e-2	3	161.057	3	NC	1
115	M10	1	max	.001	3	.563	3	.273	3	1.527e-2	3	NC	1	NC	1
116			min	-.228	4	-.109	2	-.009	5	-6.188e-3	2	NC	1	NC	1
117		2	max	0	3	.842	3	.29	3	1.742e-2	3	NC	4	NC	2
118			min	-.228	4	-.265	2	-.008	5	-7.306e-3	2	817.224	3	5530.995	1
119		3	max	0	3	1.104	3	.321	3	1.957e-2	3	NC	4	NC	5
120			min	-.228	4	-.407	2	-.002	15	-8.423e-3	2	421.361	3	2290.568	1
121		4	max	0	3	1.31	3	.36	3	2.171e-2	3	NC	4	NC	5
122			min	-.228	4	-.512	2	.003	15	-9.54e-3	2	305.127	3	1487.761	1
123		5	max	0	3	1.438	3	.403	3	2.386e-2	3	NC	5	NC	5
124			min	-.228	4	-.565	2	.008	15	-1.066e-2	2	260.751	3	1212.812	1
125		6	max	0	3	1.479	3	.445	3	2.601e-2	3	NC	4	NC	5
126			min	-.228	4	-.563	2	.013	15	-1.177e-2	2	248.972	3	1158.917	1
127		7	max	0	3	1.444	3	.482	3	2.816e-2	3	NC	4	NC	5
128			min	-.228	4	-.515	2	.015	15	-1.289e-2	2	258.907	3	1093.723	3
129		8	max	0	3	1.358	3	.511	3	3.031e-2	3	NC	4	NC	5
130			min	-.228	4	-.439	2	.016	15	-1.401e-2	2	287.008	3	958.809	3
131		9	max	0	3	1.262	3	.53	3	3.246e-2	3	NC	4	NC	5
132			min	-.228	4	-.363	2	.012	10	-1.513e-2	2	326.345	3	887.942	3
133		10	max	0	1	1.214	3	.537	3	3.461e-2	3	NC	9	NC	2
134			min	-.228	4	-.328	2	.008	10	-1.624e-2	2	350.207	3	865.394	3
135		11	max	0	10	1.262	3	.53	3	3.246e-2	3	NC	9	NC	5
136			min	-.228	4	-.363	2	.012	10	-1.513e-2	2	326.345	3	887.942	3
137		12	max	0	10	1.358	3	.511	3	3.031e-2	3	NC	4	NC	5
138			min	-.228	4	-.439	2	.019	10	-1.401e-2	2	287.008	3	958.809	3
139		13	max	0	10	1.444	3	.482	3	2.816e-2	3	NC	4	NC	5
140			min	-.228	4	-.515	2	.026	10	-1.289e-2	2	258.907	3	1093.723	3
141		14	max	0	10	1.479	3	.445	3	2.601e-2	3	NC	4	NC	5
142			min	-.228	4	-.563	2	.031	15	-1.177e-2	2	248.972	3	1158.917	1
143		15	max	0	10	1.438	3	.403	3	2.386e-2	3	NC	4	NC	5
144			min	-.228	4	-.565	2	.032	10	-1.066e-2	2	260.751	3	1212.812	1
145		16	max	0	10	1.31	3	.36	3	2.171e-2	3	NC	4	NC	5
146			min	-.228	4	-.512	2	.029	10	-9.54e-3	2	305.127	3	1487.761	1
147		17	max	0	10	1.104	3	.321	3	1.957e-2	3	NC	4	NC	5
148			min	-.228	4	-.407	2	.023	10	-8.423e-3	2	421.361	3	2290.568	1
149		18	max	0	10	.842	3	.29	3	1.742e-2	3	NC	13	NC	2
150			min	-.228	4	-.265	2	.015	10	-7.306e-3	2	817.224	3	5530.995	1
151		19	max	0	10	.563	3	.273	3	1.527e-2	3	NC	1	NC	1
152			min	-.228	4	-.109	2	.009	10	-6.188e-3	2	3333.275	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	.002	2	.081	1	.273	3	5.221e-3	3	NC	1	NC	1
154			min	-.267	4	-.002	5	-.009	5	-1.787e-4	5	NC	1	NC	1
155		2	max	.002	2	.233	3	.28	3	5.756e-3	3	NC	4	NC	2
156			min	-.267	4	-.084	2	.011	15	-1.68e-4	10	1297.176	3	7380.473	4
157		3	max	.002	2	.396	3	.306	3	6.29e-3	3	NC	4	NC	10
158			min	-.267	4	-.194	2	.02	15	-1.872e-4	10	673.172	3	2797.766	1
159		4	max	.001	2	.509	3	.343	3	6.825e-3	3	NC	4	NC	10
160			min	-.267	4	-.262	2	.021	15	-2.063e-4	10	504.6	3	1708.221	1
161		5	max	.001	2	.552	3	.387	3	7.36e-3	3	NC	5	NC	10
162			min	-.267	4	-.276	2	.017	15	-2.255e-4	10	461.166	3	1342.442	1
163		6	max	0	2	.519	3	.432	3	7.895e-3	3	NC	5	NC	5
164			min	-.267	4	-.238	2	.01	15	-2.446e-4	10	493.844	3	1249.728	1
165		7	max	0	2	.423	3	.473	3	8.429e-3	3	NC	4	NC	5
166			min	-.267	4	-.156	2	.003	15	-2.637e-4	10	624.401	3	1141.138	3
167		8	max	0	2	.29	3	.506	3	8.964e-3	3	NC	4	NC	5
168			min	-.267	4	-.053	2	0	15	-2.829e-4	10	981.156	3	978.476	3
169		9	max	0	2	.165	3	.528	3	9.499e-3	3	NC	1	NC	4
170			min	-.267	4	.004	15	.002	15	-3.02e-4	10	2129.144	3	894.151	3
171		10	max	0	1	.141	1	.536	3	1.003e-2	3	NC	4	NC	2
172			min	-.267	4	.008	15	.009	10	-3.212e-4	10	3798.998	1	867.287	3
173		11	max	0	3	.165	3	.528	3	9.499e-3	3	NC	1	NC	10
174			min	-.267	4	.008	15	.012	10	-3.02e-4	10	2129.144	3	894.151	3
175		12	max	0	3	.29	3	.506	3	8.964e-3	3	NC	4	NC	10
176			min	-.267	4	-.053	2	.019	10	-2.829e-4	10	981.156	3	978.476	3
177		13	max	0	3	.423	3	.473	3	8.429e-3	3	NC	5	NC	10
178			min	-.267	4	-.156	2	.027	10	-2.637e-4	10	624.401	3	1141.138	3
179		14	max	.001	3	.519	3	.432	3	7.895e-3	3	NC	5	NC	5
180			min	-.267	4	-.238	2	.031	15	-2.446e-4	10	493.844	3	1249.728	1
181		15	max	.001	3	.552	3	.387	3	7.36e-3	3	NC	15	NC	5
182			min	-.267	4	-.276	2	.023	15	-2.255e-4	10	461.166	3	1342.442	1
183		16	max	.002	3	.509	3	.343	3	6.825e-3	3	NC	15	NC	5
184			min	-.268	4	-.262	2	.014	15	-2.063e-4	10	504.6	3	1708.221	1
185		17	max	.002	3	.396	3	.306	3	6.29e-3	3	NC	15	NC	4
186			min	-.268	4	-.194	2	.01	15	-1.872e-4	10	673.172	3	2797.766	1
187		18	max	.002	3	.233	3	.28	3	5.756e-3	3	NC	5	NC	2
188			min	-.268	4	-.084	2	.013	15	-1.68e-4	10	1297.176	3	7756.526	1
189		19	max	.003	3	.081	1	.273	3	5.221e-3	3	NC	1	NC	1
190			min	-.268	4	.011	15	.01	10	-1.489e-4	10	NC	1	NC	1
191	M12	1	max	0	2	.032	2	.273	3	3.855e-3	3	NC	1	NC	1
192			min	-.329	4	-.033	3	-.009	5	-1.359e-4	5	NC	1	NC	1
193		2	max	0	2	.081	3	.286	3	4.271e-3	3	NC	4	NC	2
194			min	-.329	4	-.162	2	.012	10	-7.062e-5	5	1172.579	2	6657.297	4
195		3	max	0	2	.17	3	.315	3	4.687e-3	3	NC	5	NC	10
196			min	-.329	4	-.329	2	.018	10	-1.224e-5	15	631.216	2	3053.125	1
197		4	max	0	2	.222	3	.354	3	5.102e-3	3	NC	5	NC	10
198			min	-.329	4	-.435	2	.023	15	3.118e-5	15	488.416	2	1808.268	1
199		5	max	0	2	.23	3	.397	3	5.518e-3	3	NC	5	NC	10
200			min	-.329	4	-.462	2	.018	15	7.46e-5	15	461.654	2	1397.152	1
201		6	max	0	2	.195	3	.439	3	5.934e-3	3	NC	5	NC	5
202			min	-.329	4	-.409	2	.009	15	1.18e-4	15	516.901	2	1285.352	1
203		7	max	0	2	.126	3	.478	3	6.349e-3	3	NC	5	NC	5
204			min	-.329	4	-.291	2	0	15	1.614e-4	15	705.343	2	1114.259	3
205		8	max	0	2	.042	3	.508	3	6.765e-3	3	NC	4	NC	4
206			min	-.329	4	-.139	2	-.006	5	2.049e-4	15	1331.581	2	969.283	3
207		9	max	0	2	.009	1	.528	3	7.181e-3	3	NC	1	NC	4
208			min	-.329	4	-.034	3	0	15	2.483e-4	15	7126.844	2	893.429	3
209		10	max	0	1	.063	2	.535	3	7.596e-3	3	NC	4	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
210			min	-.329	4	-.068	3	.01	10	2.917e-4	15	6427.028	3	869.269	3
211		11	max	0	9	.009	1	.528	3	7.181e-3	3	NC	1	NC	10
212			min	-.329	4	-.034	3	.013	10	3.113e-4	10	7126.844	2	893.429	3
213		12	max	0	9	.042	3	.508	3	6.765e-3	3	NC	4	NC	10
214			min	-.329	4	-.139	2	.019	10	3.147e-4	10	1331.581	2	969.283	3
215		13	max	0	9	.126	3	.478	3	6.349e-3	3	NC	5	NC	10
216			min	-.329	4	-.291	2	.025	10	3.182e-4	10	705.343	2	1114.259	3
217		14	max	0	9	.195	3	.439	3	5.934e-3	3	NC	15	NC	5
218			min	-.329	4	-.409	2	.028	10	3.217e-4	10	516.901	2	1285.352	1
219		15	max	0	9	.23	3	.397	3	5.518e-3	3	NC	15	NC	5
220			min	-.329	4	-.462	2	.022	15	3.252e-4	10	461.654	2	1397.152	1
221		16	max	0	9	.222	3	.354	3	5.102e-3	3	NC	15	NC	4
222			min	-.329	4	-.435	2	.012	15	3.286e-4	10	488.416	2	1808.268	1
223		17	max	0	9	.17	3	.315	3	4.687e-3	3	NC	15	NC	4
224			min	-.329	4	-.329	2	.006	15	3.321e-4	10	631.216	2	3053.125	1
225		18	max	0	9	.081	3	.286	3	4.271e-3	3	NC	5	NC	2
226			min	-.329	4	-.162	2	.01	15	3.356e-4	10	1172.579	2	9159.337	1
227		19	max	0	9	.032	2	.273	3	3.855e-3	3	NC	1	NC	1
228			min	-.329	4	-.033	3	.01	10	3.391e-4	10	NC	1	NC	1
229	M13	1	max	0	10	0	15	.273	3	8.656e-3	1	NC	1	NC	1
230			min	-.501	4	-.245	1	-.009	5	3.811e-5	3	NC	1	NC	1
231		2	max	0	10	0	15	.291	3	1.004e-2	2	NC	5	NC	2
232			min	-.501	4	-.448	2	.014	15	-3.547e-4	3	910.49	2	5437.832	1
233		3	max	0	10	.067	3	.322	3	1.152e-2	2	NC	5	NC	10
234			min	-.501	4	-.667	2	.025	10	-7.474e-4	3	484.864	2	2260.492	1
235		4	max	0	10	.117	3	.361	3	1.3e-2	2	NC	5	NC	10
236			min	-.501	4	-.822	2	.027	15	-1.14e-3	3	364.798	2	1469.961	1
237		5	max	0	10	.126	3	.403	3	1.448e-2	2	NC	5	NC	15
238			min	-.501	4	-.893	2	.023	15	-1.533e-3	3	327.421	2	1198.142	1
239		6	max	0	10	.095	3	.444	3	1.595e-2	2	NC	5	NC	5
240			min	-.501	4	-.879	2	.015	15	-1.926e-3	3	334.31	2	1143.436	1
241		7	max	0	10	.031	3	.481	3	1.743e-2	2	NC	5	NC	5
242			min	-.501	4	-.793	2	.007	15	-2.319e-3	3	382.703	2	1097.357	3
243		8	max	0	10	-.019	15	.509	3	1.891e-2	2	NC	5	NC	5
244			min	-.501	4	-.665	2	.002	15	-2.711e-3	3	487.664	2	963.978	3
245		9	max	0	10	-.02	15	.528	3	2.039e-2	2	NC	3	NC	4
246			min	-.501	4	-.56	1	.003	15	-3.104e-3	3	664.129	2	893.881	3
247		10	max	0	1	-.021	15	.535	3	2.186e-2	2	NC	5	NC	2
248			min	-.501	4	-.518	1	.011	10	-3.497e-3	3	799.558	2	871.595	3
249		11	max	0	1	-.023	15	.528	3	2.039e-2	2	NC	3	NC	10
250			min	-.501	4	-.56	1	.015	10	-3.104e-3	3	664.129	2	893.881	3
251		12	max	0	1	-.028	15	.509	3	1.891e-2	2	NC	5	NC	10
252			min	-.501	4	-.665	2	.022	10	-2.711e-3	3	487.664	2	963.978	3
253		13	max	0	1	.031	3	.481	3	1.743e-2	2	NC	15	NC	10
254			min	-.501	4	-.793	2	.029	10	-2.319e-3	3	382.703	2	1097.357	3
255		14	max	0	1	.095	3	.444	3	1.595e-2	2	NC	15	NC	5
256			min	-.501	4	-.879	2	.028	15	-1.926e-3	3	334.31	2	1143.436	1
257		15	max	0	1	.126	3	.403	3	1.448e-2	2	NC	15	NC	5
258			min	-.501	4	-.893	2	.019	15	-1.533e-3	3	327.421	2	1198.142	1
259		16	max	0	1	.117	3	.361	3	1.3e-2	2	NC	15	NC	5
260			min	-.501	4	-.822	2	.011	15	-1.14e-3	3	364.798	2	1469.961	1
261		17	max	0	1	.067	3	.322	3	1.152e-2	2	NC	15	NC	4
262			min	-.501	4	-.667	2	.007	15	-7.474e-4	3	484.864	2	2260.492	1
263		18	max	0	1	-.012	12	.291	3	1.004e-2	2	NC	5	NC	2
264			min	-.501	4	-.448	2	.011	15	-3.547e-4	3	910.49	2	5437.832	1
265		19	max	.001	1	-.024	15	.273	3	8.656e-3	1	NC	1	NC	1
266			min	-.501	4	-.245	1	.01	10	3.811e-5	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	10	.001	5	5.257e-3	2	NC	1	NC	1
270			min	0	2	-.002	3	0	2	-7.556e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.005	5	4.83e-3	2	NC	1	NC	1
272			min	0	1	-.006	3	0	2	-7.342e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.01	5	4.402e-3	2	NC	1	NC	1
274			min	0	1	-.014	3	-.002	2	-7.127e-3	5	5438.767	3	7383.158	5
275		5	max	0	3	0	10	.017	5	3.975e-3	2	NC	2	NC	1
276			min	0	1	-.023	3	-.003	2	-6.913e-3	5	3149.488	3	4283.419	5
277		6	max	0	3	-.001	10	.026	5	3.547e-3	2	NC	2	NC	1
278			min	0	1	-.036	3	-.004	2	-6.698e-3	5	2067.971	3	2822.54	5
279		7	max	0	3	-.001	10	.037	5	3.12e-3	2	NC	7	NC	1
280			min	0	1	-.05	3	-.006	2	-6.484e-3	5	1471.2	3	2016.899	5
281		8	max	0	3	-.002	10	.048	5	2.692e-3	2	NC	10	NC	1
282			min	0	1	-.067	3	-.007	2	-6.269e-3	5	1106.461	3	1524.415	5
283		9	max	0	3	-.003	10	.061	5	2.265e-3	2	NC	10	NC	1
284			min	0	1	-.085	3	-.008	2	-6.054e-3	5	867.049	3	1200.977	5
285		10	max	0	3	-.003	10	.075	5	1.837e-3	2	NC	10	NC	9
286			min	0	1	-.105	3	-.009	2	-5.84e-3	5	701.247	3	976.836	5
287		11	max	0	3	-.004	10	.09	5	1.41e-3	2	NC	10	NC	9
288			min	0	1	-.127	3	-.01	2	-5.632e-3	4	581.546	3	814.922	5
289		12	max	0	3	-.005	10	.106	5	9.825e-4	2	NC	10	NC	9
290			min	0	1	-.15	3	-.01	2	-5.461e-3	4	492.223	3	694.049	5
291		13	max	0	3	-.005	10	.123	5	6.282e-4	3	NC	10	NC	9
292			min	-.001	1	-.174	3	-.01	2	-5.291e-3	4	423.755	3	601.384	5
293		14	max	0	3	-.006	10	.139	5	9.236e-4	3	NC	10	NC	9
294			min	-.001	1	-.199	3	-.01	1	-5.12e-3	4	370.085	3	528.772	5
295		15	max	.001	3	-.007	10	.156	5	1.219e-3	3	NC	10	NC	9
296			min	-.001	1	-.225	3	-.009	1	-4.95e-3	4	327.239	3	470.845	5
297		16	max	.001	3	-.008	10	.174	5	1.514e-3	3	9170.547	10	NC	1
298			min	-.001	1	-.252	3	-.008	1	-4.779e-3	4	292.49	3	423.932	5
299		17	max	.001	3	-.009	10	.191	4	1.81e-3	3	8255.214	10	NC	1
300			min	-.001	1	-.279	3	-.007	1	-4.609e-3	4	263.928	3	385.237	4
301		18	max	.001	3	-.01	10	.209	4	2.105e-3	3	7497.268	10	NC	1
302			min	-.001	1	-.307	3	-.004	1	-4.438e-3	4	240.18	3	352.763	4
303		19	max	.001	3	-.011	10	.226	4	2.401e-3	3	6863.121	10	NC	1
304			min	-.002	1	-.335	3	-.009	3	-4.268e-3	4	220.241	3	325.572	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	10	.001	4	0	1	NC	1	NC	1
308			min	0	2	-.003	3	0	1	-8.045e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.005	4	0	1	NC	1	NC	1
310			min	0	2	-.012	3	0	1	-7.786e-3	4	5934.196	3	NC	1
311		4	max	0	3	0	10	.01	4	0	1	NC	2	NC	1
312			min	0	2	-.027	3	0	1	-7.528e-3	4	2752.319	3	7062.125	4
313		5	max	0	3	0	10	.018	4	0	1	NC	2	NC	1
314			min	0	2	-.046	3	0	1	-7.269e-3	4	1596.461	3	4101.401	4
315		6	max	.001	3	0	10	.027	4	0	1	NC	2	NC	1
316			min	-.001	2	-.07	3	0	1	-7.01e-3	4	1049.163	3	2705.481	4
317		7	max	.001	3	0	10	.038	4	0	1	NC	5	NC	1
318			min	-.001	2	-.099	3	0	1	-6.752e-3	4	746.794	3	1935.409	4
319		8	max	.002	3	-.001	10	.05	4	0	1	NC	5	NC	1
320			min	-.002	2	-.131	3	0	1	-6.493e-3	4	561.848	3	1464.547	4
321		9	max	.002	3	-.002	10	.064	4	0	1	NC	10	NC	1
322			min	-.002	2	-.167	3	0	1	-6.234e-3	4	440.388	3	1155.249	4
323		10	max	.002	3	-.002	10	.078	4	0	1	NC	10	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	-.207	3	0	1	-5.976e-3	4	356.24	3	940.882	4
325		11	max	.002	3	-.003	10	.094	4	0	1	NC	10	NC	1
326			min	-.002	2	-.249	3	0	1	-5.717e-3	4	295.473	3	786.027	4
327		12	max	.002	3	-.003	10	.11	4	0	1	NC	10	NC	1
328			min	-.002	2	-.295	3	0	1	-5.459e-3	4	250.117	3	670.436	4
329		13	max	.003	3	-.004	10	.127	4	0	1	NC	10	NC	1
330			min	-.003	2	-.342	3	0	1	-5.2e-3	4	215.345	3	581.846	4
331		14	max	.003	3	-.005	10	.144	4	0	1	NC	10	NC	1
332			min	-.003	2	-.392	3	0	1	-4.941e-3	4	188.085	3	512.46	4
333		15	max	.003	3	-.005	10	.161	4	0	1	NC	10	NC	1
334			min	-.003	2	-.443	3	0	1	-4.683e-3	4	166.319	3	457.147	4
335		16	max	.003	3	-.006	10	.179	4	0	1	NC	10	NC	1
336			min	-.003	2	-.496	3	0	1	-4.424e-3	4	148.666	3	412.397	4
337		17	max	.004	3	-.007	10	.196	4	0	1	NC	10	NC	1
338			min	-.003	2	-.549	3	0	1	-4.166e-3	4	134.154	3	375.747	4
339		18	max	.004	3	-.008	10	.213	4	0	1	9730.909	10	NC	1
340			min	-.004	2	-.603	3	0	1	-3.907e-3	4	122.088	3	345.432	4
341		19	max	.004	3	-.008	10	.23	4	0	1	8865.344	10	NC	1
342			min	-.004	2	-.658	3	0	1	-3.648e-3	4	111.955	3	320.158	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	2.622e-3	3	NC	1	NC	1
346			min	0	2	-.002	3	0	3	-8.33e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.005	4	2.326e-3	3	NC	1	NC	1
348			min	0	1	-.006	3	-.001	3	-8.038e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.01	4	2.031e-3	3	NC	1	NC	1
350			min	0	1	-.014	3	-.002	3	-7.746e-3	4	5438.767	3	7064.277	4
351		5	max	0	3	0	5	.018	4	1.735e-3	3	NC	2	NC	1
352			min	0	1	-.023	3	-.004	3	-7.454e-3	4	3149.488	3	4104.529	4
353		6	max	0	3	.001	5	.027	4	1.44e-3	3	NC	2	NC	1
354			min	0	1	-.036	3	-.006	3	-7.162e-3	4	2067.971	3	2708.6	4
355		7	max	0	3	.002	5	.038	4	1.144e-3	3	NC	4	NC	1
356			min	0	1	-.05	3	-.008	3	-6.87e-3	4	1471.2	3	1938.344	4
357		8	max	0	3	.002	5	.05	4	8.49e-4	3	NC	5	NC	1
358			min	0	1	-.067	3	-.009	3	-6.578e-3	4	1106.461	3	1467.29	4
359		9	max	0	3	.003	5	.064	4	5.536e-4	3	NC	5	NC	1
360			min	0	1	-.085	3	-.011	3	-6.286e-3	4	867.049	3	1157.827	4
361		10	max	0	3	.004	5	.078	4	2.581e-4	3	NC	5	NC	9
362			min	0	1	-.105	3	-.012	3	-5.994e-3	4	701.247	3	943.328	4
363		11	max	0	3	.004	5	.093	4	-2.473e-5	12	NC	5	NC	9
364			min	0	1	-.127	3	-.013	3	-5.702e-3	4	581.546	3	788.369	4
365		12	max	0	3	.005	5	.11	4	5.011e-5	9	NC	5	NC	9
366			min	0	1	-.15	3	-.013	3	-5.41e-3	4	492.223	3	672.7	4
367		13	max	0	3	.006	5	.126	4	1.696e-4	9	NC	5	NC	9
368			min	-.001	1	-.174	3	-.013	3	-5.153e-3	5	423.755	3	584.054	4
369		14	max	0	3	.007	5	.143	4	2.89e-4	9	NC	5	NC	9
370			min	-.001	1	-.199	3	-.012	3	-4.907e-3	5	370.085	3	514.631	4
371		15	max	.001	3	.008	5	.16	4	6.306e-4	1	NC	7	NC	9
372			min	-.001	1	-.225	3	-.01	3	-4.662e-3	5	327.239	3	459.298	4
373		16	max	.001	3	.009	5	.178	4	9.85e-4	1	NC	15	NC	1
374			min	-.001	1	-.252	3	-.007	3	-4.417e-3	5	292.49	3	414.542	4
375		17	max	.001	3	.01	5	.195	4	1.339e-3	1	NC	15	NC	1
376			min	-.001	1	-.279	3	-.003	3	-4.171e-3	5	263.928	3	377.902	4
377		18	max	.001	3	.011	5	.212	4	1.694e-3	1	9724.309	15	NC	1
378			min	-.001	1	-.307	3	0	10	-3.926e-3	5	240.18	3	347.609	4
379		19	max	.001	3	.012	5	.229	4	2.048e-3	1	8917.693	15	NC	1
380			min	-.002	1	-.335	3	-.002	2	-3.681e-3	5	220.241	3	322.371	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	0	3	0	10	0	5	2.947e-3	2	NC	1	NC	1
382			min	0	10	0	3	0	2	-3.942e-3	5	NC	1	NC	1
383		2	max	0	3	-.001	10	.024	5	3.03e-3	2	NC	1	NC	4
384			min	0	2	-.017	3	-.016	2	-3.876e-3	5	NC	1	3769.432	2
385		3	max	0	3	-.002	10	.048	5	3.113e-3	2	NC	1	NC	4
386			min	0	2	-.034	3	-.033	2	-3.81e-3	5	NC	1	1872.283	2
387		4	max	.001	3	-.003	10	.073	5	3.197e-3	2	NC	1	NC	4
388			min	-.001	2	-.05	3	-.049	2	-3.744e-3	5	NC	1	1250.104	2
389		5	max	.001	3	-.005	10	.099	5	3.28e-3	2	NC	1	NC	4
390			min	-.002	2	-.067	3	-.065	2	-3.679e-3	5	NC	1	946.739	2
391		6	max	.001	3	-.006	10	.124	5	3.364e-3	2	NC	1	NC	4
392			min	-.002	2	-.083	3	-.079	2	-3.613e-3	5	NC	1	771.268	2
393		7	max	.002	3	-.007	10	.151	5	3.447e-3	2	NC	1	NC	4
394			min	-.003	2	-.099	3	-.092	2	-3.547e-3	5	NC	1	660.35	2
395		8	max	.002	3	-.007	10	.177	5	3.53e-3	2	NC	1	NC	4
396			min	-.003	2	-.116	3	-.104	2	-3.481e-3	5	NC	1	587.168	2
397		9	max	.002	3	-.008	10	.202	5	3.614e-3	2	NC	1	NC	6
398			min	-.003	2	-.132	3	-.113	2	-3.415e-3	5	NC	1	538.712	2
399		10	max	.002	3	-.009	10	.228	5	3.697e-3	2	NC	1	8248.382	13
400			min	-.004	2	-.148	3	-.12	2	-3.349e-3	5	NC	1	508.284	2
401		11	max	.002	3	-.01	10	.253	5	3.781e-3	2	NC	1	7176.828	13
402			min	-.004	2	-.165	3	-.123	2	-3.283e-3	5	NC	1	492.623	2
403		12	max	.002	3	-.01	10	.277	5	3.864e-3	2	NC	1	6543.853	13
404			min	-.005	2	-.181	3	-.123	2	-3.217e-3	5	NC	1	490.82	2
405		13	max	.003	3	-.011	10	.301	5	3.947e-3	2	NC	1	6240.998	13
406			min	-.005	2	-.197	3	-.119	2	-3.151e-3	5	NC	1	469.97	14
407		14	max	.003	3	-.011	10	.323	5	4.031e-3	2	NC	1	6243.347	13
408			min	-.006	2	-.213	3	-.111	2	-3.085e-3	5	NC	1	427.691	14
409		15	max	.003	3	-.012	10	.345	5	4.114e-3	2	NC	1	6611.762	13
410			min	-.006	2	-.229	3	-.098	2	-3.019e-3	5	NC	1	391.697	14
411		16	max	.003	3	-.012	10	.365	5	4.198e-3	2	NC	1	7570.459	13
412			min	-.006	2	-.244	3	-.081	2	-2.954e-3	5	NC	1	360.709	14
413		17	max	.003	3	-.012	10	.384	5	4.281e-3	2	NC	1	9864.65	13
414			min	-.007	2	-.26	3	-.057	2	-2.888e-3	5	NC	1	333.77	14
415		18	max	.003	3	-.013	10	.402	4	4.364e-3	2	NC	1	NC	4
416			min	-.007	2	-.276	3	-.028	2	-2.822e-3	5	NC	1	310.148	14
417		19	max	.004	3	-.013	10	.421	4	4.448e-3	2	NC	1	NC	1
418			min	-.008	2	-.292	3	0	12	-2.756e-3	5	NC	1	289.279	14
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-4.209e-3	4	NC	1	NC	1
421		2	max	.002	3	-.001	15	.025	4	0	1	NC	1	NC	1
422			min	-.002	2	-.033	3	0	1	-4.156e-3	4	NC	1	NC	1
423		3	max	.002	3	-.002	15	.051	4	0	1	NC	1	NC	1
424			min	-.003	2	-.065	3	0	1	-4.103e-3	4	NC	1	NC	1
425		4	max	.003	3	-.003	15	.078	4	0	1	NC	1	NC	1
426			min	-.004	2	-.097	3	0	1	-4.05e-3	4	NC	1	8680.552	4
427		5	max	.004	3	-.004	15	.105	4	0	1	NC	1	NC	1
428			min	-.005	2	-.129	3	0	1	-3.997e-3	4	NC	1	5757.389	4
429		6	max	.004	3	-.006	15	.132	4	0	1	NC	1	NC	1
430			min	-.007	2	-.16	3	0	1	-3.944e-3	4	NC	1	4226.409	4
431		7	max	.005	3	-.007	15	.159	4	0	1	NC	1	NC	1
432			min	-.008	2	-.192	3	0	1	-3.891e-3	4	NC	1	3326.254	4
433		8	max	.005	3	-.008	15	.187	4	0	1	NC	1	NC	1
434			min	-.009	2	-.224	3	0	1	-3.838e-3	4	NC	1	2758.58	4
435		9	max	.006	3	-.009	15	.213	4	0	1	NC	1	NC	1
436			min	-.011	2	-.256	3	0	1	-3.785e-3	4	NC	1	2386.818	4
437		10	max	.007	3	-.01	15	.24	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	-.287	3	0	1	-3.732e-3	4	NC	1	2142.142	4
439		11	max	.007	3	-.011	15	.265	4	0	1	NC	1	NC	1
440			min	-.013	2	-.319	3	0	1	-3.679e-3	4	NC	1	1988.453	4
441		12	max	.008	3	-.011	15	.29	4	0	1	NC	1	NC	1
442			min	-.014	2	-.351	3	0	1	-3.626e-3	4	NC	1	1908.1	4
443		13	max	.008	3	-.012	15	.314	4	0	1	NC	1	NC	1
444			min	-.016	2	-.382	3	0	1	-3.573e-3	4	NC	1	1896.58	4
445		14	max	.009	3	-.013	15	.336	4	0	1	NC	1	NC	1
446			min	-.017	2	-.413	3	0	1	-3.52e-3	4	NC	1	1963.1	4
447		15	max	.01	3	-.014	15	.357	4	0	1	NC	1	NC	1
448			min	-.018	2	-.445	3	0	1	-3.467e-3	4	NC	1	2139.199	4
449		16	max	.01	3	-.015	15	.376	4	0	1	NC	1	NC	1
450			min	-.019	2	-.476	3	0	1	-3.414e-3	4	NC	1	2509.518	4
451		17	max	.011	3	-.016	15	.393	4	0	1	NC	1	NC	1
452			min	-.021	2	-.507	3	0	1	-3.361e-3	4	NC	1	3338.791	4
453		18	max	.011	3	-.017	15	.408	4	0	1	NC	1	NC	1
454			min	-.022	2	-.538	3	0	1	-3.308e-3	4	NC	1	5965.219	4
455		19	max	.012	3	-.017	15	.421	4	0	1	NC	1	NC	1
456			min	-.023	2	-.57	3	0	1	-3.255e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	1.441e-3	3	NC	1	NC	1
458			min	0	10	0	3	0	3	-4.374e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.026	4	1.498e-3	3	NC	1	NC	4
460			min	0	2	-.017	3	-.008	3	-4.312e-3	4	NC	1	3769.432	2
461		3	max	0	3	0	5	.053	4	1.556e-3	3	NC	1	NC	5
462			min	0	2	-.034	3	-.017	3	-4.251e-3	4	NC	1	1872.283	2
463		4	max	.001	3	0	5	.08	4	1.613e-3	3	NC	1	NC	15
464			min	-.001	2	-.05	3	-.025	3	-4.189e-3	4	NC	1	1250.104	2
465		5	max	.001	3	.001	5	.108	4	1.671e-3	3	NC	1	9486.724	15
466			min	-.002	2	-.067	3	-.033	3	-4.127e-3	4	NC	1	946.739	2
467		6	max	.001	3	.002	5	.136	4	1.728e-3	3	NC	1	6893.349	15
468			min	-.002	2	-.083	3	-.041	3	-4.066e-3	4	NC	1	771.268	2
469		7	max	.002	3	.002	5	.164	4	1.786e-3	3	NC	1	5384.959	15
470			min	-.003	2	-.099	3	-.047	3	-4.004e-3	4	NC	1	660.35	2
471		8	max	.002	3	.003	5	.192	4	1.843e-3	3	NC	1	4440.742	15
472			min	-.003	2	-.116	3	-.053	3	-3.942e-3	4	NC	1	587.168	2
473		9	max	.002	3	.003	5	.219	4	1.901e-3	3	NC	1	3825.266	15
474			min	-.003	2	-.132	3	-.058	3	-3.88e-3	4	NC	1	538.712	2
475		10	max	.002	3	.004	5	.246	4	1.958e-3	3	NC	1	3420.9	15
476			min	-.004	2	-.148	3	-.062	3	-3.819e-3	4	NC	1	508.284	2
477		11	max	.002	3	.004	5	.272	4	2.016e-3	3	NC	1	3166.185	15
478			min	-.004	2	-.165	3	-.064	3	-3.781e-3	2	NC	1	492.623	2
479		12	max	.002	3	.005	5	.296	4	2.073e-3	3	NC	1	3030.838	15
480			min	-.005	2	-.181	3	-.064	3	-3.864e-3	2	NC	1	490.82	2
481		13	max	.003	3	.005	5	.319	4	2.131e-3	3	NC	1	3006.34	15
482			min	-.005	2	-.197	3	-.062	3	-3.947e-3	2	NC	1	504.22	2
483		14	max	.003	3	.006	5	.34	4	2.188e-3	3	NC	1	3106.312	15
484			min	-.006	2	-.213	3	-.059	3	-4.031e-3	2	NC	1	537.346	2
485		15	max	.003	3	.007	5	.36	4	2.246e-3	3	NC	1	3379.832	15
486			min	-.006	2	-.229	3	-.053	3	-4.114e-3	2	9268.386	5	600.923	2
487		16	max	.003	3	.008	5	.377	4	2.303e-3	3	NC	1	3959.694	15
488			min	-.006	2	-.244	3	-.044	3	-4.198e-3	2	8340.385	5	721.463	2
489		17	max	.003	3	.008	5	.392	4	2.361e-3	3	NC	1	5262.103	15
490			min	-.007	2	-.26	3	-.033	3	-4.281e-3	2	7559.909	5	980.021	2
491		18	max	.003	3	.009	5	.404	4	2.418e-3	3	NC	1	9391.939	15
492			min	-.007	2	-.276	3	-.019	3	-4.364e-3	2	6900.362	5	1784.018	2
493		19	max	.004	3	.01	5	.414	5	2.476e-3	3	NC	1	NC	1
494			min	-.008	2	-.292	3	-.011	1	-4.448e-3	2	6341.022	5	NC	1