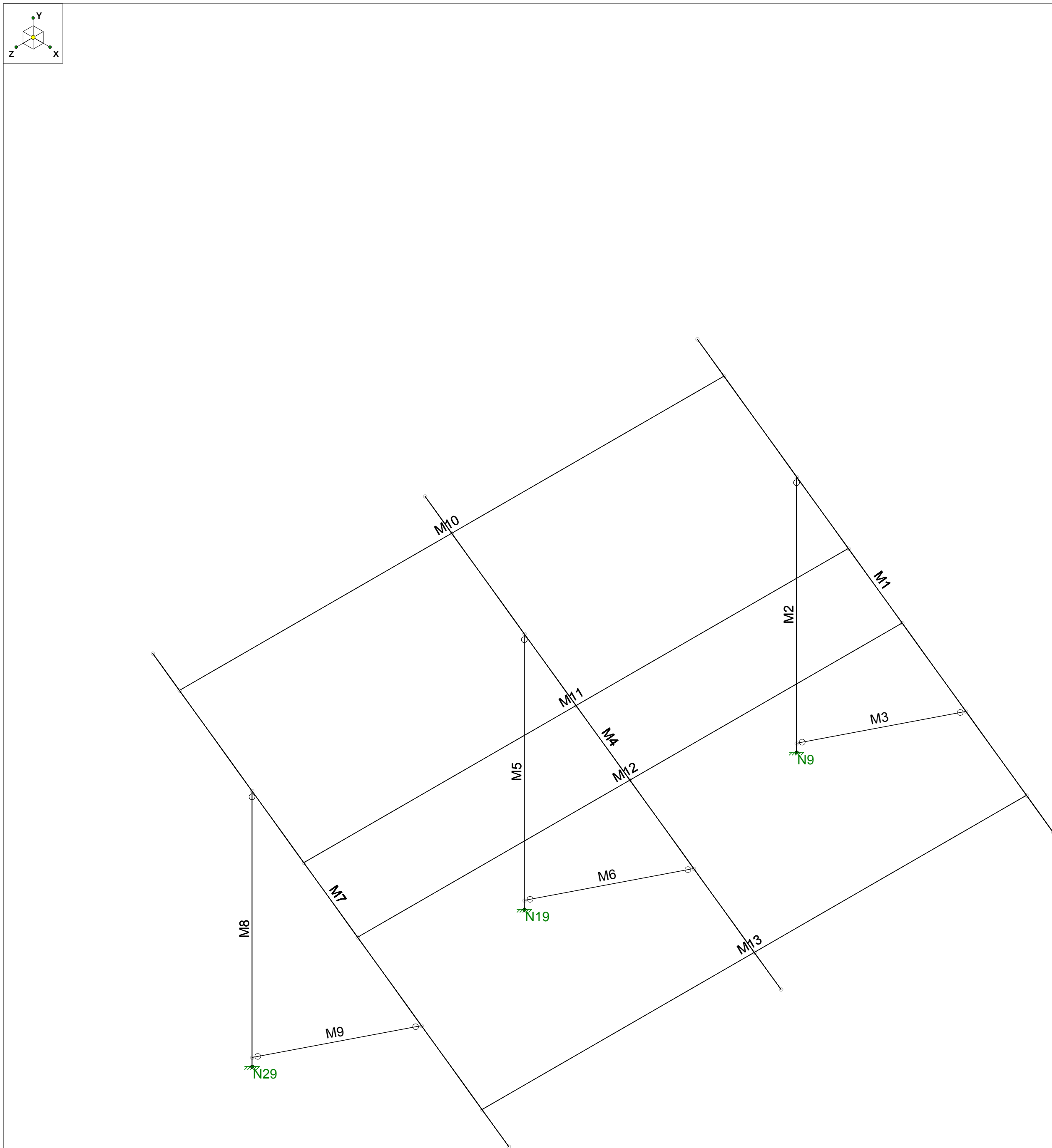


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

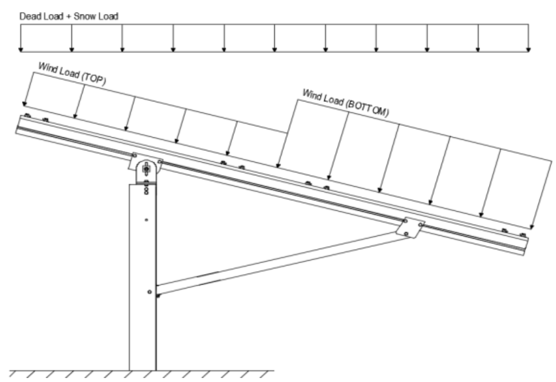
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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 = 85 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 11.34 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.

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

Purlins	Location	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

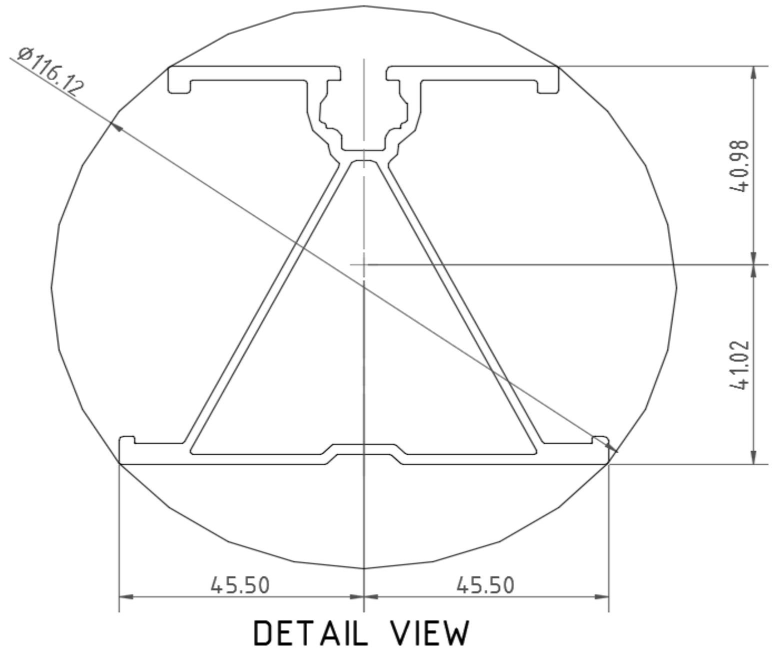
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

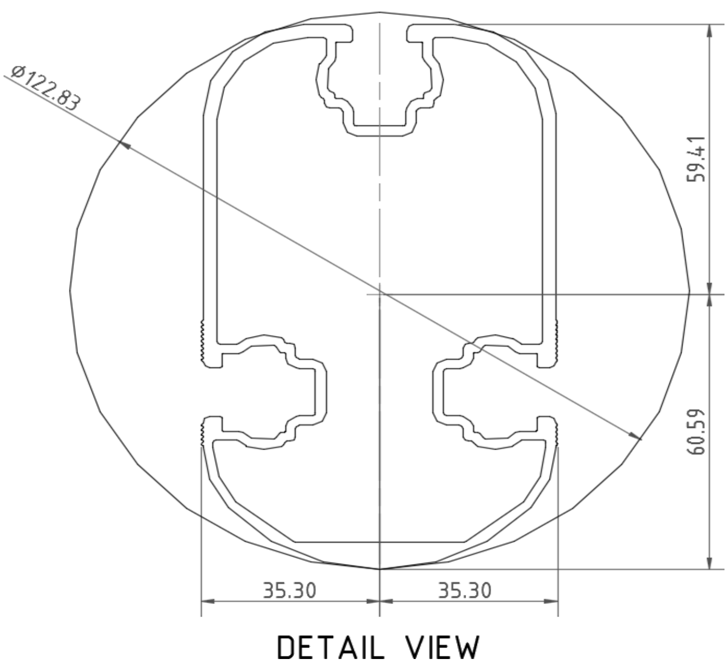
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	144	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.743	k-ft
M_z =	0.414	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	99%	



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).

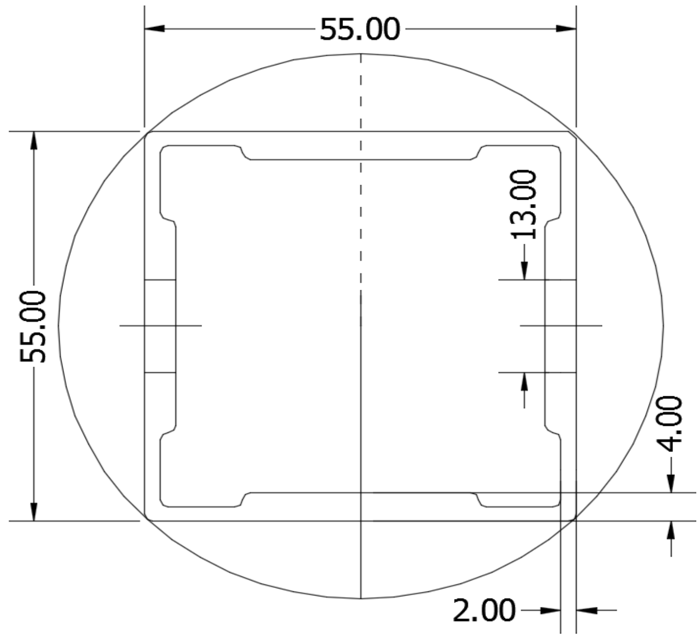
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.599	k-ft
M_z =	0.000	k-ft
P_n =	0.020	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	72%	



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 =	0.444 k-ft
P_n =	3.663 k
$M_{y\ allowable}$ =	1.408 k-ft
$M_{z\ allowable}$ =	1.408 k-ft
$P_{n\ allowable}$ =	13.425 k
Utilization =	59%

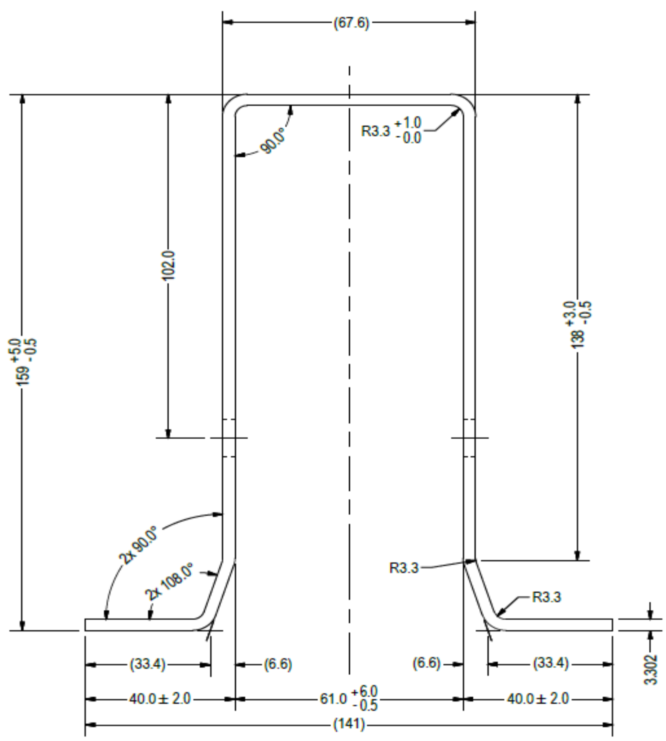


DETAIL VIEW

4.4 Post Design

Galvanized steel posts are a roll formed steel section, that are either ram driven into the ground or placed in a concrete foundation at a defined depth. Embedment depths will be provided on the structural drawings or through a geotechnical testing report. See Appendix A.4 for detailed member calculations. Section units are in (mm).

Post Type =	**FG8**
Steel Type =	J2340
F_{ty} =	60 ksi
L_b =	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 =	16.095 k-ft
M_z =	0.000 k-ft
P_r =	-3.944 k
$M_{y\ allowable}$ =	19.207 k-ft
$M_{z\ allowable}$ =	14.389 k-ft
P_c =	28.060 k
Utilization =	95%



DETAIL VIEW

5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.10 k
Maximum Lateral Load =	3.71 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)

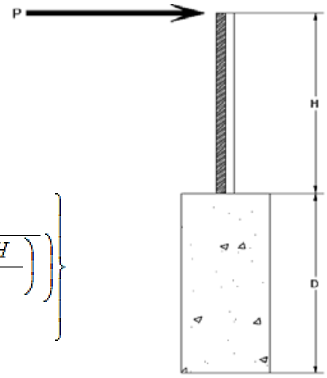
Lateral Force @ Top of Pole, P =	1.06 k
Height of Pole Above Grade, H =	7.14 ft
Diameter of Pole Footing, B =	2.00 ft
Lateral Soil Bearing Capacity, S =	0.10 ksf/ft
Isolated Pole Factor, F =	2
First Trial Depth, D =	3.25 ft

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

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

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

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



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

	Non-Constrained
Lateral Force @ Top of Pole, P =	1.06 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 =	5.71
Required Footing Depth, D =	10.11 ft
2nd Trial @ D_2 =	6.68 ft
Lateral Soil Bearing @ D/3, S_1 =	0.45 ksf
Lateral Soil Bearing @ D, S_3 =	1.34 ksf
Constant $2.34P/(S_1B)$, A =	2.78
Required Footing Depth, D =	6.24 ft
3rd Trial @ D_3 =	6.46 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 =	2.87
Required Footing Depth, D =	6.38 ft

4th Trial @ D_4 =	6.42 ft
Lateral Soil Bearing @ D/3, S_1 =	0.43 ksf
Lateral Soil Bearing @ D, S_3 =	1.28 ksf
Constant $2.34P/(S_1B)$, A =	2.89
Required Footing Depth, D =	6.40 ft
5th Trial @ D_5 =	6.41 ft
Lateral Soil Bearing @ D/3, S_1 =	0.43 ksf
Lateral Soil Bearing @ D, S_3 =	1.28 ksf
Constant $2.34P/(S_1B)$, A =	2.89
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.

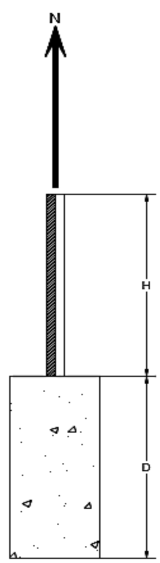
5.4 Uplifting Force Resistance

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 =	2.43	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 =	1.58	k
Required Concrete Volume, V =	10.93	ft^3
Required Footing Depth, D =	3.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.24
2	0.4	0.2	118.10	5.14
3	0.6	0.2	118.10	5.03
4	0.8	0.2	118.10	4.93
5	1	0.2	118.10	4.83
6	1.2	0.2	118.10	4.72
7	1.4	0.2	118.10	4.62
8	1.6	0.2	118.10	4.52
9	1.8	0.2	118.10	4.41
10	2	0.2	118.10	4.31
11	2.2	0.2	118.10	4.20
12	2.4	0.2	118.10	4.10
13	2.6	0.2	118.10	4.00
14	2.8	0.2	118.10	3.89
15	3	0.2	118.10	3.79
16	3.2	0.2	118.10	3.69
17	3.4	0.2	118.10	3.58
18	3.6	0.2	118.10	3.48
19	0	0.0	0.00	3.48
20	0	0.0	0.00	3.48
21	0	0.0	0.00	3.48
22	0	0.0	0.00	3.48
23	0	0.0	0.00	3.48
24	0	0.0	0.00	3.48
25	0	0.0	0.00	3.48
26	0	0.0	0.00	3.48
27	0	0.0	0.00	3.48
28	0	0.0	0.00	3.48
29	0	0.0	0.00	3.48
30	0	0.0	0.00	3.48
31	0	0.0	0.00	3.48
32	0	0.0	0.00	3.48
33	0	0.0	0.00	3.48
34	0	0.0	0.00	3.48
Max	3.6	Sum	0.85	

A 2ft diameter x 3.5ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.74	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

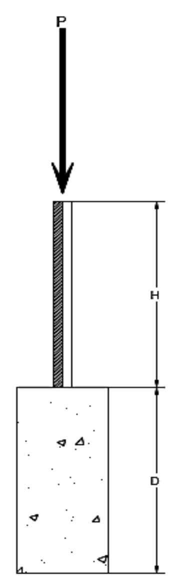
Weight of Concrete

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 =	6.70	k
Utilization =	63%	

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



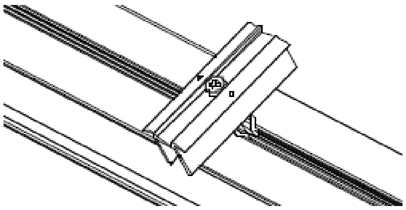
6. DESIGN OF JOINTS AND CONNECTIONS

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.

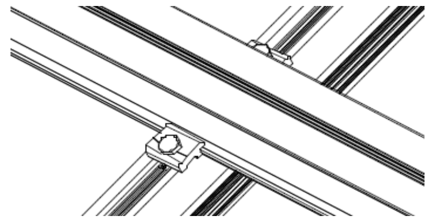
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.403	k
Allowable Uplift =	1.214	k
Utilization =	33%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	1.714	k
Allowable Uplift =	2.180	k
Utilization =	79%	

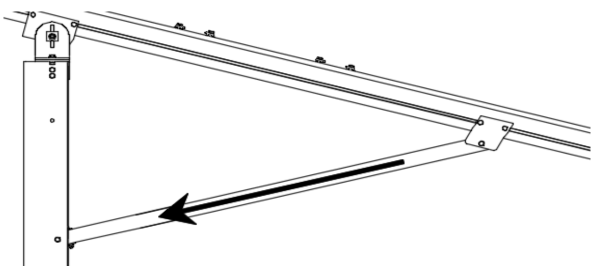


6.2 Strut Connections

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 =	3.663	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	41%	

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

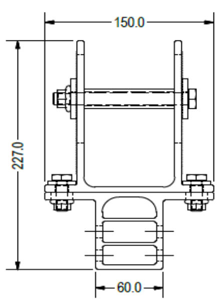


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

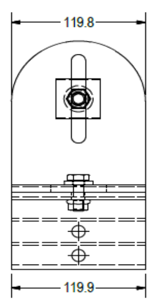
6.3 Girder to Post Connection

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.

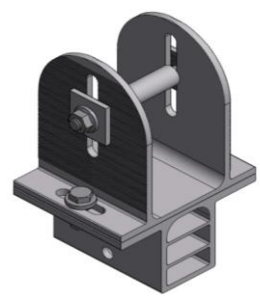
Maximum Tensile Load =	3.653	k
Allowable Load =	5.649	k
Utilization =	65%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

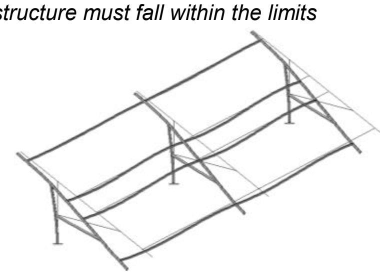
7.1 Seismic Drift

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} =	0.862	in

$0.862 \leq 1.556$, 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

$L_b =$ 144 in

J = 0.432

398.372

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

S1 = 0.51461

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

S2 = 1701.56

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

$\varphi F_L =$ 26.8 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

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

$\varphi F_L =$ 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

$\varphi F_L = 1.17\varphi yFcy$

$\varphi F_L =$ 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

$\varphi F_L = \varphi b[Bbr-mDbr*h/t]$

$\varphi F_L =$ 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

$L_b =$ 144

J = 0.432

253.34

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

S1 = 0.51461

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

S2 = 1701.56

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

$\varphi F_L =$ 28.2

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

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

$\varphi F_L =$ 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

$\varphi F_L = 1.3\varphi yFcy$

$\varphi F_L =$ 43.2 ksi

$\varphi F_L Wk =$ 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

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

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L= φyFcy
φF_L= 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

M_{max}St = 5.001 k-ft

φF_LWk= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

M_{max}Wk = 3.499 k-ft

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

$\lambda =$ 1.41113

r = 0.81 in

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

$S1^* =$ 0.33515

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

$S2^* =$ 1.23671

$\varphi cc =$ 0.77756

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

$\varphi F_L =$ 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

$\varphi F_L =$ 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

$\varphi F_L =$ 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.25 ksi

$\varphi F_L =$ 13.67 ksi

A = 663.99 mm^2

1.03 in^2

$P_{max} =$ 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	85.68 in	
Pr =	-3.94 k	(LRFD Factored Load)
Mr (Strong) =	16.10 k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00 k-ft	(LRFD Factored Load)

Flexural Buckling:			Torsional/Flexural Torsional Buckling:	
kL/r =	123.28		Fcr =	12.5831 ksi
4.71√(E/Fy) =	103.55 =>	kL/r > 4.71√(E/Fy)	Fey =	48.0382 ksi
Fcr =	16.52 ksi		Fez =	16.1601 ksi
Fe =	18.83 ksi		Pn =	28.0602 k
Pn =	36.831 k			

Bending (Strong Axis):				Bending (Weak Axis):			
Yielding:				Yielding:			
Mn =	21.95 k-ft			Mn =	14.65 k-ft		
Flange Local Buckling:				Flange Local Buckling:			
Mn =	19.207 k-ft			Mn =	14.39 k-ft		
Pr/Pc =	0.1071 <	0.2		Pr/Pc =	0.107 <	0.2	
Utilization =	0.95 <	1.0	OK	Utilization =	0.00 <	1.0	OK

Combined Forces
Utilization = 95%

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	-37.962	-37.962	0	0
2	M11	y	-37.962	-37.962	0	0
3	M12	y	-63.27	-63.27	0	0
4	M13	y	-63.27	-63.27	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	75.924	75.924	0	0
2	M11	y	75.924	75.924	0	0
3	M12	y	37.962	37.962	0	0
4	M13	y	37.962	37.962	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	845.505	2	2090.717	1	297.384	2	.434	2	.049	5	4.37	3
2		min	-1082.519	3	-1264.115	3	-388.136	5	-1.793	5	-.038	2	.182	10
3	N19	max	2768.328	2	5488.528	1	0	2	0	1	.053	4	9.568	3
4		min	-2851.716	3	-3908.676	3	-428.839	5	-1.894	4	0	3	.04	10
5	N29	max	845.505	2	2090.717	1	308.14	3	.507	3	.056	4	4.37	3
6		min	-1082.519	3	-1264.115	3	-456.034	4	-1.923	4	-.019	3	-.11	5
7	Totals:	max	4459.337	2	9669.961	1	0	1						
8		min	-5016.755	3	-6436.906	3	-1231.968	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	.006	1	.003	4	0	1	0	1	0	1
2			min	0	1	0	12	-.002	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	-1.498	5	0	1	0	5	0	15
5		3	max	-19.888	12	260.02	3	-23.413	12	.079	3	.333	1	.258	2
6			min	-220.841	1	-603.681	2	-175.098	1	-.278	2	.045	10	-.107	3
7		4	max	-20.385	12	258.957	3	-23.413	12	.079	3	.224	1	.633	2
8			min	-221.833	1	-605.099	2	-175.098	1	-.278	2	.028	10	-.268	3
9		5	max	-20.881	12	257.894	3	-23.413	12	.079	3	.116	1	1.009	2
10			min	-222.826	1	-606.516	2	-175.098	1	-.278	2	.011	10	-.429	3
11		6	max	133.353	3	538.667	2	8.856	3	.138	2	.112	2	.965	2
12			min	-604.151	1	-167.349	3	-254.506	1	-.124	3	-.043	5	-.433	3
13		7	max	132.608	3	537.25	2	8.856	3	.138	2	.012	10	.631	2
14			min	-605.144	1	-168.412	3	-254.506	1	-.124	3	-.096	4	-.329	3
15		8	max	131.864	3	535.832	2	8.856	3	.138	2	-.021	12	.298	2
16			min	-606.136	1	-169.475	3	-254.506	1	-.124	3	-.205	1	-.224	3
17		9	max	101.16	3	81.733	3	-12.531	12	.021	5	.106	1	.107	1
18			min	-834.245	1	-68.756	2	-261.831	1	-.207	2	-.008	10	-.171	3
19		10	max	100.416	3	80.67	3	-12.531	12	.021	5	.061	3	.145	1
20			min	-835.237	1	-70.174	2	-261.831	1	-.207	2	-.064	4	-.221	3
21		11	max	99.671	3	79.607	3	-12.531	12	.021	5	.049	3	.189	2
22			min	-836.23	1	-71.591	2	-261.831	1	-.207	2	-.219	1	-.271	3
23		12	max	65.791	3	677.105	3	194.342	2	.435	3	.207	1	.394	2
24			min	-1061.661	1	-475.152	2	-386.927	3	-.401	2	-.086	5	-.553	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	65.047	3	676.042	3	194.342	2	.435	3	.255	1	.689	2
26			min	-1062.653	1	-476.57	2	-386.927	3	-.401	2	-.224	3	-.972	3
27		14	max	223.729	1	427.205	2	81.223	5	.299	2	.183	3	.973	2
28			min	12.204	15	-596.709	3	-123.812	3	-.486	3	-.224	4	-1.374	3
29		15	max	222.736	1	425.787	2	79.723	5	.299	2	.106	3	.708	2
30			min	11.905	15	-597.772	3	-123.812	3	-.486	3	-.218	1	-1.004	3
31		16	max	221.743	1	424.37	2	78.224	5	.299	2	.029	3	.444	2
32			min	11.605	15	-598.835	3	-123.812	3	-.486	3	-.289	1	-.632	3
33		17	max	220.751	1	422.952	2	76.724	5	.299	2	-.031	12	.181	2
34			min	11.306	15	-599.899	3	-123.812	3	-.486	3	-.359	1	-.26	3
35		18	max	1.274	4	1.819	6	1.501	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	.002	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.003	4	0	1	0	1	0	1
40			min	0	1	-.001	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	-1.815	6	-1.499	5	0	1	0	5	0	15
43		3	max	-12.379	12	825.982	3	0	1	.07	4	.225	4	.696	2
44			min	-453.494	1	-1782.292	2	-119.739	5	0	1	0	1	-.329	3
45		4	max	-12.875	12	824.918	3	0	1	.07	4	.151	4	1.803	2
46			min	-454.487	1	-1783.71	2	-121.239	5	0	1	0	1	-.841	3
47		5	max	-13.372	12	823.855	3	0	1	.07	4	.076	4	2.91	2
48			min	-455.479	1	-1785.127	2	-122.738	5	0	1	0	1	-1.353	3
49		6	max	563.001	3	1619.594	2	0	1	0	1	0	1	2.769	2
50			min	-1574.593	1	-631.154	3	-89.774	4	-.063	4	-.046	5	-1.33	3
51		7	max	562.257	3	1618.177	2	0	1	0	1	0	1	1.764	2
52			min	-1575.585	1	-632.217	3	-91.274	4	-.063	4	-.101	4	-.938	3
53		8	max	561.512	3	1616.759	2	0	1	0	1	0	1	.76	2
54			min	-1576.578	1	-633.28	3	-92.773	4	-.063	4	-.158	4	-.545	3
55		9	max	546.919	3	211.812	3	0	1	.019	4	.071	5	.17	1
56			min	-2012.559	1	-179.202	1	-208.446	4	0	1	0	1	-.349	3
57		10	max	546.175	3	210.748	3	0	1	.019	4	0	1	.282	1
58			min	-2013.551	1	-180.619	1	-209.945	4	0	1	-.059	4	-.48	3
59		11	max	545.43	3	209.685	3	0	1	.019	4	0	1	.394	1
60			min	-2014.544	1	-182.037	1	-211.445	4	0	1	-.19	4	-.611	3
61		12	max	537.19	3	1818.941	3	0	1	.194	4	0	1	.981	1
62			min	-2455.879	1	-1395.175	2	-252.022	5	0	1	-.081	4	-1.389	3
63		13	max	536.445	3	1817.878	3	0	1	.194	4	0	1	1.841	1
64			min	-2456.872	1	-1396.593	2	-253.522	5	0	1	-.237	4	-2.518	3
65		14	max	456.651	1	1186.552	1	82.481	5	0	1	0	1	2.668	1
66			min	13.786	12	-1602.035	3	0	1	-.14	4	-.159	5	-3.599	3
67		15	max	455.658	1	1185.135	1	80.981	5	0	1	0	1	1.932	1
68			min	13.29	12	-1603.099	3	0	1	-.14	4	-.108	5	-2.604	3
69		16	max	454.666	1	1183.717	1	79.481	5	0	1	0	1	1.197	1
70			min	12.793	12	-1604.162	3	0	1	-.14	4	-.059	5	-1.609	3
71		17	max	453.673	1	1182.3	1	77.982	5	0	1	0	1	.463	1
72			min	12.297	12	-1605.225	3	0	1	-.14	4	-.01	5	-.613	3
73		18	max	1.274	6	1.821	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	-.016	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.005	4	0	1	0	1	0	1
78			min	0	1	0	12	0	12	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	.002	1	0	1	0	1	0	4
80			min	-1.274	6	-1.817	4	-1.498	5	0	1	0	5	0	15
81		3	max	4.012	5	260.02	3	175.098	1	.278	2	.091	5	.258	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	-220.841	1	-603.681	2	-52.681	5	-.079	3	-.333	1	-.107	3
83		4	max	3.549	5	258.957	3	175.098	1	.278	2	.058	5	.633	2
84			min	-221.833	1	-605.099	2	-54.181	5	-.079	3	-.224	1	-.268	3
85		5	max	3.086	5	257.894	3	175.098	1	.278	2	.024	5	1.009	2
86			min	-222.826	1	-606.516	2	-55.68	5	-.079	3	-.116	1	-.429	3
87		6	max	133.353	3	538.667	2	254.506	1	.124	3	.043	3	.965	2
88			min	-604.151	1	-167.349	3	-21.494	5	-.138	2	-.112	2	-.433	3
89		7	max	132.608	3	537.25	2	254.506	1	.124	3	.047	1	.631	2
90			min	-605.144	1	-168.412	3	-22.994	5	-.138	2	-.068	5	-.329	3
91		8	max	131.864	3	535.832	2	254.506	1	.124	3	.205	1	.298	2
92			min	-606.136	1	-169.475	3	-24.493	5	-.138	2	-.083	5	-.224	3
93		9	max	101.16	3	81.733	3	261.831	1	.207	2	.008	10	.107	1
94			min	-834.245	1	-68.756	2	-88.006	5	.019	15	-.106	1	-.171	3
95		10	max	100.416	3	80.67	3	261.831	1	.207	2	.061	2	.145	1
96			min	-835.237	1	-70.174	2	-89.505	5	.019	15	-.061	3	-.221	3
97		11	max	99.671	3	79.607	3	261.831	1	.207	2	.219	1	.189	2
98			min	-836.23	1	-71.591	2	-91.005	5	.019	15	-.106	5	-.271	3
99		12	max	65.791	3	677.105	3	386.927	3	.401	2	-.011	12	.394	2
100			min	-1061.661	1	-475.152	2	-216.079	5	-.435	3	-.207	1	-.553	3
101		13	max	65.047	3	676.042	3	386.927	3	.401	2	.224	3	.689	2
102			min	-1062.653	1	-476.57	2	-217.579	5	-.435	3	-.303	4	-.972	3
103		14	max	223.729	1	427.205	2	140.395	4	.486	3	.149	2	.973	2
104			min	15.052	15	-596.709	3	-10.698	10	-.299	2	-.184	5	-1.374	3
105		15	max	222.736	1	425.787	2	138.895	4	.486	3	.218	1	.708	2
106			min	14.753	15	-597.772	3	-10.698	10	-.299	2	-.119	5	-1.004	3
107		16	max	221.743	1	424.37	2	137.396	4	.486	3	.289	1	.444	2
108			min	14.453	15	-598.835	3	-10.698	10	-.299	2	-.055	5	-.632	3
109		17	max	220.751	1	422.952	2	135.896	4	.486	3	.359	1	.181	2
110			min	14.154	15	-599.899	3	-10.698	10	-.299	2	.004	15	-.26	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	-.002	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	-.007	3	-.002	1	0	1	0	1	0	1
115	M10	1	max	132.917	4	419.689	2	-13.559	15	.01	2	.406	1	.299	2
116			min	-10.702	10	-602.221	3	-218.871	1	-.018	3	.032	15	-.486	3
117		2	max	123.826	3	307.762	2	-10.826	15	.01	2	.147	1	.212	3
118			min	-10.702	10	-446.103	3	-169.47	1	-.018	3	.016	15	-.196	1
119		3	max	123.826	3	195.835	2	-8.094	15	.01	2	.031	3	.703	3
120			min	-10.702	10	-289.985	3	-120.069	1	-.018	3	-.046	1	-.523	1
121		4	max	123.826	3	83.908	2	-5.361	15	.01	2	.006	3	.986	3
122			min	-10.702	10	-133.866	3	-70.668	1	-.018	3	-.174	1	-.708	2
123		5	max	123.826	3	22.252	3	-2.518	10	.01	2	-.009	12	1.06	3
124			min	-10.702	10	-32.361	1	-21.267	1	-.018	3	-.235	1	-.745	2
125		6	max	123.826	3	178.371	3	28.134	1	.01	2	-.013	15	.926	3
126			min	-10.702	10	-143.406	1	-8.629	3	-.018	3	-.23	1	-.634	2
127		7	max	123.826	3	334.489	3	77.536	1	.01	2	-.011	15	.584	3
128			min	-10.702	10	-254.451	1	-4.53	3	-.018	3	-.16	1	-.372	2
129		8	max	123.826	3	490.607	3	126.937	1	.01	2	-.001	10	.062	1
130			min	-10.702	10	-365.496	1	-.432	3	-.018	3	-.04	3	-.025	5
131		9	max	123.826	3	646.726	3	176.338	1	.01	2	.179	1	.624	1
132			min	-11.851	5	-476.541	1	2.823	12	-.018	3	-.038	3	-.724	3
133		10	max	123.826	3	802.844	3	7.764	3	.018	3	.447	1	1.333	1
134			min	-10.702	10	30.742	15	-225.739	1	-.01	2	-.03	3	-1.69	3
135		11	max	123.826	3	476.541	1	-2.823	12	.018	3	.179	1	.624	1
136			min	-10.702	10	-646.726	3	-176.338	1	-.01	2	-.038	3	-.724	3
137		12	max	123.826	3	365.496	1	.432	3	.018	3	.003	5	.062	1
138			min	-10.702	10	-490.607	3	-126.937	1	-.01	2	-.04	3	.017	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	123.826	3	254.451	1	4.53	3	.018	3	-.007	15	.584	3
140			min	-10.702	10	-334.489	3	-77.536	1	-.01	2	-.16	1	-.372	2
141		14	max	123.826	3	143.406	1	8.629	3	.018	3	-.013	15	.926	3
142			min	-10.702	10	-178.371	3	-28.134	1	-.01	2	-.23	1	-.634	2
143		15	max	123.826	3	32.361	1	21.267	1	.018	3	-.009	12	1.06	3
144			min	-18.98	5	-22.252	3	-.256	5	-.01	2	-.235	1	-.745	2
145		16	max	123.826	3	133.866	3	70.668	1	.018	3	.006	3	.986	3
146			min	-32.667	5	-83.908	2	2.51	15	-.01	2	-.174	1	-.708	2
147		17	max	123.826	3	289.985	3	120.069	1	.018	3	.031	3	.703	3
148			min	-46.354	5	-195.835	2	5.242	15	-.01	2	-.046	1	-.523	1
149		18	max	123.826	3	446.103	3	169.47	1	.018	3	.147	1	.212	3
150			min	-60.041	5	-307.762	2	7.975	15	-.01	2	0	15	-.196	1
151		19	max	123.826	3	602.221	3	218.871	1	.018	3	.406	1	.299	2
152			min	-73.728	5	-419.689	2	10.707	15	-.01	2	.013	15	-.486	3
153	M11	1	max	340.01	1	401.016	2	2.246	5	0	10	.453	1	.224	1
154			min	-368.673	3	-598.424	3	-224.755	1	-.005	3	-.092	5	-.562	3
155		2	max	340.01	1	289.933	1	6.473	5	0	10	.186	1	.131	3
156			min	-368.673	3	-442.306	3	-175.354	1	-.005	3	-.086	5	-.266	2
157		3	max	340.01	1	178.888	1	10.7	5	0	10	.049	3	.617	3
158			min	-368.673	3	-286.188	3	-125.953	1	-.005	3	-.077	4	-.577	2
159		4	max	340.01	1	67.843	1	14.927	5	0	10	.019	3	.895	3
160			min	-368.673	3	-130.069	3	-76.552	1	-.005	3	-.15	1	-.738	2
161		5	max	340.01	1	26.049	3	19.155	5	0	10	-.004	12	.964	3
162			min	-368.673	3	-46.691	2	-27.151	1	-.005	3	-.219	1	-.751	2
163		6	max	340.01	1	182.167	3	28.794	4	0	10	-.004	15	.825	3
164			min	-368.673	3	-158.618	2	-11.924	3	-.005	3	-.222	1	-.614	2
165		7	max	340.01	1	338.286	3	71.652	1	0	10	.028	5	.478	3
166			min	-368.673	3	-270.545	2	-7.826	3	-.005	3	-.16	1	-.328	2
167		8	max	340.01	1	494.404	3	121.053	1	0	10	.067	5	.109	1
168			min	-368.673	3	-382.472	2	-3.728	3	-.005	3	-.044	3	-.077	3
169		9	max	340.01	1	650.523	3	170.454	1	0	10	.163	1	.692	2
170			min	-368.673	3	-494.398	2	.37	3	-.005	3	-.047	3	-.84	3
171		10	max	340.01	1	606.325	2	2.831	5	.005	3	.423	1	1.426	2
172			min	-368.673	3	-806.641	3	-219.855	1	-.001	14	-.043	3	-1.812	3
173		11	max	340.01	1	494.398	2	7.058	5	.005	3	.163	1	.692	2
174			min	-368.673	3	-650.523	3	-170.454	1	0	5	-.085	5	-.84	3
175		12	max	340.01	1	382.472	2	11.285	5	.005	3	-.002	10	.109	1
176			min	-368.673	3	-494.404	3	-121.053	1	0	5	-.082	4	-.077	3
177		13	max	340.01	1	270.545	2	15.512	5	.005	3	-.023	10	.478	3
178			min	-368.673	3	-338.286	3	-71.652	1	0	5	-.16	1	-.328	2
179		14	max	340.01	1	158.618	2	19.74	5	.005	3	-.016	12	.825	3
180			min	-368.673	3	-182.167	3	-22.25	1	0	5	-.222	1	-.614	2
181		15	max	340.01	1	46.691	2	31.13	4	.005	3	-.001	15	.964	3
182			min	-368.673	3	-26.049	3	2.831	10	0	5	-.219	1	-.751	2
183		16	max	340.01	1	130.069	3	76.552	1	.005	3	.032	5	.895	3
184			min	-368.673	3	-67.843	1	10.379	10	0	5	-.15	1	-.738	2
185		17	max	340.01	1	286.188	3	125.953	1	.005	3	.073	5	.617	3
186			min	-368.673	3	-178.888	1	15.66	12	0	5	-.015	1	-.577	2
187		18	max	340.01	1	442.306	3	175.354	1	.005	3	.186	1	.131	3
188			min	-368.673	3	-289.933	1	18.392	12	0	5	.021	10	-.266	2
189		19	max	340.01	1	598.424	3	224.755	1	.005	3	.453	1	.224	1
190			min	-368.673	3	-401.016	2	21.124	12	0	5	.06	10	-.562	3
191	M12	1	max	61.972	5	602.396	2	6.708	5	0	10	.471	1	.345	2
192			min	-27.951	9	-252.321	3	-227.109	1	-.004	3	-.118	5	.003	12
193		2	max	52.373	2	436.479	2	10.936	5	0	10	.201	1	.29	3
194			min	-27.951	9	-177.188	3	-177.708	1	-.004	3	-.106	5	-.347	2
195		3	max	52.373	2	270.562	2	15.163	5	0	10	.035	3	.476	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	-27.951	9	-102.055	3	-128.307	1	-.004	3	-.09	4	-.819	2
197		4	max	52.373	2	104.645	2	19.39	5	0	10	.009	3	.562	3
198			min	-27.951	9	-26.923	3	-78.906	1	-.004	3	-.141	1	-1.069	2
199		5	max	52.373	2	48.21	3	23.617	5	0	10	-.008	12	.548	3
200			min	-27.951	9	-61.273	2	-29.505	1	-.004	3	-.213	1	-1.098	2
201		6	max	52.373	2	123.343	3	32.964	4	0	10	-.001	15	.434	3
202			min	-27.951	9	-227.19	2	-9.415	3	-.004	3	-.219	1	-.905	2
203		7	max	52.373	2	198.476	3	69.297	1	0	10	.037	5	.219	3
204			min	-31.874	14	-393.107	2	-5.317	3	-.004	3	-.16	1	-.492	2
205		8	max	52.373	2	273.609	3	118.698	1	0	10	.083	5	.143	2
206			min	-44.305	4	-559.024	2	-1.219	3	-.004	3	-.041	3	-.096	3
207		9	max	52.373	2	348.741	3	168.1	1	0	10	.174	4	.999	2
208			min	-57.992	4	-724.941	2	2.296	12	-.004	3	-.04	3	-.51	3
209		10	max	52.373	2	890.859	2	135.713	14	.004	3	.414	1	2.076	2
210			min	-71.679	4	-423.874	3	-217.501	1	-.002	1	-.033	3	-1.025	3
211		11	max	52.373	2	724.941	2	11.756	5	.004	3	.157	1	.999	2
212			min	-27.951	9	-348.741	3	-168.1	1	0	5	-.108	5	-.51	3
213		12	max	52.373	2	559.024	2	15.983	5	.004	3	-.004	10	.143	2
214			min	-27.951	9	-273.609	3	-118.698	1	0	5	-.098	4	-.096	3
215		13	max	52.373	2	393.107	2	20.211	5	.004	3	-.023	10	.219	3
216			min	-27.951	9	-198.476	3	-69.297	1	0	5	-.16	1	-.492	2
217		14	max	52.373	2	227.19	2	24.438	5	.004	3	-.018	12	.434	3
218			min	-27.951	9	-123.343	3	-19.896	1	0	5	-.219	1	-.905	2
219		15	max	52.373	2	61.273	2	36.225	4	.004	3	0	15	.548	3
220			min	-29.506	14	-48.21	3	4.273	10	0	5	-.213	1	-1.098	2
221		16	max	52.373	2	26.923	3	78.906	1	.004	3	.041	5	.562	3
222			min	-39.346	4	-104.645	2	11.364	12	0	5	-.141	1	-1.069	2
223		17	max	52.373	2	102.055	3	128.307	1	.004	3	.088	5	.476	3
224			min	-53.032	4	-270.562	2	14.096	12	0	5	-.003	1	-.819	2
225		18	max	52.373	2	177.188	3	177.708	1	.004	3	.201	1	.29	3
226			min	-66.719	4	-436.479	2	16.828	12	0	5	.03	10	-.347	2
227		19	max	52.373	2	252.321	3	227.109	1	.004	3	.471	1	.345	2
228			min	-80.406	4	-602.396	2	19.561	12	0	5	.067	12	-.065	5
229	M13	1	max	49.663	5	601.41	2	4.941	5	.003	3	.404	1	.278	2
230			min	-174.905	1	-262.146	3	-218.689	1	-.013	2	-.113	5	-.079	3
231		2	max	35.976	5	435.492	2	9.168	5	.003	3	.145	1	.22	3
232			min	-174.905	1	-187.013	3	-169.288	1	-.013	2	-.103	5	-.413	2
233		3	max	22.289	5	269.575	2	13.396	5	.003	3	.03	3	.42	3
234			min	-174.905	1	-111.88	3	-119.887	1	-.013	2	-.1	4	-.883	2
235		4	max	8.602	5	103.658	2	17.623	5	.003	3	.005	3	.519	3
236			min	-174.905	1	-36.747	3	-70.486	1	-.013	2	-.175	1	-1.132	2
237		5	max	-2.995	15	38.385	3	21.85	5	.003	3	-.01	12	.518	3
238			min	-174.905	1	-62.259	2	-21.085	1	-.013	2	-.236	1	-1.16	2
239		6	max	-12.207	15	113.518	3	33.109	4	.003	3	-.006	15	.416	3
240			min	-174.905	1	-228.176	2	-8.362	3	-.013	2	-.231	1	-.966	2
241		7	max	-21.419	15	188.651	3	77.717	1	.003	3	.028	5	.215	3
242			min	-174.905	1	-394.094	2	-4.264	3	-.013	2	-.16	1	-.551	2
243		8	max	-23.412	12	263.784	3	127.118	1	.003	3	.071	5	.085	2
244			min	-174.905	1	-560.011	2	-.166	3	-.013	2	-.04	3	-.087	3
245		9	max	-23.412	12	338.917	3	176.52	1	.003	3	.179	1	.942	2
246			min	-174.905	1	-725.928	2	2.99	12	-.013	2	-.037	3	-.489	3
247		10	max	-23.412	12	891.845	2	138.846	14	0	15	.447	1	2.021	2
248			min	-174.905	1	-414.049	3	-225.921	1	-.013	2	-.029	3	-.991	3
249		11	max	29.732	5	725.928	2	8.648	5	.013	2	.179	1	.942	2
250			min	-174.905	1	-338.917	3	-176.52	1	-.003	3	-.09	5	-.489	3
251		12	max	16.045	5	560.011	2	12.875	5	.013	2	-.001	10	.085	2
252			min	-174.905	1	-263.784	3	-127.118	1	-.003	3	-.082	4	-.087	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	2.358	5	394.094	2	17.102	5	.013	2	-.023	10	.215	3
254			min	-174.905	1	-188.651	3	-77.717	1	-.003	3	-.16	1	-.551	2
255		14	max	-7.182	15	228.176	2	21.329	5	.013	2	-.019	12	.416	3
256			min	-174.905	1	-113.518	3	-28.316	1	-.003	3	-.231	1	-.966	2
257		15	max	-16.394	15	62.259	2	31.067	4	.013	2	.001	15	.518	3
258			min	-174.905	1	-38.385	3	2.394	10	-.003	3	-.236	1	-1.16	2
259		16	max	-23.412	12	36.747	3	70.486	1	.013	2	.038	5	.519	3
260			min	-174.905	1	-103.658	2	9.942	10	-.003	3	-.175	1	-1.132	2
261		17	max	-23.412	12	111.88	3	119.887	1	.013	2	.081	5	.42	3
262			min	-174.905	1	-269.575	2	13.403	12	-.003	3	-.048	1	-.883	2
263		18	max	-23.412	12	187.013	3	169.288	1	.013	2	.166	4	.22	3
264			min	-174.905	1	-435.492	2	16.135	12	-.003	3	.018	10	-.413	2
265		19	max	-23.412	12	262.146	3	218.689	1	.013	2	.404	1	.278	2
266			min	-174.905	1	-601.41	2	18.867	12	-.003	3	.056	10	-.079	3
267	M2	1	max	2090.717	1	1082.216	3	297.502	2	.049	5	1.793	5	4.37	3
268			min	-1264.115	3	-845.482	2	-388.171	5	-.038	2	-.434	2	.182	10
269		2	max	1520.359	1	699.142	3	204.258	2	.002	2	1.625	5	4.054	3
270			min	-1020.308	3	49.206	10	-350.665	5	-.001	3	-.331	2	.285	10
271		3	max	1517.253	1	699.142	3	204.258	2	.002	2	1.506	5	3.816	3
272			min	-1022.637	3	49.206	10	-347.973	5	-.001	3	-.265	1	.269	10
273		4	max	1514.147	1	699.142	3	204.258	2	.002	2	1.388	5	3.577	3
274			min	-1024.967	3	49.206	10	-345.281	5	-.001	3	-.199	1	.252	10
275		5	max	1511.041	1	699.142	3	204.258	2	.002	2	1.271	5	3.339	3
276			min	-1027.296	3	49.206	10	-342.589	5	-.001	3	-.134	1	.235	10
277		6	max	1507.935	1	699.142	3	204.258	2	.002	2	1.154	5	3.1	3
278			min	-1029.626	3	49.206	10	-339.897	5	-.001	3	-.068	1	.218	10
279		7	max	1504.829	1	699.142	3	204.258	2	.002	2	1.046	4	2.862	3
280			min	-1031.955	3	49.206	10	-337.205	5	-.001	3	-.046	3	.201	10
281		8	max	1501.723	1	699.142	3	204.258	2	.002	2	.94	4	2.623	3
282			min	-1034.285	3	49.206	10	-334.513	5	-.001	3	-.136	3	.185	10
283		9	max	1498.617	1	699.142	3	204.258	2	.002	2	.835	4	2.385	3
284			min	-1036.615	3	49.206	10	-331.821	5	-.001	3	-.226	3	.168	10
285		10	max	1495.511	1	699.142	3	204.258	2	.002	2	.731	4	2.146	3
286			min	-1038.944	3	49.206	10	-329.129	5	-.001	3	-.316	3	.151	10
287		11	max	1492.405	1	699.142	3	204.258	2	.002	2	.628	4	1.908	3
288			min	-1041.274	3	49.206	10	-326.437	5	-.001	3	-.405	3	.134	10
289		12	max	1489.299	1	699.142	3	204.258	2	.002	2	.526	4	1.669	3
290			min	-1043.603	3	49.206	10	-323.745	5	-.001	3	-.495	3	.117	10
291		13	max	1486.192	1	699.142	3	204.258	2	.002	2	.435	2	1.431	3
292			min	-1045.933	3	49.206	10	-321.053	5	-.001	3	-.585	3	.101	10
293		14	max	1483.086	1	699.142	3	204.258	2	.002	2	.505	2	1.192	3
294			min	-1048.262	3	49.206	10	-318.362	5	-.001	3	-.675	3	.084	10
295		15	max	1479.98	1	699.142	3	204.258	2	.002	2	.575	2	.954	3
296			min	-1050.592	3	49.206	10	-315.67	5	-.001	3	-.765	3	.067	10
297		16	max	1476.874	1	699.142	3	204.258	2	.002	2	.644	2	.715	3
298			min	-1052.921	3	49.206	10	-312.978	5	-.001	3	-.854	3	.05	10
299		17	max	1473.768	1	699.142	3	204.258	2	.002	2	.714	2	.477	3
300			min	-1055.251	3	49.206	10	-310.286	5	-.001	3	-.944	3	.034	10
301		18	max	1470.662	1	699.142	3	204.258	2	.002	2	.784	2	.238	3
302			min	-1057.581	3	49.206	10	-307.594	5	-.001	3	-1.034	3	.017	10
303		19	max	1467.556	1	699.142	3	204.258	2	.002	2	.853	2	0	1
304			min	-1059.91	3	49.206	10	-304.902	5	-.001	3	-1.124	3	0	1
305	M5	1	max	5488.528	1	2849.59	3	0	1	.053	4	1.894	4	9.568	3
306			min	-3908.676	3	-2768.592	2	-428.918	5	0	1	0	1	.04	10
307		2	max	3834.974	1	1514.497	3	0	1	0	1	1.713	4	8.782	3
308			min	-3062.452	3	57.992	15	-388.385	4	0	4	0	1	.336	15
309		3	max	3831.868	1	1514.497	3	0	1	0	1	1.581	4	8.266	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	-3064.781	3	57.992	15	-385.693	4	0	4	0	1	.317	15
311		4	max	3828.762	1	1514.497	3	0	1	0	1	1.45	4	7.749	3
312			min	-3067.111	3	57.992	15	-383.001	4	0	4	0	1	.297	15
313		5	max	3825.656	1	1514.497	3	0	1	0	1	1.319	4	7.233	3
314			min	-3069.44	3	57.992	15	-380.31	4	0	4	0	1	.277	15
315		6	max	3822.55	1	1514.497	3	0	1	0	1	1.19	4	6.716	3
316			min	-3071.77	3	57.992	15	-377.618	4	0	4	0	1	.257	15
317		7	max	3819.444	1	1514.497	3	0	1	0	1	1.062	4	6.199	3
318			min	-3074.1	3	57.992	15	-374.926	4	0	4	0	1	.237	15
319		8	max	3816.338	1	1514.497	3	0	1	0	1	.934	4	5.683	3
320			min	-3076.429	3	57.992	15	-372.234	4	0	4	0	1	.218	15
321		9	max	3813.232	1	1514.497	3	0	1	0	1	.808	4	5.166	3
322			min	-3078.759	3	57.992	15	-369.542	4	0	4	0	1	.198	15
323		10	max	3810.126	1	1514.497	3	0	1	0	1	.682	4	4.649	3
324			min	-3081.088	3	57.992	15	-366.85	4	0	4	0	1	.178	15
325		11	max	3807.019	1	1514.497	3	0	1	0	1	.558	4	4.133	3
326			min	-3083.418	3	57.992	15	-364.158	4	0	4	0	1	.158	15
327		12	max	3803.913	1	1514.497	3	0	1	0	1	.434	4	3.616	3
328			min	-3085.747	3	57.992	15	-361.466	4	0	4	0	1	.138	15
329		13	max	3800.807	1	1514.497	3	0	1	0	1	.311	4	3.1	3
330			min	-3088.077	3	57.992	15	-358.774	4	0	4	0	1	.119	15
331		14	max	3797.701	1	1514.497	3	0	1	0	1	.189	4	2.583	3
332			min	-3090.406	3	57.992	15	-356.082	4	0	4	0	1	.099	15
333		15	max	3794.595	1	1514.497	3	0	1	0	1	.068	4	2.066	3
334			min	-3092.736	3	57.992	15	-353.39	4	0	4	0	1	.079	15
335		16	max	3791.489	1	1514.497	3	0	1	0	1	0	1	1.55	3
336			min	-3095.066	3	57.992	15	-350.698	4	0	4	-.052	5	.059	15
337		17	max	3788.383	1	1514.497	3	0	1	0	1	0	1	1.033	3
338			min	-3097.395	3	57.992	15	-348.006	4	0	4	-.171	4	.04	15
339		18	max	3785.277	1	1514.497	3	0	1	0	1	0	1	.517	3
340			min	-3099.725	3	57.992	15	-345.314	4	0	4	-.289	4	.02	15
341		19	max	3782.171	1	1514.497	3	0	1	0	1	0	1	0	1
342			min	-3102.054	3	57.992	15	-342.622	4	0	4	-.407	4	0	1
343	M8	1	max	2090.717	1	1082.216	3	308.053	3	.056	4	1.923	4	4.37	3
344			min	-1264.115	3	-845.482	2	-456.171	4	-.019	3	-.507	3	-.11	5
345		2	max	1520.359	1	699.142	3	263.242	3	.001	3	1.731	4	4.054	3
346			min	-1020.308	3	-16.007	5	-402.909	4	-.002	2	-.403	3	-.093	5
347		3	max	1517.253	1	699.142	3	263.242	3	.001	3	1.594	4	3.816	3
348			min	-1022.637	3	-16.007	5	-400.217	4	-.002	2	-.313	3	-.087	5
349		4	max	1514.147	1	699.142	3	263.242	3	.001	3	1.458	4	3.577	3
350			min	-1024.967	3	-16.007	5	-397.525	4	-.002	2	-.223	3	-.082	5
351		5	max	1511.041	1	699.142	3	263.242	3	.001	3	1.323	4	3.339	3
352			min	-1027.296	3	-16.007	5	-394.833	4	-.002	2	-.133	3	-.076	5
353		6	max	1507.935	1	699.142	3	263.242	3	.001	3	1.189	4	3.1	3
354			min	-1029.626	3	-16.007	5	-392.141	4	-.002	2	-.044	3	-.071	5
355		7	max	1504.829	1	699.142	3	263.242	3	.001	3	1.055	4	2.862	3
356			min	-1031.955	3	-16.007	5	-389.449	4	-.002	2	-.017	2	-.066	5
357		8	max	1501.723	1	699.142	3	263.242	3	.001	3	.923	4	2.623	3
358			min	-1034.285	3	-16.007	5	-386.757	4	-.002	2	-.087	2	-.06	5
359		9	max	1498.617	1	699.142	3	263.242	3	.001	3	.799	5	2.385	3
360			min	-1036.615	3	-16.007	5	-384.065	4	-.002	2	-.157	2	-.055	5
361		10	max	1495.511	1	699.142	3	263.242	3	.001	3	.68	5	2.146	3
362			min	-1038.944	3	-16.007	5	-381.373	4	-.002	2	-.226	2	-.049	5
363		11	max	1492.405	1	699.142	3	263.242	3	.001	3	.561	5	1.908	3
364			min	-1041.274	3	-16.007	5	-378.681	4	-.002	2	-.296	2	-.044	5
365		12	max	1489.299	1	699.142	3	263.242	3	.001	3	.495	3	1.669	3
366			min	-1043.603	3	-16.007	5	-375.989	4	-.002	2	-.366	2	-.038	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	1486.192	1	699.142	3	263.242	3	.001	3	.585	3	1.431	3
368			min	-1045.933	3	-16.007	5	-373.297	4	-.002	2	-.435	2	-.033	5
369		14	max	1483.086	1	699.142	3	263.242	3	.001	3	.675	3	1.192	3
370			min	-1048.262	3	-16.007	5	-370.605	4	-.002	2	-.505	2	-.027	5
371		15	max	1479.98	1	699.142	3	263.242	3	.001	3	.765	3	.954	3
372			min	-1050.592	3	-16.007	5	-367.913	4	-.002	2	-.575	2	-.022	5
373		16	max	1476.874	1	699.142	3	263.242	3	.001	3	.854	3	.715	3
374			min	-1052.921	3	-16.007	5	-365.221	4	-.002	2	-.644	2	-.016	5
375		17	max	1473.768	1	699.142	3	263.242	3	.001	3	.944	3	.477	3
376			min	-1055.251	3	-16.007	5	-362.529	4	-.002	2	-.714	2	-.011	5
377		18	max	1470.662	1	699.142	3	263.242	3	.001	3	1.034	3	.238	3
378			min	-1057.581	3	-16.007	5	-359.837	4	-.002	2	-.784	2	-.005	5
379		19	max	1467.556	1	699.142	3	263.242	3	.001	3	1.124	3	0	1
380			min	-1059.91	3	-16.007	5	-357.146	4	-.002	2	-.853	2	0	1
381	M3	1	max	1237.336	2	4.147	6	92.829	2	.006	3	.064	5	0	1
382			min	-451.946	3	.975	15	-45.062	3	-.01	2	-.042	2	0	1
383		2	max	1237.098	2	3.686	6	92.829	2	.006	3	.053	5	0	15
384			min	-452.125	3	.866	15	-45.062	3	-.01	2	-.015	2	-.001	6
385		3	max	1236.86	2	3.225	6	92.829	2	.006	3	.045	4	0	15
386			min	-452.303	3	.758	15	-45.062	3	-.01	2	-.006	3	-.002	6
387		4	max	1236.622	2	2.765	6	92.829	2	.006	3	.039	2	0	15
388			min	-452.482	3	.65	15	-45.062	3	-.01	2	-.019	3	-.003	6
389		5	max	1236.384	2	2.304	6	92.829	2	.006	3	.066	2	0	15
390			min	-452.66	3	.542	15	-45.062	3	-.01	2	-.032	3	-.004	6
391		6	max	1236.146	2	1.843	6	92.829	2	.006	3	.093	2	-.001	15
392			min	-452.839	3	.433	15	-45.062	3	-.01	2	-.045	3	-.004	6
393		7	max	1235.908	2	1.382	6	92.829	2	.006	3	.12	2	-.001	15
394			min	-453.017	3	.325	15	-45.062	3	-.01	2	-.059	3	-.005	6
395		8	max	1235.67	2	.922	6	92.829	2	.006	3	.147	2	-.001	15
396			min	-453.196	3	.217	15	-45.062	3	-.01	2	-.072	3	-.005	6
397		9	max	1235.432	2	.461	6	92.829	2	.006	3	.174	2	-.001	15
398			min	-453.374	3	.108	15	-45.062	3	-.01	2	-.085	3	-.005	6
399		10	max	1235.194	2	0	1	92.829	2	.006	3	.201	2	-.001	15
400			min	-453.553	3	0	1	-45.062	3	-.01	2	-.098	3	-.005	6
401		11	max	1234.956	2	-.108	15	92.829	2	.006	3	.228	2	-.001	15
402			min	-453.731	3	-.461	4	-45.062	3	-.01	2	-.111	3	-.005	6
403		12	max	1234.718	2	-.217	15	92.829	2	.006	3	.255	2	-.001	15
404			min	-453.91	3	-.922	4	-45.062	3	-.01	2	-.124	3	-.005	6
405		13	max	1234.48	2	-.325	15	92.829	2	.006	3	.282	2	-.001	15
406			min	-454.088	3	-1.382	4	-45.062	3	-.01	2	-.137	3	-.005	6
407		14	max	1234.242	2	-.433	15	92.829	2	.006	3	.309	2	-.001	15
408			min	-454.267	3	-1.843	4	-45.062	3	-.01	2	-.15	3	-.004	6
409		15	max	1234.004	2	-.542	15	92.829	2	.006	3	.336	2	0	15
410			min	-454.445	3	-2.304	4	-45.062	3	-.01	2	-.163	3	-.004	6
411		16	max	1233.766	2	-.65	15	92.829	2	.006	3	.363	2	0	15
412			min	-454.624	3	-2.765	4	-45.062	3	-.01	2	-.176	3	-.003	6
413		17	max	1233.528	2	-.758	15	92.829	2	.006	3	.39	2	0	15
414			min	-454.802	3	-3.225	4	-45.062	3	-.01	2	-.189	3	-.002	6
415		18	max	1233.29	2	-.866	15	92.829	2	.006	3	.417	2	0	15
416			min	-454.981	3	-3.686	4	-45.062	3	-.01	2	-.202	3	-.001	6
417		19	max	1233.052	2	-.975	15	92.829	2	.006	3	.444	2	0	1
418			min	-455.159	3	-4.147	4	-45.062	3	-.01	2	-.216	3	0	1
419	M6	1	max	3663.16	2	4.147	4	0	1	0	1	.068	4	0	1
420			min	-1560.321	3	.975	15	-43.921	4	-.005	4	0	1	0	1
421		2	max	3662.922	2	3.686	4	0	1	0	1	.055	4	0	15
422			min	-1560.499	3	.866	15	-43.548	4	-.005	4	0	1	-.001	4
423		3	max	3662.684	2	3.225	4	0	1	0	1	.042	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	-1560.678	3	.758	15	-43.175	4	-.005	4	0	1	-.002	4
425		4	max	3662.446	2	2.765	4	0	1	0	1	.03	4	0	15
426			min	-1560.856	3	.65	15	-42.802	4	-.005	4	0	1	-.003	4
427		5	max	3662.208	2	2.304	4	0	1	0	1	.018	4	0	15
428			min	-1561.035	3	.542	15	-42.428	4	-.005	4	0	1	-.004	4
429		6	max	3661.97	2	1.843	4	0	1	0	1	.005	4	-.001	15
430			min	-1561.213	3	.433	15	-42.055	4	-.005	4	0	1	-.004	4
431		7	max	3661.732	2	1.382	4	0	1	0	1	0	1	-.001	15
432			min	-1561.392	3	.325	15	-41.682	4	-.005	4	-.007	4	-.005	4
433		8	max	3661.494	2	.922	4	0	1	0	1	0	1	-.001	15
434			min	-1561.57	3	.217	15	-41.308	4	-.005	4	-.019	4	-.005	4
435		9	max	3661.256	2	.461	4	0	1	0	1	0	1	-.001	15
436			min	-1561.749	3	.108	15	-40.935	4	-.005	4	-.031	4	-.005	4
437		10	max	3661.018	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1561.927	3	0	1	-40.562	4	-.005	4	-.043	4	-.005	4
439		11	max	3660.78	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1562.106	3	-.461	6	-40.188	4	-.005	4	-.054	4	-.005	4
441		12	max	3660.542	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1562.284	3	-.922	6	-39.815	4	-.005	4	-.066	4	-.005	4
443		13	max	3660.304	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1562.463	3	-1.382	6	-39.442	4	-.005	4	-.077	4	-.005	4
445		14	max	3660.066	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1562.641	3	-1.843	6	-39.068	4	-.005	4	-.089	4	-.004	4
447		15	max	3659.828	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1562.82	3	-2.304	6	-38.695	4	-.005	4	-.1	4	-.004	4
449		16	max	3659.59	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1562.998	3	-2.765	6	-38.322	4	-.005	4	-.111	4	-.003	4
451		17	max	3659.352	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1563.177	3	-3.225	6	-37.948	4	-.005	4	-.122	4	-.002	4
453		18	max	3659.114	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1563.355	3	-3.686	6	-37.575	4	-.005	4	-.133	4	-.001	4
455		19	max	3658.876	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1563.534	3	-4.147	6	-37.202	4	-.005	4	-.144	4	0	1
457	M9	1	max	1237.336	2	4.147	4	45.062	3	.01	2	.072	4	0	1
458			min	-451.946	3	.975	15	-92.829	2	-.006	3	-.02	3	0	1
459		2	max	1237.098	2	3.686	4	45.062	3	.01	2	.057	4	0	15
460			min	-452.125	3	.866	15	-92.829	2	-.006	3	-.007	3	-.001	4
461		3	max	1236.86	2	3.225	4	45.062	3	.01	2	.042	5	0	15
462			min	-452.303	3	.758	15	-92.829	2	-.006	3	-.012	2	-.002	4
463		4	max	1236.622	2	2.765	4	45.062	3	.01	2	.03	5	0	15
464			min	-452.482	3	.65	15	-92.829	2	-.006	3	-.039	2	-.003	4
465		5	max	1236.384	2	2.304	4	45.062	3	.01	2	.032	3	0	15
466			min	-452.66	3	.542	15	-92.829	2	-.006	3	-.066	2	-.004	4
467		6	max	1236.146	2	1.843	4	45.062	3	.01	2	.045	3	-.001	15
468			min	-452.839	3	.433	15	-92.829	2	-.006	3	-.093	2	-.004	4
469		7	max	1235.908	2	1.382	4	45.062	3	.01	2	.059	3	-.001	15
470			min	-453.017	3	.325	15	-92.829	2	-.006	3	-.12	2	-.005	4
471		8	max	1235.67	2	.922	4	45.062	3	.01	2	.072	3	-.001	15
472			min	-453.196	3	.217	15	-92.829	2	-.006	3	-.147	2	-.005	4
473		9	max	1235.432	2	.461	4	45.062	3	.01	2	.085	3	-.001	15
474			min	-453.374	3	.108	15	-92.829	2	-.006	3	-.174	2	-.005	4
475		10	max	1235.194	2	0	1	45.062	3	.01	2	.098	3	-.001	15
476			min	-453.553	3	0	1	-92.829	2	-.006	3	-.201	2	-.005	4
477		11	max	1234.956	2	-.108	15	45.062	3	.01	2	.111	3	-.001	15
478			min	-453.731	3	-.461	6	-92.829	2	-.006	3	-.228	2	-.005	4
479		12	max	1234.718	2	-.217	15	45.062	3	.01	2	.124	3	-.001	15
480			min	-453.91	3	-.922	6	-92.829	2	-.006	3	-.255	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	1234.48	2	-.325	15	45.062	3	.01	2	.137	3	-.001	15
482			min	-454.088	3	-1.382	6	-92.829	2	-.006	3	-.282	2	-.005	4
483		14	max	1234.242	2	-.433	15	45.062	3	.01	2	.15	3	-.001	15
484			min	-454.267	3	-1.843	6	-92.829	2	-.006	3	-.309	2	-.004	4
485		15	max	1234.004	2	-.542	15	45.062	3	.01	2	.163	3	0	15
486			min	-454.445	3	-2.304	6	-92.829	2	-.006	3	-.336	2	-.004	4
487		16	max	1233.766	2	-.65	15	45.062	3	.01	2	.176	3	0	15
488			min	-454.624	3	-2.765	6	-92.829	2	-.006	3	-.363	2	-.003	4
489		17	max	1233.528	2	-.758	15	45.062	3	.01	2	.189	3	0	15
490			min	-454.802	3	-3.225	6	-92.829	2	-.006	3	-.39	2	-.002	4
491		18	max	1233.29	2	-.866	15	45.062	3	.01	2	.202	3	0	15
492			min	-454.981	3	-3.686	6	-92.829	2	-.006	3	-.417	2	-.001	4
493		19	max	1233.052	2	-.975	15	45.062	3	.01	2	.216	3	0	1
494			min	-455.159	3	-4.147	6	-92.829	2	-.006	3	-.444	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	-.018	10	-.032	15	.033	1	1.122e-2	3	NC	3	NC	3
2			min	-.242	3	-.377	1	-.702	5	-2.729e-2	2	323.252	1	314.48	5
3		2	max	-.018	10	-.027	15	.01	1	1.122e-2	3	NC	3	NC	3
4			min	-.242	3	-.306	1	-.673	4	-2.729e-2	2	390.387	1	338.995	5
5		3	max	-.018	10	-.022	15	-.001	12	1.06e-2	3	NC	3	NC	2
6			min	-.242	3	-.234	1	-.645	4	-2.51e-2	2	492.883	1	369.018	5
7		4	max	-.018	10	-.018	15	-.002	12	9.648e-3	3	NC	3	NC	1
8			min	-.242	3	-.166	1	-.61	4	-2.175e-2	2	659.006	1	411.017	5
9		5	max	-.018	10	-.013	15	0	12	8.696e-3	3	NC	3	NC	1
10			min	-.242	3	-.104	1	-.569	4	-1.841e-2	2	833.019	14	469.445	5
11		6	max	-.018	10	-.002	10	0	3	9.188e-3	3	NC	5	NC	2
12			min	-.242	3	-.084	3	-.526	4	-1.802e-2	2	979.798	14	550.192	5
13		7	max	-.018	10	.008	10	.002	3	1.068e-2	3	NC	5	NC	2
14			min	-.242	3	-.066	3	-.483	4	-1.969e-2	2	927.876	2	659.88	5
15		8	max	-.018	10	.023	2	.001	3	1.217e-2	3	NC	5	NC	2
16			min	-.242	3	-.043	3	-.444	4	-2.136e-2	2	844.06	2	809.972	5
17		9	max	-.018	10	.04	1	0	12	1.368e-2	3	NC	1	NC	2
18			min	-.242	3	-.018	3	-.41	4	-2.152e-2	2	792.184	2	1018.74	5
19		10	max	-.018	10	.065	1	0	3	1.521e-2	3	NC	5	NC	3
20			min	-.242	3	.006	15	-.377	4	-1.903e-2	2	751.511	2	1365.403	5
21		11	max	-.018	10	.088	1	.003	3	1.675e-2	3	NC	5	NC	2
22			min	-.242	3	.01	15	-.345	4	-1.654e-2	2	722.555	2	2007.604	5
23		12	max	-.017	10	.109	1	.008	3	1.396e-2	3	NC	5	NC	2
24			min	-.242	3	.013	15	-.319	4	-1.256e-2	2	704.913	2	3424.396	5
25		13	max	-.017	10	.125	1	.013	3	8.731e-3	3	NC	5	NC	2
26			min	-.242	3	.017	15	-.294	4	-7.726e-3	2	605.992	3	5728.122	1
27		14	max	-.017	10	.172	3	.011	3	3.742e-3	3	NC	5	NC	2
28			min	-.242	3	.011	10	-.276	4	-7.674e-3	4	484.708	3	4086.419	1
29		15	max	-.017	10	.246	3	.013	1	9.599e-3	3	NC	5	NC	3
30			min	-.242	3	-.005	10	-.267	5	-7.034e-3	4	382.47	3	3036.416	1
31		16	max	-.017	10	.334	3	.017	1	1.546e-2	3	NC	5	NC	3
32			min	-.242	3	-.025	10	-.266	5	-1.028e-2	2	305.837	3	2812.391	1
33		17	max	-.017	10	.431	3	.01	1	2.131e-2	3	NC	5	NC	3
34			min	-.242	3	-.053	2	-.268	4	-1.388e-2	2	250.621	3	3283.757	1
35		18	max	-.017	10	.531	3	-.001	10	2.513e-2	3	NC	4	NC	2
36			min	-.242	3	-.094	2	-.277	4	-1.623e-2	2	211.152	3	6110.634	1
37		19	max	-.017	10	.63	3	-.004	12	2.513e-2	3	NC	1	NC	1
38			min	-.242	3	-.136	2	-.286	4	-1.623e-2	2	182.45	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	-.02	15	-.035	15	0	1	2.476e-5	5	NC	3	NC	1
40			min	-.522	3	-.84	1	-.7	4	0	1	193.68	1	314.3	4
41		2	max	-.02	15	-.029	15	0	1	2.476e-5	5	NC	10	NC	1
42			min	-.522	3	-.671	1	-.674	4	0	1	256.239	1	334.93	4
43		3	max	-.02	15	-.022	15	0	1	0	1	5903.52	12	NC	1
44			min	-.522	3	-.501	1	-.645	4	-5.221e-4	4	378.983	1	360.417	4
45		4	max	-.02	15	-.016	15	0	1	0	1	6090.347	15	NC	1
46			min	-.522	3	-.339	1	-.61	4	-1.36e-3	4	541.932	9	398.816	4
47		5	max	-.02	15	-.011	15	0	1	0	1	8176.321	15	NC	1
48			min	-.522	3	-.198	1	-.568	4	-2.199e-3	4	400.466	2	454.569	4
49		6	max	-.02	15	0	10	0	1	0	1	NC	15	NC	1
50			min	-.522	3	-.182	3	-.525	4	-2.094e-3	4	315.687	2	533.417	4
51		7	max	-.02	15	.031	2	0	1	0	1	NC	3	NC	1
52			min	-.522	3	-.147	3	-.483	4	-1.336e-3	4	282.129	2	640.87	4
53		8	max	-.02	15	.057	2	0	1	0	1	NC	5	NC	1
54			min	-.523	3	-.1	3	-.444	4	-5.784e-4	4	267.438	2	785.428	4
55		9	max	-.02	15	.084	1	0	1	0	1	NC	4	NC	1
56			min	-.523	3	-.045	3	-.411	4	-1.757e-4	4	259.106	2	977.717	4
57		10	max	-.02	15	.128	1	0	1	0	1	NC	4	NC	1
58			min	-.523	3	.006	15	-.377	4	-4.008e-4	4	252.067	2	1297.376	4
59		11	max	-.02	15	.168	1	0	1	0	1	NC	5	NC	1
60			min	-.523	3	.009	15	-.345	4	-6.259e-4	4	247.05	2	1870.577	4
61		12	max	-.02	15	.203	1	0	1	0	1	NC	5	NC	1
62			min	-.523	3	.011	15	-.318	4	-2.199e-3	4	244.35	2	2982.468	4
63		13	max	-.02	15	.247	3	0	1	0	1	NC	5	NC	1
64			min	-.524	3	.013	15	-.295	4	-4.535e-3	4	247.495	2	6173.056	4
65		14	max	-.02	15	.375	3	0	1	0	1	NC	5	NC	1
66			min	-.524	3	.012	10	-.28	4	-6.783e-3	4	260.684	3	NC	1
67		15	max	-.02	15	.551	3	0	1	0	1	NC	5	NC	1
68			min	-.524	3	-.029	10	-.275	4	-5.101e-3	4	194.141	3	NC	1
69		16	max	-.02	15	.763	3	0	1	0	1	NC	5	NC	1
70			min	-.524	3	-.098	2	-.273	4	-3.418e-3	4	148.486	3	NC	1
71		17	max	-.02	15	.998	3	0	1	0	1	NC	5	NC	1
72			min	-.524	3	-.209	2	-.273	4	-1.736e-3	4	117.864	3	NC	1
73		18	max	-.02	15	1.24	3	0	1	0	1	NC	4	NC	1
74			min	-.524	3	-.327	2	-.273	4	-6.389e-4	4	97.143	3	NC	1
75		19	max	-.02	15	1.482	3	0	1	0	1	NC	1	NC	1
76			min	-.524	3	-.444	2	-.273	4	-6.389e-4	4	82.645	3	NC	1
77	M7	1	max	.005	5	-.004	15	-.004	12	2.729e-2	2	NC	3	NC	3
78			min	-.242	3	-.377	1	-.72	4	-1.122e-2	3	323.252	1	295.088	4
79		2	max	.005	5	-.003	15	-.001	12	2.729e-2	2	NC	3	NC	3
80			min	-.242	3	-.306	1	-.679	4	-1.122e-2	3	390.387	1	323.825	4
81		3	max	.005	5	-.001	15	.01	1	2.51e-2	2	NC	3	NC	2
82			min	-.242	3	-.234	1	-.639	4	-1.06e-2	3	492.883	1	358.821	4
83		4	max	.005	5	0	15	.018	1	2.175e-2	2	NC	3	NC	1
84			min	-.242	3	-.166	1	-.599	5	-9.648e-3	3	659.006	1	402.544	4
85		5	max	.005	5	.001	5	.019	1	1.841e-2	2	NC	3	NC	1
86			min	-.242	3	-.104	1	-.558	5	-8.696e-3	3	850.249	9	458.423	4
87		6	max	.005	5	.002	5	.015	1	1.802e-2	2	NC	5	NC	2
88			min	-.242	3	-.084	3	-.518	4	-9.188e-3	3	1021.8	9	530.865	4
89		7	max	.005	5	.008	10	.007	1	1.969e-2	2	NC	5	NC	2
90			min	-.242	3	-.066	3	-.48	4	-1.068e-2	3	927.876	2	623.536	4
91		8	max	.005	5	.023	2	.002	2	2.136e-2	2	NC	4	NC	2
92			min	-.242	3	-.043	3	-.445	4	-1.217e-2	3	844.06	2	747.462	4
93		9	max	.005	5	.04	1	0	2	2.152e-2	2	NC	1	NC	2
94			min	-.242	3	-.018	3	-.41	4	-1.368e-2	3	792.184	2	925.152	4
95		10	max	.005	5	.065	1	0	2	1.903e-2	2	NC	4	NC	3

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	-.242	3	0	15	-.377	4	-1.521e-2	3	751.511	2	1202.804	4
97		11	max	.005	5	.088	1	.002	2	1.654e-2	2	NC	4	NC	2
98			min	-.242	3	0	15	-.345	4	-1.675e-2	3	722.555	2	1685.718	4
99		12	max	.006	5	.109	1	.008	1	1.256e-2	2	NC	5	NC	2
100			min	-.242	3	0	15	-.315	4	-1.396e-2	3	704.913	2	2685.708	4
101		13	max	.006	5	.125	1	.009	2	7.726e-3	2	NC	5	NC	2
102			min	-.242	3	-.002	5	-.292	4	-8.731e-3	3	605.992	3	5083.691	4
103		14	max	.006	5	.172	3	.003	2	3.1e-3	1	NC	5	NC	2
104			min	-.242	3	-.004	5	-.279	4	-6.766e-3	5	484.708	3	4086.419	1
105		15	max	.006	5	.246	3	-.002	10	6.681e-3	2	NC	5	NC	3
106			min	-.242	3	-.007	5	-.276	4	-9.599e-3	3	382.47	3	3036.416	1
107		16	max	.005	5	.334	3	-.001	12	1.028e-2	2	NC	5	NC	3
108			min	-.242	3	-.025	10	-.275	4	-1.546e-2	3	305.837	3	2812.391	1
109		17	max	.005	5	.431	3	0	12	1.388e-2	2	NC	4	NC	3
110			min	-.242	3	-.053	2	-.274	4	-2.131e-2	3	250.621	3	3283.757	1
111		18	max	.005	5	.531	3	.009	1	1.623e-2	2	NC	4	NC	2
112			min	-.242	3	-.094	2	-.27	4	-2.513e-2	3	211.152	3	6110.634	1
113		19	max	.005	5	.63	3	.031	1	1.623e-2	2	NC	1	NC	1
114			min	-.242	3	-.136	2	-.27	5	-2.513e-2	3	182.45	3	NC	1
115	M10	1	max	.001	3	.496	3	.242	3	1.341e-2	3	NC	1	NC	1
116			min	-.272	4	-.08	2	-.005	5	-5.59e-3	2	NC	1	NC	1
117		2	max	.001	3	.914	3	.283	1	1.553e-2	3	NC	4	NC	3
118			min	-.272	4	-.348	2	0	15	-6.716e-3	2	688.293	3	3144.541	1
119		3	max	.001	3	1.305	3	.417	1	1.765e-2	3	NC	5	NC	5
120			min	-.272	4	-.592	2	.007	15	-7.842e-3	2	355.846	3	1272.661	1
121		4	max	0	3	1.599	3	.54	1	1.978e-2	3	NC	5	NC	5
122			min	-.272	4	-.764	2	.016	15	-8.968e-3	2	260.986	3	824.236	1
123		5	max	0	3	1.757	3	.616	1	2.19e-2	3	NC	5	NC	15
124			min	-.273	4	-.837	2	.023	15	-1.009e-2	2	228.378	3	677.817	1
125		6	max	0	3	1.767	3	.626	1	2.402e-2	3	NC	5	NC	15
126			min	-.273	4	-.807	2	.027	15	-1.122e-2	2	226.5	3	661.521	1
127		7	max	0	3	1.65	3	.573	1	2.614e-2	3	NC	5	NC	15
128			min	-.273	4	-.69	2	.028	15	-1.235e-2	2	249.623	3	753.702	1
129		8	max	0	3	1.452	3	.504	3	2.826e-2	3	NC	5	NC	5
130			min	-.273	4	-.522	2	.026	15	-1.347e-2	2	301.269	3	1010.092	1
131		9	max	0	3	1.252	3	.519	3	3.038e-2	3	NC	4	NC	5
132			min	-.273	4	-.361	2	.022	15	-1.46e-2	2	381.066	3	1039.201	3
133		10	max	0	1	1.156	3	.524	3	3.25e-2	3	NC	4	NC	5
134			min	-.273	4	-.286	2	.02	15	-1.572e-2	2	436.261	3	1021.644	3
135		11	max	0	10	1.252	3	.519	3	3.038e-2	3	NC	4	NC	5
136			min	-.273	4	-.361	2	.023	15	-1.46e-2	2	381.066	3	1039.201	3
137		12	max	0	10	1.452	3	.504	3	2.826e-2	3	NC	5	NC	5
138			min	-.273	4	-.522	2	.031	15	-1.347e-2	2	301.269	3	1010.092	1
139		13	max	0	10	1.65	3	.573	1	2.614e-2	3	NC	15	NC	15
140			min	-.273	4	-.69	2	.039	15	-1.235e-2	2	249.623	3	753.702	1
141		14	max	0	10	1.767	3	.626	1	2.402e-2	3	8063.062	15	NC	15
142			min	-.273	4	-.807	2	.046	15	-1.122e-2	2	226.5	3	661.521	1
143		15	max	0	10	1.757	3	.616	1	2.19e-2	3	6547.405	15	NC	15
144			min	-.273	4	-.837	2	.049	15	-1.009e-2	2	228.378	3	677.817	1
145		16	max	0	10	1.599	3	.54	1	1.978e-2	3	6270.753	15	NC	15
146			min	-.273	4	-.764	2	.048	15	-8.968e-3	2	260.986	3	824.236	1
147		17	max	0	10	1.305	3	.417	1	1.765e-2	3	7237.09	15	NC	5
148			min	-.273	4	-.592	2	.043	15	-7.842e-3	2	355.846	3	1272.661	1
149		18	max	0	10	.914	3	.283	1	1.553e-2	3	NC	15	NC	3
150			min	-.273	4	-.348	2	.031	10	-6.716e-3	2	688.293	3	3144.541	1
151		19	max	0	10	.496	3	.242	3	1.341e-2	3	NC	1	NC	1
152			min	-.273	4	-.08	2	.017	10	-5.59e-3	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.004	1	.096	1	.242	3	4.574e-3	3	NC	1	NC	1
154			min	-.334	4	0	15	-.005	5	-1.153e-4	5	NC	1	NC	1
155		2	max	.003	1	.351	3	.26	1	5.159e-3	3	NC	4	NC	3
156			min	-.334	4	-.2	2	.028	15	-4.804e-5	5	964.249	3	4230.826	1
157		3	max	.003	1	.634	3	.382	1	5.744e-3	3	NC	5	NC	12
158			min	-.334	4	-.417	2	.044	15	1.051e-6	10	495.481	3	1512.891	1
159		4	max	.003	1	.832	3	.502	1	6.329e-3	3	NC	5	6492.711	15
160			min	-.334	4	-.553	2	.046	15	-1.729e-5	10	369.605	3	929.223	1
161		5	max	.002	1	.906	3	.58	1	6.914e-3	3	NC	5	8583.479	15
162			min	-.334	4	-.587	2	.037	15	-3.563e-5	10	337.474	3	741.273	1
163		6	max	.002	1	.847	3	.598	1	7.499e-3	3	NC	5	NC	5
164			min	-.334	4	-.518	2	.021	15	-5.397e-5	10	362.703	3	708.454	1
165		7	max	.001	1	.673	3	.555	1	8.084e-3	3	NC	5	NC	5
166			min	-.335	4	-.363	2	.005	15	-7.232e-5	10	463.984	3	793.376	1
167		8	max	0	1	.435	3	.497	3	8.668e-3	3	NC	5	NC	5
168			min	-.335	4	-.164	2	-.007	5	-9.066e-5	10	753.209	3	1044.517	1
169		9	max	0	1	.21	3	.517	3	9.253e-3	3	NC	1	NC	4
170			min	-.335	4	-.002	10	-.004	5	-1.09e-4	10	1830.749	3	1047.202	3
171		10	max	0	1	.181	1	.523	3	9.838e-3	3	NC	4	NC	5
172			min	-.335	4	.01	15	.02	15	-1.273e-4	10	3383.98	1	1023.286	3
173		11	max	0	3	.21	3	.517	3	9.253e-3	3	NC	1	NC	10
174			min	-.335	4	-.002	10	.031	10	-1.09e-4	10	1830.749	3	1047.202	3
175		12	max	0	3	.435	3	.497	3	8.668e-3	3	NC	5	9421.093	10
176			min	-.335	4	-.164	2	.048	10	-9.066e-5	10	753.209	3	1044.517	1
177		13	max	.001	3	.673	3	.555	1	8.084e-3	3	NC	5	6806.27	15
178			min	-.335	4	-.363	2	.06	15	-7.232e-5	10	463.984	3	793.376	1
179		14	max	.002	3	.847	3	.598	1	7.499e-3	3	9022.633	15	NC	15
180			min	-.335	4	-.518	2	.049	15	-5.397e-5	10	362.703	3	708.454	1
181		15	max	.002	3	.906	3	.58	1	6.914e-3	3	6865.55	15	NC	5
182			min	-.335	4	-.587	2	.031	15	-3.563e-5	10	337.474	3	741.273	1
183		16	max	.003	3	.832	3	.502	1	6.329e-3	3	6324.209	15	NC	5
184			min	-.335	4	-.553	2	.013	15	-1.729e-5	10	369.605	3	929.223	1
185		17	max	.003	3	.634	3	.382	1	5.744e-3	3	7101.186	15	NC	4
186			min	-.335	4	-.417	2	.002	15	1.051e-6	10	495.481	3	1512.891	1
187		18	max	.004	3	.351	3	.26	1	5.159e-3	3	NC	15	NC	3
188			min	-.335	4	-.2	2	.004	15	1.939e-5	10	964.249	3	4230.826	1
189		19	max	.004	3	.096	1	.242	3	4.574e-3	3	NC	1	NC	1
190			min	-.336	4	.011	15	.018	10	3.773e-5	10	NC	1	NC	1
191	M12	1	max	0	2	.03	1	.242	3	3.58e-3	1	NC	1	NC	1
192			min	-.422	4	-.027	3	-.005	5	-6.621e-5	5	NC	1	NC	1
193		2	max	0	2	.175	3	.259	3	3.894e-3	3	NC	5	NC	2
194			min	-.422	4	-.336	2	.025	10	-6.055e-6	15	788.984	2	4235.162	4
195		3	max	0	2	.337	3	.369	1	4.333e-3	3	NC	5	NC	10
196			min	-.422	4	-.654	2	.041	10	4.156e-5	15	421.259	2	1633.569	1
197		4	max	0	2	.433	3	.487	1	4.773e-3	3	NC	5	7436.856	10
198			min	-.422	4	-.86	2	.05	15	8.917e-5	15	323.808	2	977.652	1
199		5	max	0	2	.452	3	.567	1	5.212e-3	3	NC	5	8406.858	15
200			min	-.422	4	-.918	2	.037	15	1.368e-4	15	304.121	2	768.988	1
201		6	max	0	2	.394	3	.588	1	5.652e-3	3	NC	5	NC	5
202			min	-.422	4	-.823	2	.018	15	1.844e-4	15	337.903	2	727.974	1
203		7	max	0	2	.276	3	.549	1	6.091e-3	3	NC	5	NC	5
204			min	-.422	4	-.603	2	0	15	2.32e-4	15	455.326	2	808.833	1
205		8	max	0	2	.128	3	.501	3	6.531e-3	3	NC	5	NC	10
206			min	-.422	4	-.316	2	-.018	5	2.796e-4	15	832.544	2	1056.015	1
207		9	max	0	2	0	5	.518	3	6.97e-3	3	NC	3	NC	4
208			min	-.422	4	-.053	2	-.012	5	3.272e-4	15	3507.693	2	1044.109	3
209		10	max	0	1	.068	1	.523	3	7.409e-3	3	NC	4	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.422	4	-.065	3	.02	15	3.748e-4	15	7539.968	2	1024.971	3
211		11	max	0	9	-.001	15	.518	3	6.97e-3	3	NC	3	NC	10
212			min	-.422	4	-.053	2	.032	10	3.892e-4	15	3507.693	2	1044.109	3
213		12	max	0	9	.128	3	.501	3	6.531e-3	3	NC	5	NC	10
214			min	-.422	4	-.316	2	.046	10	4.036e-4	15	832.544	2	1056.015	1
215		13	max	0	9	.276	3	.549	1	6.091e-3	3	NC	15	6762.223	10
216			min	-.422	4	-.603	2	.06	10	4.18e-4	15	455.326	2	808.833	1
217		14	max	0	9	.394	3	.588	1	5.652e-3	3	8407.143	15	9247.639	15
218			min	-.422	4	-.823	2	.051	15	4.324e-4	15	337.903	2	727.974	1
219		15	max	0	9	.452	3	.567	1	5.212e-3	3	7072.092	15	NC	5
220			min	-.422	4	-.918	2	.029	15	4.468e-4	15	304.121	2	768.988	1
221		16	max	0	9	.433	3	.487	1	4.773e-3	3	6969.192	15	NC	5
222			min	-.422	4	-.86	2	.008	15	4.612e-4	15	323.808	2	977.652	1
223		17	max	0	9	.337	3	.369	1	4.333e-3	3	8252.175	15	NC	4
224			min	-.422	4	-.654	2	-.006	5	4.756e-4	15	421.259	2	1633.569	1
225		18	max	0	9	.175	3	.259	3	3.894e-3	3	NC	15	NC	2
226			min	-.422	4	-.336	2	-.001	15	4.634e-4	10	788.984	2	4895.461	1
227		19	max	0	9	.03	1	.242	3	3.58e-3	1	NC	1	NC	1
228			min	-.422	4	-.027	3	.018	10	4.457e-4	10	NC	1	NC	1
229	M13	1	max	0	12	-.002	15	.242	3	9.575e-3	1	NC	1	NC	1
230			min	-.665	4	-.281	1	-.005	5	8.523e-5	3	NC	1	NC	1
231		2	max	0	12	.074	3	.287	1	1.103e-2	1	NC	5	NC	3
232			min	-.665	4	-.657	1	.033	10	-2.121e-4	3	657.322	2	3093.165	1
233		3	max	0	12	.221	3	.423	1	1.249e-2	1	NC	5	8304.449	10
234			min	-.665	4	-1.024	2	.053	10	-5.094e-4	3	350.964	2	1258.171	1
235		4	max	0	12	.31	3	.546	1	1.395e-2	1	NC	5	5546.332	10
236			min	-.665	4	-1.285	2	.057	15	-8.067e-4	3	266.407	2	816.47	1
237		5	max	0	12	.328	3	.622	1	1.54e-2	1	NC	5	6508.761	15
238			min	-.665	4	-1.388	2	.047	15	-1.104e-3	3	243.159	2	671.9	1
239		6	max	0	12	.273	3	.633	1	1.686e-2	1	NC	15	NC	15
240			min	-.665	4	-1.331	2	.03	15	-1.401e-3	3	255.597	2	655.603	1
241		7	max	0	12	.161	3	.58	1	1.832e-2	1	NC	15	NC	5
242			min	-.665	4	-1.139	2	.011	15	-1.699e-3	3	307.871	2	745.978	1
243		8	max	0	12	.02	3	.502	3	1.977e-2	1	NC	5	NC	5
244			min	-.665	4	-.912	1	-.003	15	-1.996e-3	3	430.502	2	996.495	1
245		9	max	0	12	-.028	15	.517	3	2.123e-2	1	NC	3	NC	5
246			min	-.665	4	-.707	1	-.003	15	-2.293e-3	3	675.546	1	1044.122	3
247		10	max	0	1	-.027	15	.522	3	2.269e-2	1	NC	5	NC	5
248			min	-.665	4	-.612	1	.02	15	-2.591e-3	3	869.553	1	1026.96	3
249		11	max	0	1	-.031	15	.517	3	2.123e-2	1	NC	3	NC	10
250			min	-.664	4	-.707	1	.034	10	-2.293e-3	3	675.546	1	1044.122	3
251		12	max	0	1	.02	3	.502	3	1.977e-2	1	NC	15	8833.249	10
252			min	-.664	4	-.912	1	.051	10	-1.996e-3	3	430.502	2	996.495	1
253		13	max	0	1	.161	3	.58	1	1.832e-2	1	8509.533	15	7316.054	15
254			min	-.664	4	-1.139	2	.057	15	-1.699e-3	3	307.871	2	745.978	1
255		14	max	0	1	.273	3	.633	1	1.686e-2	1	6876.322	15	NC	15
256			min	-.664	4	-1.331	2	.044	15	-1.401e-3	3	255.597	2	655.603	1
257		15	max	.001	1	.328	3	.622	1	1.54e-2	1	6277.185	15	NC	5
258			min	-.664	4	-1.388	2	.025	15	-1.104e-3	3	243.159	2	671.9	1
259		16	max	.001	1	.31	3	.546	1	1.395e-2	1	6513.847	15	NC	5
260			min	-.664	4	-1.285	2	.007	15	-8.067e-4	3	266.407	2	816.47	1
261		17	max	.002	1	.221	3	.423	1	1.249e-2	1	8001.673	15	NC	4
262			min	-.664	4	-1.024	2	-.005	5	-5.094e-4	3	350.964	2	1258.171	1
263		18	max	.002	1	.074	3	.287	1	1.103e-2	1	NC	15	NC	3
264			min	-.664	4	-.657	1	0	15	-2.121e-4	3	657.322	2	3093.165	1
265		19	max	.002	1	-.026	15	.242	3	9.575e-3	1	NC	1	NC	1
266			min	-.664	4	-.281	1	.018	10	8.523e-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	7.43e-3	2	NC	1	NC	1
270			min	0	1	-.002	3	0	2	-9.694e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.006	5	6.819e-3	2	NC	1	NC	1
272			min	0	1	-.006	3	-.001	2	-9.433e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.012	5	6.208e-3	2	NC	2	NC	1
274			min	0	1	-.012	3	-.003	2	-9.171e-3	5	6142.203	3	6111.954	5
275		5	max	0	3	-.001	10	.021	5	5.597e-3	2	NC	2	NC	1
276			min	0	1	-.021	3	-.004	2	-8.91e-3	5	3557.049	3	3544.165	5
277		6	max	0	3	-.002	10	.032	5	4.986e-3	2	NC	5	NC	1
278			min	0	1	-.032	3	-.006	1	-8.648e-3	5	2335.651	3	2334.252	5
279		7	max	0	3	-.003	10	.044	5	4.375e-3	2	NC	10	NC	9
280			min	0	1	-.044	3	-.008	1	-8.387e-3	5	1661.665	3	1667.146	5
281		8	max	0	3	-.004	10	.059	5	3.764e-3	2	NC	10	NC	9
282			min	0	1	-.059	3	-.01	1	-8.126e-3	5	1249.722	3	1259.421	5
283		9	max	0	3	-.005	10	.074	5	3.153e-3	2	NC	10	NC	9
284			min	0	1	-.075	3	-.012	1	-7.864e-3	5	979.321	3	991.694	5
285		10	max	0	3	-.006	10	.091	5	2.542e-3	2	NC	10	NC	9
286			min	0	1	-.093	3	-.013	1	-7.603e-3	5	792.055	3	806.191	5
287		11	max	0	3	-.008	10	.11	5	1.931e-3	2	9689.764	10	NC	9
288			min	0	1	-.112	3	-.015	1	-7.341e-3	5	656.856	3	672.205	5
289		12	max	0	3	-.009	10	.129	5	1.321e-3	2	8174.852	10	NC	9
290			min	-.001	1	-.133	3	-.016	1	-7.15e-3	4	555.968	3	572.192	5
291		13	max	0	3	-.01	10	.149	5	7.3e-4	3	7019.458	10	NC	9
292			min	-.001	1	-.154	3	-.016	1	-6.969e-3	4	478.635	3	495.527	5
293		14	max	0	3	-.012	10	.169	5	1.128e-3	3	6117.473	10	NC	9
294			min	-.001	1	-.176	3	-.016	1	-6.787e-3	4	418.016	3	435.454	5
295		15	max	0	3	-.014	10	.19	5	1.525e-3	3	5399.793	10	NC	9
296			min	-.001	1	-.199	3	-.015	1	-6.606e-3	4	369.621	3	387.533	5
297		16	max	0	3	-.015	10	.211	5	1.923e-3	3	4819.395	10	NC	9
298			min	-.001	1	-.223	3	-.013	1	-6.424e-3	4	330.372	3	348.721	5
299		17	max	.001	3	-.017	10	.233	4	2.321e-3	3	4343.478	10	NC	9
300			min	-.002	1	-.247	3	-.01	1	-6.243e-3	4	298.111	3	316.71	4
301		18	max	.001	3	-.019	10	.254	4	2.718e-3	3	3948.601	10	NC	1
302			min	-.002	1	-.272	3	-.007	1	-6.062e-3	4	271.288	3	289.543	4
303		19	max	.001	3	-.02	10	.276	4	3.116e-3	3	3617.643	10	NC	1
304			min	-.002	1	-.296	3	-.011	3	-5.88e-3	4	248.766	3	266.772	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	.002	4	0	1	NC	1	NC	1
308			min	0	1	-.003	3	0	1	-1.048e-2	4	NC	1	NC	1
309		3	max	0	3	0	10	.006	4	0	1	NC	1	NC	1
310			min	0	1	-.012	3	0	1	-1.015e-2	4	6094.74	3	NC	1
311		4	max	0	3	0	10	.013	4	0	1	NC	2	NC	1
312			min	0	1	-.026	3	0	1	-9.815e-3	4	2824.285	3	5797.033	4
313		5	max	0	3	-.001	10	.022	4	0	1	NC	5	NC	1
314			min	-.001	1	-.045	3	0	1	-9.485e-3	4	1637.607	3	3366.199	4
315		6	max	.001	3	-.002	10	.033	4	0	1	NC	5	NC	1
316			min	-.001	1	-.068	3	0	1	-9.154e-3	4	1075.996	3	2220.178	4
317		7	max	.001	3	-.004	10	.046	4	0	1	NC	5	NC	1
318			min	-.002	1	-.096	3	0	1	-8.824e-3	4	765.804	3	1588.009	4
319		8	max	.001	3	-.005	10	.061	4	0	1	NC	10	NC	1
320			min	-.002	1	-.128	3	0	1	-8.494e-3	4	576.105	3	1201.498	4
321		9	max	.002	3	-.006	15	.078	4	0	1	NC	10	NC	1
322			min	-.002	1	-.163	3	0	1	-8.163e-3	4	451.538	3	947.631	4
323		10	max	.002	3	-.008	15	.095	4	0	1	9605.241	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	1	-.202	3	0	1	-7.833e-3	4	365.245	3	771.699	4
325		11	max	.002	3	-.009	15	.114	4	0	1	7961.089	15	NC	1
326			min	-.002	1	-.243	3	0	1	-7.502e-3	4	302.932	3	644.622	4
327		12	max	.002	3	-.011	15	.134	4	0	1	6735.271	15	NC	1
328			min	-.003	1	-.287	3	0	1	-7.172e-3	4	256.425	3	549.778	4
329		13	max	.002	3	-.013	15	.154	4	0	1	5796.305	15	NC	1
330			min	-.003	1	-.334	3	0	1	-6.842e-3	4	220.772	3	477.098	4
331		14	max	.003	3	-.015	15	.175	4	0	1	5060.705	15	NC	1
332			min	-.003	1	-.382	3	0	1	-6.511e-3	4	192.822	3	420.183	4
333		15	max	.003	3	-.016	15	.197	4	0	1	4473.713	15	NC	1
334			min	-.003	1	-.432	3	0	1	-6.181e-3	4	170.506	3	374.82	4
335		16	max	.003	3	-.018	15	.218	4	0	1	3997.849	15	NC	1
336			min	-.004	1	-.483	3	0	1	-5.851e-3	4	152.406	3	338.129	4
337		17	max	.003	3	-.02	15	.239	4	0	1	3606.841	15	NC	1
338			min	-.004	1	-.536	3	0	1	-5.52e-3	4	137.528	3	308.088	4
339		18	max	.003	3	-.022	15	.26	4	0	1	3281.834	15	NC	1
340			min	-.004	1	-.589	3	0	1	-5.19e-3	4	125.157	3	283.248	4
341		19	max	.004	3	-.024	15	.281	4	0	1	3009.012	15	NC	1
342			min	-.004	1	-.642	3	0	1	-4.859e-3	4	114.769	3	262.548	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	.002	4	3.644e-3	3	NC	1	NC	1
346			min	0	1	-.002	3	0	3	-1.111e-2	4	NC	1	NC	1
347		3	max	0	3	0	5	.006	4	3.247e-3	3	NC	1	NC	1
348			min	0	1	-.006	3	-.002	3	-1.071e-2	4	NC	1	NC	1
349		4	max	0	3	0	5	.013	4	2.849e-3	3	NC	2	NC	1
350			min	0	1	-.012	3	-.003	3	-1.031e-2	4	6142.203	3	5728.155	4
351		5	max	0	3	0	5	.022	4	2.451e-3	3	NC	2	NC	1
352			min	0	1	-.021	3	-.005	3	-9.904e-3	4	3557.049	3	3329.516	4
353		6	max	0	3	0	5	.034	4	2.054e-3	3	NC	4	NC	1
354			min	0	1	-.032	3	-.007	3	-9.503e-3	4	2335.651	3	2197.993	4
355		7	max	0	3	.001	5	.047	4	1.656e-3	3	NC	5	NC	9
356			min	0	1	-.044	3	-.009	3	-9.101e-3	4	1661.665	3	1573.55	4
357		8	max	0	3	.001	5	.062	4	1.258e-3	3	NC	5	NC	9
358			min	0	1	-.059	3	-.012	3	-8.7e-3	4	1249.722	3	1191.642	4
359		9	max	0	3	.002	5	.078	4	8.606e-4	3	NC	5	NC	9
360			min	0	1	-.075	3	-.013	3	-8.299e-3	4	979.321	3	940.738	4
361		10	max	0	3	.002	5	.096	4	4.63e-4	3	NC	5	NC	9
362			min	0	1	-.093	3	-.015	3	-7.898e-3	4	792.055	3	766.834	4
363		11	max	0	3	.003	5	.115	4	6.532e-5	3	NC	5	NC	9
364			min	0	1	-.112	3	-.016	3	-7.497e-3	4	656.856	3	641.214	4
365		12	max	0	3	.003	5	.135	4	5.372e-5	9	NC	5	NC	9
366			min	-.001	1	-.133	3	-.016	3	-7.096e-3	4	555.968	3	547.462	4
367		13	max	0	3	.004	5	.155	4	2.697e-4	9	NC	5	NC	9
368			min	-.001	1	-.154	3	-.016	3	-6.749e-3	5	478.635	3	475.631	4
369		14	max	0	3	.004	5	.176	4	5.217e-4	1	NC	5	NC	9
370			min	-.001	1	-.176	3	-.015	3	-6.432e-3	5	418.016	3	419.401	4
371		15	max	0	3	.005	5	.197	4	1.081e-3	1	NC	5	NC	9
372			min	-.001	1	-.199	3	-.012	3	-6.115e-3	5	369.621	3	374.608	4
373		16	max	0	3	.005	5	.218	4	1.641e-3	1	NC	5	NC	9
374			min	-.001	1	-.223	3	-.009	3	-5.797e-3	5	330.372	3	338.405	4
375		17	max	.001	3	.006	5	.239	4	2.201e-3	1	NC	5	NC	9
376			min	-.002	1	-.247	3	-.004	3	-5.48e-3	5	298.111	3	308.798	4
377		18	max	.001	3	.006	5	.259	4	2.761e-3	1	NC	5	NC	1
378			min	-.002	1	-.272	3	0	10	-5.163e-3	5	271.288	3	284.354	4
379		19	max	.001	3	.007	5	.279	4	3.32e-3	1	NC	5	NC	1
380			min	-.002	1	-.296	3	-.004	2	-4.846e-3	5	248.766	3	264.026	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	4.165e-3	2	NC	1	NC	1
382			min	0	10	0	3	0	2	-5.076e-3	5	NC	1	NC	1
383		2	max	0	3	-.002	10	.03	5	4.282e-3	2	NC	1	NC	4
384			min	0	2	-.015	3	-.023	2	-5.005e-3	5	NC	1	2371.098	6
385		3	max	0	3	-.003	10	.062	5	4.398e-3	2	NC	1	NC	4
386			min	0	2	-.03	3	-.046	2	-4.933e-3	5	NC	1	1161.979	6
387		4	max	0	3	-.005	10	.094	5	4.515e-3	2	NC	1	NC	4
388			min	-.001	2	-.044	3	-.069	2	-4.862e-3	5	NC	1	760.876	6
389		5	max	.001	3	-.006	10	.126	5	4.632e-3	2	NC	1	NC	4
390			min	-.002	2	-.059	3	-.091	2	-4.791e-3	5	NC	1	561.635	6
391		6	max	.001	3	-.008	10	.159	5	4.749e-3	2	NC	1	NC	4
392			min	-.002	2	-.074	3	-.112	2	-4.72e-3	5	NC	1	443.045	6
393		7	max	.001	3	-.009	10	.193	5	4.866e-3	2	NC	1	NC	4
394			min	-.003	2	-.088	3	-.131	2	-4.649e-3	5	NC	1	364.716	6
395		8	max	.002	3	-.011	10	.227	5	4.983e-3	2	NC	1	NC	4
396			min	-.003	2	-.103	3	-.147	2	-4.578e-3	5	NC	1	309.345	6
397		9	max	.002	3	-.012	10	.26	5	5.099e-3	2	NC	1	NC	4
398			min	-.003	2	-.117	3	-.16	2	-4.506e-3	5	NC	1	268.29	6
399		10	max	.002	3	-.013	10	.293	5	5.216e-3	2	NC	1	NC	4
400			min	-.004	2	-.132	3	-.169	2	-4.435e-3	5	NC	1	236.752	6
401		11	max	.002	3	-.014	10	.326	5	5.333e-3	2	NC	1	NC	4
402			min	-.004	2	-.146	3	-.174	2	-4.364e-3	5	NC	1	211.858	6
403		12	max	.002	3	-.015	10	.358	5	5.45e-3	2	NC	1	NC	4
404			min	-.005	2	-.16	3	-.174	2	-4.293e-3	5	NC	1	191.783	6
405		13	max	.002	3	-.016	10	.388	5	5.567e-3	2	NC	1	NC	4
406			min	-.005	2	-.174	3	-.168	2	-4.222e-3	5	NC	1	175.311	6
407		14	max	.002	3	-.017	10	.418	5	5.683e-3	2	NC	1	9543.098	4
408			min	-.005	2	-.188	3	-.157	2	-4.15e-3	5	NC	1	161.604	6
409		15	max	.003	3	-.018	10	.447	5	5.8e-3	2	NC	1	9119.154	4
410			min	-.006	2	-.202	3	-.139	2	-4.079e-3	5	NC	1	150.066	6
411		16	max	.003	3	-.019	10	.474	5	5.917e-3	2	NC	1	9743.385	13
412			min	-.006	2	-.216	3	-.113	2	-4.008e-3	5	NC	1	140.259	6
413		17	max	.003	3	-.02	10	.499	5	6.034e-3	2	NC	1	NC	4
414			min	-.007	2	-.23	3	-.08	2	-3.937e-3	5	NC	1	131.858	6
415		18	max	.003	3	-.021	10	.524	4	6.151e-3	2	NC	1	NC	4
416			min	-.007	2	-.244	3	-.039	2	-3.866e-3	5	NC	1	124.616	6
417		19	max	.003	3	-.021	10	.552	4	6.268e-3	2	NC	1	NC	1
418			min	-.007	2	-.258	3	0	12	-3.794e-3	5	NC	1	118.341	6
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-5.504e-3	4	NC	1	NC	1
421		2	max	.002	3	-.001	15	.033	4	0	1	NC	1	NC	1
422			min	-.001	2	-.032	3	0	1	-5.451e-3	4	NC	1	NC	1
423		3	max	.002	3	-.003	15	.066	4	0	1	NC	1	NC	1
424			min	-.003	2	-.063	3	0	1	-5.398e-3	4	NC	1	NC	1
425		4	max	.003	3	-.004	15	.101	4	0	1	NC	1	NC	1
426			min	-.004	2	-.094	3	0	1	-5.344e-3	4	NC	1	7207.976	4
427		5	max	.003	3	-.006	15	.136	4	0	1	NC	1	NC	1
428			min	-.005	2	-.126	3	0	1	-5.291e-3	4	NC	1	4734.303	4
429		6	max	.004	3	-.007	15	.172	4	0	1	NC	1	NC	1
430			min	-.006	2	-.157	3	0	1	-5.237e-3	4	NC	1	3451.299	4
431		7	max	.004	3	-.008	15	.207	4	0	1	NC	1	NC	1
432			min	-.008	2	-.188	3	0	1	-5.184e-3	4	NC	1	2701.958	4
433		8	max	.005	3	-.01	15	.243	4	0	1	NC	1	NC	1
434			min	-.009	2	-.219	3	0	1	-5.131e-3	4	NC	1	2231.488	4
435		9	max	.005	3	-.011	15	.278	4	0	1	NC	1	NC	1
436			min	-.01	2	-.25	3	0	1	-5.077e-3	4	NC	1	1924.148	4
437		10	max	.006	3	-.012	15	.312	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	-.011	2	-.281	3	0	1	-5.024e-3	4	NC	1	1721.905	4
439		11	max	.006	3	-.013	15	.345	4	0	1	NC	1	NC	1
440			min	-.012	2	-.312	3	0	1	-4.971e-3	4	NC	1	1594.37	4
441		12	max	.007	3	-.014	15	.378	4	0	1	NC	1	NC	1
442			min	-.014	2	-.343	3	0	1	-4.917e-3	4	NC	1	1526.572	4
443		13	max	.007	3	-.016	15	.409	4	0	1	NC	1	NC	1
444			min	-.015	2	-.373	3	0	1	-4.864e-3	4	NC	1	1514.365	4
445		14	max	.008	3	-.017	15	.438	4	0	1	NC	1	NC	1
446			min	-.016	2	-.404	3	0	1	-4.81e-3	4	NC	1	1564.676	4
447		15	max	.009	3	-.018	15	.465	4	0	1	NC	1	NC	1
448			min	-.017	2	-.435	3	0	1	-4.757e-3	4	NC	1	1702.236	4
449		16	max	.009	3	-.019	15	.49	4	0	1	NC	1	NC	1
450			min	-.019	2	-.465	3	0	1	-4.704e-3	4	NC	1	1993.874	4
451		17	max	.01	3	-.02	15	.513	4	0	1	NC	1	NC	1
452			min	-.02	2	-.496	3	0	1	-4.65e-3	4	NC	1	2648.977	4
453		18	max	.01	3	-.021	15	.533	4	0	1	NC	1	NC	1
454			min	-.021	2	-.526	3	0	1	-4.597e-3	4	NC	1	4726.425	4
455		19	max	.011	3	-.022	15	.551	4	0	1	NC	1	NC	1
456			min	-.022	2	-.557	3	0	1	-4.543e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	2.011e-3	3	NC	1	NC	1
458			min	0	10	0	3	0	3	-5.864e-3	4	NC	1	NC	1
459		2	max	0	3	0	15	.035	4	2.086e-3	3	NC	1	NC	4
460			min	0	2	-.015	3	-.012	3	-5.803e-3	4	NC	1	2660.97	2
461		3	max	0	3	0	15	.07	4	2.16e-3	3	NC	1	NC	5
462			min	0	2	-.03	3	-.023	3	-5.743e-3	4	NC	1	1321.708	2
463		4	max	0	3	0	15	.107	4	2.234e-3	3	NC	1	NC	15
464			min	-.001	2	-.044	3	-.035	3	-5.682e-3	4	NC	1	882.491	2
465		5	max	.001	3	0	15	.144	4	2.309e-3	3	NC	1	7642.508	15
466			min	-.002	2	-.059	3	-.046	3	-5.621e-3	4	NC	1	668.335	2
467		6	max	.001	3	0	15	.181	4	2.383e-3	3	NC	1	5525.571	15
468			min	-.002	2	-.074	3	-.056	3	-5.56e-3	4	NC	1	544.464	2
469		7	max	.001	3	0	5	.218	4	2.458e-3	3	NC	1	4300.126	15
470			min	-.003	2	-.088	3	-.066	3	-5.499e-3	4	NC	1	466.164	2
471		8	max	.002	3	0	5	.255	4	2.532e-3	3	NC	1	3535.401	15
472			min	-.003	2	-.103	3	-.074	3	-5.439e-3	4	NC	1	414.502	2
473		9	max	.002	3	.001	5	.291	4	2.607e-3	3	NC	1	3037.756	15
474			min	-.003	2	-.117	3	-.08	3	-5.378e-3	4	NC	1	380.295	2
475		10	max	.002	3	.001	5	.326	4	2.681e-3	3	NC	1	2710.799	15
476			min	-.004	2	-.132	3	-.085	3	-5.317e-3	4	NC	1	358.815	2
477		11	max	.002	3	.002	5	.359	4	2.755e-3	3	NC	1	2504.23	15
478			min	-.004	2	-.146	3	-.088	3	-5.333e-3	2	NC	1	347.759	2
479		12	max	.002	3	.002	5	.391	4	2.83e-3	3	NC	1	2393.138	15
480			min	-.005	2	-.16	3	-.088	3	-5.45e-3	2	NC	1	346.487	2
481		13	max	.002	3	.003	5	.421	4	2.904e-3	3	NC	1	2370.155	15
482			min	-.005	2	-.174	3	-.086	3	-5.567e-3	2	NC	1	355.947	2
483		14	max	.002	3	.003	5	.449	4	2.979e-3	3	NC	1	2445.511	15
484			min	-.005	2	-.188	3	-.081	3	-5.683e-3	2	NC	1	379.332	2
485		15	max	.003	3	.003	5	.474	4	3.053e-3	3	NC	1	2657.339	15
486			min	-.006	2	-.202	3	-.072	3	-5.8e-3	2	NC	1	424.213	2
487		16	max	.003	3	.004	5	.496	4	3.127e-3	3	NC	1	3109.384	15
488			min	-.006	2	-.216	3	-.06	3	-5.917e-3	2	NC	1	509.306	2
489		17	max	.003	3	.005	5	.514	4	3.202e-3	3	NC	1	4127.245	15
490			min	-.007	2	-.23	3	-.044	3	-6.034e-3	2	NC	1	691.832	2
491		18	max	.003	3	.005	5	.53	4	3.276e-3	3	NC	1	7358.123	15
492			min	-.007	2	-.244	3	-.024	3	-6.151e-3	2	NC	1	1259.401	2
493		19	max	.003	3	.006	5	.541	5	3.351e-3	3	NC	1	NC	1
494			min	-.007	2	-.258	3	-.018	1	-6.268e-3	2	NC	1	NC	1